

# PAARAgraphs



The Official Newsletter of the

**Palo Alto Amateur Radio Association, Inc.**

The Friendliest Club Around

Celebrating 86 years as an *active* amateur radio club—*Since 1937*<http://www.paara.org/>

## Ham Radio and an Adventure Game

At Quartzfest 2023, inventors Jeri Ellsworth (AI6TK) and Amy Herndon (AI6ZU) showcased the Quartzfeng

*(Adventure Game — Continued on page 5)*

**This meeting will be a  
Hybrid Meeting  
Zoom and In Person**

Time: May 5, 2023 07:00 PM Pacific Time  
Please check <https://www.paara.org> for  
Zoom Details

## Upcoming Events

• May 5*** • June 2 • July 7	PAARA General Meeting, 7:00 PM *** Zoom and In Person Meeting
• May 17 • June 21 • July 19	Board Meeting, 7:00 PM. Everyone welcome! Zoom Meeting, eMail President for details!



## PAARA Establishes Equipment Loan Program

**Doug Teter, KG6LWE  
Ric Hulett, N6AJS**

Do you have a new or recent license upgrade? Are you interested in DX, SSB, international contesting? Are you concerned about the “thousand-dollar upgrade”? If so, PAARA has a program designed specifically for you!

Are you a ‘seasoned ham’, with experience to share? You should sign up as an ‘Elmer’ in support of this program!

PAARA, ‘the friendliest club around’ wants to encourage newer hams to get on the HF bands, and explore the many aspects of amateur radio. To that end, we have established an HF rig ‘loaner program’.

This program was proposed by Doug, KG6LWE. He and Ric, N6AJS have put the details into practice.

Any PAARA member can arrange to borrow a club-owned transceiver system for 6 months, at no cost. A written agreement and a \$150 deposit are required.

A new General or Amateur Extra may not be familiar with the equipment or the required set-

*(Loan Program — Continued on page 3)*

## President’s Corner

May 2023

What a busy month April turned into. We had a wonderful Home Brew meeting on April 7th! Thanks go to everyone that brought something to share. Participants included Henry, Connie, Larry, Christopher, Clark, Doug, Mikko, and myself. Congratulations go to Mikko, Henry, and Christopher for winning the awards for the best 3 projects. See Rob’s story in this issue for a bit more detail. It was also good to see some old and new faces at the meeting.

As announced at the meeting, Mikko, needs to pass the baton for bringing coffee and cookies

*(Pres — Continued on page 2)*



(Pres — Continued from page 1)

to every meeting. He's done a stellar job since he took over the position. No one came forward during the meeting to volunteer for this position. Until someone does, we'll not have any refreshments at meetings. As mentioned at the meeting, one person doesn't have to cover every meeting. A number of people can coordinate amongst themselves to cover all the meetings. Reach out to Mikko if you have any questions.

PAARA in the Park was next up. The weather couldn't have been nicer! About 35 people came out to enjoy a day of conversation, asking questions, and enjoying ham activities. There were a handful of new hams who came to get a better idea of what one can do with that new license and to learn more about the hobby. A big shout-out goes to Darryl for the antenna building project, Rob for cooking up some fine



Fig. 1 — Conversation and antenna building

food, and Doug and Darryl for bringing their radios and Hex Beam antennas out. Hams who came and built an antenna were; Vicky, N7HBJ, Lars, AJ6WF, Barry, AI6SG, David KN6GHE, and Sam, N5EFI. Congrats go to them for building their antennas and getting them tuned. I know they all learned a lot about the process and how to tune an antenna. Another shout-out goes to everyone that came out for some fun talking about radios, playing with them, getting

questions answered, and socializing. I hope everyone enjoyed the day! Stay tuned as we're



Fig. 2 — Another satisfied customer at the EFM likely to have another event later in the year.

PAARA in the Park was quickly followed by the 1st Flea Market (EFM) in a year. It was held at a

new venue with more space than last year's location and is now a Sunday event. A big shout-out goes to all the PAARA members who volunteered their time to support PAARA's sponsorship of the event. Make sure to thank everyone that helped. Volunteers included, in no particular order; Doug, KG6LWE, Darryl, KI6LDM, Keith, K1OKS, Ric, N6AJS, Rich,

(Pres — Continued on page 3)

*(Pres — Continued from page 2)*

W6APZ, Clark, KK6ISP, Frank, AF0XX, Karen, KK6NIA, Jeff, KA6UIX, Bob, KD6KYT, Rob, KC6TYD, and Harry, K4YR. If you helped during the EFM, apologies if I didn't capture your name but please feel good about assisting us with this important event. Without everyone's assistance, this event wouldn't be possible. We should also doubly recognize those members who supported both events as going above and beyond in helping the club be the friendliest club around! We should also thank ASVARO for procuring a new and very good site with lots of space for both sellers and buyers! If you missed it this month, the next EFM will be on Sunday, May 14th.

Did you know that 4/18/23 was International Radio Amateur Radio Day? I hope you knew this and managed to make a contact or two or do some other radio-related activity. As for me, I spent it drafting this column, preparing for the Board meeting as well as my trip to the IDXC convention.

Doug, KG6LWE, received a reply from the City of Menlo Park regarding obtaining the needed approval to have Field Day (FD) at Bidwell Bayfront Park for the first time in many years. The city determined that we didn't need to pay a fee in order to have the event! Thus, we will have FD this year at Bidwell Bayfront Park! The board decided to operate 2A this year to get the ball rolling before trying to bite off more than we can manage after not having it for so long. We need to have one or two antenna parties as none of the antennas, except for one, have been used in 3 years. Keep your eyes out for the dates of the antenna parties and consider helping. It's a great way to learn about the care and feeding of antennas, their assembly, and getting them up in the air. We'll also need lots of help the weekend of the event to set up, operate the radios during the event, and take down all the antennas and equipment. Ric, N6AJS, and Randy, K8TR will be the station captions this year. Please reach out to Doug to become part of the FD team. Please make sure to block out the weekend of June 23 ~ 25 for the event. More information will be forthcoming as we get closer to FD and our plans solidify.

I hope you have blocked out August 19th for the PAARA tour of Hiller Air Museum. If you haven't

been, it's a very interesting aviation museum that's right in our neck of the woods. You can learn about the museum at: <https://www.hiller.org/>. More information will be forthcoming as we get closer to the date.

I look forward to seeing a room full of smiling faces at the May 5th meeting. It will be an IRL and Zoom meeting.

73, Jim K6SV

Get on the air to keep the airwaves alive!

*(Pres — Continued on page 5)*

*(Loan Program — Continued from page 1)*

up. Each loan comes with an 'Elmer' as part of the package: A seasoned ham will assist with antenna selection, equipment setup and operation, and will give advice and support to put the station on the air, and making contacts.

## II. Equipment

The Loaner station is an Icom IC-7300, which was a gift from the estate of a Silent Key club



Fig. 1 — Icom IC-7300 Loaner Station

member. Also included are the Icom desk microphone, and a power supply.

## IV What you need to do

1. Get in touch with Doug or Ric (e-mail) to let us know you're interested. We will arrange contact with one of our club 'Elmers'. They will arrange a site visit to check out your QTH, and make suggestions for such things as antenna type and placement.
2. Build (or buy) and install an appropriate HF antenna.
3. Review the manual to familiarize yourself with the rig and its operation. Learn the bands and frequency limits that you are permitted, and that will work with your antenna.

*(Loan Program — Continued on page 4)*

(Loan Program — Continued from page 3)

4. Sign the agreement, pay the deposit and pick up the equipment.
5. Meet with your Elmer at your QTH to finalize the installation and get on the air!
6. Your Elmer will be available for questions and advice during the loan period.

Doug Teter, KG6LWE  
 Email dteter@wawi.com  
 650-743-7892

Ric Hulett, N6AJS  
 Email N6AJS@arri.net  
 408-332-4593a

We at PAARA are looking forward to putting this equipment in the hands of an eager new operator: This could be you! Contact us with an equipment request or any questions.

## Traveling PAARAsale Flea Market

### Rob Fenn, KC6TYD

For the second club meeting in a row, I brought a bunch of recently donated SK items. Most of which consisted of electronic components and misc. hardware. Jim, K6SV had picked up items from Vic Black's (AB6SO) estate, which took up another 2 tables. For the first half hour of meeting members and guests were allowed to rummage through the items and make purchases.

For me, the most interesting part was when an old relic was found and the subsequent stories about the item started.

I'll continue to bring what's left for future meeting. It appears items sell a lot faster when folks can see the items.



## Homebrew Night

### Rob Fenn, KC6TYD

A big thanks to the following participants that brought their projects to Homebrew Night during the April club meeting:

- Connie, W6EFI — Tips on HF wire connections.
- Clark, KK6ISP — Battery conversion for IC-215.
- Henry, W6REK — A new Network Boot Rom for a new Ethernet Card for an old 1980's Radio Shack Color Computer.
- Larry, K0YPC — 40-meter Wheatstone Bridge Regenerative (WBG) Receiver. A Switched Capacitor Audio Filter. A Balanced Line Tuner.
- Doug, KG6LWE — Unique KX3/Pandadapter setup.
- Christopher, AI6KG — DDF Antenna Array Switching System.
- Jim, K6SV — Business band go box for King of the Hammers off road race.
- Mikko, AB6RF — Custom Bluetooth interface for IC-705 and 2.5GHz

All entries were very interesting and informative. With help from the audience three winners won Home Depot gift cards for the most creative projects.

Those winners were Mikko, \$60; Henry, \$40; and Christopher, \$20.



Left to Right: Mikko, Henry and Christopher

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Fig. 3 — Discussions at PAARA in the Park

(Adventure Game — Continued from page 1)

2023 project, an electronic badge, designed to gamify Ham radio, that combined ham radio, GPS, APRS, an OLED display, and a Raspberry Pi Pico processor. This device allowed users to participate in a text-based fantasy adventure with monsters and dragons while exploring the campsite.

The badge connected to a base station and computer, transmitting GPS data via APRS to position users in the campground. As players moved around the campsite, their in-game locations updated. The APRS system facilitated communication between the badge and server, enabling multiple users to collaborate in real-time to defeat virtual foes.

An additional feature of the gameplay was the use of text-to-speech technolo-

gy, which narrated the gameplay to users as they received updates from the server. This added a deeper level of immersion for the users.

The project also taught practical ham radio skills through immersive gameplay. As players used the badge's radio transceiver, they gained hands-on experience with radio operation and network communication.

The Quartzfest 2023 badge made Quartzfest enjoyable by blending engaging gameplay with valuable ham radio education, promoting teamwork, friendship, and skill development in a shared adventure.

Jeri and Amy will share details about how they created the badge and the lessons learned.

You won't want to miss this!

### April 2023 Board Meeting Minutes

Present were President Jim Thielemann K6SV, Vice President Rob Fenn KC6TYD, Secretary Ric Hulett N6AJS, Directors Doug Teter KG6LWE, Joel Wilhite KD6W, and Walt Gyger K6WGY. Also present was Clark Martin KK6ISP. A quorum was present.

**President's Report:** PAARA in the Park was a great success. We had 35 visitors, a few new hams, and gained 3 new members. Darryl's KI6LDM antenna build project was very well received. We saw some vintage club members. We look forward to doing another one. We can improve our publicity on these meets.

**Thanks to everyone who participated in the April Electronic Flea Market:** We had a successful sponsorship, the first in 3 years for PAARA. We received a congratulatory e-mail from Mikel KN6QI (ASVARO) thanking PAARA for their support.

**Secretary's Report:** The April postcards brought a few more renewals, and some new hams have joined:

Welcome to Sameer N5EIF, David KN6GHE, Lars AJ6WF, and Barry AJ6SG. Our total membership is now 141.

**Treasurer's Report:** Field trip to the Hiller Air Museum: We have reserved August 19 with the museum. We will need to advise them of how many visitors to expect. Rob will put together a flyer, and start promoting on the nets.

**VP / Program Chair Report:** Congratulations to the club on their support of PAARA in the Park, and the EFM. Next month's guest speakers are Jeri Ellsworth AI6TK and Amy Hearn AI6ZU: They will show us a new item they have created that combines ham radio and a fun adventure game.

We have speakers lined up for April, May, and June.

The April meeting Homebrew Night had some interesting late additions. We had 30 members at the in-person meeting.

**Radio Sales:** Nothing has sold since the meeting in April. We have received \$1200 from sales of club radios and donated SK equipment. Our highlighted item for sale is the FT-991 from the estate of Vic Black AB6SO (SK). See the PAARA website for details.

### Old Business

A key feature of PAARA is our newsletter, PAARAgaphs: And a key feature of PAARAgaphs is

member-written articles. You can be a published author: Write up a note or article describing your ham experiences for PAARAgaphs and submit to Jim K6SV: See you name in print! Buy five copies for your mother!

Our accountant has the books up to date. We are getting close to having all the requested reports for the California DOJ regarding the raffle filing.

**ARRL Field Day:** The Field day event is 10 weeks away. We will begin preparation: planning antennas, stations, et cetera. We have received confirmation from Menlo Park: We will not have to apply for a special event permit for Bedwell Park. Fees for park use are also waived.

Field day will be at Bedwell Bayfront Park this year. We will operate class 2A (plus a GOTA station).

propose 40m beam, wire for 80m. Doug KG6LWE will set up antenna work day(s).

We need a club member to take on food for Field Day.

**Status of New Ham e-mails:** Rob KC6TYD is working on some graphics and text. This will be a postcard size message, conveying: 'congrats... what's next?'

### New Business

**PAARA needs some volunteers to step up:** Open posts include:

1. Refreshments (Coffee / snacks) for the club meetings
2. QSL manager for the club call signs
3. Monday Night Net manager for one week during the month.

Contact any board member to sign up.

**Electronic Flea Market report:** The PAARA EFM was a success! Everybody liked the new venue. We netted about \$2500 to the club after the event fee, food and supplies.

**The Internet Archive has a ham-radio section:** The Digital Library of Amateur Radio and Communications. (<https://archive.org/details/dlarc>). They have requested to archive and publish the PAARAgaphs newsletter on their site. The board voted to approve this request.

Pacificon is 6 months away, from October 20 to 22. Mikko AB6RF will sponsor W1AW/6 operation, if the call sign is available.

The meeting was adjourned at 8:20 pm

Respectfully submitted,

Ric Hulett N6AJS  
 PAARA Secretary

## Palo Alto Amateur Radio Association, Inc.

PO Box 911 Menlo Park, CA 94026

### Officers

President .....	Jim Thielemann, K6SV	408-839-6815
	thielem@pacbell.net	
Vice President.....	Rob Fenn, KC6TYD	650-888-9060
	kc6tyd@gmail.com	
Secretary.....	Ric Hulett, N6AJS	408-332-4593
	N6AJS@arrl.net	
Treasurer .....	Bob Korte, KD6KYT	650-522-0110
	bob@rgktechsales.com	

### Directors

Director ('23-'24) .....	Joel Wilhite, KD6W	408-839-5948
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Director ('23) .....	Doug Teter, KG6LWE	650-743-7892
	dteter@wcwi.com	
Director ('23) .....	Darryl Presley, KI6LDM	650-255-2454
	ki6ldm@arrl.net	

### Appointed Positions

Membership .....	Ric Hulett, N6AJS	408-332-4593
	N6AJS@arrl.net	
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	N6AJS@arrl.net	
Station Trustee W6OTX, W6ARA.....	Gerry Tucker, N6NV	
Station Trustee K6YQT	Doug Teter, KG6LWE	650-743-7892
Station Trustee K6OTA	Ron Chester, W6AZ	
Property Manager .....	Doug Teter, KG6LWE	
Badge Coordinator.....	Doug Teter, KG6LWE	650-743-7892
	dteter@wcwi.com	
Historian Position .....	<i>Position Vacant</i>	
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	Shrikumar, KA6Q	
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Field Day Coordinator.	Doug Teter, KG6LWE	650-743-7892
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	kk6isp@sonic.net	
Webmaster.....	Shrikumar, KA6Q	
	webaron@gmail.com	
Technical Coordinator.	Christopher, AI6KG	408-348-0304
	ch@murgatroid.com	
QSL Manager.....	Marty Wayne, W6NEV	408-234-8023
Speaker Coordinator...	Rob Fenn, KC6TYD	650-888-9060

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Member Profiles .....	<i>Position Vacant</i>	
Technical Tips.....	Ric Hulett, N6AJS	
Photographer .....	<i>Position Vacant</i>	

## VE Exams

De Anza Park, Sunnyvale, 2nd Saturday 10:30 am each month except November and December. See website for details and exceptions: <http://amateur-radio.org>

## Electronics Flea Market (ESM)

Sponsorship: Association of Silicon Valley Amateur Radio Organizations (ASVARO)  
 The Electronics Flea Market is seeking a new location. Until that is resolved, the EFM is on hold. Website: <http://www.electronicfleamarket.com/>

## PAARA — Palo Alto Amateur Radio Association

Meets 1<sup>st</sup> Friday 7:00pm each month at Room H-6, Cubberley Community Center; Net 145.230 - PL 100Hz Mondays at 8:30. See website at <http://www.paara.org>. For more information. contact: Joel Wilhite KD6W, [KD6W@ARRL.NET](mailto:KD6W@ARRL.NET), 650-325-8239

## FARS — Foothills Amateur Radio Society

Meets 4<sup>th</sup> Friday each month at 7:00pm at Covington School, Los Altos. Website: <http://www.fars.k6va.org>

## NCDXC — Northern California DX Club

Meets 3<sup>rd</sup> Thursday 7:00pm each month, Repeater for member info 147.360. Contact [president@ncdxc.org](mailto:president@ncdxc.org). Website: <http://ncdxc.org>. YouTube content: "The Northern California DX Club Official Channel". Cohost of the International DX Convention.

## The 50MHz & Up Group of Northern California

This organization specializes in vhf + wak signal and microwave activities. Meetings are held on the first Tuesday of each month. Time is usually 5pm for in person meetings, and 7pm for Zoom only meetings. In person meetings are held Sports Basement, 1177 Kern Ave, Sunnyvale. Always check the website, <http://50MhzandUp.org>, for correct information. Zoom information is also there.

## San Mateo Radio Club W6UQ.ORG

Meets, 3<sup>rd</sup> Friday, January through November.  
 Tuesdays & Thursdays, [Directed] Net, 7pm, N6ZX 145.370Hz, -600KHz, PL107.2Hz  
 Contact: [SanMateoRadioClub@gmail.com](mailto:SanMateoRadioClub@gmail.com), Website: <http://W6UQ.org/calendar>

## SPECS

### Southern Peninsula Emergency Communication System users Group

Meets each Monday 7:30pm and 8:00pm.  
 See: <https://specsnet.org/monday-night-net> for more info.  
 Contact: <https://www.specsnet.org/contact> or [board@specsnet.org](mailto:board@specsnet.org)

## SCARES

### South County Amateur Radio Emergency Service

Meets 3<sup>rd</sup> Thursday 7:30pm each month, Belmont EOC, Belmont City Hall, One Twin Pines Lane, Belmont CA 94002. Net is on 146.445 [PL 114.8] & 444.50 (PL-100) 7:30 Monday evenings. Contact: President Gary D. Aden, K6GDA 650-743-1265 (D), 650- 595-5590 (N)  
 Web: <http://k6mpn.org> E-mail: [pres@k6mpn.org](mailto:pres@k6mpn.org)

## SCCARA

### Santa Clara County Amateur Radio Association

Operates W6UU & W6UU/R, repeater 146.985-pl  
 Nets: 2m, 7:30pm Mon; 70cm, 10M (28.385) 8PM Thur.  
 Meets 2<sup>nd</sup> Mon each month @ 7:30 PM.  
 ARRL/VEC license testing contact 408-507-4698

## SVECS — Silicon Valley Emergency Communications

Operates AA6BT repeater (146.115 MHz+)  
 Website: <http://www.svecs.net> or contact: Lou Stierer WA6QYS 408 241 7999

## WVARA — West Valley Amateur Radio Association

W6PIY six-meter repeater on 52.58MHz. Normally, six-meters is linked with 147 and 223, while 441 and 1286 repeaters are linked.

VHF: 52.58 (-500) 151.4 ctcss	UHF:	
147.39 (+600) 151.4 ctcss		441.35 (+5.0) 88.5 ctcss
223.96 (+1.6) 156.7 ctcss		1286.20 (-12m) 100.0 ctcss

Meetings are 2nd Wednesday of every month except July, August and December.

Website: <http://wvara.org>. Contact: [info@wvara.org](mailto:info@wvara.org)

(Please send changes to [PAARAgaphs editor](mailto:PAARAgaphs editor))



### PAARA Weekly Radio Net

Info and Swap Session  
 every Monday evening at 8:30pm  
 on the N6NFI 145.230 MHz repeater

#### Week Control Operator

1 <sup>st</sup>	Doug - KG6LWE
2 <sup>nd</sup>	Doug - KG6LWE
3 <sup>rd</sup>	Ric - N6AJS
4 <sup>th</sup>	Rob - KC6TYD
5 <sup>th</sup>	Rob - KC6TYD

If you're interested in trying out at Net Control, Contact Doug, KG6LWE. It's good practice, and lots o' fun! Give it a try.

**Meeting Location — Middlefield Road  
 between San Antonio and Charleston in Palo  
 Alto. 4000 Middlefield Road**

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KJ6GUK General License, PAARA member

777 Woodside Rd., Suite B, Redwood City, CA 94061

**Email:** KARLDRESDEN@juno.com

### Palo Alto Amateur Radio Association P.O. Box 911, Menlo Park California 94026-0911

Club meetings are on the first Friday of each month,  
 7:00pm at the Room H-6, Cubberley Community Center.

Radio NET & Swap Session every Monday evening, at  
 8:30pm, on the 145.230 –600 MHz repeater, PL 100Hz.

Membership in PAARA is \$25.00 per calendar year,  
 which includes one subscription to PAARAgaphs  
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440 – 444.475 up 5 MHz	DMR
900 – 927.225 down 25 Mhz PL: 100Hz	On Line

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## PAARA Badges

Badges can be ordered through our website <https://www.paara.org/pages/members-current.html>.

Scroll to the bottom of the page and fill out the info. All badges will be mailed.

The cost for a badge is \$25.00.

### PAARAgaphs Ad Rates

PAARAgaphs accepts paid advertisements from non-members. (short personal ads remain free for members in good standing). All ad rates listed are per issue.

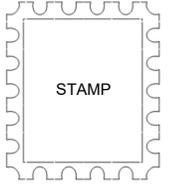
- Not-for-profit ads by association members for ham-related items and wants. No cost for business card-size ads (additional space at \$2.50 per business card size per issue).
- For Profit organizations and/or individuals: \$5-business card size, \$14.00-quarter page, \$25-half page, \$50 full page or back cover per issue.

These fees may be reduced or waived in exchange for a valuable consideration that is given to the Association or its general membership. Such consideration must be in addition to any existing arrangements with the association. The PAARAgaphs editors reserve the right to reject any ad deemed to be not in the best interest of the Association.

All fees payable in advance by the year with "scanner-ready" copy or text-only ads. Give payment and copy to **Walt Gyger, K6WGY**.

# PAARAgaphs — May 2023

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Palo Alto Amateur Radio Association, Inc.  
 PAARAgaphs Newsletter  
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**FTDX101MP | 200W HF/50MHz Transceiver**  
 • Hybrid SDR Configuration • Unparalleled 70 dB Max. Attenuation VC-Tune • New Generation Scope Display 30SSS • ABL (Active Band Indication) & MPVD (Multi-Purpose VFO Outer Dial) • PC Remote Control Software to Expand the Operating Range • Includes External Power With Matching Front Speaker



**FT-891 | HF-50 MHz All Mode Mobile Transceiver**  
 Rugged construction in an ultra compact body • Stable 100 Watt Output with Efficient Dual Internal Fans • 32-Bit IF DSP Provides Effective and Optimized QRM Rejection • 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-4000XD | 2W/40 Mobile**  
 • Color display-green, blue, orange, purple, gray • GPS/APRS • Packet 1200/9600 bit/s real • 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 Filtering Filters Produce Excellent Shape Factor • 5-Full-Color Touch Panel w/30 Spectrum Stream • High Speed Auto Antenna Tuner • Microphone Amplifier w/2-Stage Parametric Equalizer • Remote Operation w/optional LAN Unit (SD-LAN10)



**FTM-300DR | C4FM/FM 144/430MHz Dual Band**  
 • 50W Ballistic Output Power • Real Dual Band Operation (V-X, U-H, V-L, U-H) • 2-inch High-Res Full Color TFT Display • Band Scope • Built-in Bluetooth • WIRES-X™ Portable Digital VoiceBand Mode with RH-200



**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 Audio and Switches Accordingly • Huge 1.05 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 Tracking Filter for enhanced performance • 3.5 inch Full Color TFT USB Capable • Internal Automatic Antenna Tuner • High Accuracy TCXO



**FT-2980N1 | Heavy-Duty 80W 2M FM Transceiver**  
 • Massive heatsink guarantees 80 watts of solid RF power • Loud 3 watts of audio output for noisy environments • Large 6 digit backlit LCD display for excellent visibility • 200 memory channels for serious users



**FT-65R | 144/430 MHz Transceiver**  
 Compact Commercial Grade Rugged Design • Large Front Speaker Delivers 1W of Powerful Clear Audio • 5 Watts of Reliable RF Power With- in a compact Body • 3.5-Hour Rapid Charge-In- cluded • 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 • Mounted in Multiple Positions • Supports Optional Bluetooth® Wireless Operation Using the SSM-BT10 or a Commercially Available Bluetooth® Headset



**FTDX101D | HF + 6M Transceiver**  
 • Narrow Band SDR & Direct Sampling SDR • Crystal Routing Filters Phenomenal Multi-Signal Receiving Characteristics • Un- parallelized - 70dB Maximum Attenuation VC-Tune • 15 Separate (HAM 10 + GEN 5) Powerful Band Pass Filters • New Generation Scope Displays 3-Dimensional Spectrum Stream



**FT-818ND | HF/6M/2M/440 All Mode Portable Xcvr**  
 • Ultra-Compact/Portable • Multi-Color Easy to See LCD • 208 Memory Channels/10 Memory Groups • Built-in Electronic Keyer • Internal Battery Operation Capability • Two Antenna Connectors • Built-in High Stability Oscillator <math>\pm 0.5\text{ ppm}</math>



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