

#619 - February 2024



Publication of the Northern California Contest Club





NCCC – 53 years of contesting excellence

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NCCC MEETING https://nccc.cc/meetings.html

Next ZOOM Meeting
Tue 13 Feb 2024 1800 PST
"Operating as a Rover

"Operating as a Rover Andrea Slack, K2EZ

President's Report

David West, KO6MGreeting Kbers!



Fantastic job in the last several contests! Of course, I am still anxiously awaiting the 10 m results but that is beside the point.

Thank you to Dave, WD6T, for filling in for VP/CC as Chris was at the TX5S DXpedition. I will say, I haven't followed expeditions much in the past, typically I can't get through, I forget to try, or I just don't have the bandwidth. This one was something

different for me and it shows the power of social media in our little section of the world. For instance, dx-world.net had posts both on their site and on social media nearly every day with updates about everything the team was doing. Next there were various slack or groups.io groups with updates direct from the TX5S members themselves with up to the minute information. Of course, it all culminated in the grapevine effect with Facebook and Reddit posts which then go viral. Everywhere one looked online there was TX5S information. (Kudos to their Social Media Manager!) Now add in the fact that with their Internet connection they were uploading logs instantly for some modes and extremely regularly for other modes and this might be what got me hooked on chasing them.

On one of their last nights after reading a slack conversation about how friends were logging them so easily, I decided to jump on the

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opportunity. They were on FT8, 40m at the time. Since it was FT8, I logged them almost instantly with no issue at all. In my excitement I posted it to the slack group and was met with cheering of course but John, NN6U, posted a snapshot of the Club Log page. "In the log" so to speak. It was there, at that moment, that I knew I needed more of them in my log. I found them on 80 m, then on 160 m. Each QSO sent me back to Club Log to see if I was in the log but also to see which operator had logged me. It became another highlight for me in the game. However, the game had to be paused, as it was nighttime and 10, 15, and 20 were not options. I woke up the next morning and before the coffee was even brewing, I was looking for them on 20m. Before I knew it, "In the log". Regretfully, I didn't catch them on 10, 12, 15, and 17.

Now, you're probably wondering where I'm going with this. I will say that there were several posts in various groups about experiences like mine. People getting caught up in sharing their experiences with logging TX5S. Those posts often expressed jubilee in being an ATNO (All Time New One for those not in the know, which I was not until sometime last year). Then the posts always lit up with excitement when the Club Log page was updated. All of this shows that Ham Radio can be a spectator event. With enough Internet connection, people will follow the action and converse. Humans love competition and they love bragging. Both being keys parts of a spectator sport. Sites like 3830scores.com, contestonlinescore.com, and ClubLog.org all help fuel our need for contesting being fun. Remember, some of us aren't in it for awards that we know we are never going to get because we aren't giant stations. Some of us do it for the instant gratification and the doing better than so and so. So as Bob Barker said, "post your scores live and update your clublogs and eqsls often." Okay, I know he didn't say that, but I say, "Do you part in building and keeping the excitement in our hobby." The next generation of contesters is really enjoying bringing today's technology into this hobby. I could go on, but I know I'm out of space....

Upcoming events:

- Lots of State QSO Parties. [see State QSO Party Club Challenge below]
- CQ WW RTTY WPX Contest 0000Z, Feb 10 to 2359Z, Feb 11
- ARRL Inter. DX Contest, CW 0000Z, Feb 17 to 2400Z, Feb 18
- North American QSO Party, RTTY 1800Z, Feb 24 to 0559Z, Feb 25
- ARRL Inter. DX Contest, SSB 0000Z, Mar 2 to 2400Z, Mar 3

KB!

State QSO Party Club Challenge

The new SQP Club Challenge competition will run concurrently with the 2024 SQP Challenge. The SQPCC scoring will be compiled from individual SQP Challenge entries into 3830scores.com which include a club name. The SQPCC will only include individuals who have qualified for the SQP Challenge. Start sharing the news with your contest club and rally the troops. SQPCC rules are now available on *this* website. The SQPCC club rankings/scores will be posted on our website frequently during the season. An announcement will be posted here and in the QSO Party groups io email forum when results are available.

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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: <u>David Jaffe</u>, WD6T Director: Bob Cox, <u>K3EST</u> Director: John Miller, K6MM

Director: Ed Radlo, AJ6V

Volunteers

Charter Member: Rusty Epps, <u>W6OAT</u> Awards Chair: Gary Johnson, <u>NA6O</u>

California QSO Party Chair: Dean Wood, N6DE

QSL Mgr [K6ZM]: vacant

QSL Mgr [K6CQP/N6CQP/W6CQP]: Dean Wood, N6DE

NAQP Teams: Fred Jensen, <u>K6DGW</u> NA CW Sprint Teams: Bob Vallio, <u>W6RGG</u>

NCCC Email Reflector Admin: Phil Verinsky, W6PK Worked All CA Counties Award: Fred Jensen, K6DGW

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

Home: 775.501.5488 Cell: 530.210.0778

VP/CC Report

Chris Tate, N6WM KBers @ Sea The Relation of Contesting and Dxpeditioning



One may think competitive radiosport operators would be a world apart from those amateurs who choose to venture to rare and exotic destinations to activate DXCC entities for the worldwide

ham community, but in fact some of the best operators on DXpeditions are contesters themselves. I'd like to talk a little bit about this and share my TX5S experience with you.

As I sit here aboard the fishing vessel Shogun, currently in heavy seas off the coast of Baja California enroute to its home port of San Diego, I reflect on the more than 113,000 qsos (public source – clublog) our team made on Clipperton Island last week. On this team are 5 NCCC members, Chris N6WM (me), Steve W1SRD, Walt N6XG, Andreas N6NU, and recent NCCC addition Paul N6PSE. Several of us have been though this experience before.

In my mind, there is no doubt that my time in the contest chair has contributed to my ability to operate and control the massive pile ups created by CQing from a rare entity as we did as TX5S. Years of pile up management, CW experience, and learning to operate SSB across cultural

and language barriers all contribute to preparation for this task. The adrenaline rush is more intense, but I still feel that superstation preparedness, and working as a team at N6RO, (let me repeat this one, being part of a contest multi op team) all made me an ideal candidate to occupy the DXpedition chair. That, combined with a bit of an adventurous spirit, former military experience, and general experience with the out doors really help close any gaps and allowed my to have a wonderful experience.

Being part of a club like the NCCC was key to making this a fun and fulfilling experience. Getting to destinations like this is arduous, and setting up and preparations are tiring and wear you down.. So when you are operating a pile up, getting a KB brings a feeling of warmth and fellowship, and I hope I was able to reciprocate that to as many of you as I could, handing KBs to fellow NCCC members on a fairly regular basis. It was great to work you all.

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Many contesters merge these two portions of our avocation (DXpeditioning and contesting). Folks like Ed Muns W0YK (P49X) from Aruba and Rich N6KT operating from PJ4, and others, like Dave WD6T or Denny KX7M who recently contested from 3B8 among many others, and myself included bring these fun aspects of our hobby together as well providing experience on both extremes.

As I was preparing to Join the Navy in 1985 as a 19 year old, my late father said words to me that resonated for the rest of my live. He said," Chris, your journey in life is just beginning. Seize the opportunity to go places, do things, experience things. Be willing to take a risk! Don't let those chances pass you by". I am grateful that I took that advice, and have experienced many things to the extremes that have helped me fulfill my dreams, from military service, travel, to Amateur radio, I feel that taking a risk every now and then, to do something special has made me a better Contester, DXpeditioneer, and most importantly a better human being. I encourage you all, if you able to consider taking that opportunity.. and help make your experience exciting and fulfilling.

Finally, it takes a team to support the home front during these sometimes protracted events. I, as a member of the board, and your VP/CC am grateful to my fellow board members for their support, in particular Dave, WD6T, who stepped in to keep the contest cheerleading candle burning, and of course our President Dave, KO6M, for working with us, to keep the club candle burning. Finally I want to again thank the NCCC membership for your support and understanding. These experiences are valuable and rare. I am grateful to you all for your support.

Our next contest is WPX RTTY, and it will occur just a few short days after my return to the United States, This is a fun contest that with a properly setup RTTY station can provide hours of fun and contest action. I hope as you read this many of you will be able to operate it, it is one of my favorites.

I wish you all a wonderful February, I hope all your stations fair well in the rough weather hitting Northern CA, and believe it or not, look forward to feeling that wind and rain on my face, as I return home after a month at sea.

73 es KB

Chris, N6WM

At The February Meeting by Andrea Slack, K2EZ



Andrea Slack, K2EZ has been licensed since 1980. Her introduction to amateur radio occurred at age 15 when her father invited her to attend an introductory session of a novice license class the local Amateur Radio club was hosting. She continued to attend with her father they both earned their licenses. For many years Andrea was primarily a CW op and she developed an early interest in experimenting with antennas. She has also dabbled in wide ranging aspects of amateur radio including DXing, contesting, satellites, digital communications,

traffic handling, RACES, VHF weak signal, FM and repeaters. Amateur radio has also been influential in Andrea's choice of career and has opened many doors and opportunities throughout the years. She currently works as an engineer doing mixed analog, digital and microprocessor controls. In recent years Andrea has discovered a passion for VHF roving and mobile ops. She has four national first place VHF contest wins as a Rover. Three as a limited rover and one in the more advance classic rover category. She currently holds the record for the most number of grids activated in a VHF contest and has set half a dozen division score records.

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Steve Merchant, K6AW SK



Steve passed away at Cottage Hospital in Santa Barbara after a brief illness. Steve was a longtime member of the Northern California Contest Club and served for many years on the board of the NCDXF (Northern California DX Foundation). He was very active with the N6RO team in Oakley, California and was a member of the HC8N team in the Galapagos Islands. He also operated from VK9LZ, HV4NAC, VP8ORK and others. He managed the NAQP SSB contest and CQ WPX contest. He was an active DXer and contester. <*K8CX*>

Steve's passing is very sad. Barb and I will greatly miss his presence as a partner in our lives. When we were traveling more, Steve used to mind our house and cats (and operate). He didn't think our kitchen knives were sharp enough, so he always brought his own set. When he worked for Nokia, as a contest ham it was no big deal for him to be up at 4:00 AM for a conference call from California to Finland and India. *Dave and Barb, W6NL & K6BL>*

Steve and I were close friends. Contests together off and on for 40 years. Molly and I will miss him. <*Steve, AC6T>*



K6AW was a key member of the Radio Oakley contesting team for more than three decades. He not only operated with our team, he contributed to the N6RO station by doing tower work, donating equipment and antennas, etc. He was active in many other areas of contesting and ham radio in general.



We are currently hanging contest plaques on a new interior wall in the station, and finding Steve's callsign on most of our multi operations recognitions/wins in major contests going back into the 1980's. I and other RO team members are spearheading a nomination of K6AW into the CQ Contest Hall of Fame. We're having a zoom meeting soon to compose the nomination for NCCC to submit. <*Ken*, *N6RO*>

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THE LUMBER YARD

Awards and Kudos for NCCC Members

Dave, KA6BIM

Northwest Division Winner for the 2022 Nov Sweepstakes Phone Northwest Division Winner for the 2023 RTTY RU Single OP Unlimited High Power 1st Place High Power Out of State for the 2023 Washington Salmon Run.

Jim, K6EI

The QST Dec 2023 Cover Plaque Award

"My Introduction to Parks on the Air"

Jim Peterson, K6EI, has won the QST Cover Plaque Award for his article detailing his POTA activation at the Point Cabrillo Light Station State Historic Park in Mendocino County.

Send news and photos of your achievements, honors, and recognition's to <u>The Lumberyard</u> and it will be part of the JUG archives at the Digital Library of Amateur Radio Communications, part of the WayBack Machine, said to last forever.

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Tube of the Month

Norm Wilson, N6JV

Visit the Tube Museum at n6jv.com

B



In 1921, the American Radio and Research Corporation (AMRAD), developed a cold cathode, half wave rectifier called the "S" tube for use in low power electrical devices. The next year, a former AMRAD employee named Charles Smith came up with a way to make home refrigerators. He was approached by a WWI veteran named Laurence Marshall, an engineer interested in starting a company to make them with Smith. Their new business became the American Appliance Company. Before any refrigerators were made, they realized that they

should switch over to products in the hot radio/communications industry. Smith was familiar with the S tube, so they successfully acquired the rights to it from AMRAD.



In 1925, the helium filled, full wave, B rectifier was announced. Business was good but another company claimed that they had the rights to the name American Appliance Company. After only a month in production, they had to change the name on the tubes and adopted "Raytheon MFG Company". The first B tubes were marked "Raytheon" following the popular trend to have catchy trade names like pliotron or kenotron. Raytheon caught on and the newly re-branded tubes were standard in many receiver AC power supplies. The B rectifier operated at voltages as high as 350 volts at 60 ma and was often referred to as the B-60. To compete with the new RCA rectifiers, the B was replaced by the BH rectifier that would handle 85 ma and was less costly to produce. It looked like a mushroom as seen in the third example.

Within two years of the first sale of the B tube, RCA decided to change the rules for radio makers and required only RCA tubes were to be used. Raytheon was about out of business and had to ally with Union Carbide to

produce receiving tubes labeled Eveready-Raytheon and also bought Acme-Delta Co., a maker of transformers and other auto and power equipment. In WWII, Raytheon demonstrated their ability to mass produce magnetrons and became one of the largest military contractors.



The first example is a B tube with the American Appliance Company name.

These were produced for about one month. The second example with slightly different construction is marked Raytheon MFG Company and was made in larger quantities. Early examples had only American Appliance Company printed on a paper label.

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Editor Notes



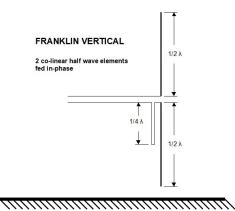
Welcome home to the TX5S crew! Chris was even able to prepare and forward his column while enroute home on a less than glassy sea. He sent it on CW through KPH on the Holy Frequency. The JUG is hoping for a spell-binding, first-person(s) account – it's OK to collaborate -- of a very successful expedition for a future issue.

As always, it seems, the JUG is in need of stories, technical comment, ideas, and the like and will be carefully checking the email inbox at least daily.

Historic Antennas

The Franklin Vertical

Requiring no radials or ground plane, and providing a very low angle of radiation, the Franklin Vertical was the target of some experimentation by a small number of AM Broadcast stations. In N. California, KNBC [now KNBR] experimented with a Franklin in the very late 40's despite being on 680 kHz making the vertical antenna very tall. KFBK [1530 kHz] in Sacramento built a directional Franklin array in the lower Sacramento Valley that is still in use. The higher frequency helps a lot but it is still a fairly large. The primary advantage of the Franklin, beyond not requiring a radial ground plane, is nearly zero near-field ground loss and an extremely low angle of radiation that minimizes multi-path interference between ground and sky waves at the edges of the station's coverage area. So, what's a Franklin Vertical?



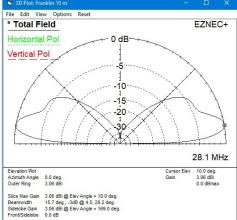
It's simply two ½ waves fed in-phase and is thus 1 wavelength tall [see diagram]. Low angle radiation and no radials are often desirable attributes for amateurs too, and some of our HF bands are high enough in frequency to make the antenna physically manageable. The illustration employs a series ¼ wave stub to get the two elements fed in-phase but there are a variety of methods available. The

impedance at the ends of a ½ wave element is very high, open-wire an odd multiple of ¼ wave long will get it into the range of coax balun.

The very low angle of radiation is apparent from the

NEC plot. Given the right pine tree, one could build a Franklin for 20m by hanging a wire from a high branch.

KFBK is also semi-famous for home-brewing a 50 kW "outphasing" transmitter which is still their stand-by. They sold the rights to RCA and the design became RCA's Ampliphase series. If that's not enough, KFBK was also the radio home of the late Rush Limbaugh in the 70's.



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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

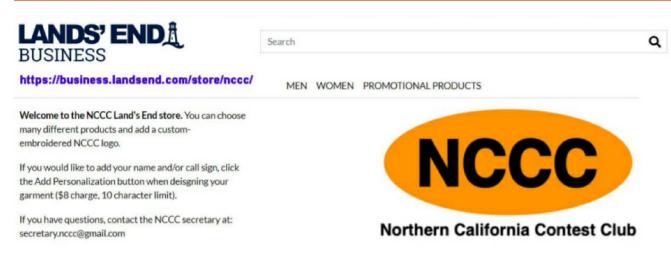
Find NCCC on Social Media

Facebook: "Northern California Contest Club"

Twitter: "NCCCKB"

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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.

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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 K35 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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 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-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-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-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-R8600 | Wideband SDR Receiver

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



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-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-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-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



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



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-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-V86 | VHF 7W HT

7W OutputPower Plus New Antenna Provides 1.5 Times More Coverage • More Audio, 1500 mW Audio Output • IP54 & ML-STD 8106-Regod Design Against Dust & Water • 19 Hours of Long Lasting Battery Life • 200 Memory Channels, 1 Call Channel & 6 Scan Edges



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IC-T10 | Rugged 144/430 MHz Dual Band

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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





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FTDX101MP | 200W HF/50MHz Transceiver

Hybrid SDR Configuration • Unparalleled 70 dB Max. Attenuation VC-Tune • New Generation Scope Display 30SS • ABI (Active Band Indicator) & MPVD (Multi-Purpose VFO Outer Dial) • PC Remote Control Software to Expand the Operating Range • Includes External Power With Maching Front Speaker



FTDX10 | HF/50MHz 100 W SDR Transceiver



FT-991A | HF/VHF/UHF All ModeTransceiver

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



FTDX101D | HF + 6M Transceiver

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



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

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



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

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



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

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



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

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



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

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



FTM-400XD | 2M/440 Mobile

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

FT-70DR C4FM/FM 144/430MHz Xcvr

 System Fusion Compatible • Large Front Speaker delivers 700 mW of Loud Audio Output
 Automatic Mode Select detects CAFM 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 wBuilt-in Bluetooth[©] Unit = Built-in High Precision GPS Antenna = 1200/9600bps APRS Data Communications = Supports Simultaneous C4FM Digital = Mizro SD Card Sixt

Mizro SD Card Sixt

FT-65R | 144/430 MHz Transceiver

Compact Commercial Grade Rugged Design • Large Front Speaker Delivers 1W of Powerful Clear Audio • SWatts 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-B110 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
- FAX All store locations

NEW CASTLE, DE (800) 644-4476

MAIL - All store locations

MILWAUKEE, WI WOODBRIDGE (800) 558-0411 (800) 444-4799

(800) 444-4799 SALEM, NH WINTER SPRINGS, FL (800) 327-1917

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