2021 Field Day Results Are Here! | 63

QST

DIGITAL EDITION

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The Centenary of the Transatlantic Tests

A Celebration!

QST Reviews

WA3RNC TR-25 40/20-Meter CW Transceiver Kit

Eton Elite Executive Portable Receiver

MFJ-9232 Mini Loop Tuner

Win4IcomSuite Software

The Best of the Best

A Superb All-around Wide-Coverage Transceiver

FT-991A 100W

HF/50/144/430MHz TRANSCEIVER

- Includes HF through UHF with one Radio
- Supports SSB/CW/AM/FM and C4FM digital
- IF Roofing Filters produce Excellent Shape Factor
- IF DSP enables Superb Interference Rejection
- Built in Real-Time Spectrum Scope Display
- 3.5-inch TFT Color Touch Panel Display
- 100 Watts (2 Meter & 70 Centimeter: 50 Watts) of Solid Performance

* External Speaker SP-10: Optional

The New Standard High Performance SDR Transceiver

FTDX10 100W

HF/50MHz TRANSCEIVER

* External Speaker SP-30: Optional

- Hybrid SDR Receiver (Narrow Band SDR & Direct Sampling SDR)
- 9MHz Down Conversion Receiver Configuration
- IF Roofing Filters produce Excellent Shape Factor
- IF DSP enables Superb Interference Rejection
- 5-inch TFT Color Touch Panel with 3DSS*1 Visual Display
- Superior Operating Performance by means of the MPVD*3

The World Leading HF Transceiver with Hybrid SDR

In Homage to the Founder of Yaesu – Sako Hasegawa JA1MP

FTDX101MP 200W

HF/50MHz TRANSCEIVER

The Ultimate

FTDX101D 100W

HF/50MHz TRANSCEIVER

- Dual Hybrid SDR Receivers (Narrow Band SDR & Direct Sampling SDR)
- 9MHz Down Conversion Receiver Configuration
- IF Roofing Filters produce Excellent Shape Factor
- VC-Tune (Variable Capacitor Tuning) Signal Peaking
- IF DSP enables Superb Interference Rejection
- 7-inch TFT Color Touch Panel with 3DSS*1 Visual Display
- Superior Operating Performance by means of ABI*2 & MPVD*3

* Microphone M-1: Optional

* Photo shows the FTDX101MP

*1 3DSS: 3-Dimensional Spectrum Stream *2 ABI: Active Band Indicator *3 MPVD: Multi-Purpose VFO Outer Dial

YAESU The radio

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The Best of the Best
Narrow Band SDR Transceiver

FTDX10

Unrivaled RF Performance
Narrow Band SDR Technology is the Revolution

Inheriting the performance of the FTDX101, which is validated to exceed HF transceivers in laboratories around the world.

The most advanced digital narrow band SDR technology is combined with the RF Front-End engineering, such as the low noise-figure RF amplifier and the very sharp shape factor roofing filter designs that Yaesu has incorporated over the years, resulting in unsurpassed HF receiver performance.

Equipped with the latest MPVD feature, and 3DSS visual display to deliver superior Operability and Visibility.

A New Legend in HF Transceivers debuts

HF/50MHz TRANSCEIVER

FTDX10 100W

- The image is shown with an optional third party external display that may be connected using a DVI-D digital cable.
- Shown with Optional External Speaker SP-30.

YAESU
The radio

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MA-6B 6-Band Beam

Small Footprint -- Big Signal

2-Elements on 20/17/15/12/10/6 Meters!!!

Cushcraft's latest MA-6B gives you *2-elements on six bands!* You get solid *signal-boosting directivity* in a bantam-size and weight.

It mounts on your roof or mast using standard TV hardware. It's perfect for exploring exciting DX without the high cost and heavy lifting of installing a large tower and a full-sized array. Its 7 foot 3-inch boom has less than 9 feet of turning radius. Contest tough -- handles 1500 Watts.

The unique MA-6B is a *two-element Yagi* on 20/17/15/12/10/6 Meters. It delivers solid power-multiplying gain over a dipole on *all* bands. You get automatic band switching and a super easy installation in a compact 26-pound package.

When working DX, what really matters are the interfering signals and noise you *don't hear*. That's where the MA-6B's impressive side rejection and front-to-back ratio really shines.

MA-5B, $599.95. Like MA-6B but five bands: 20/17/15/12/10 Meters. 12 and 17 Meters is a single element trapped dipole. ***See cushcraftamateur.com*** *for gain figures.*

Cushcraft 10, 15 & 20 Meter Tribander Beams

Only the best tri-band antennas become DX classics, which is why the Cushcraft World-Ranger A4S, A3S, and A3WS go to the head of the class. For more than 30 years, these pace-setting performers have taken on the world's most demanding operating conditions and proven themselves every time. The key to success comes from attention to basics. For example, element length and spacing has been carefully refined over time, and high-power traps are still hand-made and individually tuned using laboratory-grade instruments. All this attention to detail means low SWR, wide bandwidth, optimum directivity, and high efficiency -- important performance characteristics you rely on to maintain regular schedules, rack up impressive contest scores, and grow your collection of rare QSLs!

It goes without saying that the World-Ranger lineup is also famous for its rugged construction. In fact, the majority of these antennas sold years ago are still in service today! Conservative mechanical design, rugged over-sized components, stainless-steel hardware, and aircraft-grade 6063 make all the difference.

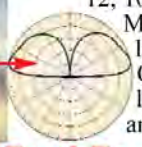
The 3-element A3S/A3WS and 4-element A4S are world-famous for powerhouse gain and super performance. **A-3WS, $569.95,** 12/17 M. **30/40 Meter** *add-on kits* available.

Cushcraft R9 . . . *80-6 Meters* *80 Meters . . . No Radials . . . 1500W*

Cushcraft's world famous R8 now has a big brother!

Big Brother R9 now includes 75/80 Meters for local ragchewing and worldwide low band DX *without radials*!

It's omni-directional low angle radiation gives you exciting and easy DX on all 9 bands: 75/80, 40, 30, 20, 17, 15, 12, 10 and 6 Meters with low SWR. QSY instantly -- no antenna tuner needed.



Use full *1500 Watts* SSB/CW when the going gets tough to break through pileups/poor band conditions.

R9 is super easy to assemble, installs just about anywhere, and its low profile blends inconspicuously into the background in urban and country settings alike.

Compact Footprint: Installs in an area about the size of a child's sandbox -- no ground radials to bury with all RF-energized surfaces safely out of reach.

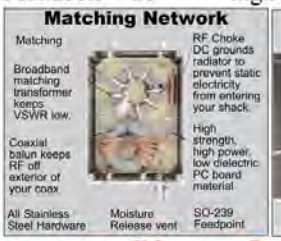
Rugged Construction: Thick fiberglass insulators, all-stainless steel hardware and 6063 aircraft-aluminum tubing is double or triple walled at key stress points to handle anything Mother Nature can dish out.

31.5 feet tall, 25 lbs. Mounting mast 1.25 to 2 in. Wind surface is 4 square feet.

R8, $619.95. Like R9, less 75/80 M.

R-8TB, $109.95. Lets you tilt your antenna up/down easily by yourself to work.

R-8GK, $89.95. Three-point guy kit for high winds.



Cushcraft Dual Band Yagis

One Yagi for Dual-Band FM Radios

Dual-bander VHF rigs are the norm these days, so why not compliment your FM base station with a dual-band Yagi? Not only will you eliminate a costly feed line, you'll realize extra gain for digital modes like high-speed packet and D-Star! Cushcraft's A270-6S provides three elements per band and the A270-10S provides five for solid point-to-point performance. They're both pre-tuned and assembly is a snap using the fully illustrated manual.

Cushcraft Famous *Ringos* Compact FM Verticals

W1BX's famous *Ringo* antenna has been around for a long time and remains unbeaten for solid reliability. The Ringo is broad-banded, lighting protected, extremely rugged, economical, electrically bullet-proof, low-angle, and more -- but mainly, it just plain works! To discover why hams and commercial two-way installers around the world still love this antenna, order yours now!

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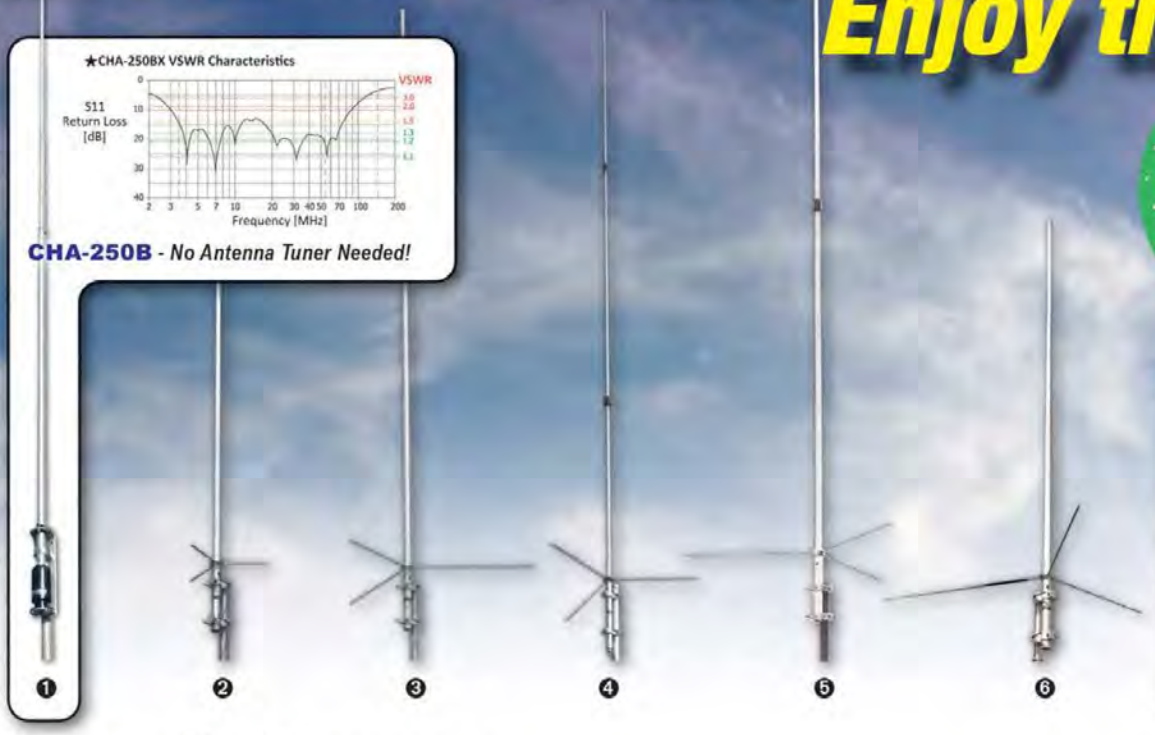
CHA-250B - *No Antenna Tuner Needed!*



CTC-50M *Window Gap Jumper*
No more drilling or open windows!

Base Antennas

❶ COMET CHA-250B BROADBAND 80M THROUGH 6M VERTICAL ANTENNA
A newly designed broadband vertical with NO GROUND RADIALS. EXTREMELY easy to assemble, requires no tuning or adjustments and VSWR is under 1.5:1 from 3.5-57MHz! • TX: 3.5MHz – 57MHz • RX: 2.0– 90MHz • VSWR is 1.5:1 or less, continuous • Max Power: 250W SSB/125W FM• Impedance: 50 Ohm • Length: 23' 5" • Weight: 7 lbs. 1 oz. • Conn: SO-239 • Mast Req'd: 1" – 2" dia. • Max wind speed: 67MPH

❷ COMET GP-3 DUAL-BAND 146/446MHZ BASE REPEATER ANTENNA
Wavelength: 146MHz 6/8 wave • 446MHz 5/8 wave x 3 • Max Pwr: 200W • Length: 5'11"• Weight: 2lbs. 9ozs. • Conn: Gold-plated SO-239 • Construction: Single-piece fiberglass

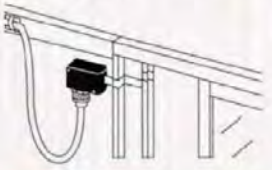
❸ COMET GP-6 DUAL-BAND 146/446MHZ BASE REPEATER ANTENNA
Wavelength: 146MHz 5/8 wave x 2 • 446MHz 5/8 wave x 5 • Max Pwr: 200W • Length: 10'2"• Weight: 3lbs. 8ozs. • Conn: Gold-plated SO-239 • Construction: Fiberglass, 2 Sections

❹ COMET GP-9 / GP-9N DUAL-BAND 146/446MHZ BASE REPEATER ANTENNA
BEST SELLER! • Wavelength: 146MHz 5/8 wave x 3 • 446MHz 5/8 wave x 8 • Max Pwr: 200W• Length: 16' 9"" • Weight: 5lbs. 11ozs. • Conn: GP-9 Gold-plated SO-239 • GP-9N Gold-plated N-type female • Construction: Fiberglass, 3 Sections

❺ COMET CX-333 TRI-BAND 146/220/446MHZ BASE REPEATER ANTENNA
Wavelength: 146MHz 5/8 wave x 2 • 220MHz 5/8 wave x 3• 446MHz 5/8 wave x 5 • Max Pwr: 120W • Length: 10'2" • Weight: 3lbs. 1oz • Conn: Gold-plated SO-239 • Construction: Fiberglass, 2 Sections

❻ COMET GP-15 TRI-BAND 52/146/446MHZ BASE REPEATER ANTENNA
Wavelength: 52MHz 5/8 wave • 146MHz 5/8 wave x 2 • 446MHz 5/8 wave x 4 • Max Pwr: 150W • Length: 7'11" • Weight: 3lbs. 1oz. • Conn: Gold-plated SO-239• 2MHz band-width after tuning (6M) • Construction: Single-piece fiberglass

❼ COMET CTC-50M WINDOW GAP JUMPER
Avoid drilling holes or leaving windows open/unlocked. Flat coax easily forms to window frame. Low loss SO-239 on each end, 15 inch length.
• Max Pwr: **HF** 100W PEP / **VHF** 60W FM / **UHF** 40W FM / **900-1300 MHz** 10W FM



CAA-500MarkII
1.8-500MHz Antenna analyzer

The CAA-500MarkII combines the simplicity and accuracy of an analog instrument, PLUS...a full color LCD graphic display • Resistive (R) and Reactive (X) components of impedance graphed and displayed numerically • SWR readings in both graphic and numerical results.

Operates on 8-16VDC external power, 6 AA Alkaline or NiMH rechargeable cells • Trickle charger built in (only when using NiMH batteries) • Typical battery life: 9 hours of continuous operation • Battery level indicator • Selectable auto power-off time limit preserves battery capacity • SO-239 connector for 1.8-300MHz range • N-female connector for 300-500MHz range

The perfect combination of analog and graphic information, designed in particular for antenna diagnostics and adjustments while on the roof, tower or in the field!

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Protect your CAA-500MarkII from moisture, shock, dents and dings!
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Write for *QST*

www.arrl.org/qst-author-guide
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Our Cover
This month, we celebrate the centenary of the Transatlantic Tests, the December 1921 technological feat that proved amateur radio signals could be heard across the Atlantic Ocean. Station 1BCG in Greenwich, Connecticut was the first of several stations heard in Ardrossan, Scotland by Paul Godley, 2ZE, ARRL's handpicked envoy. The hat depicted on the cover — it's the left and right sides of one hat — was the prize won in a bet about the success of the Transatlantic Tests. Learn more about the bet in "A Wager Won, An Ocean Spanned," in this issue. Ham radio's celebration of this 100-year milestone will extend into 2022! Read more about what's to come in "Celebrate the Transatlantic Tests with ARRL and RSGB." [Chris Zajac photos]

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DIAMOND ANTENNAS help you get the most out of your on-air experience.

For all your base station and repeater needs, DIAMOND has an antenna that will work for you.

You've tried the rest, now own the best!

Here is a small sample of our wide variety of antennas

Model	Bands	Length Ft.	Max Pwr. Rating	Conn.
Dualband Base Station/Repeater Antennas				
X700HNA (4 section)	2m/70cm	24	200	N
X510HD (3 Section)	2m/70cm	17.2	330/250	UHF or N
X300A (2 Section)	2m/70cm	10	200	UHF or N
X200A (2 Section)	2m/70cm	8.3	200	UHF
X50A (1 Section)	2m/70cm	5.6	200	UHF or N
X30A (1 Section)	2m/70cm	4.5	150	UHF
Monoband Base Station/Repeater Antennas				
F23H (3 Section)	144-174 MHz (W/ Cut Chart)	15	350	UHF
F22A (2 Section)	2m	10.5	200	UHF
CP22E (Aluminum)	2m	8.9	200	UHF
F718A (Coax Element)	70cm	15	250	N
Dualband Mobile Antennas				
SG7900A	2m/70cm	62.2 in.	150	UHF or NMO
SG7500A	2m/70cm	40.6 in.	150	UHF or NMO
NR770H Series	2m/70cm	38.2 in.	200	UHF or NMO
MR77 Series	2m/70cm	20 in.	70	Mag Combo
AZ504FXH	2m/70cm	15.5 in.	50	UHF
AZ504SP	2m/70cm	15.5 in.	50	UHF
NR7900A	2m/70cm	57 in.	300/250	UHF
Monoband Mobile Antennas				
NR22L	2m	96.8 in.	100	UHF
M285	2m	52.4 in.	200	UHF or NMO

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David A. Minster, NA2AA, ARRL Chief Executive Officer, na2aa@arrl.org

Second Century

One Year Down…The Future To Go!

What an amazing first year it has been, serving you as ARRL CEO. The time has flown by incredibly fast! I want to use this month's column to touch on three things of importance: giving thanks, reviewing progress, and looking to the future. Over the course of the many Zoom and in-person appearances I have made, it is has been wonderful answering member questions. This column will be a little longer than usual, so I hope you'll hang in there and get through all of it.

Here we are, just after your Thanksgiving celebration, and hopefully it was a joyful and healthy one. This is my favorite time of year: college football, autumn colors, the cooling of the air and the onset of winter, DX contests, and a time for family — for community — and to give thanks. I want to thank you for your membership in ARRL over the past year, and in particular thank our Life, Diamond Club, and Maxim Society Members. Even though we continue to struggle with the fears and mandates associated with COVID, our community feels as strong as ever. As hard and as diligently as we have worked for you over these past 12 months, we appreciate your interest, involvement, and commitment to ARRL. It is your kind words of support and the smartly constructed ideas that make our efforts feel rewarding.

I also want to thank our Board members and Officers. Our "first among peers," these volunteers spend a tremendous amount of their time working with you and with HQ to improve both ARRL and the hobby at large. We frequently ask the question, "Is this good for ham radio?" Every day, throughout the hobby, I find self-serving and arrogant behavior on the air and on social media that fails this test. This behavior regularly works against efforts to attract newcomers to our ranks, including more youth and women. We must use the lens of a living in a fishbowl to guide how we interact with each other if we have any hope of attracting new people to amateur radio. The Board members and managers at HQ know that everything we do must be intentional, deliberate, collaborative, and positive, to drive amateur radio forward. The support I have received from Board members this past year has been outstanding and has made learning the job, and doing the job, both easier and gratifying.

Before moving on, one thing I want to state clearly and unambiguously is that the notion of a "lack of transparency" is now yesterday's news. I have opened wide the doors to my office for the Board members. I go above and beyond to communicate what is happening at HQ and involve them, not from a micromanagement perspective, but rather one where they want to be involved in the good work that is going on. This has manifested in now monthly Executive Committee meetings where the CEO update is on the agenda every time. There are certain topics that are not for publication, such as some of our efforts in Washington DC, for obvious reasons, but when you see ARRL leadership at hamfests or conventions, questions about these topics are enthusiastically and clearly communicated.

When I came into HQ last year, my mission was clear. I needed to prepare ARRL for a transformation to the digital realm. We have a good news/bad news situation. The bad news is that we are so late to the game. The good news is that there have been many advances that we can now evaluate and pursue without having to develop them (and potentially fail at) using member dollars. In preparation for this journey through digital transformation, the first thing that jumped out at me was the culture of ARRL, both inside and outside HQ.

Collaboration was clearly lacking. Despite past efforts to combat this, the organization operated in a stovepiped way: You stay in your yard, and I'll stay in mine. This does not lead to the kind of thinking and ideas required to create digital products, and to move from a publisher's timeline to real time! As I explained to HQ staff in two different all-hands Zoom calls, "This is going to feel uncomfortable, and not everyone is going to want to go along for the ride." The change has been difficult for some who were embedded in thinking, "We've always done it this way, why do we have to change?" Unlike the Spanish conquistador Cortés, who burned his ships to give his crew the motivation and the clarity that change was non-negotiable, we at HQ are going through a change management process that includes understanding the "why" behind this transformation.

Outside of HQ, ARRL is a challenging environment. Leaders are not hired, they're elected. Volunteers are not managed, they are led. Does this mean the elected leaders are popular? Yes. Does this mean they are qualified to inspire and lead? Sometimes yes, sometimes no.

(Continued on page 30.)

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TH-7DX	**7**	**For Gain and F/B ratio–See...**		**1500**	**10, 15, 20**	**9.4**	**100**	**24**	**31**	**20**	**75**	**1.5-2.5**	**HAM-IV**	**$1099.95**
TH-5MK2	5			1500	10, 15, 20	7.4	100	19	31.5	18.42	57	1.5-2.5	HAM-IV	$899.95
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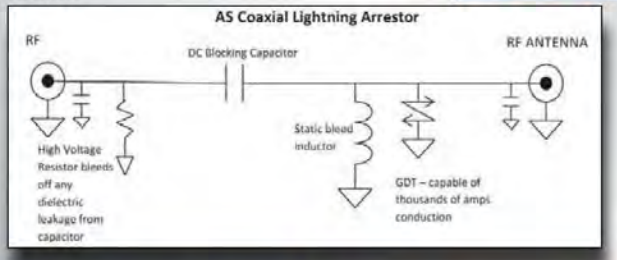

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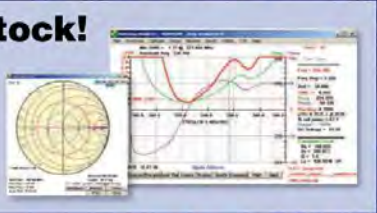

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Caroline Kenney, ckenney@arrl.org

Member Spotlight

Bill Meara, N2CQR

First licensed at 14 years old in 1973, Bill Meara, N2CQR, became interested in ham radio through the excitement of technical and scientific pursuits. Building his own equipment was what caught his attention, but forming connections within the ham radio community captured his spirit.

Homebrewing

Bill believes understanding the technical foundation of ham radio is a vital part of participating in the hobby, so homebrewing became Bill's passion. He has built many SSB transceivers and recently recreated his original radio station from 1973, including a Lafayette HA-600A receiver, a Heathkit DX-40, and a Globe VFO Deluxe.

Bill is also interested in QRP (low power) rigs, especially because of the homebrewing community of QRPers. The sense of community is one of Bill's favorite aspects of ham radio, and he remains connected by sharing his technical knowledge. Bill explained, "There is a special satisfaction that comes from putting on the air a rig that you have built yourself."

Bill said it's important for hams to fully understand the gear and how it works. "The key is to build something, to get started, and to become part of a worldwide group," Bill added.

Ham Radio Abroad

Early on, ham radio took a back seat in his life while he pursued a career as a Foreign Service officer.

During his assignment in the Dominican Republic in 1993, at the suggestion of his wife Elisa, he unpacked his original Drake 2-B and his Hallicrafters HT-37, both of which had "dutifully followed [him] around the world." Bill was inspired to get a Dominican license, get back on the air, and start homebrewing again.

Between 1996 and 2000, he was in the US, followed by 10 years overseas, staying in the Azores, London, and Rome. Bill said, "Being a ham and a homebrewer added a special dimension to these overseas experiences. I was able to connect with and relate to members of the local community in a special way."

A Global Community

In 2005, while living in London, Bill and his friend Mike Caughran, KL7R (SK), began the *SolderSmoke* podcast. Bill said, "From the beginning, the podcast has been about homebrew radio and about the global friendships that arise among people around the world who build radio gear amidst clouds of solder smoke."

The podcast serves as an inspiration, a collaboration, and a place to share what Bill calls *knack stories* — reminiscences of discovering ham radio young and how the interest in the technical aspects of the hobby have kept everyone active. Bill said these kinds of stories surpass geographical boundaries and connect everyone in the global community of hams.

Faced by the devastating death of Mike in 2007, Bill wasn't sure the podcast would continue, but he said, "Listeners wrote to me saying how much they missed it, and they asked me to continue. So I did."

In 2014, master homebrewer Pete Juliano, N6QW, was interviewed on the airwaves, and the episode was so successful, Bill asked him to stay involved as a new cohost. Pete is renowned for his technical skill and knowledge.

The podcast was born from the desire to create a global community, and Bill says it has been successful in that endeavor. *SolderSmoke* is probably the longest-running ham radio podcast, and Bill explained many of their listeners have been there since the beginning. Bill is also active on the associated blog (**soldersmoke.blogspot.com**), and a segment of the podcast is dedicated to answering listeners' questions. Bill emphasizes that "help and advice is usually just an email away."

Beyond Ham Radio

Bill retired from the Foreign Service in 2019 and has been pursuing technical and scientific interests. Besides the podcast and ham radio, Bill enjoys astronomy, and he even has a telescope set up for backyard stargazing. He also wrote several books based on his experiences abroad: *SolderSmoke: Global Adventures in Wireless Electronics* and *Us and Them*. Both are available on Amazon. For more information about Bill or the *SolderSmoke* podcast, visit **www.soldersmoke.blogspot.com**.

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ARRL is an incorporated, noncommercial association without capital stock chartered under the laws of the State of Connecticut, and is an exempt organization under Section 501(c)(3) of the Internal Revenue Code of 1986. Its affairs are governed by a Board of Directors, whose voting members are elected every 3 years by the general membership. The officers are elected or appointed by the Directors.

ARRL is noncommercial, and no one with a pervasive and continuing conflict of interest is eligible for membership on its Board.

"Of, by, and for the radio amateur," ARRL numbers within its ranks the vast majority of active amateurs in the nation and has a proud history of achievement as the standard-bearer in amateur affairs.

A *bona fide* interest in Amateur Radio is the only essential qualification of membership; an amateur radio license is not a prerequisite, although full voting membership is granted only to licensed amateurs in the US.

Membership inquiries and general correspondence should be addressed to the administrative headquarters: ARRL, 225 Main St., Newington, Connecticut 06111-1400 USA.

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The 15 Divisions of ARRL are arranged into 71 administrative *Sections*, each headed by an elected *Section Manager* (SM). Your Section Manager is the person to contact when you have news about your activities, or those of your radio club. If you need assistance with a local problem, your Section Manager is your first point of contact. He or she can put you in touch with various ARRL volunteers who can help (such as Technical Specialists).Your Section Manager is also the person to see if you'd like to become a Section volunteer. Whatever your license class, your SM has an appointment available. Visit your Section page at **www.arrl.org/sections**.

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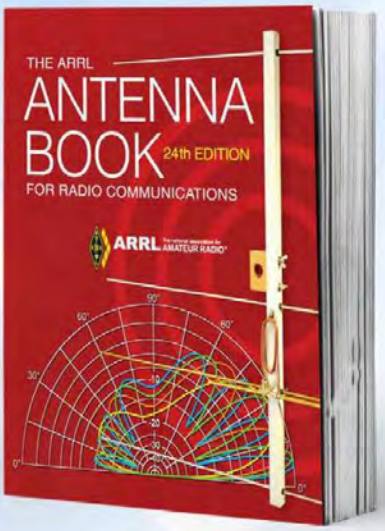

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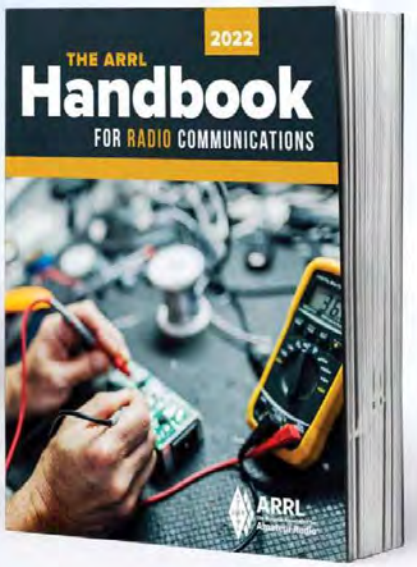

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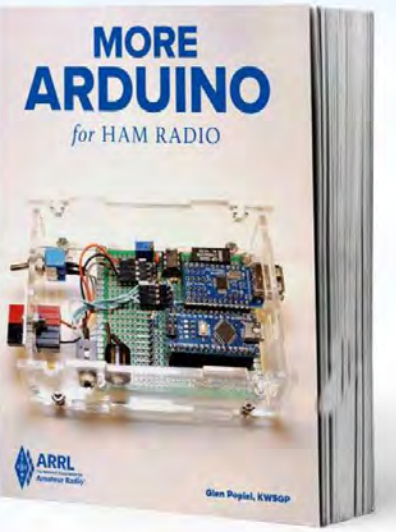

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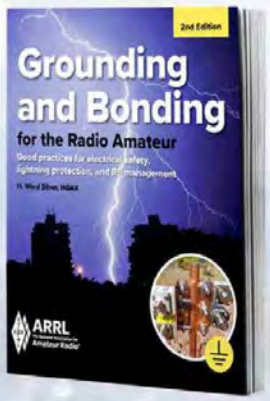

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Up Front

NARA's ARRL Field Day display beside Chuck Wagoner's, KØWAG, RV portable setup.

Success in Iowa for ARRL Field Day 2021

Newton Amateur Radio Association (NARA) set up an ARRL Field Day operation in Maytag Park in Newton, Iowa, using Chuck Wagoner's, KØWAG, RV as the operation center and two generators for the power source. They had several visitors, including Harrison Cool, an 11-year-old from Kansas, who got to make several contacts with the help of NARA members Brian Meeker, KEØRMA, and Chuck Miller, NØNC. Other visitors included Iowa House of Representatives Member Wes Breckenridge, Newton City Councilman Mark Hallam, four regulars from the local net, and a local restaurant owner.

11-year-old Harrison Cool after success on the air.

Michigan Backyard On the Air for ARRL Field Day

Karl Schwab, KO8S, has a large antenna farm in Michigan. Knowing this could be considered a luxury to some hams, especially those in HOA-restricted areas, he invited Mike Baker, K8MGB, to operate from his backyard. Karl connected Mike's equipment with his HF triband Yagi, tuned to the 20-meter band, and the signals started to come in. Mike was delighted by the chance to operate from such a well-equipped station. Karl was happy to help — and make a new radio friend.

Mike Baker, K8MGB, who lives in a HOA-restricted location, was given the opportunity to operate during 2021 ARRL Field Day from Karl Schwab's, KO8S, well-equipped station.

Karl Schwab, KO8S, has an antenna farm in Michigan, which consists of a 64-foot aluminum tower, stacked with multiple Yagi antennas to cover a wide spectrum of bands, including 440 MHz, and 2, 6, 10, 15, 20, and 160 meters.

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Correspondence

Letters from Our Members

Celebrating Inclusivity in *QST*

I was pleasantly surprised to see a young female operator on the cover of the October 2021 issue, and enjoyed reading the cover story, "The First-Ever Youth on the Air Summer Camp." As I turned the pages, I found more examples of excellent writing featuring inclusivity and diversity in amateur radio. The issue included things like a "Correspondence" letter supporting a struggling ham trying to make contacts and friends on the air, a "Member Spotlight" of a disabled ham who embraces amateur radio as therapy, and the article, "Grammy-Nominated Musician Raul Midón, AE3RM, Takes Radio on the Road," about a blind musician and ham.

Kudos to *QST* for walking the walk on inclusivity and diversity in amateur radio and ARRL. We need more of this!

Mary Duval, K1MTD
Andover, Connecticut
Life Member

A Plea for Paper QSLs

I have always looked forward to receiving paper QSLs in the mail. When I earned my Novice-class license in 1973, we would exchange our name and signal report using the R-S-T system (Readability-Signal Strength-Tone). Then, for the next 15 – 20 minutes we would send our addresses so we could exchange QSL cards. Most of the time, if you sent a self-addressed stamped envelope (SASE), you got a QSL back.

For over a year, I've been attempting to earn an eight-band Worked All States Award (WAS) using FT8. Many stations I contact show that they use Logbook of The World (LoTW), but I find that many hams don't follow through with their contact uploads.

I prefer confirming a contact the old-fashioned way, with a direct QSL and a SASE. While working on obtaining eight-band WAS, I've sent out dozens of SASEs trying to confirm contacts. Some were sent a year and a half ago, and I've still not received a return. Fewer than 35% of my SASEs receive a return confirmation.

If you get a QSL and a SASE, please respond. It may not be your method of choice, but there are some hams who still enjoy paper QSLs!

Shane Brady, WB2WPM
West Seneca, New York

A Memorable Antenna Mount

I was part of the event featured on the cover of the November 1971 issue shown in the September 2021 "A Look Back" column. The image shows a helicopter mounting a high-gain antenna on top of a 150-foot-high water tower.

The Northwest Florida FM Association, operators of the 2-meter FM repeater WB4KLT, wanted to mount this antenna at their repeater transmitting site in Fort Walton Beach, Florida. They had to use a helicopter because the antenna was too big to carry up the interior steps, and the city didn't want to scratch the paint on the tower by pulling it up.

This method of installation required two trips: one to carry the stainless-steel mounting bracket, and one to carry the antenna. The two-seat helicopter normally carried tourists on sightseeing flights, and charged $1 per minute for use. However, it was worth the expense to ensure a safe trip for the $200 antenna. It took three helicopter passes to get the 25-foot antenna in just the right position to be secured to its mounting bracket.

The antenna was mounted with the dipoles to the north so that the null fell over the Gulf of Mexico. When installing the antenna, there were three hams on top of the tower, one assisting the helicopter pilot, and three on the ground.

After 50 years, the water tower is still in place. Since then, it has been repainted and the antenna was removed. In 1981, our radio club upgraded the repeater to a single-site operation. The receiver for the original repeater was in Destin, while the transmitter was in Fort Walton Beach (about 6 miles away). This eliminated the high cost of a duplexer, but necessitated a 6-mile 440 MHz FM radio link. The link was effective, but required a lot of maintenance on tubes and mechanical relays. We shared the link frequency band with the US Navy, and sometimes a ship in the Gulf of Mexico would bring up the repeater with each sweep of their radar beam.

Eventually, the club bought a duplexer for the water tower site in Destin, where the repeater continues today. The frequency is 147.00, plus offset (147.60) and 100 Hz CTCSS tone. The call sign is W4RH/R, and I continue to monitor it 24 hours a day.

Four of the seven hams who were a part of the antenna mounting in 1971 are now Silent Keys: W4SMS, W4FDJ, WB4TPR, and W4WBW. I've done my best to stay in touch with WA7DVD and WB4EQU over the years, and hope they're both doing well.

Frank Butler, W4RH
Fort Walton Beach, Florida
Life Member

Send your letters to "Correspondence," ARRL, 225 Main St., Newington, CT 06111. You can also submit letters by fax at 860-594-0259, or via email to **letters@arrl.org**. We read every letter received, but we can only publish a few each month. We reserve the right to edit your letter for clarity, and to fit the available page space. Letters published in "Correspondence" may also appear in other ARRL media. The publishers of *QST* assume no responsibility for statements made by correspondents.

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Building a Crystal Radio Kit Changed My Life, and Now I'm Passing the Torch to The Next Generation!

By: Steve Buffa (5 Minute Read)

When I was younger, I spent a lot of time with my uncle in who was very much into analog electronics. I would especially look forward to the holiday season as I would typically spend the entire winter break with him and my grandmother. One night after he returned home from work, I remember him bringing home a mysterious box full of parts. I was intrigued to say the least!

When I asked him what was in the box, he said it's called a "Crystal Radio Kit". My mind raced with excitement and I couldn't wait to crack into the box and begin building whatever it was. What happened next changed my life forever!

When we finally finished building the kit, he put the earpiece into my ear, and began turning a dial on the unit. To my amazement I could hear someone's voice. I was stunned, where was this voice coming from? After all, there were no batteries, how could I be hearing anything? What he said next really blew my mind. He said, the voice and the power were coming from radio waves which were invisible to the naked eye.

Not only were those some of the best memories of my life, but from that moment forward, I knew I wanted to study everything I could about electronics. In fact, it led to a successful career as an electrical engineer. Now that I'm older and have nieces and nephews of my own, I knew that I wanted to pass this excitement and knowledge to the next generation. But how? Electronics today are far more complicated than they were when I was starting out decades ago.

After a bit of googling, I ran across something called Arduino. It's a super simple to use electronics platform which allows anyone to build some truly incredible projects. It's coded in a basic form of a language called C.

With the holiday's rapidly approaching, I wanted to get my hands on an Arduino based kit so that I could spend some quality time with my nephew and pass the torch to the next generation. Luckily, I keep all my past issues of QST magazine and happened to see a review of a product called the Dr.Duino Explorer which is an Arduino compatible kit.

After reading this review, I knew that this was exactly what I was looking for. It comes as a DIY style kit accompanied by a superb set of step-by-step online instructions that teach you about the Arduino as you build it. PLUS, for a limited time, when you order your own Explorer Edition from www.DoctorDuino.com, you'll even get access to an Arduino Boot Camp for FREE!

It's perfect for jump starting your Arduino journey, by teaching you what you can and can't do with Arduino, and ends with you creating your very own Morse code machine! I'd hurry though, because it looks like this is only available to the first 200 takers!

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As seen in QST Magazine January 2021
Page 48 Product Review Section

«The Dr.Duino Explorer Edition is a well-designed development, prototyping and troubleshooting platform»
Revied by Glen Popiel, KW5GP

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W1AW Schedule

PAC	MTN	CENT	EAST	UTC	MON	TUE	WED	THU	FRI
6 AM	7 AM	8 AM	9 AM	1400		FAST CODE	SLOW CODE	FAST CODE	SLOW CODE
7 AM-1 PM	8 AM-2 PM	9 AM-3 PM	10 AM-4 PM	1500-1700 1800-2045	VISITING OPERATOR TIME (12 PM-1 PM CLOSED FOR LUNCH)				
1 PM	2 PM	3 PM	4 PM	2100	FAST CODE	SLOW CODE	FAST CODE	SLOW CODE	FAST CODE
2 PM	3 PM	4 PM	5 PM	2200	CODE BULLETIN				
3 PM	4 PM	5 PM	6 PM	2300	DIGITAL BULLETIN				
4 PM	5 PM	6 PM	7 PM	0000	SLOW CODE	FAST CODE	SLOW CODE	FAST CODE	SLOW CODE
5 PM	6 PM	7 PM	8 PM	0100	CODE BULLETIN				
6 PM	7 PM	8 PM	9 PM	0200	DIGITAL BULLETIN				
6^{45} PM	7^{45} PM	8^{45} PM	9^{45} PM	0245	VOICE BULLETIN				
7 PM	8 PM	9 PM	10 PM	0300	FAST CODE	SLOW CODE	FAST CODE	SLOW CODE	FAST CODE
8 PM	9 PM	10 PM	11 PM	0400	CODE BULLETIN				

W1AW's schedule is at the same local time throughout the year. From the second Sunday in March to the first Sunday in November, UTC = Eastern US time + 4 hours. For the rest of the year, UTC = Eastern US time + 5 hours.

♦ Morse code transmissions: Frequencies are 1.8025, 3.5815, 7.0475, 14.0475, 18.0975, 21.0675, 28.0675, 50.350, and 147.555 MHz.

Slow Code = practice sent at 5, 7½, 10, 13, and 15 WPM.

Fast Code = practice sent at 35, 30, 25, 20, 15, 13, and 10 WPM.

Code bulletins are sent at 18 WPM.

For more information, visit us at
www.arrl.org/w1aw

♦ W1AW Qualifying Runs are sent on the same frequencies as the Morse code transmissions. West Coast qualifying runs are transmitted by various West Coast stations on CW frequencies that are normally used by W1AW, in addition to 3590 kHz, at various times. Underline 1 minute of the highest speed you copied, certify that your copy was made without aid, and send it to ARRL for grading. Please include your name, call sign (if any), and complete mailing address. Fees: $10 for a certificate, $7.50 for endorsements.

♦ Digital transmissions: Frequencies are 3.5975, 7.095, 14.095, 18.1025, 21.095, 28.095, 50.350, and 147.555 MHz.

Bulletins are sent using 45.45-baud Baudot, PSK31 in BPSK mode, and MFSK16 on a daily revolving schedule.

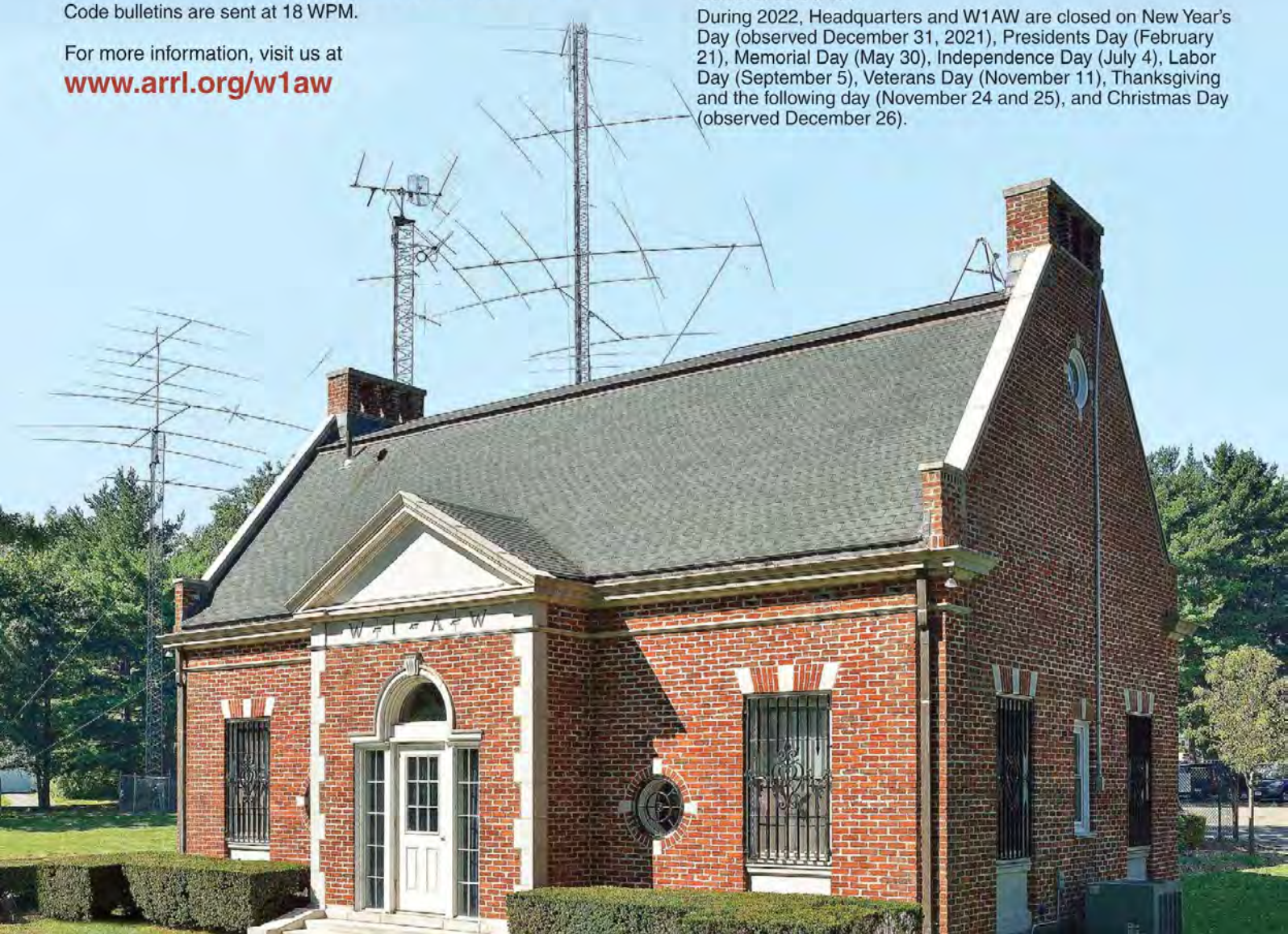
Keplerian elements for many amateur satellites will be sent on the regular digital frequencies on Tuesdays and Fridays at 6:30 PM Eastern time using Baudot and PSK31.

♦ Voice transmissions: Frequencies are 1.855, 3.99, 7.29, 14.29, 18.16, 21.39, 28.59, 50.350, and 147.555 MHz. Voice transmissions on 7.290 MHz are in AM double sideband, full carrier.

♦ Notes: On Fridays, UTC, a DX bulletin replaces the regular bulletins. W1AW is open to visitors 10 AM to noon and 1 PM to 3:45 PM Monday through Friday. FCC-licensed amateurs may operate the station during that time. Be sure to bring a reference copy of your current FCC amateur license. In a communication emergency, monitor W1AW for special bulletins as follows: voice on the hour, teleprinter at 15 minutes past the hour, and CW on the half hour.

W1AW code practice and CW/digital/phone bulletin transmission audio is also available real-time via the *EchoLink Conference Server* W1AWBDCT. The conference server runs concurrently with the regularly scheduled station transmissions. The W1AW Qualifying Run texts can also be copied via the EchoLink Conference Server.

During 2022, Headquarters and W1AW are closed on New Year's Day (observed December 31, 2021), Presidents Day (February 21), Memorial Day (May 30), Independence Day (July 4), Labor Day (September 5), Veterans Day (November 11), Thanksgiving and the following day (November 24 and 25), and Christmas Day (observed December 26).



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Second Century (Continued from page 9.)

The area that required immediate attention was Field Services. Our Section Managers and Affiliated Club Leaders had been left to their own devices for quite some time, leading some to even claim that clubs are dead. We were doing little-to-no development with these thousands of Field Service volunteers. We have changed that. The Board has established a new standing committee focused on both EmComm and Field Services, and we have hired a dedicated Field Services Manager, Mike Walters, W8ZY, who has jumped right in, developing relationships and communications with Section Managers, as well as working to revitalize clubs through new initiatives.

I went into last January's board meeting with great hope for three new initiatives. The first is creating a 5-year strategy for ARRL. I have not been able to devote the time necessary to this, but I am glad it turned out that way. What I have learned over the past year has shaped my perspective on not just where, but how ARRL needs to move forward strategically. Having a clearer vision will give me the ability to lead this strategic planning effort more successfully.

The second is a review of our development efforts. You won't be surprised to know that member dollars do not cover the ever-growing costs associated with the advocacy and operation of our association. Raising funds for specific initiatives, as well as more broadly for a general endowment fund, allows us to pursue the things that members — and, frankly, non-members too — take for granted. ARRL has always, and will always, be focused on the complex web of relationships that need to be cultivated for both advocacy and defense. We will also seek to fund big projects that will lead to improvement of the hobby from a technical and operational perspective. We are now seeking to hire a manager to take on fund raising on a larger scale, and with a background in both making and receiving grants.

The third initiative is called Project X. This is an effort to create an ecosystem for radiosport. It naturally would include electronic logs and confirmations found in Logbook of The World today, as well as awards. Our vision is to go beyond this, creating live uploading of contacts and the creation of new products for users. For example, it would be possible to create contests within contests through real-time logging and scoring, so that small groups of individuals or small teams could compete against each other, potentially using a different set of scoring rules, to move away from the publishing timeline to real-time gaming environments. Just ask a young ham: Do you want to know who won now, or wait a year to find out?

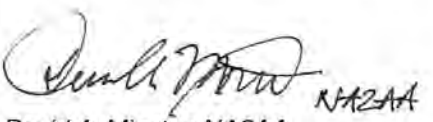
I had hoped to make more progress on this, but what makes LoTW great also hurts progress. The very people who should be involved with moving Project X forward are too embedded in the past, so I have had to find alternative resources to work with. These conversations have led to the view that open-source applications can sit on top of Project X to create innovative features with data that do not exist today. This is extremely exciting stuff.

Another ecosystem we are building is Learning & Licensing. We are taking our educational resources from YouTube to the ARRL Learning Network, on to the ARRL Learning Center, and harmonizing them with all of our licensing materials to create an environment where people can grow in the hobby. To that end, we worked with YouTube content creator Dave Casler, KEØOG, to come on board as a subject-matter expert and to allow ARRL to edit and host his licensing videos for all three exams.

We've also hired another YouTuber, Steve Goodgame, K5ATA, to run our Education and Learning area. Steve has been a successful teacher, finding ways to integrate ham radio into his curriculum, and licensing scores of youngsters as new hams. He also made sure every new licensee received their first radio. Steve will be taking his formula nationally. We've enjoyed continued success with our Collegiate Amateur Radio Initiative (CARI), where regular meetings with college and university ham radio clubs are conducted on Zoom. Our goal here is not to teach operating skills, but rather to instill in younger hams the passion for the hobby we felt as youngsters and letting them run with it — in their own ways — using today's standards.

As I look to the future, I've never seen a brighter horizon. Amateur radio equipment has never been more capable at the price points that are available today. The hobby has never been more diverse, from the perspectives of modes as well as people! Amateur radio is a global hobby and must be viewed from a global perspective. One only need see the IARU meetings and the initiatives ARRL is participating in to witness the diversity!

ARRL is more than an association. It is a community. We are so much more than the list of member benefits enumerated in *QST* every month. ARRL is structure. It is resilience and resolve. It is cooperation and collaboration. It is promotion and protection. Why isn't *every living licensed ham* in the United States an ARRL member? That's a great question. We need to be leaders, to be connectors, to be positive, and yes, even evangelical about amateur radio and ARRL. I wish you a wonderful holiday season. Be radio active, get involved with your local club, and help us grow ARRL for the future.



David A. Minster, NA2AA
Chief Executive Officer

Practical Solutions for an End-Fed 20-Meter Vertical

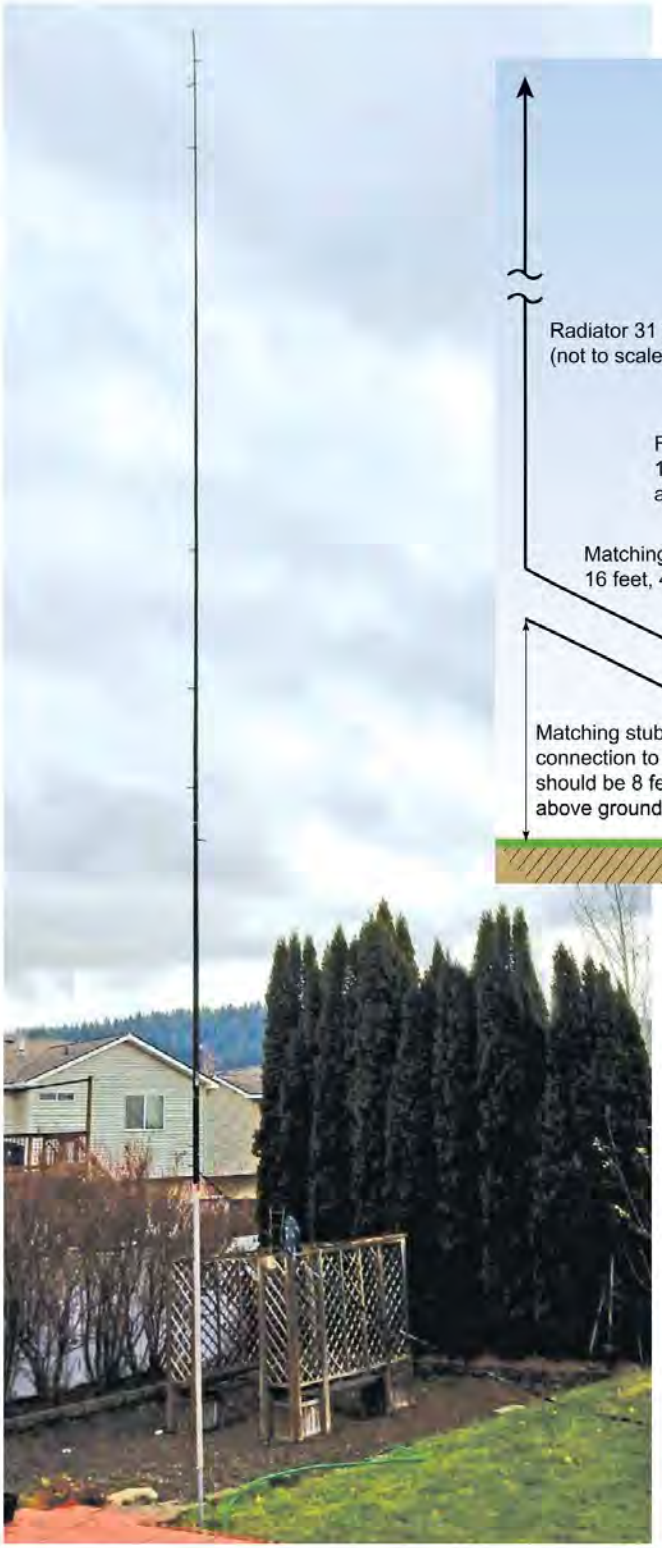
How to use the Zepp (J-pole) matching method on an HF antenna.

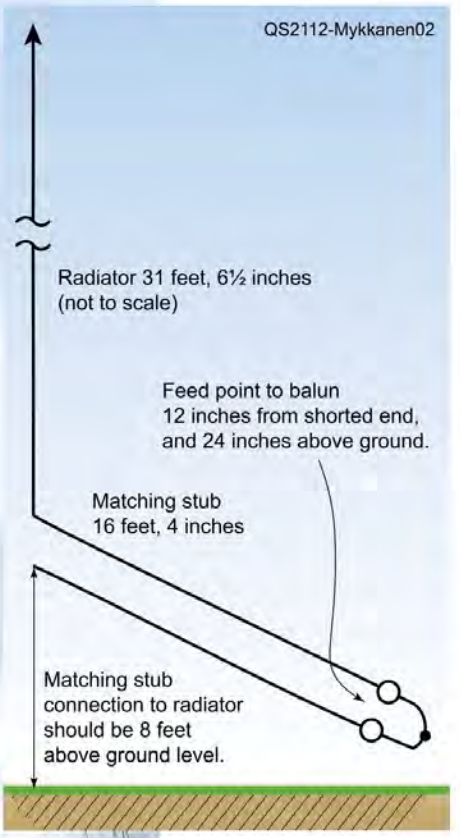
Toivo Mykkanen, W8TJM

Putting up a dipole antenna for temporary use can be difficult if trees or tall structures are not available. A Zepp-style, end-fed, half-wave vertical (see Figure 1) can be a good solution because its maximum radiation point is well above ground level, it requires only one mounting point (see the sidebar, "Mounting the Pole"), and it has no need for ground radials.

Overview

The Zepp-style vertical uses a half-wave radiator made from 14-gauge insulated antenna wire zip-tied to a 33-foot telescoping fiberglass pole, which is easy to find. The radiator feed point must be kept more than 8 feet above the ground to reduce the detuning effect of the earth, as well as to ensure that the high voltages at the bottom of the antenna are out of reach (see Figure 2). The base and top of the half-wave vertical have a very high impedance, and the voltages are high when running 100 W. An 8-foot fiberglass tube or stiff drain pipe should be used to support the 33-foot telescoping pole, or a 43-foot telescoping pole could be used to eliminate the bottom support tube. A shorted quarter-wave matching section is used to bring the high radiator base impedance down to a 50 Ω match. This is the same method used to feed the J-pole antenna, except that the quarter-wave section is at an angle rather than being an extension of the radiating section.





◀ **Figure 1** — The author's Zepp-style, end-fed, half-wave vertical in his yard.

▲ **Figure 2** — The J-pole antenna layout.

Mounting the Pole

There are various methods of supporting the 8-foot bottom tubing (see Figures A and B). A 4-foot-long, ¾-inch galvanized water pipe can be pounded or water-jetted into your lawn as a simple way to install the antenna. The pipe could also be inserted into "A Mast Holder That's Always Ready," which was included in the *Hints and Hacks* column in the November 2020 issue of *QST*. For portable operation, mounting the antenna on a parked vehicle can be easily accomplished by using a 2-foot-long, ¾-inch threaded rod placed on a vehicle trailer hitch.

Figure A (top) — Using a hose to water-jet a pipe support into the ground.

Figure B (bottom) — The pole is mounted using a vehicle hitch.

Figure 3 — The upper and lower ends of the antenna's matching section.

Figure 4 — The connection of the balun to the matching section.

Building the Matching Section

A quarter-wave matching section of 450 Ω ladder line shorted at one end is used to transform the high base impedance of the radiator to 50 Ω. Cut the ladder line to 16 feet, 4 inches in length, trim the radiator end, and strip ½ inch of insulation from one conductor. On the other end, strip ½ inch of insulation from each conductor, twist the ends together, and solder it to create the shorted end. Heat-shrink tubing can be applied to the shorted end after soldering, if desired. Scrape away ½ inch of the insulation on both conductors exactly 12 inches from the shorted end. This allows a feed point connection to a current balun (see Figure 3).

Adding the Balun

The current balun is made from 14 turns of RG-58 coax wound onto a FT240-61 core and is used to create a balanced connection to the quarter-wave matching stub. Other ferrite core types may be substituted. The balun should connect to the stub exactly 12 inches from its shorted end. Keep the coax from the balun to the feed point to less than 4 inches (see Figure 4), but any reasonable length of coax can run from the balun to your rig.

Determining Lengths for Other Bands

It is highly recommended that you build the 20-meter version with the recommended materials first, to gain familiarity with this type of antenna. The velocity factors for the radiator and the quarter-wave line are important to consider, as they determine the lengths that provide a good SWR on this antenna. You can then design for other bands with the experience gained from building the 20-meter version.

Note that the resonant frequency of the antenna will be influenced by conductive materials near the elements. This includes buildings, rain gutters, and vegetation, as well as the height above ground Experiment to get the best match.

The dimensions for any frequency can be determined by using these formulas:

- Radiator length (feet) = 448/Frequency in MHz
- ¼-wave line length (feet) = 231/Frequency in MHz
- Distance from shorted end to feed point (inches) = 179/Frequency in MHz

Quarter-wave matching lines are quite effective, as they have a very high *Q* (quality factor) and are easily repeatable. The high impedance of the antenna can be visualized by looking at how close the 50 Ω feed point is to the shorted end versus the distance to the end of the half-wave radiator. Impedances of approximately 8,000 Ω at the half-wave radiator are possible with this design.

Connecting the Radiator

The radiator is made from insulated 14-gauge stranded antenna wire, and should be cut to 31 feet, 6.5 inches in length. Connect the antenna wire to the quarter-wave line with a lug connector or splice reducer. These are very handy for quickly making and breaking antenna connections. Reusable zip-ties are used to attach the radiator wire to the telescoping pole every 2 to 3 feet. The wire can also be loosely spiraled around the pole — about 1 turn for each 2 feet of length.

Getting on the Air

The quarter-wave ladder line matching section should be tightly wrapped with zip ties to the mast a few inches below where it connects with the half-wave radiator. This ensures that it is well supported as it slopes down toward the balun (see Figure 5). Support the balun with a short pole about 2 feet off the ground. I used self-fusing tape to protect the balun from the elements and to seal coaxial connectors. Sealant should also be applied to all exposed conductors to keep moisture from wicking in and causing corrosion.

Figure 5 — The balun is supported above ground with a short pole.

Figure 6 — An antenna analyzer shows the achievable SWR.

Power Capability

The power handling capability of this antenna is limited by the voltage breakdown of the matching section at its termination to the radiator. Arcing could happen at high power, especially in wet conditions. The antenna has been tested at 800 W with no problems.

Results

The dimensions in this article should get you a reasonable standing wave ratio (SWR) if the exact recommended materials are used (see Table 1). The feed point can be moved toward or away from the shorted end to bring the resonant point to your preferred operating frequency (see the sidebar, "Determining Lengths for Other Bands"). The radiator and stub length can also be changed in small increments. You should be able to easily get a good voltage standing wave ratio (VSWR) across the whole band (see Figure 6).

Table 1 — Materials

Item	Source
14-gauge insulated antenna wire	DX Engineering
450 Ω window line	DX Engineering
Wire splice coupling	Lowe's
Toroid	eBay
RG-58 coax	DX Engineering
Fiberglass telescoping pole	GigaParts
Fiberglass mounting tube	MFJ

All photos by the author.

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QEX
A Forum for Communications Experimenters

All ARRL members can now enjoy the digital edition of *QEX* as a member benefit. Coming up in the November/December 2021 and future *QEX* issues are articles and technical notes on a range of amateur radio topics. These are at the top of the queue.

- James Kretzschmar, AE7AX, controls a 16 × 2 LCD display with a TI microcontroller.
- Andrew Anderson, WQ1S/VK3CV, uses the 30 THz band as a communications medium.
- George Steber, WB9LVI, describes his SSB receiver based on the Silicon Labs Si4732-A10 IC.
- Tom Alldread, VA7TA, describes a tweezers probe for measuring SMD components.
- Larry Lamano, WA0QZY, builds a pulse generator for making TDR measurements.
- In his essay series, Eric Nichols, KL7AJ, describes maximum power transfer.
- Chuck MacCluer, W8MQW, describes sequencing of antenna change-over relays.
- Tim Czerwonka, WO9U, creates custom keyboards using QMK firmware.
- Lynn Hansen, KU7Q, describes automation options for the CTR2 HMI.

QEX, a forum for the free exchange of ideas among communications experimenters, is edited by Kazimierz "Kai" Siwiak, KE4PT, (**ksiwiak@arrl.org**) and is published bimonthly. The printed edition annual subscription rate (six issues per year) for members and non-members in the US is $29. First-class delivery in the US is available at an annual rate of $40. For international subscribers, including those in Canada and Mexico, *QEX* can be delivered by airmail for $35 annually; see **www.arrl.org/qex**.

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Mark J. Wilson, K1RO, k1ro@arrl.org

Product Review

WA3RNC TR-25 40/20-Meter CW Transceiver Kit

Reviewed by Paul Danzer, N1II
n1ii@arrl.net

The TR-25 CW transceiver kit from John Dillon, WA3RNC, covers two popular bands — 40 and 20 meters — and operates from 9.5 to 14 V dc, which is helpful for portable operation where battery voltage may decline over time. There's an adjustable low-battery indicator that you can set according to your power source. The TR-25's RF output power is adjustable, and the radio delivers up to about 10 W output on 40 meters and 7 W on 20 meters.

One of the more interesting features of the TR-25 is its operating controls. Small kit transceivers often use multifunction controls and cascading menus, and unless you use the kit regularly, you may forget how to use the menus and settings. With the TR-25, there is a knob or a switch for every function — no multi-level menus!

Circuit Highlights

The TR-25 circuitry is divided into two PC boards (see Figure 1). The upper board contains a preprogrammed ATmega328P microcontroller for control functions. The **TUNE** encoder sets the frequency and incorporates a pushbutton switch to select tuning increments (10 Hz, 100 Hz, or 1 kHz). Other functions, such as receiver incremental tuning (RIT, ± 5 kHz), band selection, and the internal CW keyer speed are controlled by the microcontroller as well.

The bulk of the analog/RF circuits are on the lower board. From the BNC antenna connector, a received signal is routed to a band-select relay and then to a band-pass filter for the selected band. The filter output passes through a solid-state TR switch and a gain control, then through a second set of filters and finally to an SA612 double balanced mixer.

An SI5351 phase-locked loop with a 25 MHz crystal as its time base provides a switched local oscillator (LO)

Bottom Line

The WA3RNC TR-25 40/20-meter CW transceiver kit goes together quickly. The finished product is attractive, has a quality feel, and is very easy to use.

Figure 1 — The kit is assembled as two PC boards. The upper board contains the display and controls. On the center right is the microcontroller. This IC is plugged in after the two boards are assembled as a sandwich. The lower board has the final amplifier FET and heatsink in the center. The numbered and matched filter crystals are along the bottom edge.

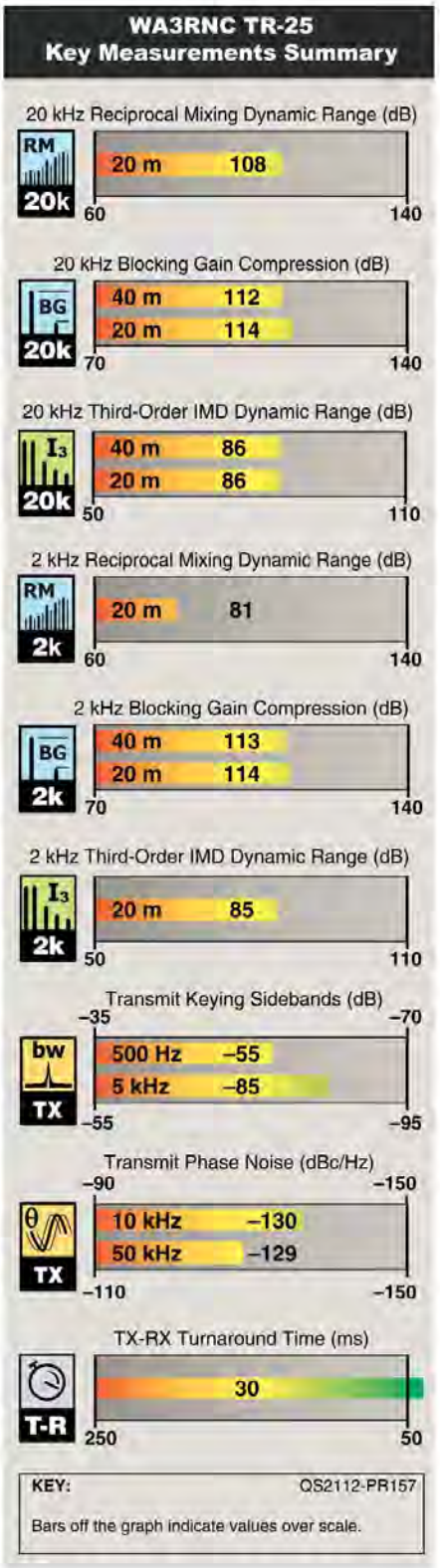


Table 1
WA3RNC TR-25 CW Transceiver

Manufacturer's Specifications	Measured in the ARRL Lab
Frequency coverage: 7.0 – 7.3 MHz and 14.0 – 14.35 MHz.	As specified.
Power requirement: 9.5 – 14 V dc at >110 mA receive; 1.1 A transmit at 10 V.	Receive: 102 mA from 9.5 – 14 V dc. Transmit, 7 MHz/14 MHz: 10 V dc, 1.1/1.07 A; 14 V dc, 1.4/1.3 A.
Mode of operation: CW.	As specified.
Receiver	**Receiver Dynamic Testing***
Sensitivity: –125 dBm.	Noise floor (MDS): 7 MHz, –137 dBm; 14 MHz, –135 dBm.
Noise figure: Not specified.	7 MHz, 11.6 dB; 14 MHz, 13.6 dB.
Blocking gain compression dynamic range: Not specified.	Blocking gain compression dynamic range: *20/5/2 kHz offset* 7 MHz 112/112/113 dB 14 MHz 114/114/114 dB
Reciprocal mixing dynamic range: Not specified.	14 MHz, 20/5/2 kHz offset: 108/104/81 dB.

ARRL Lab Two-Tone IMD Testing

Band	*Spacing*	*Measured IMD Level*	*Measured Input Level*	*IMD DR*
7 MHz	20 kHz	–137 dBm	–51 dBm	86 dB
		–97 dBm	–37 dBm	
		–26 dBm	0 dBm	
14 MHz	20 kHz	–135 dBm	–49 dBm	86 dB
		–97 dBm	–36 dBm	
		–36 dBm	0 dBm	
14 MHz	5 kHz	–135 dBm	–49 dBm	86 dB
		–97 dBm	–36 dBm	
14 MHz	2 kHz	–135 dBm	–50 dBm	85 dB
		–97 dBm	–37 dBm	

Second-order intercept point: Not specified.	+43 dBm at 7 and 14 MHz.
IF/audio response: Better than 350 Hz.	Range at –6 dB points: 600 – 825 Hz (225 Hz).
Transmitter	**Transmitter Dynamic Testing**
Power output: At 14 V dc, 7 MHz, 0 – 9 W; 14 MHz, 0 – 7 W.	7 MHz: 0 – 9.6 W at 13.8 V dc; 0 – 4.5 W at 9.5 V dc. 14 MHz: 0 – 7.2 W at 13.8 V dc; 0 – 3.5 W at 9.5 V dc.
Spurious-signal and harmonic suppression: 52 dB.	>60 dB (see Figure A). Complies with FCC emission standards.
CW keying characteristics: Not specified.	See Figures B and C.
Transmitted phase noise: Not specified.	See Figure D
Transmit-receive turnaround time: Not specified.	S-9 signal, 30 ms.

Size (height, width, depth): 2 × 6 × 3.25 inches including protrusions. Weight, 11 ounces.

Second-order intercept point was determined using S-5 reference.

*Receiver bandwidth is fixed and measured in the ARRL Lab at 225 Hz at –6 dB.

signal to the mixer. Following the mixer is a crystal filter made from four matched and numbered crystals in series. These feed another SA612, which has the beat frequency oscillator (BFO) feeding one of its inputs. The audio output is from an LM386 op-amp on the upper board. One interesting auxiliary circuit uses an LM358 dual op-amp to make an operator-settable alarm that blinks the **LOW BATT** LED when the input voltage falls below the set value.

On the transmit end, the TR-25 uses a BS170 driver and an IRF510 final amplifier operating in Class B. The amplifier output is routed through a bifilar impedance matching transformer and the appropriate bandpass filter at the BNC output.

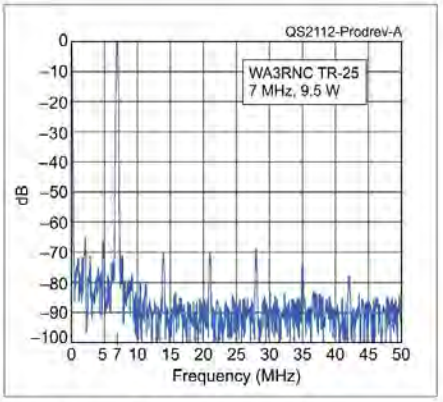


Figure A — Spectral display of the WA3RNC TR-25 transmitter output. Power output is 9.5 W on the 7 MHz band. This plot shows the output spectrum from 0 to 50 MHz. The second harmonic is down 70 dB from the carrier, and the third harmonic is down 69 dB. The vertical scale is 10 dB per division.

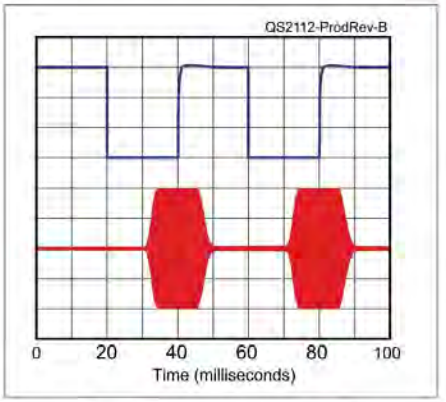


Figure B — CW keying waveform for the WA3RNC TR-25 showing the first two dits using external keying. Equivalent keying speed is 60 WPM. The upper trace is the actual key closure; the lower trace is the RF envelope. Horizontal divisions are 10 ms. The transceiver was being operated at 7 W output on the 14 MHz band. Rise time is 2.1 ms and fall time is 2.9 ms. First dit: on delay, 12.8 ms; off delay, 7.2 ms. Second dit: on delay, 12.8 ms; off delay, 7.2 ms.

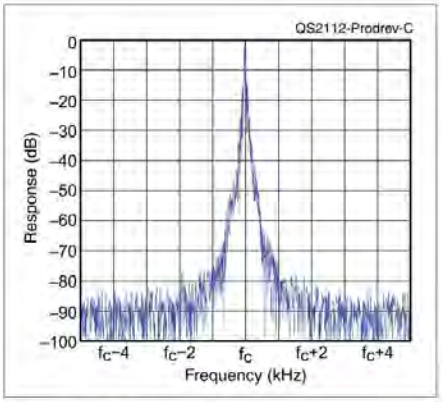


Figure C — Spectral display of the WA3RNC TR-25 transmitter during keying sideband testing. Equivalent keying speed is 60 WPM using external keying. Spectrum analyzer resolution bandwidth is 10 Hz, and the sweep time is 30 seconds. The transmitter was being operated at 7 W PEP output on the 14 MHz band, and this plot shows the transmitter output ±5 kHz from the carrier. The reference level is 0 dBc, and the vertical scale is in dB.

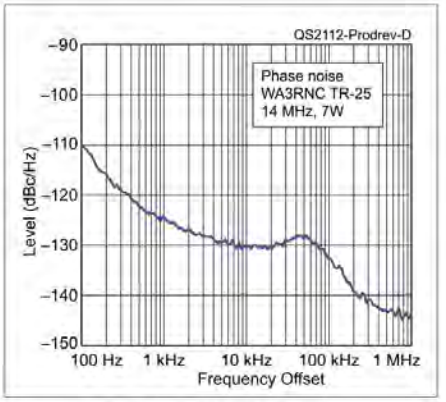


Figure D — Spectral display of the WA3RNC TR-25 transmitter output during phase-noise testing. Power output is 7 W on the 14 MHz band. The carrier, off the left edge of the plot, is not shown. This plot shows phase noise 100 Hz to 1 MHz from the carrier. The reference level is –90 dBc/Hz, and the vertical scale is 10 dB per division.

Figure 2 — The parts are packed in individual bubbles arranged in the order they are assembled. One set is for the lower board, another set for the upper board, and a third set for hardware and connectors.

Building the Kit

In the supplied kit, the two PC boards are populated with about 200 surface-mounted components, leaving 55 through-hole parts for the builder to install. Critical circuits are pre-aligned.

The WA3RNC website offers downloadable instructions as several PDF documents. It's a good idea to read the *TR-25 Pre-Assembly Information* document first, as it gives an overview of how the assembly will proceed, as well as some general notes about things to be aware of as you build. There are separate *Assembly Procedure* documents for the upper and lower PC boards. *TR-25 Final Assembly* and *TR-25 Checks and Tests* explain how to adjust internal controls that are not usually changed very often after initial setup, and also show how to make sure the radio is operating properly. The last document is *TR-25 Operating Instructions*.

The parts are supplied in small bubble-like connected envelopes (see Figure 2) arranged in the same order as the steps in the assembly manuals. I put a 16 × 18-inch aluminum oven liner from the supermarket cooking section on my workbench to catch any parts that I may drop. A few small paper cups are useful for temporary storage of small hardware that will be used in a later step.

Not supplied is clear nail polish, needed to keep a few screws and nuts from loosening, and two clothespin-like plastic clips for holding the PC board and case in place during assembly (you can also use rubber bands). A very small amount of thermal heatsink compound is suggested for the final amplifier transistor heatsink.

The assembly instructions are clear, although in some sections the text is printed as one long extended paragraph, which can make it easy to lose your place. I used a red pencil to put a check mark next to the part number in the text as I mounted each component.

Lab Notes
WA3RNC TR-25 CW Transceiver

The ARRL Lab tested an assembled version of the TR-25, with the results shown in Table 1. The transceiver is rated for operation from 9.5 to 14 V dc and draws just over 100 mA on receive, a plus for conserving battery power during portable operation. Even with minimum supply voltage, our radio put out 4.5 W on 40 meters and 3.5 W on 20 meters.

Receive sensitivity is excellent, and dynamic range is good. If too many strong signals are a problem, turn down the RF gain with the front-panel control. The CW waveform is clean, with good keying sidebands. The transmitter easily meets FCC spectral purity requirements.

During testing, we noticed that output power dropped off after 7.5 to 15 seconds of transmitting a steady carrier at full power. John Dillon explained that the radio does this by design, using a polyfuse whose resistance is dependent on current and temperature. This is a safety measure to protect the final amplifier and does not affect normal operation, except perhaps if you're transmitting for a long time to adjust an external antenna tuner. I set the Lab's keying generator to 35 WPM and transmitted for 10 minutes with no drop in output power.

I thought the radio was well constructed, wonderful to operate (no endless menus to back out of), and all of the controls and switches have a quality feel about them and operate smoothly. — *Paul Cianciolo, W1VLF, ARRL Lab Test Engineer*

Mounting the final amplifier and heatsink requires some care. The FET leads have to be bent over to fit the solder holes. I found that everything fit fine when I bent the leads at the transition of the wide and the narrow sections. As noted in the instructions, be careful with the placement of the plastic washer and mica insulator.

The kit uses six toroids (five inductors and a transformer). The instructions describe how to wind them, but pre-wound and prepared toroids are also available as an option. Winding the toroids is not difficult but does require finger agility and attention to detail. When you use enameled wire for windings, be aware that solder will not adhere to the enamel coating. Therefore, you must prep the wire ends down to clean, bare copper to ensure good solder joints. For this project, though, we chose to use the pre-wound toroids, which came ready to install with pre-tinned leads.

Finishing Touches

The PC boards fit neatly into a two-piece plastic case, but first there are internal trimmer potentiometers that must be adjusted. The process is described in the *TR-25 Final Assembly* manual. The first trimmer controls a blue LED, which is set to just barely light when no signal is present and glow brighter with received signals. The second trimmer sets the operating point for the final amplifier FET in a multi-step procedure detailed in the manual. Once this trimmer is set, you should not have to re-adjust it, but it is accessible with the case removed.

Another trimmer accessible with the case removed sets the sidetone volume. The sidetone is the actual transmitted signal heard in the receiver. When the tone of the incoming signal is matched to the transmit sidetone pitch, it will be perfectly on frequency. The final trimmer sets the threshold of the red low-voltage warning LED from 9 to 11.5 V.

The case is held together with four long self-tapping screws. The knobs are held in place with setscrews, so they can be placed to clear the front panel. The large **TUNE** knob requires more clearance because it also has a pushbutton function. Two toggle switches, POWER and BAND/RIT, are secured to the panel with nuts. A red cover dresses up the POWER switch and a white one does the same for BAND/RIT. A clear plastic cover protects the display. Disassembling the enclosure can be tedious, so it's a good idea to complete all adjustments and fully test the radio before placing the PC board assemblies in the enclosure.

On the Air

The TR-25's connections and controls are refreshingly simple. On the left side are a 2.1 millimeter coaxial dc power jack and two 3.5 millimeter phone jacks. One is for an external key or keyer, and the other for paddles controlling the internal keyer. The right side has the BNC antenna jack and a 3.5 millimeter jack for headphones or a loudspeaker. I found the audio output a bit low, but this is somewhat dependent on the sensitivity of the loudspeaker.

The TR-25 seems to have been designed with human factors in mind; an operator can use it without a long learning process. For example, the pushbutton switch of the large **TUNE** knob selects the tuning steps. A short push of the knob switches between 10 Hz and 100 Hz, but a longer push changes to 1 kHz steps. This prevents you from accidently tuning far away from the station you were trying to hear.

Similarly, all the controls are on the front panel. Keyer speed is adjustable from 5 to 35 WPM. Transmit power is adjustable from 0 to 5 W or more, depending on battery voltage. RF gain and volume are easily adjustable as well.

The **BAND/RIT** toggle switch with the white cap uses momentary contacts. One short click up alternates the band between 40 and 20 meters. One long click up stores the current frequency (one memory per band), and the radio returns to this frequency each time it's turned on. Two short upward clicks recalls the stored frequency. Clicking down toggles the receiver incremental tuning (RIT) on and off. The orange LED reminds you that RIT is on, and the RIT offset is shown in the display.

I found plenty of signals on 40 meters in the evening and 20 meters during the day. Even though the power output is less than 10 W, it wasn't very hard to have many enjoyable contacts. With the slow tuning rate, it was easy to match the sidetone pitch to the received signal and arrive right on frequency. TR switching is silent. The TR-25 is so easy to use that I felt right at home after using it only once or twice.

Manufacturer: John Dillon, WA3RNC, **www.wa3rnc.com.** Price: $250 (kit); pre-wound toroids, $18; precision optical encoder, $30; factory wired and tested, $310.

Eton Elite Executive Portable Receiver

Reviewed by Steve Ford, WB8IMY
wb8imy@arrl.net

While not a "pocket" radio, the Eton Elite Executive packs a lot of functionality into a package that is just 4.1 × 6.6 × 1.2 inches. This compact receiver covers the following frequency bands: long wave (150 to 285 kHz), AM broadcast (520 to 1710 kHz), medium and short wave (1.711 to 29.999 MHz), FM broadcast (87.5 to 108 MHz), and aeronautical (118 to 137 MHz). Receiving modes include AM, FM (in stereo if you're using headphones or earbuds), and SSB.

The Elite Executive sports a 30-inch telescoping antenna. For AM broadcast and long wave, however, it relies on an internal ferrite rod antenna. If you want to attach an external antenna, the Elite Executive accommodates that option with a 3.5 millimeter jack on the side of the enclosure. An adjacent **DX/LOCAL** switch reduces front-end gain to avoid overload when you are using an external antenna.

The receiver includes a 2-inch diameter loudspeaker next to a sizable amber digital display. Main tuning and volume controls take the form of knobs on the side of the case. The entire area below the display is devoted to buttons for accessing the various functions, as well as the memories.

It is interesting to note that in addition to the earbud/headphone jack, the Elite Executive also offers a separate **LINE IN/OUT** jack (see Figure 3). Not only does the radio provide a fixed, line-level audio output signal at this port for recording purposes, or for routing audio to a separate amplifier system, it also allows you to feed audio *to* the radio for listening through its internal speaker. Considering the proliferation of wireless earbuds and speakers these days, I suspect this input would see little use. Regardless, it is still handy to have available — just in case.

The Elite Executive arrives with a nicely designed faux-leather partial case secured to the radio by magnetic disks. When folded back under the radio, the case

Bottom Line

The Eton Elite Executive is a portable receiver that covers a number of different bands, including SSB capability on the HF amateur bands. The audio quality is quite good, especially when listening to the FM broadcast band with stereo headphones.

Figure 3 — The left side of the receiver has an external antenna jack, a DX/local switch to reduce gain if the receiver overloads, a stereo headphone jack, and an external power jack. The right side includes tuning and volume controls and a line in/out jack.

serves as a platform if you wish to position the receiver horizontally with a slight upward tilt. It reminded me of the magnetically attached keyboards and covers you frequently see with tablet computers and other mobile devices. Of course, the covering can be removed completely if you wish.

I powered the Elite Executive with four alkaline AA batteries and enjoyed considerable operating time. Alternatively, you can purchase rechargeable NiMH batteries and charge them when needed with the charger supplied with the radio. While you can also power the radio directly from the charger, the user manual cautions against this, warning of potential "interference." This is true. The dc provided by the module no doubt gets the job done in terms of charging batteries, but it is not well filtered, and the result appeared, at times, as a noticeable buzz.

On the Beach

I was fortunate to have the Elite Executive in my possession during what may have been one of the best times for conducting this type of review — a beach vacation. It gave me ample time to explore the features of the radio and enjoy many relaxing "test sessions."

Being right at the edge of the Atlantic Ocean, I dared to hope that I'd be able to receive long-wave signals from Europe. It was not to be. During my first evening attempt, I quickly discovered that the internal ferrite rod antenna, which the Elite Executive defaults to for this band, just wasn't up to the task. Long-wave listening is a challenge even with the best antennas, so this did not come as a surprise.

AM broadcast listening with the internal antenna offered a much better experience. The radio seemed sufficiently sensitive and selective. As on all bands, you can tune manually, or command the receiver to scan and stop on the strongest signals. You can also enter frequencies directly via the numeric keyboard buttons on the front panel.

Shortwave and Amateur Bands

Extending the telescoping antenna, I was eager to cruise the medium- and short-wave bands. The Elite Executive divides this range into several frequency segments according to wavelength. Repeatedly pressing the **METER** button steps you through the bands.

Naturally, I began by exploring the amateur bands. I pressed the **METER** button to access "41 Meters" and then tuned manually into the 40-meter ham band from there. With the SSB mode enabled (and lower sideband selected), I was able to eavesdrop on several conversations. To successfully tune SSB signals, however, you must first navigate in 1 kHz steps until you get close to the desired signal and then press the tuning knob to enable 10 Hz fine tuning.

While the user manual mentions the **WIDE** and **NARROW** bandwidth buttons, it doesn't provide detail about the bandwidths available. As it turns out, you can select a bandwidth as narrow as 500 Hz when listening to short wave frequencies. The selected bandwidth is indicated by the small icon on the screen, adjacent to the equally small S-meter display.

With the receiver in the SSB mode and the 500 Hz bandwidth selected, I prowled for CW activity and wasn't disappointed. Propagation conditions were mediocre at the time, but I was able to copy signals on various bands, even while using only the telescoping antenna. I attached a 50-foot wire to the external antenna port and, of course, the improvement was dramatic.

To enhance short wave broadcast enjoyment, the Elite Executive offers a synchronous AM mode with selectable sidebands. The purpose of synchronous AM is to mitigate the effects of selective fading by substituting

an internally generated carrier signal for the fluctuating carrier you are attempting to receive. Synchronous AM performance can be a mixed bag among consumer grade receivers, and that was the case here as well. The Elite Executive's synchronous AM feature reduced distortion, but it often did so at a significant cost to the overall fidelity of the signal. When the goal was to make a signal at least listenable, the radio's synchronous AM mode made a major difference, but for the sake of better audio quality, I frequently chose not to use it.

FM Broadcast Band

The FM broadcast listening experience with the Elite Executive was outstanding. With headphones, the stereo audio was full bodied with excellent channel separation. When traveling it is helpful to make a quick scan of the available FM signals. To that end, the Elite Executive provides ATS — Auto Tuning Storage. With a button press, the radio will race through the FM broadcast band and store every signal it encounters into one of seven memory locations in each of its 99 memory "pages" (the radio offers a total of 700 memories). ATS is only available in the FM broadcast band.

The Elite Executive's memory feature is highly versatile. You can copy and paste memory contents from one slot to another, for example. You can also assign alphanumeric labels to each memory, which becomes awfully convenient after you've stored a slew of frequencies and can't remember the station names or call signs.

While browsing the FM broadcast band I came to appreciate the Elite Executive's RDS decoding capability. Known formally as the Radio Data System, RDS is a stream of digital information that many FM broadcast stations in the United States include with their analog transmissions. When decoding RDS data, the Elite Executive will display whatever text is in the stream, such as the station call sign, song title, artist, and more. With the press of a button, you can select the type of information you prefer to see, such as song titles only.

Aeronautical Band

No exploration of the Elite Executive would be complete without venturing into the aeronautical frequencies. These transmissions to and from aircraft use amplitude modulation on frequencies between 118 and 137 MHz. Exchanges are often short but interesting. During an episode of severe weather, I listened to pilots as they responded to air-traffic controllers guiding them around areas of heavy precipitation. Even when using just the telescoping antenna, there were always aviation signals to be found. For this band, the Elite Executive includes a squelch function, which made monitoring much more enjoyable.

Finally, like many consumer receivers, the Elite Executive provides a clock and multifunction alarm. You can awaken to your favorite FM broadcast station, or even to one of the National Institutes of Standard and Technology stations such as WWV, although that wouldn't be the most pleasant way to greet the morning.

Conclusion

The Eton Elite Executive is a well-made portable receiver with a number of convenient features. It is well suited for traveling or casual listening at home. The radio can also double as a test receiver for those times when you need to diagnose a problem with a transceiver.

Although some retail advertising states that the Elite Executive can receive digital HD radio signals of the type heard in the US, or the DAB digital format that is used in Europe, Eton confirmed that the radio does not include that capability.

Manufacturer: Eton Corporation, 1015 Corporation Way, Palo Alto, CA 94303; **www.etoncorp.com**. Price: $150.

MFJ-9232 Mini Loop Tuner

Reviewed by Phil Salas, AD5X
ad5x@arrl.net

The MFJ-9232 Mini Loop Tuner is a 25 W version of the MFJ-933 150 W manual loop tuner. Like the MFJ-933, the MFJ-9232 doesn't function as a traditional small magnetic transmitting loop system, which should normally have a loop circumference of 1/10-wavelength or less. For the best performance, MFJ recommends that the loop wire length should be at least 3/4 of a quarter wavelength on the band on which you are operating. The manual also has recommended fixed wire lengths that will permit operation over about a 1.5:1 frequency range.

Unlike the air-dielectric variable capacitors used in the 150 W manual loop tuners, the MFJ-9232 uses solid-dielectric variable capacitors that use plastic film between the capacitor plates. While these variable capacitors limit transmitting power to 25 W maximum, they do result in a very compact design, which is desirable for low-power home and portable operation. Mechanically, the MFJ-932 loop tuner is quite small, with dimensions of just 1.5 × 2¾ × 4 inches.

Using the MFJ-9232

No manual was provided with the MFJ-9232, but a PDF version is downloadable from MFJ's website. As the manual explains, you must be mindful of safe RF exposure limits because of the high RF power density of any small loop antenna system. At low power levels this is probably not as much of a problem, but it's still a good idea to evaluate RF exposure. (More information and an RF exposure calculator are available at **www.arrl.org/rf-exposure**.)

To start, you select a wire length for the band or bands on which you want to operate. MFJ's recommended wire lengths for single-band and multi-band operation are given in Table 2.

The MFJ-9232 comes with 53 feet of insulated #20 AWG stranded wire and eight ring terminals that fit the threaded post terminals on the tuner (see Figure 4), though it is interesting to note that the MFJ-9232 manual suggests using #10 AWG or larger stranded wire to minimize losses. For my tests, I cut the supplied wire to lengths of 20 feet, 9 feet, and 4 feet, to cover 40/30 meters, 30 – 17 meters, and 17 – 10 meters respectively. If your transceiver does not include an SWR meter, you will need to insert one between your transceiver and the MFJ-9232.

Tuning Procedure

The tuning procedure involves peaking the MFJ-9232 for maximum noise (or S-meter reading), and then applying RF power (no more than 5 to 10 W) and

Table 2
MFJ-9232 Loop Wire Lengths

Single Band Wire Lengths		Multiband Wire Lengths	
Band (meters)	Length (feet)	Bands (meters)	Length (feet)
80	63.0	40/30	20.0
40	28.0	30/20	13.0
30	20.0	30/20/17	9.0
20	13.0	20/15	7.0
17	9.0	17/15/12/10	4.0
15	7.0		
12	5.5		
10	4.0		

Bottom Line

The MFJ-9232 Mini Loop Tuner works well as a low-power portable loop antenna tuner. It gives you another option for your portable HF operation.

Figure 4 — Ring terminals and 53 feet of #20 AWG wire are supplied with the tuner.

readjusting the controls for minimum SWR. The manual is a little confusing in that it says to pre-set the **TUNING** control for **LOW FREQ** and the **MATCHING** control for **MIN C**, but they are only labeled from 0 – 10. So I assumed that 0 meant **LOW FREQ** and **MIN C**. This seemed to work for me.

Finding resonance is an iterative process, wherein you increase the **TUNING** control in small increments while adjusting **MATCHING** through its full range, while listening for a noise peak at each **TUNING** control position. Once you've found the peak, apply RF power and fine tune the SWR. I found that the **TUNING** control was quite sharp, while the **MATCHING** control was broader. Also, regardless of what the manual states, this is not

Adding an Internal SWR Indicator

For portable operation, I prefer a minimum amount of equipment for easy transport, setup, and use. So my one pet peeve with the MFJ-9232 was that you must use an external SWR meter if your radio doesn't include one. As it turns out, there is enough room inside the MFJ-9232 to add a resistive bridge SWR indicator. This modification has the additional advantage of limiting the worst-case SWR your transceiver sees to 2:1 during the tuning process. Figure 5 shows the circuit. The Caddock 50 Ω, 15 W thick-film resistors used take up less room than 2 W resistors with leads would. An ultra-bright LED serves as the SWR indicator.

All the parts are mounted on a 1.2 × 1.2-inch piece of 0.020-inch-thick copper-clad PC board material.

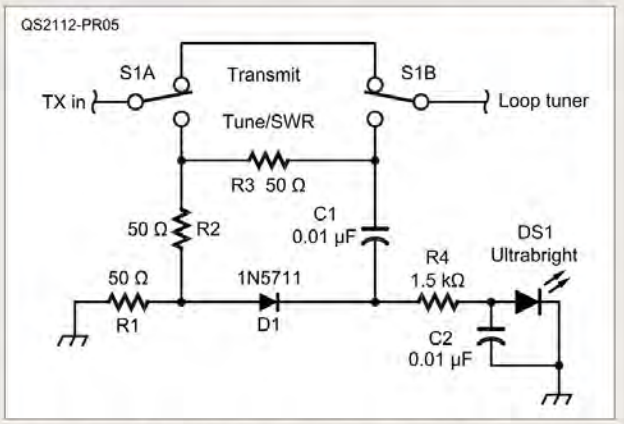


Figure 5 — Schematic of the resistive bridge SWR indicator. Mouser part numbers are given in parentheses (**www.mouser.com**).

D1 — 1N5711 Schottky diode (511-1N5711)
C1, C2 — 0.01 µF, 500 V disc ceramic capacitor (594-D103K69Y5PL63L0R)
DS1 — 10,000 mcd, 5 mm ultra bright red LED (604-WP7113SECKJ3)
R1 – R3 — Caddock 50 Ω, 15 W thick-film resistor (684-MP915-50) plus #2 screws, nuts, and lockwashers for mounting
R4 — 1.5 kΩ, ¼ W resistor (71-CCF071K50GKE36)
S1 — DPDT toggle switch (612-200MDP1T1B1M1QE)

Figure 6 shows the bridge mounted inside the MFJ-9232. Holes were drilled in the front panel of the MFJ-9232 for the new switch and LED. The SWR bridge is mounted to the MFJ-9232 front panel using the switch mounting hardware. I labeled the switch positions (**SWR** and **TX**) using Casio white-on-clear labeling tape.

Now it is very easy to tune the MFJ-9232. After peaking the receiver noise, flip the switch to the **SWR** position, transmit a low-power (5 W or less) signal, and tweak the MFJ-9232 controls until the LED noticeably dims or, preferably, completely goes out. Flip the switch back to **TX** and you're ready to go. During the tuning process, you can apply up to 25 W to the circuit, but there is limited heat-sinking for the resistors available on the copper-clad PC board. Keep tuning time to a minimum if applying that much power. Additional photos are available from **www.arrl.org/qst-in-depth**.

Figure 6 — The SWR bridge can be mounted inside the MFJ-9232.

a very high-Q antenna system when used with the recommended wire lengths. So once the antenna is tuned, you can actually move around within a significant portion of that band without having to retune.

I have three portable radios: a Xiegu G90, an Elecraft KX3, and a QRP Labs QCX-mini 20 meter transceiver. I found that when adjusting the **TUNING** control it was hard to detect noise peaks just by listening, so my starting SWR was often greater than 3:1.

The KX3 was the easiest transceiver to use, as it has a built-in SWR meter and puts out a low-power tuning carrier into even a pretty high SWR. This made it easy to trim the MFJ-9232 SWR.

The G90 also has an internal SWR meter, but the transmitter folds back power when it encounters an SWR greater than 3:1 regardless of transmitting power. This made it difficult to trim the SWR. However, I was able to get close to an optimum tuning solution by looking at the G90's spectrum display, which made it quite easy to see the noise peak differences. This normally got me to an initial SWR of under 3:1, and then I could fine tune the MFJ-9232.

The QCX-mini doesn't have an internal SWR meter, so I used an external one. I was always able to tune the SWR to 1:1 on 40 meters through 10 meters, all the bands on which I tested the MFJ-9232. Tuning was not difficult at all.

On the Air

For my on-the-air tests I used the 20-foot loop on 40 and 30 meters and the 9-foot loop for 20 meters, both of which worked quite well for me. The loop wires were attached to a tree and fence near the picnic table in my backyard. I was easily able to make several CW contacts on all three bands, as well as a few SSB contacts on 20 meters. These would be my wire lengths of choice for portable operation — at least until the higher frequency bands start opening up a bit more. My operating time was somewhat limited due to the summer Texas heat!

Manufacturer: MFJ Enterprises, 300 Industrial Park Rd., Starkville, MS 39759; **www.mfjenterprises.com**. Price: $119.95.

Win4IcomSuite Software

Reviewed by Steve Ford, WB8IMY
wb8imy@arrl.net

The Icom IC-7300 packs a wealth of features into a compact case — and does so at a reasonable price. No radio is perfect, though. A commercial radio's design is limited by constraints imposed by size, anticipated selling price, and much more. In the case of my IC-7300, I find that the spectrum scope display is smaller than I would like. These days I find that eyeglasses are mandatory operating aids.

I was envious of the displays I saw at other stations. Those lucky hams controlled their transceivers through software and luxuriated in simulated controls, indicators, and, yes, spectrum scopes splashed across large, wide-screen monitors. They tuned frequencies with mouse clicks on colorful waterfall displays. They could see every signal across hundreds of kilohertz at once.

In some instances, their transceivers were in other rooms within their homes, controlled remotely through their Wi-Fi networks while the operator lounged on the couch with a laptop computer. And then there were the radios located hundreds of miles away, yet you could hardly tell; the software control was as smooth as butter.

I soon decided that having software control was a "club" I wanted to join.

Introducing *Win4IcomSuite*

Win4IcomSuite by Tom Blahovici, VA2FSQ, costs just $50 and meets my needs. Not only does it provide remote control of the IC-7300, it also adds flexibility not found in the radio itself.

As the name suggests, *Win4IcomSuite* is a Windows application that works with many recent Icom transceivers. For this review I used it with my IC-7300, but the functions are much the same for other models.

The *Win4IcomSuite* also has six "virtual radios" that can interface to third party software such as *HRDLogbook*, *DM780*, *DXLab Suite*, *N1MM+*, *Log4OM*, and many more. This means that *Win4IcomSuite* can run

Bottom Line

Win4IcomSuite software includes many useful display and control features for the IC-7300 or other Icom transceivers.

Figure 7 — The primary *Win4IcomSuite* control window.

alongside these applications while still handing the tasks of transceiver control.

To get the best performance from *Win4IcomSuite*, you'll need a monitor capable of at least 1920 × 1080 resolution, the 64-bit version of Windows Vista, 7, 8, or 10; and a modern computer (for example, a PC with an Intel Core I3 processor or higher). The recommended minimum RAM is 4 GB, but I'd suggest 8 GB.

A detailed manual is available, and I strongly encourage new users to read it carefully before firing up the software. One aspect that has the potential to be confusing is the initial connection between *Win4IcomSuite* and the radio. To support complex functions such as the spectrum scope display, data must fly back and forth at a fast clip, so a 115,200-baud connection is required. This means you must make some changes in the transceiver menus to allow the radio to support this data rate, and to establish a dedicated line for the software. For example, you may need to "unlink" the IC-7300's USB port from its CI-V remote function.

At my station, I use the IC-7300 with several different software applications, some of which do not support a 115,200-baud data rate. It would be a pain to have to manipulate the IC-7300's menus each time I switch between the *Win4IcomSuite* and the other application. Fortunately, *Win4IcomSuite*'s virtual radio feature solves this issue, although setting up the feature may be a non-trivial exercise for some hams. My approach was to purchase one of the CI-V interface cables you'll find online for less than $30. This allows me to configure *Win4IcomSuite* to use the IC-7300's dedicated USB port exclusively at 115,200 baud, while allowing my other applications to use the transceiver's CI-V port at a different data rate.

Windows Galore

The primary *Win4IcomSuite* control window (Figure 7) is a pleasure to behold. Every function of the IC-7300 is available here. You can switch between transmit and receive, raise and lower the audio gain, activate the built-in antenna tuner, adjust filter bandwidths, and adjust many other settings. Tom has even modeled two "meters" complete with bouncing needles. Right clicking on the meters allows you to select their measurement functions.

The *Win4IcomSuite* **WINDOW** menu reveals all the other companion displays you can open, including the spectrum scope. All the companion windows can be open simultaneously.

Opening the **CLUB LOG SPOTS** window causes *Win4IcomSuite* to query the Club Log DX cluster and display the results (there is a pause of a few seconds while it is making the initial inquiry). If you have a free account with Club Log and upload your logs to the database, you'll see color-coded spots in this window that flag DXCC entities you've worked, or still need. If the spectrum scope is running (see Figure 8), *Win4IcomSuite* will also display any Club Log spots that fall within the frequency range you are monitoring.

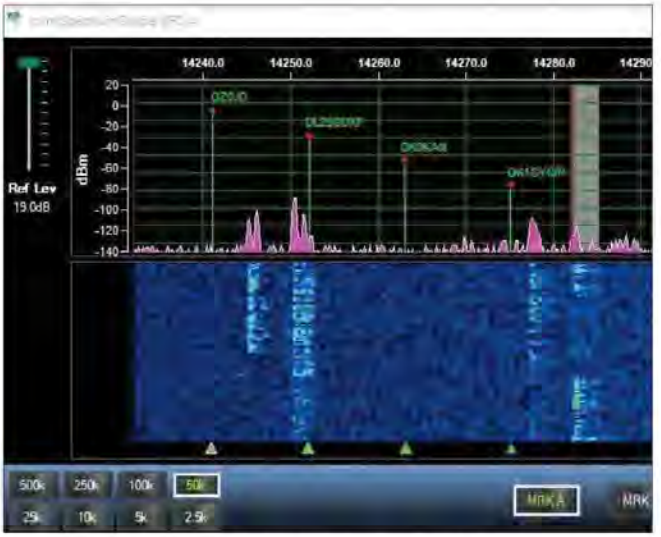


Figure 8 — *Win4IcomSuite* renders the IC-7300's spectrum display in an easy-to-view size (this is just a portion of that screen). When the Club Log DX cluster window is active, spots are displayed within the spectrum scope as well.

Figure 9 — A portion of the EiBi shortwave listening database window.

For shortwave listening, *Win4IcomSuite* includes a window that displays the Eike-Bierwirth (EiBi) shortwave listening database (see Figure 9). The application updates this information on a regular basis, and you can scroll through all the broadcast and utility listings that appear. A mouse click will take you directly to the frequency. You can even sort the list so that it only displays stations known to be on the air at that moment.

Win4IcomSuite includes a separate window for frequency memories. You can store favorite frequencies here and instantly select them with a mouse click. *Win4IcomSuite* includes scanning functions that you can access through a separate window.

Win4IcomSuite also provides a CW sending terminal. This is extremely convenient for DX hunting and contest use, but of course, you can type out a CW conversation as well if you'd rather not use a key. In this window you can even log the contact in *Win4IcomSuite*'s ADIF logbook.

Remote Control

With *Win4IcomSuite*, you can control your radio remotely, either through your home network or at a distance via the internet. There is a separate server program that links with *Win4IcomSuite* to make this possible. This program must be running on a computer connected to the transceiver.

There is also a client application that is installed (along with *Win4IcomSuite*) in whatever computer you are using at your operating position. When everything is installed and configured, you access your transceiver by starting *Win4IcomSuite* and then running the client application that handles receive and transmit audio. I tried it on my home network and it worked perfectly.

The user manual goes into substantial detail about how to set up remote operating. If you're not familiar with the computer networking, you'll need to read this section with particular care. This is especially true if you plan to attempt internet remote control. Tom has made the process as smooth as possible, but you'll still have to jump several hurdles such as possibly opening a dedicated port in your router configuration and dealing with alerts from your firewall software.

Win4IcomSuite has more features than I can cover in a single review. Suffice to say it is a highly attractive, well-written application that is more than worth the price. I'd suggest downloading the trial version first. This version is fully functional for 30 days, giving you plenty of time to make sure it works well at your station. Larger versions of the screen captures in this review and additional illustrations are available from **www.arrl.org/qst-in-depth**.

Manufacturer: Tom Blahovici, VA2FSQ; **icom.va2fsq.com**. Price: $60. There is also a version of this software for Yaesu transceivers at **yaesu.va2fsq.com**. and Elecraft radios at **va2fsq.com**.

Steve Ford, WB8IMY, wb8imy@arrl.net

Eclectic Technology

Can You Upgrade to Windows 11? Maybe Not!

Figure 1 — Bad news from Windows for my station PC. TPM either doesn't exist or hasn't been enabled.

Microsoft has announced the debut of the new Windows 11 operating system. It features a new look, improved performance, and several interesting functions. Best of all, the upgrade is *free* for Windows 10 users.

However, there is a "gotcha" in store for those of us with station computers that have motherboards manufactured prior to 2016. If you're one of these unfortunate folks, when Windows Update attempts the free upgrade you may receive an error message: "This PC can't run Windows 11." That's because Windows Update will only perform the upgrade if you own a "supported system."

The issue involves *TPM*, the Trusted Platform Module, and a function known as *Secure Boot*. These security features must be present and functional before Windows 11 will install. The TPM, in particular, is critical.

If your machine is new enough to include a TPM, but it has been disabled for whatever reason, you can activate it by accessing your PC's BIOS menu. More about that in a moment.

What are TPM and Secure Boot?

TPMs are controversial among security specialists and governments. A TPM is a strong preventative against firmware attacks, but it may restrict the kinds of software your machine is allowed to run.

Secure Boot is a feature in your computer's software that controls which operating systems are allowed to be active on a single PC. It prevents certain types of malware from taking over your machine, but it can also prevent you from being able to install a second operating system on your computer (such as Linux).

Do a TPM Check

Here is a quick test to see if your computer has a version 2.0 TMP enabled. Go to your Windows search box in the lower left corner of the desktop, type **tpm.msc**, and press the **ENTER** key.

If a screen appears saying you have it, you're good to go. If you see a screen like the one in Figure 1, you have a problem.

Meddling with BIOS

There is a chance that your PC has the TPM module, but it hasn't been turned on. To find out, you'll have to enter the Basic Input/Output System, better known as *BIOS*.

Many hams have serious qualms about doing anything to BIOS. This is understandable, as making the wrong changes in the BIOS can wreak havoc on your computer. If you are not confident, stop here and take your station computer to a knowledgeable friend or to a PC service shop.

If you choose to proceed, grit your teeth, turn on or restart your computer, and immediately press and hold the **DEL** key on your keyboard. Keep holding the key down until you are presented with the BIOS menu.

Now look for a security section, or something similar. It may be hiding within an "advanced" menu. When you find it, see if TPM is included among the available options.

If you don't see a menu option pertaining to the TPM, that's the end of the line. Exit the BIOS without saving the configuration.

On the other hand, if you discover that a TPM is present but disabled, enable it. Save your BIOS configuration and exit. Don't touch anything else. When your computer boots up again, rerun the TPM check. With luck, you'll be presented with good news.

If not, your remaining option may be to do a manual Windows 11 install or upgrade from a downloaded ISO file. This approach may work for those running 6th- or 7th-generation Intel Core CPUs or first-generation AMD Ryzen processors.

I'm one of the unlucky, but for now I am content with Windows 10 and my current hardware. No doubt there is a new PC in my future, but not today.

Dave Casler, KEØOG, askdave@arrl.org

Ask Dave

Get more information from the "*QST*: Ask Dave" YouTube playlist at **https://bit.ly/3z2MBMI**.

Antennas, Transmission Line Losses, and More

160-Meter Antenna Woes

Q Allen Woodruff, KE8CCD, of Ohio writes: I built a single-band 160-meter doublet (dipole) antenna with #14 stranded wire, fed with 100 feet of 450 Ω ladder line into a homebrew 4:1 balun to 50 Ω coax. I used the standard formula of L(ft) = 468/f (MHz) to get the correct length for the dipole. Why do I have such a high standing wave ratio (SWR)?

A There are several things going on here. A single dipole will not cover the entire 160-meter band, because the band is so wide compared to its center frequency. The more important factor is height above ground. For optimal performance, a 160-meter dipole should be ½ wavelength above the ground. At 1.9 MHz (the center of the band), the height would be 123 feet (37 meters) in the air. That takes two very tall poles! When an antenna is lower than that, the feed-point impedance falls from about 70 Ω to about 30 Ω and then rises a bit when it's even closer to ground.

Next, let's look at your feed line. The 450 Ω ladder line is a mismatch to the dipole. If you were to feed the ladder line all the way to your wide-range tuner, that wouldn't be too much of a problem because the feed line's high impedance can handle quite a mismatch. However, a 4:1 balun that's 100 feet down the ladder line and attached to a 50 Ω coax cable multiplies the impedance by four times, or 200 Ω, which is quite a mismatch to the ladder line (you really need a 9:1 balun).

If someone at your local club is a whiz at Smith charts, they can help plot all of this and provide an explanation of what's going on. There's not a lot about Smith charts in the amateur literature, and I'm afraid I know next to nothing about them, except that some people find them useful.

I would suggest dropping the coax and balun and getting more ladder line so that you have a run from the antenna feed point all the way to your tuner. If the SWR is less than 10:1, a wide-range tuner should be able to handle it.

If the antenna is only about 1/10 wavelength off the ground, you'll have a nice near vertical incidence skywave (NVIS) antenna on the band. That's good for local communications over a range of 300 miles or so.

Poor SWR Loses Power in a 50 Ω Feed Line

Q Jim Morgan, W9EMM, of Illinois asks: There's a lot of talk about the radiating power lost when using a tuner. Have you ever used a wattmeter at the transmitter and another at the antenna to see the actual wattages?

A Let's clear up a common misconception: except for very minor resistive losses in its wires, there's no loss in an antenna tuner because all of the components are reactive (usually two capacitors and one inductor). Reactive elements store and release energy; only resistive elements turn current into heat.

The power loss in a system with a tuner is almost all in the ohmic losses of the transmission line or the antenna, or in any reflected power that makes its way back to the transmitter's final amplifier stage.

Using two wattmeters for measurement (like you mentioned) will reveal the power lost in the transmission line for your antenna (see subsection 23.5.4 in the 24th edition of *The ARRL Antenna Book*). I don't have a remote-reading wattmeter to put at the junction of the transmission line and the antenna, but I can easily calculate the line loss, which would be a function of the cable used and the SWR on the line. Let's look at a commonly used coax: RG-8X. Table 23.1 in *The ARRL Antenna Book* shows its loss at 10 MHz (30 meters) and is about 0.8 dB per 100 feet, so it's a good cable for general HF operations.

However, things change with SWR. Higher SWR indicates greater reflected power, so the same energy transits the line multiple times, adding to the total resistive losses. Figure 1 shows this relationship between SWR and line losses. If the transmission line loss is 0.8 dB when the load and line are matched, a bad SWR figure of 10:1 (which can still be handled by most wide-range antenna tuners) will add almost 2 dB of loss, for a total of about 2.7 dB. Therefore, almost half of the transmitter's output

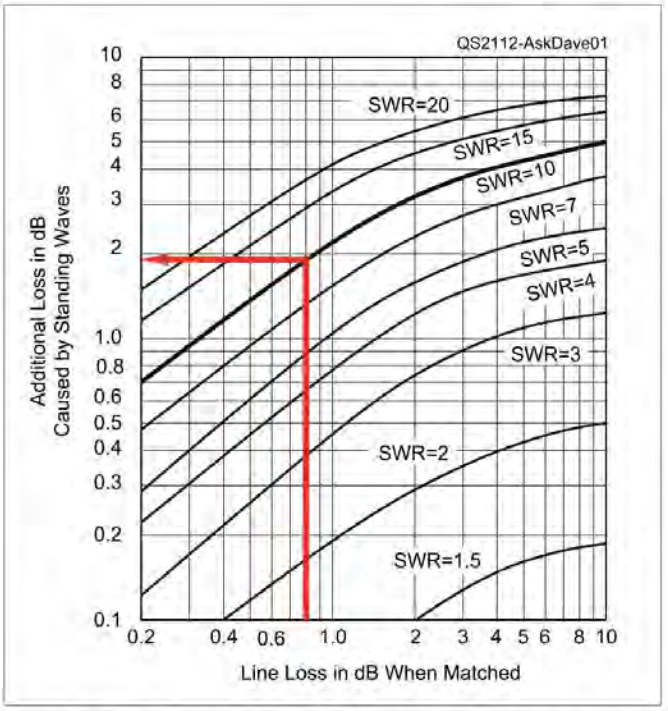


Figure 1 — This figure from *The ARRL Antenna Book* shows the additional loss introduced by high SWR. Although the ohmic loss caused by the coaxial feed line itself is only 0.8 dB, the SWR of 10:1 adds nearly 2 dB of loss, causing almost half the transmitter power to be lost as heat in the line. The long-term fix is to work on the antenna system to improve the SWR.

power will be wasted in the feed line's resistive losses. While this can be workable for temporary operations, it would be wise in the long run to work on the antenna system to lower the SWR as close to 1:1 as possible.

Check out the video answer to this question in the "QST: Ask Dave" playlist on ARRL's YouTube channel, at **https://www.youtube.com/user/ARRLHQ/playlists**.

Where Are the Radials?

Q Bob Miner, K5JPB, of New Mexico asks: I understand that a vertical antenna should have numerous radials to overcome ground losses. That's especially important in the Southwestern desert, with its dry, sandy, rocky soil. For portable operations, I get good results with eight 10-foot radials. Manufacturers of portable verticals frequently recommend one long "counterpoise." That may work, but it seems to contradict all of the material I've read about radials. What's up?

A The definition of "counterpoise" is rather hazy. Several sources say it's just another name for a tuned radial field, although current usage seems to be more generalized. I tend to think of it as something capacitive (or at least reactive) for the antenna to work against, which is perhaps equally hazy. If the counterpoise is too long it can radiate, putting RF where we don't want it.

I've seen portable antennas with a single wire or element as a counterpoise, but you're correct that it isn't much of a radial field. A vertical antenna with a single-wire counterpoise is decidedly a compromise and less effective than a full-size dipole a half-wave in the air. In a portable situation, however, an antenna like this works well enough, in the sense that "any antenna is better than no antenna." You can make contacts even with portable QRP gear, especially on modes such as FT8, which are designed for low power and non-optimal situations. The fact that these antennas work at all (and many people even use them successfully), has led some manufacturers to make the single counterpoise into a marketing feature.

My primary vertical antenna is a ground-mounted SteppIR BigIR with more than 30 radials of various random lengths. It works like a charm. An elevated vertical can get by with two tuned (resonant) radials per band, although four would be better. For my YouTube channel (**www.youtube.com/davecasler**), I'm testing a DX Commander portable vertical antenna with the extra radials kit, which has 45 radial elements. I anticipate good performance.

The bottom line is that radials matter. Good luck with your portable operations!

Antenna vs. High Brush

Q Bill Brooks, KC3WJB, of Pennsylvania asks: I have an end-fed half-wave (EFHW) dipole strung between my house and a tree that's 150 feet away and up a steep hillside. When I put it up, I cleared brush out of the way. Should I be concerned about the brush, or should I clear it again?

A Although it sounds like your question is about the brush affecting the RF performance, which it will only minimally, my concern is for the physical protection of your antenna. If the brush grows high enough, it could easily snap the wire in high winds. I recommend installing a spring at one end of the antenna (the end at your house would probably would be the most accessible). A screen door spring would work well. You can also use multiple bungee cords if they're protected from the sun inside a plastic pipe or something similar. The idea is to have enough tension on the line to keep it reasonably tight, but also enough give to avoid breakage if the brush hits it.

Or you could hire some local teenagers (with their parents' permission) to cut the brush, and then show them your ham shack. Maybe it would pique their own interest in ham radio!

Send your questions to **askdave@arrl.org**, or fill out the form at **www.ke0og.net/ask-dave**. I answer some questions here, and some via videos on my YouTube channel (**www.youtube.com/davecasler**), or during my weekly livestream on Thursdays at 6:45 to 8:15 PM Mountain Time on my channel.

Hints & Hacks

Reviving Old Scanners; Repurposing Plastic Clothes Hangers

Replacing a Boatanchor Backlight

I've owned two Realistic (RadioShack) PRO-2006 scanners since the mid-1990s and they're still top-quality analog receivers, covering the frequency range from 25 – 1300 MHz and capable of demodulating AM and narrow as well as wideband FM signals.

One of the historical problems with this series of scanners, starting with the PRO-2004, the PRO-2005 and finally the PRO-2006, is that the electroluminescent (EL) backlight that illuminates the LCD display weakens over time. Both of my displays had become almost unreadable, even under good ambient lighting. Fortunately, it is not only possible but surprisingly easy to replace these backlights, and this fix can be applied to other radios as well.

After disassembling the scanner and removing the front panel, the original backlight is easily unsoldered from the printed circuit board. The backlight then slips out from underneath the LCD display (see Figure 1).

The original parts are no longer available, but new EL panels are plentiful and even if they are oversized, they can be trimmed to size to create a suitable replacement. I found new panels on eBay for less than $10 each. You can see the difference in size between the original and the untrimmed replacement in Figure 2. I was apprehensive about cutting the large panel, as I wasn't sure whether the panel's brightness level was in some way related to the surface area of the electrical connection made on the top of the panel (you can see the metal connection from the top pin as it runs up along the left-hand side and across the top of the panel). It turns out, though, that as long as a connection is maintained at some point on the top of the panel it will in fact illuminate fully (the second pin connects to the bottom side of the layered panel).

To successfully trim the EL panel, you need a very sharp pair of scissors or a box cutter with a fresh blade; a dull cutting edge may potentially delaminate the panel's layers, which could cause dark spots or even failure. I taped the replacement panel down to my cutting surface and traced the outline of the old panel on it

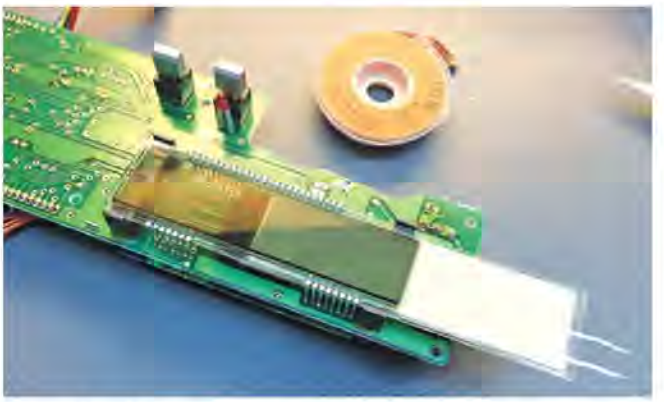


Figure 1 — After unplugging the display board and removing the metal shield, you simply unsolder two leads and slide the original backlight panel out.

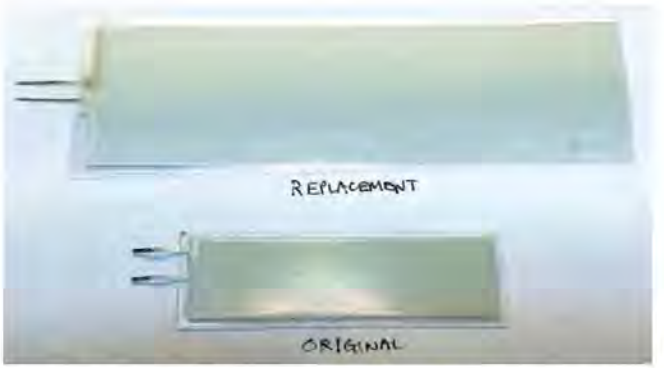


Figure 2 —The size difference between the original panel and the untrimmed replacement is not a problem!

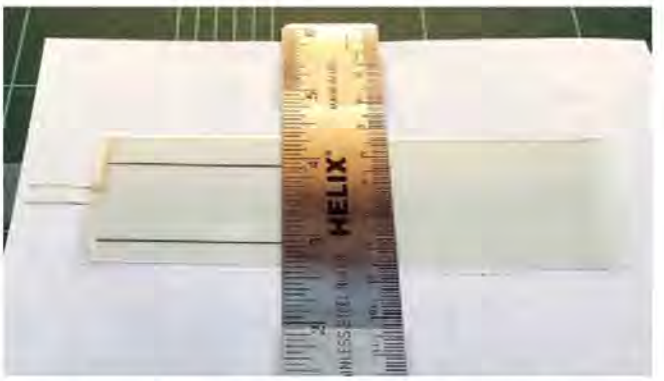


Figure 3 — With a marker and the original panel as a template, trace its outline on the replacement panel prior to cutting. Use a straightedge to guide your blade for clean, accurate cuts.

Figure 4 — It's obvious which scanner has the replacement backlight panel!

(Figure 3). I taped the straightedge down along the lines before making the cuts; that kept the straightedge and blade from wandering as I made the cuts.

After completing the cuts, I applied a small amount of Super Glue® (cyanoacrylate) along the edges to seal them and keep any moisture from migrating into the panel.

With the new EL panel in place, the improvement is remarkable, as you can see in Figure 4.

EL panels use an ac power source, usually a simple inverter circuit producing up to 100 V at a frequency of several hundred hertz or more. Although the current needed to power one an EL panel is low, the relatively high voltage posed a potential shock hazard — another reason to seal the edges.

This inexpensive repair should extend the service life of the scanner by many more years. Knowing now that the procedure works, I even purchased a couple of additional replacement panels to salt away for future needs. — *73, Dino Papas, KL0S,* **kl0s@cox.net**

A Zero-Dollar Insulated Shaft

If you're ever in need of a plastic shaft for a homebrew project such as a receiver, transceiver, or antenna tuner, you can make one in short order from a plastic clothes hanger for almost no cost. A single hanger can provide two shorter lengths and one longer. Simply cut the necessary pieces to length and then grind the ends to fit whatever shaft couplers you are using. — *73, Edward Barbacow, K3ZCY,* **k3zcy@zoominternet.net**.

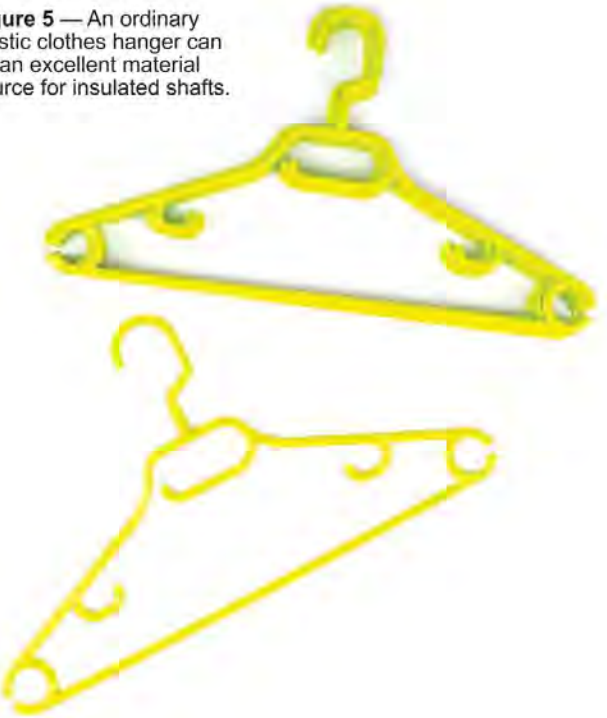


Figure 5 — An ordinary plastic clothes hanger can be an excellent material source for insulated shafts.

"Hints and Hacks" items have not been tested by *QST* or ARRL unless otherwise stated. Although we can't guarantee that a given hint will work for your situation, we make every effort to screen out harmful information. Send technical questions directly to the hint's author.

QST invites you to share your hints with fellow hams. Send them to "Attn: Hints and Hacks" at ARRL Headquarters, 225 Main St., Newington, CT 06111, or via email to **hh@arrl.org**. Please include your name, call sign, complete mailing address, daytime telephone number, and email address on all correspondence. Whether you are praising or criticizing an item, please send the author(s) a copy of your comments.

Strays

QST Congratulates...

George J. Whalen, NY9A, on the publication of his book, *The Story of Radio: To 5G Wireless*, which recounts the history of radio technology from the landline telegraph to the beginnings of the 5G rollout. The book is available from **Amazon.com** for Kindle or in softcover. A hardcover edition will be available soon.

How the Transatlantic Test of 1921 Initiated International Amateur Radio Communication

This one-way transmission test has greatly impacted the advancement of amateur radio techniques, technologies, and discoveries over the past 100 years.

Carl Luetzelschwab, K9LA

In 1921, signals from huge VLF stations in the US reached across the Atlantic Ocean to Europe, and amateurs communicated from the east coast of the US to California. Many amateur radio operators believed that they, too, could span the Atlantic, even with modest stations.

ARRL strongly believed in this endeavor, and sent Paul Godley, 2ZE, a seasoned operator and accomplished receiver designer, to the UK via the *Aquitania*, to be an auxiliary to the British efforts to listen for American hams. The December 1921 Transatlantic Test was the second to be completed, following the first unsuccessful test held earlier that year. The December test was a one-way transmission. European hams listened for American hams, and successfully received the signals of many US hams in Ardrossan, Scotland, where Godley was, as well as in England, Holland, Germany, and France. Two-way transatlantic contacts weren't completed until 1923.

Here are some of the ways this successful test was the first step forward in the progression of amateur radio.

The Radio Act of 1912

Because of interference to commercial and naval radio operations, the Radio Act of 1912 relegated amateur radio operators to wavelengths of 200 meters and shorter (frequencies of 1.5 MHz and higher). At that time, it was believed that these frequencies were only useful for relatively short distances, and therefore considered to be a "wasteland." Fortunately, the 1921 Transatlantic Test dispelled this myth, and led to greatly increased use of shortwave frequencies for transoceanic contacts.

The Ardrossan station with Inspector E.D. Pearson of the Marconi International Marine Communication Co., who was the checking operator throughout the test. [February 1922 *QST* photo]

Understanding the Ionosphere

The Transatlantic Test of 1921 was one of many factors that brought about new research of the ionosphere. Although American electrical engineer Arthur Kennelly and English mathematician Oliver Heaviside independently postulated the existence of the ionosphere in 1902 from Italian electrical engineer Guglielmo Marconi's transatlantic feat in 1901, it wasn't until 1924 that English physicist Sir Edward Appleton proved the existence of the ionosphere.

We now have a much better understanding of the ionosphere, and realize that our HF frequencies can easily allow long-distance contacts with modest stations.

The Beginning of DX Operation

Although the 1921 Transatlantic Test was only a one-way transmission because of severe restrictions on transmitter power and antenna size for British hams, it set the stage for late 1923, when the first two-way contacts were completed between the US and Europe.

When ARRL sent Godley to the UK to listen for signals from American radio amateurs, it was essentially the first-ever DXpedition. Thus, the Transatlantic Test, and other tests that followed, gave rise to the practice of making DX contacts, as well as hams traveling for DXpeditions.

The Emergence of Receive Antennas

In 1920, the Radio Corporation of America (RCA) tasked Harold Beverage with developing receiving systems (receivers, antennas, and interference reduction techniques) for transoceanic communications. In June 1921, Beverage obtained a US patent for his radio receiving system: the Beverage antenna.

Fortunately, Godley met Beverage aboard the *Aquitania*. Godley tried Beverage's new invention, hoping to improve his reception of signals from America. This was a critical factor for Godley's success during the 1921 Transatlantic Test. This type of antenna is now used by many 160- and 80-meter operators around the world, to improve the signal-to-noise ratio (SNR) on those bands with higher noise levels. The invention of improved receiving antennas emerged from the Transatlantic Test, although radio amateurs didn't use them in meaningful numbers for more than 50 years.

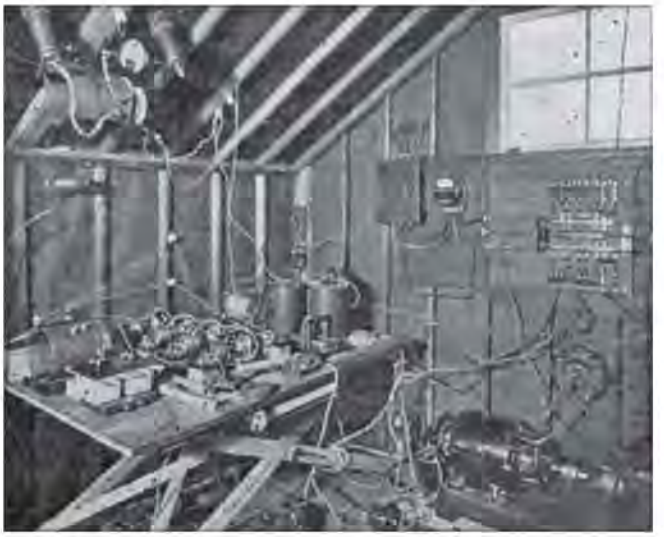
A Rise in CW Transmissions

As reported by The Editor of *QST* in "The Story of the Transatlantics" in the February 1922 issue, Godley, the British, and a few other countries heard many American stations during the 1921 test. Most of these American signals used CW transmissions, and only a few spark transmitters were heard. These results set the stage for the increased use of CW and the demise of spark.

The majority of the American stations that Godley heard used CW, and Godley used a superheterodyne receiver, invented by American electrical engineer Edwin Armstrong in 1918. This sent amateur radio on its way to improved CW transmitters and superheterodyne receivers capable of operation at much higher frequencies.

Summary

The Transatlantic Test of 1921 was a great step forward for amateur radio operators. I'd like to thank those who participated in both the one-way and two-way tests all those years ago for their efforts. They ushered in the dawn of international amateur radio. I'd also like to thank Frank Donovan, W3LPL, for his contributions to this article.



The 1BCG transmitter, organized by members of the Radio Club of America in Greenwich, Connecticut, was the strongest of many stations in the east coast of the US heard by Paul Godley, 2ZE, during the December 1921 Transatlantic Test. It ran about 1,000 W input, and it took up the entire corner of a small building. Now, a modern transceiver with a 1 kW input amplifier would easily fit on a desktop. [Radio Club of America photo]

AMERICAN RADIO RELAY LEAGUE
Amateur Radio Station
282 Fern Street,
West Hartford, Conn.

1MO

Radio F8AB

This will confirm communication with you on 11-27-23 at 10[38] P. M., E.S.T. Wave 103 meters.

Your Signals were heard on _____ at _____ M., E.S.T. Wave _____ meters.

Will be glad to give you a description of 1MO if you want it, OM. How?

La QSL de 1MO.
Oui, vraiment FB !

Best 73, J. H. Schnell

Operator

Oh Boy!!! F.B.

A QSL for one of the first two-way transatlantic contacts. [**www.hamgallery.com** photo]

For more information on the Transatlantic Test of 1921 and commemorations of its anniversary, visit **http://arrl.org/transatlantic**.

Carl Luetzelschwab, K9LA, started his radio career as a shortwave listener in the late 1950s, using a National NC-60 receiver. After discovering amateur radio, he received his Novice-class license in 1961. He selected K9LA as his call sign in 1977. Carl enjoys propagation, DXing, contesting, playing with antennas, and fixing/using vintage equipment. He's a graduate of Purdue University (where he earned his Master's degree in electrical engineering) and worked for Motorola (in Schaumburg, Illinois, and Fort Worth, Texas), and for Magnavox (now Raytheon) in Fort Wayne, Indiana, as an RF design engineer. Carl retired in October 2013. He can be reached at **k9la@arrl.net**.

For updates to this article, see the *QST* Feedback page at www.arrl.org/feedback.

VOTE
If you enjoyed this article, cast your vote at www.arrl.org/cover-plaque-poll

Celebrate the Transatlantic Tests with ARRL and RSGB

ARRL and the Radio Society of Great Britain (RSGB) have planned a series of joint events to celebrate the centenary of the successful 1921 Transatlantic Tests by radio amateurs, which spurred technological advances in long-distance and global two-way radio communications. Watch for further information about these events in 2021 and 2022.

160-Meter Transatlantic Centenary QSO Party 0200 – 0800 UTC Sunday, December 12, 2021

Commemorating the very hour 100 years ago, when the first transatlantic message from amateur radio station 1BCG in Connecticut reached the listening station of Paul Godley, 2ZE, in Ardrossan, Scotland, ARRL and RSGB will activate CW-only special event stations for 6 hours.

A team of stations from GMDX Group, a Scotland-based DX society, will share the operations as GB2ZE in Scotland, while ARRL will activate W1AW from Newington, Connecticut. Operations will commence at 0200 UTC and continue until at least 0800 UTC. If propagation conditions across the Atlantic permit, operations will continue beyond 0800 UTC.

GMDX Group will award a *quaich* (a traditional Scottish two-handled drinking cup that commemorates friendship) to the first stations in North America and the UK to complete contacts with both W1AW and GB2ZE during the QSO party. ARRL and RSGB will jointly publish successful contacts, and will offer a downloadable certificate to stations that contact one or both activated stations.

More Events and Commemorations

For more information, visit **www.arrl.org/transatlantic** and **www.rsgb.org/transatlantic-tests**.

Transatlantic Centenary DX Marathon December 2022

ARRL and RSGB will commemorate the centenary of the Transatlantic Tests held between 1921 and 1923 with a DX marathon in December 2022. All radio amateurs will be encouraged to mark these historic events by making contacts throughout the month. Full details will be available closer to the date.

W1AW Commemorative Transatlantic QSL Card

Stations making contacts from December 11, 2021 to December 31, 2022, may request a commemorative W1AW QSL card. US stations send a self-addressed stamped envelope; international stations request a QSL card via the ARRL QSL Bureau.

2021 ARRL 160-Meter Contest

From 2200 UTC Friday, December 3 to 1559 UTC Sunday, December 5, this annual CW contest is most like the Transatlantic Tests of the early 1920s. Visit **www.arrl.org/160-meter** for contest rules and information.

Special Event Call Sign GB1ØØ2ZE

From December 1 to December 26, 2021, the Crocodile Rock Amateur Group (CRAG), based near Ardrossan, Scotland, will activate the special event call sign GB1ØØ2ZE, to commemorate the successful reception of amateur transatlantic signals by Paul Godley, 2ZE. In tribute, RSGB will encourage stations in the UK and Crown Dependencies to add the suffix "/2ZE" to their normal call sign throughout the period.

"A Glorious Page" in the History of Amateur Radio

Bruce Godley Littlefield, grandson of Paul F. Godley, 2ZE, contributed this image of a document that ARRL presented to his grandfather to commemorate the success of the Transatlantic Tests.

Bruce told ARRL, "It is the resolution presented to my grandfather by ARRL, dated February 17, 1922. This is roughly 18" × 28" and a magnificent work of art... I have had it re-matted and re-assembled with archival materials, though the frame and glass remain original. It was professionally scanned at high resolution so that copies could be made as desired, at the request of the other Godley grandchildren and their descendants."

The resolution commends and thanks Godley, who "accepted the invitation of the American Radio Relay League and at Ardrossan, Scotland, in the face of great physical discomforts, unfavorable climatic conditions, and technical handicaps, set up his apparatus and wrote a glorious page in the history of the American Radio Amateur by the unprecedented reception in Europe of twenty-six United States and Canadian amateur stations." It is signed by ARRL President Hiram Percy Maxim, ARRL Traffic Manager Fred H. Schnell, and ARRL Secretary K. B. Warner. [Used with permission; from the collection of Bruce Godley Littlefield, grandson of Paul F. Godley, 2ZE]

A Wager Won, An Ocean Spanned

An unusual artifact from ARRL's museum collection attests to high spirits at the time of the Transatlantic Tests.

In 1921, during the excitement leading up to the Transatlantic Tests, ARRL Secretary K. B. Warner, W1EH, offered to bet "a hand-painted derby hat" that US signals would be heard in Europe during the tests. W. W. Burnham, a well-known manufacturer of ham radio gear, accepted that bet.

As we know now, ARRL's representative in Ardrossan, Scotland — Paul Godley, 2ZE — heard many US signals during the tests. The success of the tests meant that Burnham owed Warner a hat. The use of the term "derby" baffled the British hatmakers (what we call a "derby" in the US is known as a "bowler" in England), so they made their best guess and painted a hat of the type traditionally worn at derby races.

Warner eventually donated the congratulatory topper, which features a hand-painted US flag on one side and a UK flag on the other, to ARRL. The cover of this issue of *QST* shows both sides of the hat and both flags, in honor of what hams on both sides of the Atlantic achieved in the Transatlantic Tests 100 years ago.

The American Radio Relay League, Inc.

Resolution

Whereas, in order to bring the radio amateurs of the United States and Canada and of the several European nations into closer contact, to demonstrate the possibility of transmitting radio signals across the Atlantic Ocean under the legal restrictions of limited power and wave-length prescribed by the governments of the United States and Canada to advance the radio art, and to facilitate the interchange of free messages between the citizens of different countries, the American Radio Relay League conducted certain Transatlantic Transmission Tests in the month of December, nineteen hundred and twenty-one; and

Whereas, the difficulties attendant upon the reception by European amateurs of American signals of such restricted power and wave length over distances in excess of three thousand miles were considered so great as to endanger the success of the tests and to justify the sending of the most skillful American amateur available to a European site to assist with his apparatus and experience in listening for American signals; and

Whereas, the Board of Direction of the American Radio Relay League was of the unanimous opinion that Paul Norman Godley because of his long experience in amateur work, his thorough knowledge of the requirements of this class, and his achievements as an experimenter and developer of highly efficient short-wave receiving apparatus, was best prepared to bring success to these tests, and

Whereas, the said Godley accepted the invitation of the American Radio Relay League and at Ardrossan, Scotland, in the face of great physical discomforts, unfavorable climatic conditions, and technical handicaps, set up his apparatus and wrote a glorious page in the history of the American Radio Relay by the unprecedented reception in Europe of forty-six United States and Canadian amateur stations; Now Therefore be it

Resolved, that the Board of Direction of the American Radio Relay League does hereby tender to Paul Norman Godley its warmest congratulations on his remarkable achievement and its hearty thanks for his service to amateur radio in the faithful discharge of the duties accepted and performed by him in so highly commendable and meritorious a manner; and be it further

Resolved, that in testimony hereof these resolutions shall be appropriately inscribed and presented to Paul Norman Godley as certification of the appreciation of the American Radio Relay League.

In Witness Whereof the Board of Direction has caused to be affixed hereunto its official seal and the signatures of its headquarters officers, at the office of the American Radio Relay League in Hartford, on this the seventeenth day of February in the Year of our Lord one thousand nine hundred and twenty-two

Hiram Percy Maxim, President
H. Beckwith, Treasurer
K. B. Warner, Secretary

The UK flag adorns the left-hand side of the hat.

The US flag flies on the right-hand side of the hat.

The hand-painted inscription on the hat reads, "In Commemoration of the Success of The Anglo-American Wireless Test Organized by The A.R.R.L., 1921."

The interior of the hat features an inscription from W. W. Burnham to K. B. Warner, along with a label indicating that the hat came from Harrods, a famous London department store.

Happy Holidays and Peace on Earth

From the ARRL Staff and *QST* Contributing Editors

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Ken Bailey, K1FUG
Tom Bell, KC1MHQ
Zoe Belliveau, W1ZOE
Adam Bernard
Shelly Bloom, WB1ENT
Stephanie Borden, W2MAU
Kathy Bouchard
Margie Bourgoin, W1MRG
Paul Bourque, N1SFE
Matthew Brady
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Al Brogdon, W1AB
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Bruce Draper, AA5B
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Luci Goodwin
Doug Haney
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Caroline Kenney
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Amy Leary, KB1TLM
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Ann-Marie Pinto
Lisa Riendeau
Janet Rocco, W1JLR
Kim Rochette
Scott St. Onge, WF4STR
Phil Salas, AD5X
Michael Scharr
Jim Schaum
Becky Schoenfeld, W1BXY
Andrey Seleznev
Barry Shackleford, W6YE
H. Ward Silver, N0AX
Jon Siverling, WB3ERA
Kai Siwiak, KE4PT
Maria Somma, AB1FM
John Stanley, K4ERO
Melissa Stemmer, KA7CLO
Cathy Stepina
Sharon Taratula
Lisa Tardette, KB1MOI
Yvette Vinci, KC1AIM
Deborah Voigt
Paul Wade, W1GHZ
Michael Walters, W8ZY
Maty Weinberg, KB1EIB
Joshua Weissman
Kelly Wells
Mark Wilson, K1RO

Volunteer Monitor Program Report

The Volunteer Monitor (VM) Program is a joint initiative between ARRL and the FCC to enhance compliance in the Amateur Radio Service. This is the September 2021 activity report of the VM Program.

♦Technician operators in Mansfield, Ohio; Avon Park, Florida, and Pulaski, Tennessee, received advisories after making numerous FT8 contacts on 20 meters. Technician licensees do not have operating privileges on 20 meters.

♦A Volunteer Monitor in Mission Viejo, California, received a Department of Homeland Security, United States Coast Guard Certificate of Appreciation for his efforts in locating a defective transmitter on Marine Radio Channel 16 that was blocking emergency communications on that channel.

♦A former licensee in Durham, North Carolina, received an advisory for operating under a call sign and license cancelled by the FCC.

♦An operator in White Pine, Tennessee, received an advisory regarding operation on 7.137 MHz, a frequency not authorized under his General class license.

♦Operators in Swannanoa, North Carolina, and New Albany, Indiana, received Good Operator notices for exemplary operation during 2021 and for regularly assisting other operators with transmitter adjustments and amateur radio procedures.

♦The VM Program made one recommendation to the FCC for case closure.

♦VM Program statistics for August showed 2,008 hours on HF frequencies and 2,642 hours on VHF frequencies and above, for a total of 4,650 hours. — *Thanks to Riley Hollingsworth, K4ZDH, Volunteer Monitor Program Administrator*

Rick Lindquist, WW1ME, ww1me@arrl.org

Happenings

ARRL Continues Its Efforts to Preserve Amateur Radio Secondary Use of the 3 GHz Band

ARRL President Rick Roderick, K5UR, in a written statement (**www.arrl.org/arrl-statement-on-3-ghz-band-oct-2021**) on the newly filed H.R.5378 before the US House Commerce Communications and Technology Subcommittee on October 6, urged Congress to direct the FCC to preserve Amateur Radio's secondary use of the 3 GHz band. President Roderick's statement was the result of a quick, well-organized response by ARRL to counter the continuing threat to Amateur Radio's secondary use of the 3 GHz band.

Some 10 days earlier, ARRL became aware of a provision in the $3.5 Trillion Budget Reconciliation Bill that would have required that approximately 200 MHz of the 3.1 – 3.45 GHz band be reallocated to the use of 5G vendors. Moving swiftly, the ARRL Executive Committee authorized FCC counsel to begin preparations to respond. But, confronted with the probable delay of the Reconciliation Bill and an uncertain future for the 3 GHz provisions, Subcommittee Chairman Michael Doyle (D-PA-18) and Representative Doris Matsui (D-CA-6) introduced similar reallocation language on September 29 as H.R.5378 (117th Congress, 1st Session) and scheduled hearings on it and related communications bills for Wednesday, October 6, 2021.

The Executive Committee and the Legislative Advocacy Committee immediately tasked ARRL's lobbyists to initiate efforts to obtain support for ARRL's position. Meetings were held

on short notice to request support with the offices of Subcommittee members including Representatives Adam Kinzinger (R-IL-16) and Tim Walberg (R-MI-7), as well as with Representatives John Larson (D-CT-1) and Joe Courtney (D-CT-2).

In addition, ARRL's lobbyists, ARRL Atlantic Division Vice Director Bob Famiglio, K3RF, and ARRL Washington Counsel David Siddall, K3ZJ, met with Chairman Doyle's Chief of Staff on October 1, to explain the importance of Amateur Radio maintaining authority to operate in the 3.3 – 3.45 GHz band.

In his written statement (**www.arrl.org/arrl-statement-on-3-ghz-band-oct-2021**) submitted to the Subcommittee in conjunction with the hearing, President Roderick emphasized that permitting Amateur Radio to continue to have use of the 3.3 – 3.45 GHz band on a strictly secondary, non-interfering basis will provide full protection to commercial licensees with exclusive licenses and further the public interest in providing a means for continued technological innovation.

Despite vigorous opposition from ARRL and others, the FCC in 2020 ordered the "sunsetting" of the 3.3 – 3.5 GHz band in order to auction the spectrum to commercial 5G providers. The Commission allowed amateur operations to continue in the lower 150 megahertz of the band, 3.3 – 3.45 GHz, until it acts in a future rulemaking to address that spectrum. Amateur operations were allowed to continue in the upper 50 megahertz, 3.45 – 3.5 GHz, only until 90 days after the auction including that spectrum has closed. The auction began in early October; it is likely that operations will have to cease in February or March, 2022.

"A core standard of spectrum policy should be to maximize use of this valuable but finite spectrum resource," President Roderick told the panel. "The [FCC] in earlier proceedings adopted a variety of methods to share and maximize use of the spectrum by radio amateurs and others, but in its latest 3 GHz proceeding it did not do so, despite hundreds of comments filed by radio amateurs."

President Roderick said that if the current policy continues, existing spectrum at 3 GHz being addressed in H.R.5378 "will be cleared indiscriminately," leaving "significant spectrum resources vacant into the foreseeable

future while radio amateur experimentation and operation will be forced to cease for no reason except regulatory myopia. It need not be so."

President Roderick pointed out that in earlier proceedings, the FCC adopted methods to ensure unencumbered spectrum access by primary users while accommodating secondary users on a non-interference basis. "These methods work well and remain effective without complaint in other frequency bands, and also should be applied to the 3 GHz band," he said.

Primary commercial users "would rarely use all of their licensed spectrum throughout their entire licensed service areas," President Roderick said. In its recent 3 GHz proceeding, however, the FCC "went beyond merely prohibiting amateur operations in areas and at times when primary Commission licensees might use the spectrum," ruling instead that all amateur operation in the subband being auctioned must terminate within 90 days of the auction's close. President Roderick told the FCC that it is not logical for the Commission to leave spectrum unused before licensees start using it.

"ARRL, on behalf of the more than 750,000 amateur licensees in the United States, respectfully requests that Congress take this opportunity to instruct the Commission in H.R.5378 that radio amateur secondary uses should continue to be authorized in the 3 GHz band," President Roderick concluded. He said there is no technical basis for removing amateur secondary operations from the 3 GHz band where radio amateurs "long have used the bits and pieces of unused spectrum for technological innovation."

H.R.5378 is not yet law, and ARRL's efforts to preserve amateur radio access to 3.3 – 3.45 on a secondary basis will continue.

On behalf of ARRL, President Roderick expressed appreciation for the support and efforts of Chairman Doyle and Representatives Larson, Courtney, Kinzinger, and Walberg to meet with ARRL representatives on short notice and to include ARRL's position on H.R.5378 in the Committee's hearing record. — *Thanks to the ARRL Board of Directors' Executive Committee*

Georgia Gets a New SM; Re-Elected SMs Begin New Terms

Jim Millsap, K9APD, became the ARRL Georgia Section Manager (SM) on October 1. Millsap, of Acworth, was the only candidate to apply by the June 4 nomination deadline. Millsap had been an ARRL Emergency Coordinator and District Emergency Coordinator. He also served as the ARRL Southeastern Division Vice Director from 2012 to 2014. Outgoing SM David Benoist, AG4ZR, decided not to run for a new term after serving since November 2016.

The following incumbent SMs faced no challengers in the summer election cycle and also began new 2-year terms on October 1: Robert Wareham, N0ESQ (Colorado); Diana Feinberg, AI6DF (Los Angeles); Carol Milazzo, KP4MD (Sacramento Valley); Bill Hillendahl, KH6GJV (San Francisco); Stuart Wolfe, KF5NIX (South Texas); Monte Simpson, W7FF (Western Washington), and Dan Ringer, K8WV (West Virginia).

Eastern Washington SM Jo Whitney, KA7LJQ, was also the only nominee when the June 4 nomination deadline arrived. Initially scheduled to start her term on October 1, she was appointed to begin on July 1 after outgoing SM Jack Tiley, AD7FO, stepped down before the completion of his term.

ARRL Awards Colvin Grant to 3Y0J Bouvet Island DXpedition

ARRL has awarded a Colvin Grant of $5,000 to Amateur Radio DXpeditions (ARD), the Norwegian nonprofit organization that is sponsoring the 3Y0J DXpedition to Bouvet Island in fall 2022. Co-leaders for the effort are Ken Opskar, LA7GIA; Rune Øye, LA7THA, and Erwann Merrien, LB1QI.

The multinational team plans to activate Bouvet in November 2022. A dependency of Norway, Bouvet is a subantarctic island in the South Atlantic and the second-most-wanted DXCC entity, behind North Korea. Bouvet has not been activated since the winter of 2007 – 2008.

ARD would field a team of 12 operators for a 20-day stay on Bouvet. The DXpedition has set a goal of 120,000 contacts.

The Colvin Award is funded by an endowment established by the legendary DX couple Lloyd Colvin, W6KG (SK), and Iris Colvin, W6QL (SK). The award is intended to support amateur radio projects that promote international goodwill in the field of DX.

The 3Y0J team said that with its overall budget of $650,000, this DXpedition to Bouvet will be the most costly ever. Visit the 3Y0J DXpedition website (**www.3y0j.no**) for more information.

ARDC Grant Provides ARESLAX with Sophisticated Noise Location Capabilities

ARESLAX, an arm of the ARRL Los Angeles Section, has used a $23,600 grant from Amateur Radio Digital Communications (ARDC) to purchase equipment that will help its Amateur Radio Emergency Service® (ARES®) team members to locate and eliminate sources of radio frequency interference (RFI) that could hinder their operations.

"Earthquakes and wildfires are the primary disaster threats this region faces," ARRL Los Angeles Section Manager (SM) Diana Feinberg, AI6DF, explained. "Because these incidents occur without any advance warning, disaster communication groups in the [ARRL] Los Angeles Section must maintain a high degree of readiness."

Thanks to the grant, Feinberg said that ARESLAX purchased a Fluke ii910 Precision Acoustic Imager, which combines ultrasonic detection with visual techniques to pinpoint an interference source, such as power line noise, and produce photographic evidence. ARESLAX used its own funds to purchase a Radar Engineers 243 RFI Locator.

"For an increasing number of [ARRL] Los Angeles Section hams, EMI or RFI issues have made the HF bands difficult or impossible to use for DXing, contesting, emergency communication, or casual operating," Feinberg said. She pointed out that the network of overhead power lines that expanded with the county from 1940 through 2010 has now deteriorated, resulting in arcing. "Additionally, our urban noise floor is rising from the millions of electrical devices used by consumers and businesses, including solar charging controllers and grow lights," she said.

RFI complaints can go unresolved for years, and tracking down interference sources has been the focus of a corps of technical volunteers. The new equipment makes that job far less time-consuming and more successful, ARESLAX said.

This image from the Fluke ii910 Precision Acoustic Imager pinpoints the source of power line noise.

Past AMSAT President and Director, and Amateur Satellite Pioneer Tom Clark, K3IO, SK

Tom Clark, K3IO (SK)

AMSAT-NA Past President and ham radio satellite and digital pioneer Tom Clark, K3IO (ex-W3IWI), of Columbia, Maryland, died on September 28 at the age of 82. He was an ARRL Life Member and a member of the ARRL Maxim Society and ARRL Diamond Club. Clark's accomplishments are legendary, and he left a lasting footprint on the worlds of amateur radio satellites and digital techniques.

"His longtime technical achievements, mentoring to others, and technical leadership will be missed by his many peers and friends the world over," said AMSAT stalwart Bob McGwier, N4HY. To honor Clark, AMSAT rebranded its annual gathering as the 2021 AMSAT Dr. Tom Clark, K3IO, Memorial Space Symposium and Annual General Meeting.

A founding member of Tucson Amateur Packet Radio (TAPR), Clark was a co-founder of the TAPR/AMSAT DSP Project, which led to software-defined radio (SDR). He was a leader in the development of the AX.25 packet radio protocol. Clark served as AMSAT's second President, from 1980 until 1987. He also served on the AMSAT and TAPR Boards.

In concert with McGwier, Clark developed the first amateur digital signal processing (DSP) hardware as part of the TAPR/AMSAT DSP project. This led to the software-defined transponder (SDX) for satellite work.

Clark received a doctorate in astrogeophysics from the University of Colorado. He went on to serve as Chief of the Astronomy Branch at NASA Marshall Space Flight Center and was a Senior Scientist at NASA Goddard Space Flight Center.

In 2016, ARRL awarded Clark with its President's Award, recognizing his 60 years of advancing amateur radio technology. On that occasion, McGwier said, "There would be no AMSAT to inspire all of this work without Tom Clark. Tom... saved the organization and inspired all of us to look to the future and aim for the stars."

Rick Palm, K1CE, k1ce@arrl.net

Public Service

A History of the Altruistic Efforts of ARRL and Public Service Operators

For more than a century, ARRL has been developing disaster and emergency communications programs and services complemented by the ever-advancing technology and technique of radio. The early history of amateur radio emergency communications and ARRL is described eloquently in ARRL Assistant Secretary Clinton B. DeSoto's classic 1936 tome, *Two Hundred Meters & Down — The Story of Amateur Radio*.

Orange County (California) Fire Watch volunteer Steve Graboff, MD, W6GOS, checks in from a deployment location. Ham operators have been contributing to the safety of their communities for over 100 years. [Photo courtesy of Ray Hutchinson, AE6H]

DeSoto described the typical ham of 1936 as a member of an adventurous band of free spirits involved in the radio art for the enjoyment of it. However, he also spoke seriously about altruistic service. Technical advancement of amateur radio is an operator's contribution to humanity as well, but DeSoto specifies emergency communications operators as having an unparalleled service "of matchless heroism in flood and disaster...their great emergency system of communications carrying on when all others have failed. In many years, no community in distress in this country has been without valiant aid from amateur radio."

Traffic handling and message relaying was a major part of the basis of the founding of ARRL in 1914. DeSoto said: "Floods, hurricanes, earthquakes — disasters of all varieties provide a large part of the amateur message total in the form of emergency traffic. Amateurs almost invariably served as the last line of communication in times of natural emergency…" He went on to say that from 1916 to 1936, there had been more than 40 major (and many minor) natural disasters for which hams were the last line of communication. He wrote that the predominant characteristic of the amateur is their altruism, which is still true more than 100 years later.

Early Humanitarian Activities

In 1913, on the heels of invention and development of radio design, the primary interest had become application and practice. In March of that year, "a possible new activity for amateur radio made itself apparent when amateur stations successfully bridged the communications gap surrounding a large, isolated area left by a severe windstorm in the Midwest," DeSoto wrote.

The government and ARRL worked together to prepare for World War I. In 1917, amateurs were ordered off the air, and as the US went to war, thousands of amateurs with the requisite emergency and message handling skills served the war, until the armistice in 1918.

In 1922, state governors hailed amateur radio operators as a "reserve of radio minute men for national emergencies." In 1929, the Army Amateur Radio System (the predecessor to the Military Auxiliary Radio System) organized networks across the country to assist the Army and American Red Cross for disaster relief communications.

In 1931, after years of experimentation with long-distance communications, a few hams realized that there was value in line-of-sight communications, which would ultimately serve as the bedrock for countless Amateur Radio Emergency Service® (ARES®) groups of the future.

DeSoto wrote, "Since 1919, amateur radio has been the principal, if not the only communication link, following nearly 40 major and a great number

of less consequential disasters." He cites the historic floods of March 1936 as the greatest amateur radio emergency public service of that time. As flooding spread over northern New England, normal communications were cut off, and amateur communications systems expanded flexibly and spontaneously to meet the needs of the disaster. It was estimated that 1,000 amateur stations were engaged in providing effective emergency communications for prompt warning of authorities, immediate evacuation of threatened areas, and expedient supply of relief and rescue assistance.

In the last chapter of his book, DeSoto expressed what still holds true today: "The right of amateur radio to exist comes from its public utility. Operators perform a continuing public service in that they train themselves in a highly specialized and difficult field to be of use to the nation in time of emergency."

ARRL and ARES Today

Since those early days, ARRL has devoted vast organizational resources to continue the tradition of developing the radio amateur's ability to provide emergency communications through programs such as ARES, consistent with the FCC's basis/purpose for amateur radio that includes "...the value of the amateur service to the public as a voluntary noncommercial communication service, particularly with respect to providing emergency communications."

Most issues of *QST* reveal how seriously we take that charge. There are well-known incidents, such as the September 11 terrorist attacks, after which radio amateurs risked their lives in an unstable disaster area, as well as the responses to hurricanes Andrew (1992), Katrina (2005), Harvey/Irma/Maria (2017), and most recently, Ida (2021), to name just a few.

And then there are the smaller, but equally important responses. For example, in the "Celebrating Our Legacy" column of the October 2021 issue of *QST*, Craig Moyer, NN2B, represents ongoing ham altruism by saying: "Since 2010, my interest in radio and public safety has led me to take a Community Emergency Response Team (CERT) class, as well as get training to become a structural and wildland volunteer firefighter and EMT..." Without individual interest and participation from numerous hams like Craig, we wouldn't be able to mount responses to large-scale events when they occur.

How to Get Involved

With more than a century of public service and the disaster and emergency communications services behind us — services that radio amateurs continue to provide today — it becomes clear that amateur radio public service is a humanitarian effort.

Find your place on your local ARES team to fulfill your aspirations to serve as a humanitarian. Contact your local ARES Emergency Coordinator or ARRL Section Manager (listed on page 16 of this issue) for local and Section information, and how to join.

Editor's note: The summary of amateur radio communications history was based on an article written by the author and published in the September 2019 issue of The ARES Letter.

Field Organization Reports

September 2021

Public Service Honor Roll

This listing recognizes radio amateurs whose public service performance during the month indicated 70 or more points in six categories. Details on the program can be found at **www.arrl.org/public-service-honor-roll**.

638 WA7PTM
495 WA3EZN
446 KE8BYC
444 AC0KQ
437 W7PAT
416 WA2CCN
408 AD3CM
360 N9VC
310 KB3YRU W7EES
280 KB3YYC
270 ND8W
250 KB2RTZ
244 KT2D
240 KK6GXG
235 N5MKY
227 KE8KOC
220 WA0QLW KD2NMG
205 WO2H
190 W8DJG
185 KC9FXE
179 N3KRX

175 W2PH
170 K0FBS
168 NI2W
166 KM8V
162 K0WAV
160 K9ILJ AI9F N1LL N4CNX KW1U
158 K3MIY WM2C
157 WD8USA
155 K0RCJ
150 N8SY
148 KF0BPN
144 W9RY KC8T K3FAZ
143 AL0Y
140 WB9QPM N3XMB W8IM K4IWW KK3F
136 N2DW
135 N2LC W4DNA
131 W3YVQ

130 WB9WKO N2JBA WK4WC KD8ZCM
127 KV8Z
125 AG9G KE5YTA KF5OMH KO4OL
122 KC8YVF
121 WB8YYS
120 WA4VGZ WC4FSU K9LGU KA9MZJ K3JL KA9QWC KY2D KG5NNA KB8PGW NA7G N7IE
116 K8AMH
115 KD0HHN N1TF
114 KD8KBX
112 KY2MMM
111 W3CJD
110 WA1URS N3SW K6HTN AC8NP KC8WH KB2QO AA3SB WB8TQZ N1IQI W1RVY
109 KB1TCE

107 W4EDN
105 W2PAX K1XFC
102 K2VTT
100 W4CMH W1KX WB4RJW AD4DO KZ8Q KN9P NX9K KD8UUB K3RC AC8RV WB8SIQ KL7RF K3YAK W2AH AK2Z KB2YAA W2ZXN N1LAH
98 K8MDA K8RDN
97 N6IET KT4WX
95 W9EEU K1HEJ
94 KB1NMO K1STM
90 W1LBV KB9GO WB6NCT AB9ZA K8KRA N8MRS KB8HJJ WD0BFO KA2HZP N4ZM W4KX K8ED KD2PQP WB4ZDU KC1KVY

89 KB3IN KF5IVJ
87 K6JT
85 WX2DX KA1G KC1HHO
83 AB3WG
82 KA0DBK
81 N2TSO
80 AJ7B KR4ST KM4WHO W9BGJ W8GSR KA2GQQ KB1NAL
79 KB8RCR
78 WB8R KA2JFU WA1LPM
76 W3ZR KE8ANW K2EAG
74 K4FHR
73 KU1U KB0DTI
72 K6RAU KB3MXK
71 N0UMP K2MTG WB3FTQ
70 WB2VUF

The following stations qualified for PSHR in August, 2021, but were not listed in this column yet: K0RCJ 155, WV5Q 147, N7IE, NA7G 120, W5XX 82.

Section Traffic Manager Reports

The following Section Traffic Managers reported: AR, CO, CT, DE, EMA, EPA, IL, IN, KS, KY, LA, LAX, MDC, ME, MI, MO, NC, ND, NE, NFL, NM, NNJ, NTX, NV, OH, OR, SD, SFL, SJV, SNJ, UT, WCF, WMA, WNY, WPA, WWA, WI, WY.

Section Emergency Coordinator Reports

The following Section Emergency Coordinators reported: ENY, EPA, KY, MDC, MI, MO, ND, NLI, NV, OR, SCV, SNJ, TN, UT, VA, WPA, WTX, WY.

Brass Pounders League

The BPL is open to all amateurs in the US, Canada, and US possessions who report to their SMs a total of 500 or more points or a sum of 100 or more origination and delivery points for any calendar month. Messages must be handled on amateur radio frequencies within 48 hours of receipt in standard ARRL radiogram format. Call signs of qualifiers and their monthly BPL total points follow.

KK3F 1,182, KY2D 1,084, NX9K 1,052, WB9WKO 694, K6HTN 853, N9CK 580.

Bruce Draper, AA5B, aa5b.corral@gmail.com

Contest Corral December 2021

Check for updates and a downloadable PDF version online at **www.arrl.org/contest-calendar**.
Refer to the contest websites for full rules, scoring information, operating periods or time limits, and log submission information.

Start - Finish Date-Time		Date-Time		Bands	Contest Name	Mode	Exchange	Sponsor's Website
1	0230	1	0300	1.8-21	Phone Weekly Test – Fray	Ph	Name, SPC	www.perluma.com/Phone_Fray_Contest_Rules.pdf
1	1300	1	1400	1.8-28	CWops Mini-CWT Test	CW	Name, mbr or SPC or "CWA"	cwops.org
1	1700	1	2000	144	VHF-UHF FT8 Activity Contest	Dig	4-char grid square	ft8activity.eu/index.php/en
1	1900	1	2000	1.8-28	CWops Mini-CWT Test	CW	Name, mbr or SPC or "CWA"	cwops.org
2	0000	2	0300	1.8	QRP ARCI Top Band Sprint	CW	RST, SPC, mbr or power	qrparci.org/contest
2	0000	3	0300	7	Walk for the Bacon QRP Contest	CW	Max 13 WPM; RST, SPC, name, mbr or power	qrpcontest.com/pigwalk40
2	0300	2	0400	1.8-28	CWops Mini-CWT Test	CW	Name, mbr or SPC or "CWA"	cwops.org
2	0700	2	0800	1.8-28	CWops Mini-CWT Test	CW	Name, mbr or SPC or "CWA"	cwops.org
2	1700	2	1900	3.5-14	RTTYops Weeksprint	Dig	Other station's call, your call, serial, name	rttyops.com
2	1800	2	2200	28	NRAU 10-Meter Activity Contest	CW Ph Dig	RS(T), 6-char grid square	nrrlcontest.no
2	2000	2	2200	1.8-50	SKCC Sprint Europe	CW	RST, SPC, name, mbr or "none"	www.skccgroup.com
3	0145	3	0215	1.8-21	NCCC RTTY Sprint	Dig	Serial, name, QTH	www.ncccsprint.com
3	0230	3	0300	1.8-21	NCCC Sprint	CW	Serial, name, QTH	www.ncccsprint.com
3	2000	3	2100	1.8-28	K1USN Slow Speed Test	CW	Max 13 WPM; RST, SPC, name, mbr or power	www.k1usn.com/sst.html
3	2200	5	1559	1.8	ARRL 160-Meter Contest	CW	W/VE: RST, ARRL/RAC Section; DX: RST	www.arrl.org/160-meter
4	0500	5	1000	3.5-28	UFT Meeting	CW	RST, mbr or "NM"	uft.net/les-rencontres-uft
4	0600	4	0800	7, 14	Wake-Up! QRP Sprint	CW	RST, serial, suffix of previous QSO	qrp.ru/contest/wakeup
4	1200	5	1159	3.5-28	PRO CW Contest	CW	RST, serial, "/M" if member	www.procontestclub.ro
4	1300	4	1330	144	Two-Meter Classic Sprint	CW Ph	Serial, 4-char grid square	fwrc.info
4	1800	5	2359	3.5-28	FT Roundup	Dig	W/VE: RST, state/province; DX: RST, serial	www.rttycontesting.com
6	0000	6	0100	1.8-28	K1USN Slow Speed Test	CW	Max 20 WPM; name, SPC	www.k1usn.com/sst.html
7	0100	7	0159	1.8-50	Worldwide Sideband Activity Contest	Ph	RS, age group (OM, YL, Youth)	wwsac.com/rules.html
7	0200	7	0400	3.5-28	ARS Spartan Sprint	CW	RST, SPC, power	arsqrp.blogspot.com
7	1700	7	1900	3.5-14	RTTYops Weeksprint	Dig	Other station's call, your call, serial, name	rttyops.com
8	0130	8	0330	3.5-14	NAQCC CW Sprint	CW	RST, SPC, mbr or power	naqcc.info
8	1700	8	2000	432	VHF-UHF FT8 Activity Contest	Dig	4-char grid square	ft8activity.eu/index.php/en
11	0000	12	2359	28	ARRL 10-Meter Contest	CW Ph	W/VE/XE: RST, state/province; DX: RST, serial	www.arrl.org/10-meter
11	0000	13	2359	1.8-7	PODXS 070 Club Low Band Sprint	Dig	RST, SPC	www.podxs070.com
11	0600	12	1800	3.5-28	TRC Digi Contest	Dig	RST, serial, "TRC" if membr	trcdx.org/rules-trc-digi
11	1200	12	2359	1.8-50	SKCC Weekend Sprintathon	CW	RST, SPC, name, mbr or "none"	www.skccgroup.com
11	1300	12	1300	3.5, 7	ARI 40/80 Contest	CW Ph Dig	RS(T), 2-letter province code	www.ari.it/en/contest-hf
11	1600	12	1559	3.5-28	International Naval Contest	CW Ph	RS(T), mbr (and club) or serial	www.marinefunker.at
12	2000	12	2300	1.8-28	QRP ARCI Holiday Spirits Homebrew	CW	RST, SPC, mbr or power	qrparci.org/contest
12	2100	12	2259	14	CQC Great Colorado Snowshoe Run	CW	RST, SPC	www.coloradoqrpclub.org/contests
13	0100	13	0300	1.8-28	4 States QRP Second Sunday Sprint	CW Ph	RS(T), SPC, mbr or power	www.4sqrp.com
16	0000	17	0300	14	Walk for the Bacon QRP Contest	CW	Max 13 WPM; RST, SPC, name, mbr or power	qrpcontest.com/pigwalk20
17	1600	17	1700	3.5, 7	AGB-Party Contest	CW Ph Dig	RST, serial, mbr (if member)	ev5agb.com/contest/agb_party.htm
17	1800	17	2200	1.8	Russian 160-Meter Contest	CW Ph	RS(T), oblast code or serial	www.topband.ru/rules.htm
18	0000	18	2359	1.8-50	Feld Hell Sprint	Dig	RST, mbr, SPC, grid	sites.google.com/site/feldhellclub
18	0000	18	2359	3.5-28	OK DX RTTY Contest	Dig	RST, CQ Zone	okrtty.crk.cz
18	0000	18	2359	1.8-144	RAC Winter Contest	CW Ph	VE: RS(T), province/territory; Non-VE: RS(T) + serial	www.rac.ca/contesting
18	0000	19	2359	50-1296	ARRL EME Contest	CW Ph Dig	Signal report	www.arrl.org/eme-contest
18	1200	19	1159	3.5-28	Padang DX Contest	Ph	RS, serial	padangdxc.com/rules
18	1400	19	1400	1.8-28	Croatian CW Contest	CW	RST, serial	9acw.org/index.php/rules
18	1500	19	1500	1.8	Stew Perry Topband Challenge	CW	4-char grid square	www.kkn.net/stew
19	1800	19	2359	3.5-28	ARRL Rookie Roundup, CW	CW	Name, 2-digit year first licensed, SPC	www.arrl.org/rookie-roundup
19	2300	20	0100	1.8-28	Run for the Bacon QRP Contest	CW	RST, SPC, mbr or power	qrpcontest.com/pigrun
22	0000	22	0200	1.8-50	SKCC Sprint	CW	RST, SPC, name, mbr or "none"	www.skccgroup.com
22	0130	22	0330	3.5-14	NAQCC CW Sprint	CW	RST, SPC, mbr or power	naqcc.info
25	1200	26	1159	3.5-28	Gedebage CW Contest	CW	RST, serial	olkb.or.id
26	0000	26	1159	3.5-28	RAEM Contest	CW	Serial, latitude and longitute (e.g. 57N 95W)	raem.srr.ru/rules
26	0830	26	1059	3.5, 7	DARC Christmas Contest	CW Ph	RS(T), DOK (or "NM" if not DARC member) or serial	darc.de/der-club/referate/conteste
30	1200	30	2359	3.5-28	YOTA Contest	CW Ph	Age (or average age for multi-ops)	www.ham-yota.com/contest
31	0900	31	2359	3.5, 7	Bogor Old and New Contest	Ph	RS, operator age	contest.orari-bogor.org

There are a number of weekly contests not included in the table above. For more info, visit: **www.qrpfoxhunt.org**, **www.ncccsprint.com**, and **www.cwops.org**. All dates refer to UTC and may be different from calendar dates in North America. Contests are not conducted on the 60-, 30-, 17-, or 12-meter bands. Mbr = Membership number. Serial = Sequential number of the contact. SPC = State, Province, DXCC Entity. XE = Mexican state. Listings in blue indicate contests sponsored by ARRL or *NCJ*. The latest time to make a valid contest QSO is the minute listed in the "Finish Time" column. *Data for Contest Corral is maintained on the WA7BNM Contest Calendar at* **www.contestcalendar.com** *and is extracted for publication in* QST *2 months prior to the month of the contest. ARRL gratefully acknowledges the support of Bruce Horn, WA7BNM, in providing this service.*

2021 ARRL Field Day Results

Almost 27,000 participants joined in the fun during Field Day this year, making over 1.4 million contacts.

Paul Bourque, N1SFE
ARRL Contest Program Manager

Similar to last year, the 2021 ARRL Field Day was unique because of the COVID-19 pandemic restrictions on gathering. Groups and individuals around the US, Canada, and 13 DX entities successfully demonstrated how they were able to adapt their pre-pandemic Field Day strategies to participate in this year's event.

The two temporary rule waivers that were issued last year due to the pandemic were extended into 2021, allowing Class D (home) stations to count their contacts with other Class D stations for points (standard Field Day rules don't count Class D-to-Class D contacts toward the total score). Additionally, Class D and E stations were limited to 150 W output power for this year. As with last year, all entrants, regardless of their entry class, were able to apply their individual scores to their club's aggregate score.

Ryan Kinnett, NG6F (who took the photo on the right), and Matthew Bennett, AC6X (who took the photo below), operated backpack-style QRP portable from the hills above Rose Bowl Stadium in Pasadena, California, for the 2021 ARRL Field Day.

Because many areas of the US loosened their restrictions on gatherings in public spaces, there was an increase in the number of Class A (groups of three or more) participants compared to last year, comprising almost 18% of the total number of entries for this year's event. The Class D (home stations, commercial power) category had the largest number of entrants, followed by Class E (home stations, emergency power). Class D and E stations comprised roughly 67% of the total entries for the 2021 Field Day event.

This year, there was a total of 5,979 entries submitted and 26,698 reported participants. While the total number of entries

Transmitter Count by Class

Class	Class Definition
A	Three-person or more club/non-club portable using emergency power
AB	Per above, with battery or alternate non-generator power source
AC	Per above, but with commercial power
B1	One-person club/non-club portable using emergency power
B1B	One person per above, with battery or alternate non-generator power source
B1C	One person per above, but with commercial power
B2	Two-person club/non-club portable using emergency power
B2B	Two persons per above, with battery or alternate non-generator power source
B2C	Two persons per above, but with commercial power
C	Mobile stations
D	Home stations using commercial power
E	Home stations using emergency power
F	EOC stations

Count by Class Summary

Class	Entries	Class	Entries	Class	Entries	Class	Entries
A	909	B1B	256	B2C	12	E	1,003
AB	43	B1C	36	C	69	F	140
AC	104	B2	80	D	2,913	Checklog	102
B1	284	B2B	28				

Transmitter Count by Class

1A	153	4AC	13	2D	89
2A	277	5AC	3	3D	28
3A	253	8AC	1	4D	8
4A	111	1B1	276	5D	1
5A	66	2B1	7	6D	2
6A	30	3B1	1	8D	1
7A	9	1B1B	249	1E	905
8A	5	2B1B	7	2E	68
9A	2	1B1C	35	3E	22
11A	1	2B1C	1	4E	6
14A	1	1B2	54	6E	1
15A	1	2B2	26	8E	1
1AB	20	1B2B	15	1F	28
2AB	7	2B2B	13	2F	60
3AB	10	1B2C	9	3F	26
4AB	4	2B2C	3	4F	14
5AB	1	1C	62	5F	7
6AB	1	2C	6	6F	2
1AC	15	4C	1	7F	2
2AC	42	1D	2,784	9F	1
3AC	30				

Entries by ARRL RAC Section/Prefix

Section	Entries	Section	Entries	Section	Entries	Section	Entries
AB	25	MB	5	ONN	9	VI	4
AK	10	MDC	123	ONS	101	VT	15
AL	102	ME	33	OR	84	WCF	61
AR	56	MI	160	ORG	104	WI	111
AZ	135	MN	117	PAC	15	WMA	31
BC	83	MO	129	PE	2	WNY	101
CO	101	MS	39	PR	23	WPA	87
CT	66	MT	28	QC	74	WTX	26
DE	21	NC	215	RI	23	WV	46
EB	53	ND	12	SB	31	WWA	155
EMA	82	NE	28	SC	70	WY	13
ENY	90	NFL	102	SCV	121	DX: VK – Australia	1
EPA	174	NH	40	SD	12	DX: PY – Brazil	1
EWA	38	NL	3	SDG	38	DX: TI – Costa Rica	1
GA	144	NLI	40	SF	40	DX: HI – Dominican Republic	1
GTA	84	NM	44	SFL	56	DX: UA3 – European Russia	3
IA	41	NNJ	94	SJV	31	DX: DL – Germany	1
ID	45	NNY	14	SK	8	DX: YB – Indonesia	2
IL	197	NT	2	SNJ	63	DX: JA – Japan	11
IN	100	NTX	189	STX	149	DX: XE – Mexico	2
KS	47	NV	34	SV	71	DX: HP – Panama	1
KY	66	OH	246	TN	138	DX: SP – Poland	2
LA	47	OK	47	UT	32	DX: S5 – Slovenia	1
LAX	145	ONE	82	VA	195	DX: YV – Venezuela	1
MAR	34						

2021 Field Day Overall Statistics

Number of Participants:	26,698
Total Entries:	5,979
Checklogs:	102
CW QSOs:	604,811
Digital QSOs:	297,418
Phone QSOs:	529,830
Total QSOs:	1,432,059

Entries by BASE Class Summary

Class	Entries
A	1,070
B	704
C	70
D	2,979
E	1,015
F	141
Total	5,979

During the 2021 ARRL Field Day, the ARRL Board of Directors presented a plaque to the Dade Radio Club of Miami to commemorate 75 years of being an ARRL Affiliated Club. From left to right, Jeff Beals, WA4AW, Southern Florida Assistant Section Manager; Julio Herrera, KK4KMO, President of the Dade Radio Club of Miami, and Barry Porter, KB1PA, Southern Florida Section Manager. [Dade Radio Club of Miami, W4NVU, photo]

decreased by 41% from last year, the total number of participants increased by about the same margin, with the number of participants closer to pre-pandemic Field Day numbers. Additionally, this year's event had about 10,000 fewer participants than 2019.

Compared to 2020, this year showed a 23% decrease in the number of contacts reported. However, in comparison to 2019, this year showed a 31% increase.

Activity by Class

Class A — Club or Non-Club groups of three or more people who set up temporary/portable Field Day sites away from their usual station locations: 1,070 entries (17.9%).

Class B — Temporary or portable Club or Non-Club groups, or one or two people who set up temporary/portable Field Day sites away from their usual station locations: 704 entries (11.8%).

Class C — Mobile or rover operators from vehicles, bicycles, and even boats: 70 entries (1.2%).

Class D/Class E — Stations operating from home, using either commercial power (Class D) or emergency power (Class E): 3,994 entries (66.8%).

Class F — Stations operating from or as Emergency Operations Centers (EOCs): 141 entries (2.34%).

Checklogs — 102 entries were listed as checklogs because they were DX stations or were missing the required list of calls sorted by band and mode. Checklogs are acknowledged at the bottom of the page at **www.arrl.org/logs-received**.

This year, almost 99% of the total entries received were submitted via the web applet, which is about the same as in 2020. A few minor changes were made to the applet for clarity, making it easier than ever for you or your group to submit your Field Day results to ARRL.

Soapbox Comments

Some of this year's entrants have posted their stories to the Field Day Soapbox (**http://field-day.arrl.org/fdsoapbox.php**), sharing how they adapted their strategies to meet the changing pandemic guidelines. The MIT Radio Society, W1MX, couldn't use their club station as they had in prior years. Instead, they hung a few dipole antennas at a local park and operated Field Day from there with battery power.

Barry Strickland, AB4QL, intently operated the CW station during the DeKalb County Amateur Radio Club, W4DGH, Field Day event in Fort Payne, Alabama. [Robert Hamilton, W4YPX, photo]

Laguna Mountain WFD, WW6CC, ensured all their participants were fully vaccinated prior to gathering at a location near the Palomar Observatory atop Palomar Mountain in San Diego County, California. They used homebrew antennas, including two that the group constructed specifically for this year's Field Day.

Looking Ahead

Many groups and individuals are already looking forward to Field Day 2022, and are actively planning for the event. Share what your strategies will be for next year with the amateur radio community via the ARRL Field Day Facebook page, at **www.facebook.com/groups/arrlfd**. The 2022 ARRL Field Day will take place on June 25 – 26.

Eleven-year-old Delaney Bailey, KFØFUP, made 50 contacts operating phone during the 2021 ARRL Field Day, while her dad, Morgan Bailey, II, NSØR, handled the logging. They participated as part of the Jackson Amateur Radio Club's event at the Banner Creek Science Center & Observatory in Jackson County, Kansas. [Morgan Bailey, NJ8M, photo]

Scores

Club Aggregate Scores are listed below. Aggregate scores are listed alphabetically by club name, along with the total score of individual entries attributing their score to the club, and the number of individual entries. Due to the high volume of entries this year, full line scores will be posted in the digital edition of *QST* and on the ARRL Field Day Page at **http://field-day.arrl.org**. Please visit that page or the digital edition for full Class A, B, C, D, E, and F line scores.

You can also click here to find Categories A through F results.

Club Aggregate Scores

Club Name	Aggregate Score	Entries
220 MHz Guys	398	1
3 Guys with Radios ARC	900	1
3 Rivers ARC	952	1
3730 Group	3,634	1
4SQRP	3,536	5
510 RG	8,330	1
603 ARC	862	1
618 Comms	410	1
694 Group	194	1
721st Mechanized Contest Battalion	2,276	1
985 Users Field Day Event	2,908	1
ACARES	596	1
Ad Hoc ARS	2,052	1
Adams Co. ARS	3,400	7
Addison Co. ARA	2,404	3
Aero ARC	2,490	1
Aeronautical Center ARC	449	2
Aerospace Employees Assn. ARC	2,690	4
Ak-Sar-Ben ARC	4,218	6
Alabama Contest Group	2,292	2
Alachua EOC RC	3,290	1
Alamance ARC	9,170	6
Alameda Co. RACES	1,042	1
Alamogordo ARC	1,344	1
Alaska Airlines ARC	365	1
Albany ARA	7,514	5
Albemarle ARC	13,330	13
Albemarle ARS	1,626	5
Alberta Clippers	1,350	1
Albuquerque DX Assn.	8,364	4
Alexandria RC	6,838	5
Alford Memorial RC	4,620	2
Algoma ARC	4,826	5
Algonquin ARC & Waltham ARA	2,626	1
All Things ARA	1,400	1
Allegheny Valley RA	1,250	1
Alliance ARC	3,088	1
Almaden RC	324	1
Alpha RC	1,444	1
Amargosa ARC	2,470	1
Amateur Radio of Churchill Co.	1,256	1
America West ARC	854	1
American Legion Post 1 ARC	920	1
American Legion Post 33 ARC	880	1
American Legion Post 91 ARC	876	1
Anaconda ARC	2,856	1
Ancient Modulators	334	1
Anderson Island ARC	956	1
Anderson RC	7,102	6
Andrew Johnson Radio ARC	2,802	1
Androscoggin ARC	1,298	1
Anne Arundel RC	5,740	6
Anoka Co. RC	2,816	2
Anonymous Contest Group	1,678	1
Antelope Valley ARC	970	1
Anthracite Repeater Assn.	3,304	2
Antietam RA	5,662	4
Apple City ARC	1,410	1
AR Assn. of the Tonawandas	730	1
AR Caravan Club	556	2
AR Tower Trailer Team	808	1
ARA of Nebraska	2,802	1
ARA of the Southern Tier	2,102	2
ARC at Univ. of Arkansas	1,640	1
ARC EmComm Service	3,932	3
ARC of Augusta	1,518	2
ARC of Butts Co.	1,072	4
ARC of Columbia Co.	672	2
ARC of Parker Co.	1,270	1
ARC Panama City	264	1
Arctic ARC	246	1
Area 51 Radio Group	1,102	1
ARES of Douglas and Elbert Co.	8,352	1
ARESLAXNW	4,106	2
Arizona ARC	1,126	1
Arizona Outlaws Contest Club	16,110	9
Arkansas Diamond ARC	122	1
Arkansas Radio Emergency Services	810	1
Arkansas River Valley ARF	5,864	8
ARL of Lawrence Co.	1,110	1
Arlington ARC	2,736	1
Aroostook ARA	1,986	1
Arrow Comm. Assn.	4,801	6
ARTS of Louisville	3,244	2
Ascension ARC	1,198	2
Ashe Co. ARC	1,220	1
Assoc. Radio Amateurs of Long Beach	2,746	5
Assoc. Radio Amateurs of S. New England	3,878	1
Atchison Co. ARS	1,078	2
Athens Co. ARA	3,378	2
Atlanta RC	1,102	3
Atlantic Region Repeater Legion	1,394	1
Augusta Univ. ARC	4,542	1
Austin ARC	7,388	9
Austin Area ARC	956	1
AZ DARC	3,464	4
Azalea Coast ARC	2,468	5
Bainbridge Island ARC	964	2
Baldwin Co. ARC	8,986	6
Balihoo ARC	80	1
Baltimore Polytechnic Alumni RC	1,054	1
Bama Ham'ers	2,568	1
Bankhead ARC	2,306	1
Barnstable ARC	11,468	6
Barrie ARC	4,191	11
Barron Co. ARA	1,388	1
Barrow ARC	1,288	1
Barry ARA	2,170	4
Barstow ARC	2,032	2
Basin ARC	3,408	1
Bass Hill Repeater Group	3,330	1
Bastrop Co. ARC	2,118	1
Batesville Area RC	3,040	5
Baton Rouge ARC	2,712	2
Bay Area DXers	5,392	2
BayNet ARC	1,514	3
Bayouland Emergency ARES	1,996	1
Baytown Area ARC	1,544	1
bcars.org	3,496	2
BCI Communications ARC	64	1
BEANOS	6,480	2
Bear Bait RC	2,456	2
BEARS of Manchester ARC	2,672	2
Beaufort Radio Amateur Group	696	1
Beaumont ARC	3,638	1
Beaver Valley ARA	1,698	1
Bedford ARC	960	3
Bedlington Terrior ARC of Tucson	6,008	1
Belews Cove Minions	3,774	1
Bella Vista RC	4,608	1
Bellbrook ARC	5,310	5
Benicia ARC	2,459	3
Benton ARS	7,868	5
Bergen ARA	2,154	5
Bergen Co. Emergency Management RC	926	1
Berger's Bandits RC	6,682	1
Berks Amateur Radio Contest Club	798	1
Bernalillo Co. ARES	1,876	1
Berwick Contest Team	7,480	1
Big Bend ARC	7,090	2
Big Island ARC	2,590	7
Big Sandy ARC	872	3
Big Signal ARC	452	1
Big Sky Contesters	288	1
Big Stefa Memorial FD Group	5,716	1
Bill, Ken, and Marty	1,460	1
Billerica ARS	1,768	2
Binghamton ARA	2,716	2
Birmingham ARC	3,350	2
Bishop ARC	2,949	3
Bitterroot ARC	836	2
Black Diamond ARC	594	4
Black River ARC	2,734	2
Black River Radio Ops	11,864	1
Blackstone Valley ARC	3,258	1
Blazing Paddles FD Team	8,004	1
Bledsoe Co. ARC	1,490	1
Bloomington ARA	1,454	1
Bloomington ARC	1,586	1
Blossomland ARA	5,674	2
Blount Co. ARC	1,162	1
Blue Ridge ARC	4,836	3
Blue Springs ARC	878	1
Bluegrass ARS	54	1
Boaz-Albertville ARC	776	1
Boca Raton ARA	3,904	7
Boeing Employees AR Operators North Soc.	420	1
Boeing Employees ARS	1,684	3
Boeing Employees ARS — St. Louis	8,606	6
Boerne ARC	1,288	1
Bolingbrook Area Radio Contesters	74	1
Bolingbrook ARS	3,894	8
Bonac ARC	4,068	2
Bonner Co. ARES	2,752	4
Boomer Bill ARC	464	1
Boone and Hamilton Co. ARES	1,726	3
Boonville ARC	2,370	1
Bootheel ARC	1,972	2
Border City RC	1,696	2
Boschveldt QRP Club	2,075	1
Boston ARC	4,486	4
Boston Valley Simplex Club	572	2
Boulder ARC	12,366	7
Bourbon Fueled Nerds	664	1
Brainerd Area ARC	4,562	3
Brandon ARC	272	2
Brandon ARS	3,536	1
Brazoria Co. AR Service	318	1
Brazos Valley ARC	7,722	5
Bridgerland ARC	2,394	1
Brightleaf ARC	3,860	3
Bring Back the Band	1,872	1
Bristol ARC	5,277	6
Broken Arrow ARC	910	1
Broken Arrow Emergency Management ARC	2,140	2
Brookings Radio Research Club	160	1
Broughton Memorial FD Grp	15,990	16
Brownwood ARC	832	1
Brunswick Shores ARC	4,750	9
Bryan ARC	3,030	3
Buckhead Contest Club	3,016	1
Bullitt ARS	8,778	4
Burlington ARC	3,495	4
Burlington Co. RC	5,268	4
Butler Co. (OH) ARA	2,494	1
Butler Co. (PA) ARA	4,560	1
Butler Co. AR Public Service Group	5,962	5
Cabarrus ARS	3,946	3
Calgary ARA	5,536	1
Calhoun Co. ARA	2,684	2
Calhoun Co. EOC	3,558	1
California City ARC	1,702	1
California Dept. of Justice ARC	974	1
California DX Assn.	4,014	1
Calvert ARA	1,462	1
Cambridge ARA	1,982	2
Cambridge ARC	388	1
Camden Co. ARS	82	1
Camp Trouten	1,268	1
CANAMARA	526	1
Candlewood ARA	4,352	1
Canton ARC	3,514	2
Cape Ann ARA	1,208	2
Cape Fear ARS	7,194	4
Cape May Co. ARC	1,944	1
Capital Area ARES Unit	758	1
CARA/OBARC	4,376	5
Carbon ARC	114	1
Carbon Co. DXCC	11,864	5
Caribbean Amateur Radio Group	758	1
Carolina Airstream Club	1,082	1
Carolina ARES	656	1
Carolina DX Assn.	5,444	5
Carroll Co. ARC	2,616	2
Carson City Ares	370	1
Carter Co. ARA	560	1
Carteret Co. ARS	518	1
Carteret Emergency Management Vol. ARC	1,904	1
Cascade RC	2,104	2
Cascades ARS	262	1
Case ARC of Case Western Reserve Univ.	1,880	1
Cass Co. Area AR Operators	1,252	1
Castle Shannon VFD ARC	664	1
Cedar Creek ARC	1,266	1
Cedar Grove ARC	1,968	1
CenTor ARC	2,990	6
Central Alberta ARC	1,084	1
Central Dakota ARC	852	1
Central Idaho ARC	4,300	1
Central Illinois RC	1,834	5
Central Indiana ARA	80	1
Central Kansas ARC	624	1
Central Kentucky ARS	11,798	1
Central Louisiana ARC	5,920	3
Central Massachusetts ARA	4,292	3
Central Michigan ARC	4,042	3
Central Mississippi ARA	2,738	1
Central Missouri RA	2,784	3
Central Montana ARC	1,550	2
Central New York ARC	1,088	1
Central New York Contesters	882	1
Central Ohio Operators Klub	1,082	2
Central Oregon Coast ARC	4,538	6
Central Oregon DX Club	5,054	1
Central Texas DX and Contest Club	10,944	1
Central Valley AR Enthusiasts	950	1
Central Vermont ARC	2,130	1
Central Virginia Contest Club	2,550	2
Central Washington ARC	1,400	2
Central West Virginia Wireless Assn.	17,504	8
Centralia ARES	872	1
Champaign ARA	120	1
Chandler Ham RC	1,586	3
Charleston ARS	2,266	3
Charlevoix/Cheboygan/Emmet Co. Pub Srvc Comm. Org.	1,476	1
Charlotte ARC	1,180	1

Charlotte ARS	3,328	1
Charlotte Co. ARC	586	1
Chatauqua AR Service	1,494	1
Chattanooga ARC	1,648	1
Chautauqua and Erie ARC	326	1
Chehalis Valley ARS	1,088	1
Cherokee ARS	4,366	4
Cherokee Capital ARS	1,478	1
Cherryland ARC	4,174	3
Cherryville Repeater Assn. II	2,968	4
Chesapeake AR Service	4,360	5
Chesapeake Bay Radio Assn.	2,998	2
Cheshire Co. DX ARC	2,126	1
Chester ARES	458	1
Chester Co. Amateur Radio	398	1
Chew's Ridge Gang	9,190	1
Chicago Suburban Radio Assn.	3,086	8
Citrus Co. ARC and ARES	2,644	1
City of Cypress RACES	298	1
Clallam Co. ARC	3,352	4
Clark Co. (IN) ARC	3,316	4
Clark Co. (WA) ARC	6,104	6
Clark Co. (WA) ARES/RACES	826	2
Clark Fork Valley ARC	1,126	1
Clarksville Amateur Radio and Pilots Assn.	474	1
Clarksville ARS	978	1
Clay Co. (IN) Auxcomm	2,126	1
Clay Co. (NC) Auxcomm	3,866	3
Clayton Radio Dawgs	4,842	1
Clearwater ARS/St. Petersburg ARC/Upper Pinellas ARC	6,086	2
Cleveland ARC	1,698	3
Cleveland Co. AR Service	7,682	7
Clinton Co. ARA	2,604	1
Clinton Co. Contesters	3,230	1
Club de Radio Amateur Outaouais	7,865	9
Club Groupe Radio Amateur Amical	1,392	1
Club KC5NX	3,845	3
Club Radio Amateur de Québec	17,404	15
Club Radio Amateur Sorel-Tracy	1,102	2
Club Radioamateur De La Vallée Du Richelieu	714	1
Club Radioamateur Drummondville	920	2
Club Sation Répétitrice de Laval	1,364	6
Coast Side ARC	920	1
Coastal ARS	2,366	1
Coastal Plains ARC	2,096	4
Coastline ARA	418	1
Cochise ARA	6,250	7
Coconino ARC	220	3
Collins Aerospace Radio Grp	5,914	1
Collins ARC	6,272	3
Collins Melbourne Comm/Nav	584	1
Colorado QRP Club	7,005	5
Columbia (MD) ARA	4,308	12
Columbia (OR) ARA	1,676	2
Columbia ARC (SC)	626	2
Columbia ARS	2,104	1
Columbia River DX Club	802	1
Columbia-Montour ARC	5,864	12
Columbus ARC	8,158	3
Communications Support Team	322	1
Community ARC	262	1
Comox Valley ARC	7,042	12
Comstock ARA	86	1
Condo Valley ARC	275	1
Conejo Valley ARC	6,188	6
Contest Club Ontario	12,151	8
Contoocook Valley RC	10,228	1
Copper Country Radio Amateur Assn.	1,060	2
Coquitlam ARC	2,893	4
Corona Police Dept. CSV Grp	2,216	3
CorTek RA	1,670	1
Coshocton Co. ARA	4,924	2
Cottonwood Heights ARC	3,210	1
Cove Repeater Assn.	1,538	1
Coventry EMA	4,180	1
Coweta RC	1,778	2
Cowichan Valley ARS	322	1
Cowtown ARC	2,824	1
Coyote ARC	198	1
CQ805	2,172	1
Crawford ARS	4,936	1
Crawford Mountain Boys and One Girl	2,248	1
CRCRST	3,727	3
CRES ARC	3,158	3
Crescenta Valley RC	1,554	7
Crooked River Contest Club	1,542	2
Crookston Pirates	378	1
Cross Co. ARC	656	1
Cross Roads Ham RC	1,614	2
CTRI Contest Group	8,526	1
Culpeper ARA	2,928	1
Culver City ARES	3,139	6
Cumberland ARC	3,976	8
Cumberland Plateau ARC	5,154	2
Cumberland Valley ARC	2,436	1
Cupertino ARES	4,671	12
Cuyahoga ARS	17,278	14
Cuyahoga Falls ARC	11,217	5
CVARC	4,050	1
CWOps	3,254	1
Dade RC of Miami	878	1
Dallas ARC	8,426	11
Dalton ARC	134	1
Dartmouth ARC	486	1
David M. Fiedler Memorial ARC	2,196	1
David Sarnoff ARC	2,770	6
Davie/Cooper City ARC	4,590	3
Davis Co. ARC	2,824	2
Dayton ARA	794	2
Daytona Beach CERT AR Team	2,054	1
DCT ARC	338	1
Decatur ARC	1,872	1
Deep Dixie Contest Club	6,820	2
Deep South ARC	4,898	4
DeForest ARC	1,948	1
DeKalb Co. ARC Ed Ringer Memorial FD Team	5,006	2
Del Mar CERT	4,226	1
Delaware ARA	13,564	4
Delaware Lehigh ARC	1,848	2
Delaware Repeater Assn.	2,062	3
Delaware Valley RA	1,348	1
Delmarva DX Assn.	2,176	2
Delta ARC Memphis	2,464	1
Delta ARS	600	2
Denton Co. ARA	3,532	1
Denver Radio League	828	1
Denver RC	2,654	4
Des Moines Radio Amateur's Assn.	2,846	1
Desert Creek DX Dogs	736	1
Desert Radio Amateur Transmitting Soc.	7,272	18
Desertores FD Squad	2,816	1
Desoto ARC	766	2
Detroit Lakes ARC	608	1
DFW Contest Group	8,160	5
Dial RC of Middletown	12,112	6
Dickson Co. ARC	3,028	2
Disney EARS	2,395	2
District 3 AR Group	436	1
Dixie ARC	2,754	1
Doghouse East	314	1
Douglas Co. ARC	692	2
Douglas Co. Radio Responders	490	1
Downey ARC	4,108	6
Dr. Loomis Memorial Junior Mechanics League	4,398	1
Drake ARC	3,702	1
Draper Ham RA	1,968	1
Dupage ARC	11,900	9
Dutchess Demons	518	1
East Bay ARC	608	1
East Greenbush ARA	1,692	6
East Pasco ARS	1,584	1
East Penn ARC	1,490	1
Eastern Arizona ARS	638	1
Eastern Connecticut ARA	4,140	1
Eastern Fulmont ARC	2,156	3
Eastern Michigan ARC	1,982	1
Eastern New Mexico RC	202	1
Eastern Ohio Contesters	188	1
Eastern Ontario ARC	952	1
Eastern Ozarks ARC	310	2
Eastern Pennsylvania ARA	2,104	1
Eastern Panhandle ARC	1,730	1
Eastern Shore ARC	3,974	10
Easton ARS	2,930	2
Eastside AR Service	1,942	1
Eaton Co. ARC	1,174	1
Eau Claire ARC	622	1
Ed and Joe Tech Club	1,185	1
Edgefield Co. ARC	1,656	1
Edison Amateur Radio Network	286	1
Edmond ARS	12,704	7
Edmonds Woodway ARC	1,838	2
Education Alliance for AR	616	1
Egyptian RC	252	2
El Dorado Co. ARC	9,440	8
El Paso ARC	996	2

Being without a tower didn't stop the Sun Country Amateur Radio Society, KB4KP, in Marion County, Florida, from operating in the 2021 ARRL Field Day. Instead, they suspended one of their antennas from a crane brought in specifically for the event. The crane was secured in a fenced-in area that was adjacent to their three operating positions. [Bruce Richardson, WA4IPU, photo]

El Segunda AR Group	436	1
Elgin ARS	3,708	5
Elk Co. ARA	1,628	1
Elk River Ham Group	1,276	1
Elkhorn Valley ARC	1,194	1
Ellis Co. ARC	2,494	2
Ellsworth Amateur Wireless Assn.	5,785	7
Elmira ARC	2,332	7
Elmore Co. ARC	832	1
Elmore Co. ARES	1,268	1
Emergency ARC of Hawaii	584	1
Emergency Communications Assn.	2,046	5
Emergency Repeater System	2,092	1
Emporia ARS	446	1
Endless Mountains ARC	2,134	3
Englewood ARS	422	1
Escondido ARS	2,032	1
Estes Valley ARC	2,346	5
EUPAR Club	86	1
Everglades ARC	372	2
EVQRP	1,892	4
EWEphoria RC	376	2
Explorer Post 599	2,358	2
F.A.R.G.	1,790	1
Fair Lawn ARC	2,466	5
Fallbrook ARC	4,480	6
Falmouth ARA	4,132	8
FARCE	1,700	2
Farrell-Gray	872	1
Faulkner Co. ARC	2,392	2
Fauquier ARA	6,210	2
Fayette Amateur Radio Transmitting Soc.	690	1
Fayette Co. ARC	5,040	1
FBOM International	1,004	1
FD Philips NEO	850	3
Federación de Radio Aficionados de PR	8,130	9
Fidelity ARC	3,114	1
Findlay RC	2,508	2
First Baptist Church Huntsville RC	1,410	2
First Class CW Operators Club USA	3,030	1
First State ARC	5,052	1
Five Flags ARA	5,086	2
Florence ARC	530	1
Florida Contest Group	12,627	12
Floyd ARS	472	1
Fluvanna ARES Group	2,438	1
FM38 Repeater Group	4,544	1
FMARC	130	1
Fond du Lac ARC	1,280	2
Foothill Flyers RC	400	1
Foothills ARC	614	1
Foothills ARS (CA)	1,482	5
Forsyth ARC	13,074	5
Fort Collins CW	7,634	1
Fort Herkimer ARA	2,836	1
Fort Madison ARC	3,276	4
Fort Myers ARC	416	3
Fort Smith Area ARC	2,422	3
Fort Venango Mike and Key Club	2,212	1
Fort Wayne DX Assn.	7,698	1

Fort Wayne RC	6,488	6
Forx ARC	4,818	1
Four County ARES	1,716	1
Four Lakes ARC	2,591	3
Fox Cities ARC	1,814	2
Fox Mike Hotel Portable Ops Team	718	1
Fox River Radio League	7,064	2
Fox River Relay League	3,798	2
Framingham ARA	4,492	8
Frankford RC	31,386	11
Franklin (NC) ARC	3,472	3
Franklin Co. (MA) ARC	3,916	3
Franklin Co. (NC) ARC	7,590	5
Franklin Co. (OH) Auxiliary Comm. Club	912	1
Franklin Co. (VA) ARC	8,808	2
Franklin Co. ARES	1,062	1
Franklin Springs Hams	626	1
Fredericton ARC	840	1
Fresno ARC	1,268	2
Front	692	1
Fullerton RC	1,034	1
Fulton Co. ARC	14,186	2
FVFD21	5,324	7
G.R.E.A.T. Club	800	1
Gainesville ARS	1,346	3
Garden City ARC	1,246	3
Garden School ARC	896	1
Garden State ARA	5,680	5
Garland ARC	1,692	4
Garrett Co. ARES	3,070	1
Gaston Co. ARS	2,592	1
Gaston RC	692	1
Gateway ARC	7,300	2
GEARS	2,060	2
Geauga ARA	1,076	1
Genesee Co. RC	462	1
Genesee Radio Amateurs	4,264	2
George Co. ARES	906	1
Georgia Auxcomm	485	1
Georgia Tech ARC	1,790	1
Georgian Bay ARC	3,376	4
GLARB	668	1
Gloucester Co. ARC	18,824	5
Glynn ARA	5,714	2
GMARC	390	1
Goddard ARC	466	1
Gold Coast ARA	6,440	5
Golden Spike ARC	1,156	1
Gordon PA Field Day Group	466	1
Goshen ARC	168	1
GOTAHAMS	4,494	4
Grand Rapids ARA	196	1
Grand Strand ARC	1,692	3
Grande Ronde Radio Amateurs Assn.	3,688	1
Granite State ARA	5,590	8
Grassroots ARC	636	1
Gratiot Co. Old Timers	1,472	1
Grayson Co. ARC	4,368	2
Great Bay RA	2,838	1
Great Lakes CWops Club	8,912	3
Great River ARC	996	1
Great Salt Lake Contest Club	3,862	1
Great South Bay ARC	3,288	2
Great Southern DX Assn.	6,890	9
Greater Beloit ARC	5,248	1
Greater Nebraska ARL	1,620	1
Greater Norwalk ARC	6,046	1
Green Bay Mike & Key Club	1,850	2
Green Mountain Wireless Soc.	1,468	2
Green River Valley ARS	1,766	1
Greensboro Digital RA	446	1
Greenwood ARC	1,728	5
Greer ARC	12,684	4
Grundy Co. ARC	1,100	2
Grupong Magellan Org. Search & Rescue Team	1,052	1
GSBARC	526	1
Guadalupe Valley ARC	1,822	1
Guelph ARC	474	1
GVARC/SBCARA	4,298	6
Gwinnett ARS	14,143	9
Haldimand Norfolk ARC	3,790	9
Half Moon Bay ARC	3,152	5
Half Wave Soc.	88	1
Halifax ARC	8,906	13
Hall of Science ARC	776	1
Ham Assn. of Mesquite	3,890	4
Ham Radio Adventures	572	1
HAMARS	1,806	1
Hambuds	3,736	1
Hamfesters RC	2,320	4
Hamilton (OH) ARC	2,442	3
Hamilton (ON) ARC	3,730	7
Hampden Co. RA	8,310	6
Hampstead Hams	1,790	4
HAMsters	852	1
Hancock ARC	3,610	1
Hancock-Hawkins AR Team	978	3
Hannibal (MO) ARC	3,812	5
Harford Co. ARES/RACES	3,018	1
Harris Family	640	1
Hassayampa AR Klub	1,036	1
Hattiesburg ARC	5,820	2
Hays/Caldwell ARC	432	2
Haywood Co. ARC	2,510	1
Hazel Park ARC	7,138	3
HDXCC	136	1
Healing Springs Mtn. VHF Soc.	1,248	5
Heart of America RC	3,184	2
Heartland DX Assn.	3,472	1
Heartland Hams ARC	1,380	1
Helena ARC	1,316	1
Hellgate ARC	10,008	3
Hellgate Contest Club	394	1
Henry Co. ARC	2,512	2
Henry Co. EOC	480	1
Heritage Hunt Hams	5,564	5
Heritage Village Radio and Electronics Club	298	1
Hernando Co. ARA	3,710	1
Hiawatha ARA	546	1
Hiawatha Valley ARC	2,426	3
Hickman ARC	574	1
Hidden Springs Field Day Site	916	1
Hidden Valleys ARC	1,440	1
High Desert AR Group	62	1
High Point ARC	3,830	2
High Sierra Field Day Group	6,682	3
Highland ARA	2,360	1
Highlands Co. ARC	1,098	3
Highlands Hams	520	2
Highline ARC	2,002	2
Hi-Line ARC	376	2
Hilltop Transmitting Assn.	5,964	6
Hinesville ARR Emergency Soc.	200	1
Hiram Percy Maxim Memorial Station	2,963	1
Hocking Valley ARC	644	1
Holiday City ARC	154	1
Holland ARC	1,050	2
Holmesburg ARC	2,698	3
Honeywell-Glendale ARC	428	1
Hood Co. ARC	2,974	1
Hoodview ARC	676	3
Hoosier Hills Ham Club	1,620	1
Hop River RC	74	1
Houston ECHO Soc.	590	1
HP Alumni RC	4,928	4
HP Boise ARC	2,254	1
HRO Milwaukee Employees ARC	424	1
Huber Heights ARC	2,144	1
Hudson Valley Contesters and DXers	5,428	4
Hughes ARC	1,866	5
Humboldt ARC	588	2
Hunt Co. Packet Club	4,420	1
Huntsville ARC	24,497	8
Huron ARA	2,498	2
Hurst ARC	1,138	1
Independent Radio Crew	2,326	1
Indian Peaks RC	1,406	1
Indian River ARC	616	1
Indiana Co. ARC	1,928	1
Indy Midtown ARC	570	1
Indy United ARC	21,236	3
Insurance City Repeater Club	1,570	1
Intercity ARC	2,388	2
Inverhuron Ham RC	3,110	3
Iowa City ARC	2,134	1
Iowa Wireless AR Network	3,684	2
Iredell Co. ARS	158	1
Iroquois Co. ARC	272	1
Irvine Disaster EmComms	4,393	14
Irving ARC	1,068	3
Island Co. ARC	1,482	2
Issaquah ARC	1,694	3
IWARN	526	1
Jackson Co. (MS) ARA	716	3
Jackson Co. AR Service	504	1
Jackson Co. ARC	7,624	2
Jacksonville ARS	1,462	2
Jamestown ARC	1,346	1
JANET Club	1,705	1
Jasper RC	1,494	1
Jay Co. ARC	1,434	1
Jayhawk ARS	978	1
Jefferson (LA) ARC	4,520	4
Jefferson Co. (TX) ARC	3,448	2
Jefferson Co. (WA) ARC	2,396	6
Jefferson Co. ARC	540	1
Jersey Shore ARS	1,588	2
Jim Bell Wireless Assn.	1,786	1
Jims Farm Group	250	1
Johnson Co. Radio Amateurs Club	10,658	1
Johnson Space Center ARC/Clear Lake ARC	5,266	1
Jonathan Sennetti	550	1
Juneau ARC	2,877	2
Juniata Valley ARC	1,296	1
Jupiter Tequesta Repeater Group	2,914	1
K1USN RC	4,036	4
KA3PVM and family, plus N3DRL	1,758	1
Kachina ARC	116	1
Kalamazoo ARC	998	2
Kanawha ARC	7,452	2
Kansas Antenna Club in Johnson Co.	2,644	2
Kansas City Assn. for the Blind ARC	780	1
Kansas City Contest Club	2,558	2
Kansas/Nebraska ARC	1,110	1
KARO-ECHO	1,548	1
Katy ARS	1,310	3
Kaw Valley ARC	3,368	2
Kay Co. ARC	1,882	2
KCARC	220	1
Keeping Amateur Radio Fun	630	1
Kemptville AR Group	2,059	4
Kendall ARS	2,156	5
Kendallville Contesters/ 21 Repeater Group	668	1
Kennehoochee ARC	2,216	1
Kent ARS	1,082	1
Kent Co. ARC	2,178	2
Kentucky Colonels ARC	2,388	1
Kentucky Contest Group	10,352	4
Kentwater ARC	448	1
Keowee Toxaway ARC	1,774	1
Kern Co. Central Valley ARC	1,364	2
Kershaw Co. ARC	44	1
Keuka Lake ARA	2,522	6
Key City ARC	964	1
Kicked Back Contesters Club	1,220	2
Kilocycle Club of Fort Worth, TX	3,002	2
King George AR Operators	3,612	2
King Harbor Yacht Club Radio Fleet	2,324	1
Kingman Amateur Radio CW Operators Club	808	2
Kings Co. and Annapolis Valley ARCs	6,176	4
Kings Co. RC	172	1
Kings Point ARC	4,068	5
Kingsport/Bays Mountain ARC	2,178	1
Kingston Amateurs	9,120	8
Kitchener-Waterloo ARC	8,566	10
Kitsap Co. ARC	2,336	3
Kitsap Co. DX Club	1,930	1
Klamath Basin ARA	2,472	1
Knob Hill Krew	350	1
Knox Co. ARC	1,232	1
KO4HRD-NS2X Team	670	2
Kokomo ARC	1,650	1
Koolau ARC	476	1
Kootenai ARS	1,526	1
Korean ARA	1,886	1
KSC ARC	752	1
KX4PR FD Group	422	1
La Mirada RC	2,248	1
Lafayette DX Assn.	6,368	2
LaGrange ARC	434	1
Laguna Mountain WFD	2,316	1
Lake Agassiz RC	1,674	1
Lake ARA	12,286	3
Lake Area AR Klub	4,360	9
Lake Area Radio Klub	6,542	1
Lake Co. (OH) ARA	10,112	6
Lake Co. RACES/ARES	4,702	2
Lake Conroe ARC	1,900	1
Lake Country AR Service	634	1
Lake Cumberland ARA	558	1
Lake Monroe ARS	6,182	2
Lake of the Ozarks ARC	1,854	1
Lake Oswego ARES	1,014	1
Lake Whitney ARS	440	1
Lakeland ARC	5,856	9
Lakes Area ARC	110	1
Lakes Region Repeater Assn.	1,126	1
Lakeshore RC	940	1
Lakewood ARC	428	1
Lambert Family	904	1
Lambton Co. RC	1,940	4
Lamorinda Area Radio Interest Group	1,284	1
Lancaster Co. ARES	3,684	1
Lancaster RC	5,410	4
L'Anse Creuse ARC	7,100	3
Larkfield ARC	928	1
Las Moras ARC	1,858	1
LaSalle Co. IL RACES	540	1
Laughery Valley ARC	724	1
Laurel ARC	1,340	2
Lebanon Valley Soc. of Radio Amateurs	2,944	2
LEFROG	7,434	2
Lehigh Valley ARC	1,502	1
Leisure World of Maryland ARC	116	2
Lemhi ARC	862	1
Lenoir ARC	2,888	3
Lewis and Clark RC	240	1
Lewisville ARA	150	1
Lewisville ARC	94	1
Lighthouse ARA	2,710	1
Lighthouse Point BBQ Club	426	1
Limestone ARES	2,226	1
Lincoln ARC	5,160	1
Lincoln Co. (ME) ARC	3,370	1
Lincoln Co. (OR) ARC	884	1
Lincoln Co. Volunteer Comm.	1,028	1
Lincoln Hills ARGroup	1,490	1
Lisbon Area ARA	1,374	1
Lithopolis FD Group	2,168	1
Littleton Area RC	2,964	2
Livermore AR Klub	1,374	3
Liverpool Amateur Repeater Club	4,358	2
Livonia ARC	10,534	2
Lockport ARA	2,150	1
Lodi ARC	1,436	3
LOHSEP ARC	248	1
London ARC	8,114	14
Long Island CW Club	766	3
Long Island Mobile ARC	5,168	3
Long Tail RC	1,288	1
Longmont ARC	1,966	4
Loren D Hayes Memorial ARC	910	1
Los Alamos ARC	826	1
Los Angeles ARC	2,812	1
Loudoun AR Group	2,670	5
Low Country Contest Club	2,502	1
Lower Arkansas Ham Operators Group	634	1
Lubbock ARC	650	1
Lucas ARC	3,506	3
Luke-Jack Searchers	212	1
Lynchburg ARC	11,946	9
M.A.R.C	390	1
Mabcom	102	1
Mackenzie Regional RC	360	1
Macon Co. ARC	3,970	5
Macoupin Co. ARC	2,144	1
Mad River RC	16,222	6
Madison Co. Ohio ARC	3,578	1
Magic Valley ARC	1,644	1
Magnolia DX Assn.	528	1
Mahoning Valley ARA	3,862	5
Maine Ham Radio Soc.	562	1
Manatee ARC	450	1
Manhattan Area ARS	1,188	2
Manila Creek Stake ERC	164	1
Manitoulin ARC	282	1
Manotick AR Group	560	1
Mansfield-Johnson ARS	8,048	6
Maple Grove RC	2,300	1
Maple Ridge ARC	510	2
MARC/DECT	7,520	6
MARCA	2,841	5
Marconi ARC of Newfoundland	2,135	1
Marietta ARC	1,278	1
Marple Newtown ARC & Mobile Sixers RC	3,878	4
Marshall (TX) ARC	734	1
Marshall Co. ARC	520	1
Martin Co. ARA	2,894	1
Martinez ARC	990	1
Maryland Mobileers ARC	3,784	1
Masonic Village ARC	2,804	2
Massillon ARC	4,368	1
Masters of Reception	760	1
Matagorda Co. Arc	2,204	3
Maui ARC	3,873	2
Maury ARC	3,696	4
Maury River Rain Dogs	638	1
Maxim Integrated Beaverton & Friends	958	1
Mayerthorpe Flying Tigers	764	1
McDowell ARA	3,770	1

McGregor Memorial EMS ARC	462	1
McHenry Co. RACES/ARES	2,136	1
McHenry Co. Wireless Assn.	16,172	3
McKean Co. ARC	4,604	1
McKinney ARC	4,594	2
McMinn Co. ARC	1,630	1
McMinnville ARC	2,534	8
Mecklenburg ARS	3,694	2
Medina Co. AR Corporation	3,109	2
Medina Co. ARC	6,608	1
Meigs Co. ARC	1,776	1
Mercer Co. ARC	4,648	1
Meriden ARC	4,306	9
Merrymeeting ARA	1,194	1
Mesilla Valley RC	3,608	3
Metro ARC	274	1
Metro Atlanta Telephone Pioneer ARC	1,920	1
Metro Detroit SATERN	620	1
Metro DX Club	7,418	2
Metrocrest ARS	4,154	8
Metropolitan ARC	680	1
Metuchen RC	1,156	1
MGRA/CGARC	3,766	2
Miamisburg Wireless Assn.	440	1
Mich-A-Con ARC	2,340	1
Michigan Amateur Radio Alliance	1,802	1
Michigan QRP Club	300	1
Microhams ARC	4,512	4
Mics & Beers	1,098	1
Mid Island RA	288	1
Mid-Atlantic ARC	802	1
Middle Peninsula ARC	2,084	1
Middle Tennessee ARC	1,194	1
Middlesex ARS	2,744	4
Midland (MI) ARC	476	2
Midland (TX) ARC	9,530	6
Mid-MO ARC	7,788	16
Mid-State ARC	978	1
Midwest ARC	1,214	1
Mike & Key ARC	18,552	11
Mila's Field Day Group	2,064	1
Mile Highlanders Group	582	2
Mile Lake Radio Assn.	2,406	1
Milford (OH) ARC	330	1
Milky Way Wireless Club	1,192	1
Milton ARC	162	1
Milwaukee Radio Amateurs Club	2,883	6
Milwaukee School of Engineering ARC	726	1
Mine Canyon Contest Club	794	1
Mining ARC/St. Paul RC	3,860	3
Minnesota Wireless Assn.	16,394	10
Minnetonka Minnesota RC	144	1
Misfits ARC	4,006	1
Mississauga ARC	1,552	3
Mississippi Coast ARA	208	2
MSU ARC, Magnolia ARC, Lowndes Co. ARC, MFJ ARC	9,418	1
Mississippi Valley ARA	25,406	3
Mississippi Valley DX/Contest Club	906	1
Missouri Illinois ARC	1,902	1
Missouri Outdoor Club	2,582	1
MIT Radio Soc.	528	1
Mizpah Shrine Radio Unit	1,852	3
MM Expeditionary Force	2,158	1
Mobile ARC	3,022	1
Mohawk ARC	6,889	7
Mohegan ARC	1,392	1
Moncton Area ARC	1,390	1
Monessen ARC	1,602	1
Monkey Lover's Radio Consortium	8,288	7
Monroe Co. ARS	1,364	1
Monroe Co. Radio Comm. Assn.	6,488	5
Montachusett ARA	2,514	4
Montezuma Valley AR Operators	3,630	1
Montgomery ARC	13,166	14
Montrose Co. ARC	5,734	2
Montvale OEM	3,200	4
Moose Jaw ARC	1,386	1
Moose Pirates	1,522	1
Morehead ARS	2,562	1
Moreno Valley ARA	932	1
Morocco Mole Contest Club	1,406	1
Morongo Basin ARC	206	1
Morris RC/Hanover TWP OEM	9,460	8
Morrow Co. AR Service	1,294	1
Mother Lode Dx/Contest Club	2,030	1
Motor City RC	1,508	4
Motorola ARC	1,850	1
Mound ARA	5,846	4
Mountain AR Contest Org.	7,544	1
Mountain ARC	1,178	1
Mountain Group	1,710	1
Mountain State Transmitters	956	1
Mountain Top ARA	850	1
Mountaineer ARA	7,080	3
MQBARC	1,558	1
Mt. Airy VHF Club	1,348	1
Mt. Diablo ARC	1,528	1
Mt. Magazine ARC	1,586	1
Mt. Shasta ARC	184	1
Mt. Vernon (OH) ARC	5,390	1
Mt. Vernon (VA) ARC	1,300	4
Mui's Marauders	7,218	1
Muncie Area ARC	1,632	1
Murgas ARC	5,530	4
Murray State Univ. ARC	3,910	1
Muscle Shoals ARC	3,618	1
Muskegon Area AR Council	290	1
Muskogee ARC	13,110	1
Musselshell ARC	642	1
N. New England Field AR Operators	1,936	1
N0OH Field Day	1,694	1
N2LBR Contest Team	5,342	1
N3RRDS	498	1
N4N Field Day Group	9,552	3
N5CST	980	1
Nacogdoches ARC	1,068	1
Nanaimo ARA	2,562	6
Narwhal ARS	1,634	1
NASA Ames Research Center ARC	870	1
Nashoba Valley ARC	6,650	2
Nashua Area Radio Soc.	9,935	5
Nashville ARC	2,104	1
Nassau ARC	4,016	1
Natchaug ARC	538	1
National Electronics Museum RC	2,210	1
National Trail ARC	1,226	1
Naturist ARC	506	1
NC TRI-CLUB	4,398	1
NCAARS/Brock Mtn CG	7,218	1
NE TX QRP Contest Fed.	1,680	1
Neighbor Kids	3,690	1
Nelson Co. Post 42 American Legion ARC	1,320	2
NEMO ARC	5,584	5
NEPA Emergency Services ARC	600	1
New England QRP Group	5,160	1
New England Radio Discussion Soc.	2,542	1
New Jersey Antique RC	2,096	1
New Jersey Institute of Technology ARC	236	1
New Mexico BCARES Team	2,908	4
New Mexico Big River Contesters	1,598	1
New Providence ARC	13,930	13
New River Valley ARC	2,020	1
Newark Ohio ARA	1,292	1
Newport Co. RC	13,222	2
Newton ARA	1,476	2
Newton/McPherson ARC	2,234	1
NF4AC	270	1
NFLARC	491	2
NHRC A.R.S.	1,450	1
Niagara Frontier Radiosport	11,532	11
Niagara Peninsula ARC	9,364	16
Niagara RC	2,068	2
Nittany ARC	4,550	6
Nittany Contest Club	5,152	2
Nixa ARC	1,198	1
NOARS-LCARA	5,780	4
Nodaway Co. Contesters	778	1
Noise Blankers Radio Group	3,934	1
North Augusta Belvedere RC	4,552	7
North Bay ARA	2,214	1
North Coast ARC	2,115	1
North Country ARA	354	1
North East Iowa Radio Amateur Assn.	1,496	1
North East Tarrant ARC	180	1
North Franklin ARS	1,000	1
North Fulton ARL	17,748	18
North Georgia QRP Club	1,174	1
North Georgia ARC	2,568	2
North Georgia QRP Club	1,807	5
North Georgia VHF Soc.	522	1
North Hills ARC	1,734	1
North Hills RC	1,270	3
North Mason ARES	656	1

Nathaniel Frissell, W2NAF, shared a fun moment with his son Anthony, while participating in the 2021 ARRL Field Day. [Nathaniel Frissell, W2NAF, photo]

North Okaloosa ARC	3,514	4
North Okanagan RAC	3,559	10
North Ottawa ARC	864	2
North Penn ARC	2,202	1
North Port ARC	6,966	2
North Richland Hills ARC	6,244	10
North Shore (BC) ARC	2,596	3
North Shore (IL) RC	21,620	24
North Shore (ON) ARC	6,154	14
North Shore RA	218	1
North Texas Homeschoolers ARC	198	1
North Texas Radiosport Assn.	1,804	1
North Yellowstone ARC	628	1
Northeast ARC	3,804	1
Northeast Arkansas RC	348	1
Northeast Iowa Radio Amateur Assn.	2,504	2
Northeast Maryland AR Contest Soc.	13,812	15
Northeast Mississippi Radio Amateurs	2,514	1
Northeast Tarrant ARC	3,890	4
Northeast Wireless RC	2,612	1
Northeast Wisconsin ARC	4,248	1
Northeastern Indiana ARA	4,096	7
Northern Arizona DX Assn.	2,606	1
Northern Berkshire ARC	1,352	1
Northern California Contest Club	1,792	3
Northern Colorado ARC	1,074	1
Northern Illinois Quad Co. AR Group	2,000	2
Northern Lakes ARC	494	3
Northville ARA	494	2
Northwest ARS	626	1
Northwest Arizona Travelers FD	1,526	1
Northwest ARS	3,818	2
Northwest Florida ARC	6,476	5
Northwest Illinois ARC	2,280	2
Northwest Indiana DX Club	642	2
Northwest Ohio ARC	824	1
Not Case ARC	8,134	1
Not Quite Workable Contest Club	4,366	3
Novi ARC	662	1
NS1T Field Day	504	1
NV4H FD Group	3,256	1
Oak Forest ARC	872	2
Oak Hill ARC	8,958	3
Oak Ridge ARC	1,986	1
Oakland Co. ARS	6,466	1
Oakland Radio Comm. Assn.	2,768	7
OCAPA	5,425	9
Ocean Co. ARES	1,868	4
Ocean Monmouth ARC	4,336	1
Ocean State ARG	600	1
Ogden ARC	2,888	2
Ohio Army National Guard Veterans RC	520	1
Ohio Valley ARC	2,300	1
Ohio Valley Experimenters Club	610	2
OH-KY-IN ARS	15,788	7
Okaw Valley ARC	4,656	1
Old Barney ARC	14,160	19
Old Post ARS	1,839	3
Ole Virginia Hams	2,526	1
Onslow ARC	366	1
Orange ARC	928	1
Orange Co. (CA) ARC	16,707	6
Orange Co. (NY) ARC	9,372	13
Orange Co. Radio Amateurs & Durham FM Assn.	35,560	26
Orange Park ARC	4,384	6
Orca DX and Contest Club	3,368	3
Oregon State Police ARA	1,472	1
Oregon Tualatin Valley ARC	4,334	4
Orlando ARC	1,590	1
Orleans Co. ARC	2,962	2
Oro Valley ARC	5,848	6
Oroville ARS	486	1
Orrville ARS	784	1
Otsego Co. ARA	2,916	1
Ottawa ARC	3,440	3
Ottawa Valley Mobile RC	17,307	27
Ottawa Valley QRP Soc.	1,948	2
Outagamie ARES/RACES	634	1
Overlook Mountain ARC	2,620	3
Owatonna Steele Co. AR	4,000	1
Owensboro ARC	2,872	1
Oxford Co. ARES	2,085	1
Ozaukee RC	12,170	5
Ozone ARC	1,428	2
Pacific Co. EOC	98	1
Pacific Northwest VHF Soc.	1,738	1
Paducah ARA	12,962	8
Page Valley ARC	3,506	1
Pahrump Amateur Radio Repeater Assn.	1,354	3
Palatine ARES/RACES/ AuxComm	254	1
Palestine Anderson Co. ARC	708	1
Palm Bay ARC	1,654	1
Palms West ARC	1,200	2
Palo Alto ARA	11,783	9
Palos Verdes ARC	19,786	22
Palouse Hills ARC	1,160	1
Pamlico ARC	1,816	1
Pamlico ARS	3,298	8
Panama City ARC	4,695	7
Panhandle ARC	6,592	2
Panoramaland ARC	3,878	3
PAPA System	576	2
Parker RA	8,000	7
Parkersburg Amateur Radio Klub	2,258	1
Parma RC	632	1
Parsippany-Troy Hills RACES	1,286	1
PART of Westford	7,916	7
Pasadena RC/JPLARC/ CITARC	22,543	27
Paso Robles ARC	4,372	3
Passaic Co. ARES Team	4,022	1
Pathfinders ARC	1,632	1
Patoka Valley ARC	1,330	3

Paul Bunyan ARC	512	1
Paulding ARC	2,596	2
Peace Country ARC	166	1
Peace River Radio Assn.	1,128	1
Peak RA	220	1
Peconic ARC	1,510	5
Peekskill/Cortlandt ARA	3,662	1
Peel ARC	11,055	14
Pella ARC	920	1
Peninsula Radio Operators	126	1
Penn Wireless Assn.	3,808	2
Pennsylvania Ridge Runners United	580	1
Pentagon ARC	604	1
Peterborough ARC	3,184	7
Phillips Co. ARC	2,080	1
Philmont Mobile RC	1,622	3
Pictou Co. ARC	786	1
Piedmont ARC	9,948	5
Pilot Knob ARC	2,676	1
Pin Pals	1,210	1
Pine State ARC	2,836	1
Pine Bluff ARC	972	2
Pioneer ARC	1,660	1
Piscataquis ARC	1,068	1
Plano AR Klub	3,792	4
Platinum Coast ARS	7,932	2
Platte Co. ARG	3,338	2
Plattsmouth ARC	986	1
Plymouth Historical Museum/ Univ. Michigan	306	1
Pocatello ARC	452	1
PODXS 070	7,376	17
Point Loma Radio Ops Group	5,216	1
Pontotoc Co. ARA	338	1
Port City ARC	12,348	1
Port Lavaca ARC	1,796	4
Portage Co. AR Service	14,920	4
Porterville ARA	34	1
Portland ARC	3,318	3
Portola Valley ARC	1,210	1
Portsmouth RC	1,020	1
Potomac Valley RC	22,640	15
Pottstown Area ARC	3,988	4
Poway ARS	1,518	1
Powhatan Area RC	2,336	1
Prairie Dog ARC	12,150	1
Preble ARA	2,458	1
Prescott-Russell ARC	520	2
Presque Isle Co. ARC	434	1
Preston Co. ARC	644	1
Pretty Good Ham Club	164	1
Pride Radio Group	148	1
Prince William Co. ARES	1,412	1
Princeton Ham RC	1,328	1
Proske's Posse	3,516	1
Providence EMA RACES Club	1,208	1
Providence Radio Assn.	7,052	2
Pueblo West ARC	2,382	3
Puerto Rico AR League	2,934	1
Putnam Co. ARES/RACES	492	1
Putnam Emergency Amateur Repeater League	2,116	6
QRP ARC International	3,695	2
QSY Soc.	1,422	2
Queen Anne's ARC	916	3
Queen City Emergency Net	1,252	1
Quinte & Prince Edward RCs	3,974	6
Radio Activity of Savannah	620	1
Radio Amateur Club of Knoxville	1,392	1
Radio Amateur Soc. of Norwich	3,182	1
Radio Amateurs of Greater Syracuse	4,296	2
Radio Amateurs of Northern Vermont	15,900	1
Radio Amateurs of Skagit Co.	4,286	3
Radio Artisans	1,626	1
Radio Assn. of Erie	3,382	1
Radio Assn. of Western New York	1,187	3
Radio Central ARC and Order of Boiled Owls of NY	10,280	4
Radio Club of Redmond	1,738	3
Radio Club of Tacoma	4,634	11
Radio Farm	8,460	2
Radio Operadores Del Este	4,056	4
Radio Soc. of Ohio	2,776	1
Rains ARA	1,966	2
Raleigh ARS	9,244	2
Ramapo Mountain ARC	872	2
Ramona Outback ARS	1,056	1
Randallstown ARC	11,870	1
Randolph Co. Emergency RC	3,676	2
Rappahannock Valley ARC	14,656	2
Raritan Bay Radio Amateurs	1,506	3
Raytown ARC	628	4
Raytown CERT	1,660	1
Reading RC	7,158	7
Red Mountain Radio Amateurs	418	1
Red Mule DX	1,250	1
Red River Radio Amateurs	3,912	2
Red River Valley ARC	1,000	1
Red Rose Repeater Assn.	2,036	1
Redding Veterans ARC	140	1
Redneck Radio Rangers	918	1
Redondo Beach DCS	1,656	3
Redstone Rockets	2,738	2
REDXA/MARS	11,600	10
Reelfoot ARC	5,696	3
Regina ARA	375	1
Renfrew Co. ARC	672	1
Reno Co. ARA	3,914	5
Renton EmComm Services	574	1
Reynolds Brothers Expeditions	454	1
RF Hill ARC	1,436	3
Rhode Island ARES	780	1
Rich and Ron's Field Day	870	1
Richard Olson, K9BWI, Memorial FD Club	4,970	1
Richardson Wireless Klub	5,310	10
Richfield RC	570	2
Richmond Amateur Telecommunications Soc.	902	2
Richmond ARC	718	2
RICOMU/RIEMA	3,556	1
Ridge Runners RC	7,160	1
Rip Van Winkle ARS	2,598	1
River Bend Wireless Operators Club	2,782	1
River City AR Comm. Soc.	626	1
River City ARC	2,642	1
Riverland ARC	1,820	2
Riverside Co. ARA	836	4
Roanoke Valley ARC	4,855	3
Rochester (MN) ARC	5,844	2
Rochester (NY) DX Assn.	17,666	11
Rockingham Co. ARC	1,418	1
Rockwall ARC	294	1
Rocky Mountain Ham Radio	7,518	2
Rogue Valley ARC	4,164	1
Rome RC	646	2
Royal Gorge ARC	1,216	1
Ruckerville Amateur Transmitting Soc.	2,866	3
Rueda Del Bengay	1,434	1
Runestone ARC	1,752	3
Rusk Co. ARC	1,152	1
SAARS	5,740	3
Sabin Field Day 2021	1,448	1
Sachse ARA	1,246	1
Sacksafone Acres RA	264	1
Saginaw Valley ARA	2,658	4
Saguaro Nights ARC	1,550	1
Salem ARC	1,052	1
Saline Co. ARES	616	1
Salkehatchie ARS	6,546	4
San Andreas Faultline FD Survivors	3,786	2
San Angelo ARC	1,692	1
San Antonio RC	1,488	1
San Diego ARES	9,328	10
San Fernando Valley ARC	3,450	5
San Francisco RC	1,492	2
San Gorgonio Pass Amateur Club	2,048	6
San Jose ARES/RACES	1,958	6
San Juan Co. ARS	1,366	4
San Luis Valley ARA	1,166	1
San Mateo RC	5,158	1
Sand Springs Wireless Assn.	1,322	1
Sandhills ARC	3,316	1
Sandia Vista ARC	560	1
Sandy ARC	350	1
Sangamon Valley RC	2,516	5
Santa Clara Co. ARA	2,092	6
Santa Clarita ARC	820	2
Santa Cruz Co. ARC	60	1
Santa Fe ARC	1,574	1
Santa Rosa Co. ARES	2,952	2
Sarasota Emergency RC	686	1
Saratoga Co. ARA	4,884	5
SARC-SEPAR	7,404	7
Sask Alta RC	2,550	1
Saskatoon ARC	64	1
Sawnee ARA	6,388	6
SC4ARC	8,971	10
SCAN/Red Ant Annihilators	1,760	1
Scarborough ARC	418	2
Scenic City ARS	168	1
Schaumburg ARC	3,296	2
Schoharie Co. ARA	1,076	1
Scioto Valley ARC	2,360	1
Sci-Tech ARS	3,432	2
Seattle ACS	2,586	5
Seaway Valley ARC	512	1
Sedalia Pettis AR Klub	1,100	1
Seneca Area Radio Amateurs	360	1
Seneca RC	5,052	1
Seward ARC	686	1
Shannon ARC	154	1
Sheboygan Co. ARC	1,874	3
Shelby ARC/ARES of Clev. Co.	3,430	1
Shelby Co. ARC	2,154	2
Shelby Co. ARES	2,140	1
Shenandoah Valley ARC	3,734	2
Sherlock ARA	214	1
Shiawassee ARA	62	1
Shore Points ARC	754	1
Shreveport ARA	8,746	9
Shy-Wy ARC	3,060	2
Sierra ARC of the High Mojave	2,326	2
Sierra Blanca ARC	2,028	2
Sierra Foothills ARC	9,884	10
Sierra Nevada ARS	5,458	5
Signal Hill ARC	13,234	5
Silver Comet ARS	3,252	4
Silver Springs RC	3,360	2
Silvercreek ARA	2,992	2
Sioux Empire ARC	3,468	2
Six Meter Club of Chicago	1,773	6
SK Contest Club	1,042	1
Ski Country ARC	5,170	3
Sky Valley ARC	2,678	5
Skyline ARC	1,236	1
Skyline Tower ARC	764	1
Skyview Radio Soc.	6,726	4
Sleeping Bag Portables	1,136	1
SLSRC	218	1
SMARTS RC	1,484	1
Smithchart ARS	9,881	5
Smoky Mountain ARC	10,602	10
Snake River ARC	1,310	1
Snohomish Co. Hams Club	3,652	8
Snoring Beagle Field Day Dogs	1,174	1
Soc. of Midwest Contesters	8,252	10
Soc. of Newfoundland Radio Amateurs	1,304	1
Socorro ARA	3,864	4
Solivita RC	1,424	1
Somerset Co. ARC	1,524	5
Sonoma Co. Radio Amateurs	6,452	12
Sooland ARA	862	1
SOTA LEOs	1,412	1
Souris Valley ARC	4,806	1
South Bay ARA	9,153	20
South Bay ARC	1,338	7
South Canadian ARS	5,858	6
South Carroll AR Group	2,924	2
South Central RC	1,814	1
South East Contest Club	386	1
South East Metro ARC	3,012	3
South East Texas ARC	1,630	1
South Georgia ARC	3,566	1
South Halton ARES Group	916	1
South Jersey Radio Assn.	14,384	10
South Lyon Area ARC	8,374	11
South Mountain Radio Amateurs	4,628	8
South Orange ARA	2,864	1
South Pasadena ARC	1,805	5
South Plainfield ARC	4,670	1
South San Francisco Comms.	394	3
South Texas Remote DX Club	4,730	2
South Towns ARS	6,724	2
South Wake ARC	3,662	4
South West Louisiana Amateur Repeater Club	1,652	3
South West Ohio DX Club	1,478	1
Southborough Rod & Gun ARC	1,796	1
Southeast KS ARC	1,060	1
Southeast Louisiana ARC	434	1
Southern Arizona DX Assn.	174	1
Southern Berkshire ARC	1,890	2
Southern California Contest Club	17,906	4
Southern Counties ARA	4,538	5
Southern Indiana Tri-County ARC	478	1
Southern Michigan ARS	1,464	1
Southern Pennsylvania ARC	1,032	2
Southern Pennsylvania Comm. Group	2,430	1
Southington ARA	598	1
Southwest Dallas Co. ARC	6,006	4
Southwest Iowa ARC	262	1
Southwest Mississippi ARC	1,848	3
Southwick RACES	3,798	1
Spa ARA	988	1
SPARGE	525	1
SPARK/HPT/PARC	3,576	1
Spartanburg ARC	4,046	1
Spirit Valley Amateurs	430	2
Splinter Group ARC	4,380	6
Splitrock ARA	10,079	4
Spokane DX Assn.	5,550	4
Spout Springs Repeater Assn.	2,042	1
Spring Hill ARC	478	1
Springfield RACES Club	470	1
Springhill Repeater Assn.	4,164	1
Squaw Island ARC	190	1
St. Charles ARC	9,024	6
St. Clair ARC	2,196	2
St. Cloud ARC	1,146	1
St. Croix ARA	164	1
St. Croix Valley ARC	100	1
St. Louis & Suburban RC	1,892	3
St. Louis ARC	8,390	7
St. Louis QRP Soc.	6,765	1
St. Mary's Co. ARA	2,220	1
Stamford ARA	2,660	2
Stanford ARC	19,766	1
Stanislaus ARA	250	2
Stanly Co. ARC	1,098	1
Stanwood-Camano ARC	6,421	4
Statesboro ARS/Southeast ARA	950	1
Ste. Genevieve Co. ARC	800	1
Steel City ARC	4,250	1
Sterling Park ARC	1,667	4
Steubenville-Weirton ARC	508	1
Stillwater ARA	3,754	8
Stillwater ARC (OK)	1,484	3
Stockton-Delta ARC	3,998	1
Stones River ARC	2,912	1
Story Co. ARC	3,318	1
Straight Key Century Club	200	1
Stratford ARC	382	1
Stubblefield Repeater Club	122	1
Sturdy Memorial Hospital ARCA	2,768	4
Suburban Technical ARS	222	1
Sullivan ARC	2,642	1
Sullivan Co. NY ARES	2,588	1
Sumner Co. ARA	1,636	2
Sumter ARA	2,084	1
Sun City ARC	2,796	3
Sun City Hilton Head ARC	2,144	3
Sun City Peachtree AR Group	1,120	2
Sun City Summerlin ARC	1,370	1
Sun Coast ARC Soc.	628	3
Sun Country ARS	3,592	2
Sun Parlour ARC	3,358	4
SundayNightNet.org	308	1
Sunnyvale ARES	2,940	4
Superstition ARC	2,564	5
Survivors of Broadcast	328	1
Susquehanna Co. ARC	3,542	1
Susquehanna Valley ARC	3,798	1
Sussex ARA	1,074	1
Swamp Fox Contest Group	2,100	1
Swan Ham RC	400	2
Sweetwater ARC	1,172	1
Tallahassee ARS	4,298	4
Tamaqua Wireless Assn.	1,460	1
Tamiami ARC	4,392	3
Tampa ARC	7,358	1
TCARES	1,684	1
Team Cramp/MXG Designs Radio Geeks	2,430	1
Team RU	326	1
Technology in ARC	514	1
Tellico Lake ARC	5,474	5
Telluride ARC	1,308	1
Tenn Rose	4,710	1
Tennessee Contest Group	8,020	6
Tennessee Valley DX Assn.	7,044	1
Terrace ARC	296	1
Terre Haute RC	4,092	1
Texas DX Soc.	5,714	5
Texas Emergency Amateur Communicators	1,536	2
The 415 ARC	6,916	2
The FPL Group	4,438	1
The Great White North II	624	1
The Megamachine Repeater	1,894	1
The Ohio 337 Ragchew Crew	1,290	1
The Road Show ARC	1,672	1
The Villages ARC	4,169	4

The World RC	3,458	1
Theodore Roosevelt ARC	1,314	1
Thibodaux ARC	1,642	1
Thousand Islands Radio Club	2,540	1
Three Amigos	1,354	1
Three Ammonites	1,150	1
Thunder ARC	2,060	1
Thunderbird ARC	2,280	3
TicBite ARA	765	1
Tilson Contest Club	8,174	1
Tippecanoe ARA	6,376	3
Tipton ARS	6,410	1
TLSC Amateur Radio Group	1,996	2
Toccoa ARS	664	1
Toledo Mobile RA	2,678	5
Toledo Radio Amateur Club	3,004	1
Tompkins Co. ARA	1,402	2
Tom's Garage ARC	8,774	1
Top of Michigan ARC	852	1
Toronto ARC	3,220	6
Tortolina RC	530	1
Tortolita RC	13,166	13
Transit On The Rubicon Family FD Excursion	1,112	1
Traveling Amateur Radio Team	1,696	1
Tri-City Radio Amateur Club	1,750	1
Tri-County ARC (NC)	162	1
Tri-County ARC (PA)	1,310	4
Tri-County ARC (TX)	2,012	1
Tri-County ARC (WI)	5,536	4
Tri-County Radio Assn.	6,234	3
Tri-State ARS (IN)	950	5
Tri-County ARA (CA)	1,272	4
Tri-County ARC (TX)	52	1
Trident ARC	4,482	5
Tri-Lakes ARC	5,514	4
Trilogy ARC	578	1
Trine Amateur Radio Club	276	1
Tri-State Amateur Radio Group	462	1
Tri-State ARA	2,984	3
Tri-States ARC	708	1
Tri-Town Radio Amateur Club	6,579	4
Trojan ARC	5,800	1
Troy ARA	1,740	1
Truckee Radio Amateur Soc. Hams	4,910	1
Truro ARC	1,589	5
Tucker Family RC	4,116	1
Tulsa Digital RC	5,985	1
Turkey Heaven Mtn. Repeater Assn.	3,612	3
Tusco ARC	4,272	1
Twin Cities Repeater Club	2,628	2
Twin City ARC	3,524	3
Twin City FM Club	1,264	2
Twin Ops Warriors	1,614	1
Twin Rivers ARC	422	1
Twin State RC	2,612	2
Two Rivers AR Group	1,134	1
Two Rivers ARC	2,670	1
TX Emergency Amateur Communicators	324	1
Tyler ARC	2,964	2
Union City Wireless Assn.	882	1
Union Co. ARC	4,272	2
Union Co. Indiana Bicentennial	234	1
Union Métropolitaine des Sans-filistes de Montréal	5,990	7
Uniontown ARC	5,914	2
United Radio Amateur Club	1,294	4
Univ. of Alabama RC	1,506	2
Univ. of Arizona ARC	4,060	1
Univ. of Southern California ARC	650	1
Univ. of Texas ARC	382	1
Upsher Area ARC	626	1
US West Wireless Club	202	1
USECA	368	1
USS Kitty Hawk ARC	1,702	1
USS Wisconsin RC	212	1
Utah ARC	7,409	2
Utah DX Assn.	1,224	1
Utah Valley ARC	6,764	1
Utica ARC	1,914	1
Utica Shelby Emergency Comm. Assn.	1,360	3
VA2LPQ et al.	706	1
Vaca Valley RC	3,060	1
Valdosta ARC	1,242	1
Valencia Co. ARA	1,302	1
Valley and Massanutten ARA	11,106	9
Valley of the Moon ARC	2,222	2
Valley RC of Oregon	3,320	6
Van Wert ARC	5,386	1
VBARC-VADXCC	4,592	1
VCARS-SSARC	4,608	1
VE3GTM Field Day	850	1
VE6FAR Cycle 25	5,230	10
VECTOR	138	1
Ventura Co. ARC	2,282	1
Ventura Co. ARS	226	1
Verde Valley ARA	844	2
Vermilion Range ARC	2,502	1
Vero Beach ARC	3,452	1
Victor Valley ARC	552	2
Victoria ARC	632	1
Victoria-Haliburton ARA	1,132	3
Vienna Wireless Soc.	9,140	11
Vieques Island ARC	2,150	1
Vilas Co. RC	1,797	1
Village 7 ARC	1,582	1
Village Hams	1,396	1
Villanova Univ. ARC	520	1
Vintage Radio & Comm. Museum of CT ARC	312	1
Virginia Mountain ARC	2,646	1
Vm Okla Nan Ola ARC	6,115	1
Volusia ARES and West Volusia ARS	1,026	1
W/K ARC of Greater Milwaukee	6,600	1
WØRCZ Memorial Station	1,458	1
W3AO PVRC	115,649	37
W6TRW ARC	1,836	1
Wabash Valley ARA	5,690	1
WACOM	690	1
Wahkiakum Co. ARC	5,089	5
Waldo Co. ARA	3,936	1
Walla Walla Valley ARC	1,048	1
Walton Co. Repeater Group and Walton Co. ARES	1,820	1
WARA/GBARC	1,372	1
Warminster ARC	5,080	9
Warren ARA	6,646	1
Warren ARS	1,070	1
Warren Co. EmComm Group	1,318	1
Warren Co. NY RC	6,502	4
Warrensburg Area ARC	1,548	1
Wasco ARS	668	1
Washington Amateur Comm.	2,332	1
Washington Area ARC	1,872	2
Washington Co. ARC	790	1
Watauga ARC	5,026	5
Waterton ARS	5,192	2
Waterton Contest Club	372	1
Watertown ARC	500	2
Wayne ARC	4,786	4
Wayne Co. ARC	4,752	2
WCARC-OH	480	1
WCARC-TX	17,406	17
WCARES-TN	18,544	23
WCARS-Murphy/Cherokee Co. ARES	736	1
WD Contest Group	4,172	2
Weld ARS	418	1
Wellesley ARS	1,635	5
Wellington RC	114	1
West Alabama ARC	1,856	1
West Allis Radio Amateur Club	2,676	4
West Baldwin City ARC	558	1
West Chester ARA	5,242	3
West Essex ARC	2,258	2
West Fork ARC	3,380	1
West Georgia ARS	3,278	2
West Island ARC	572	2
West Jersey DX Group	8,150	1
West Kootenay ARC	632	1
West Point Fire CERT	872	1
West Seattle ARC	350	1
West Texas ARC	1,542	1
West Valley ARA	18,647	13
West Valley ARC	158	2
West Virginia Amateur Radio	3,420	1
Westchester Emergency Comm. Assn.	12,856	3
Westcoast ARA	952	2
Western Carolina ARS	1,040	1
Western CO ARC	1,470	1
Western IL ARC	5,214	4
Western KS ARC	1,940	1
Western PA Wounded Hams	1,886	1
Western Piedmont ARC	380	1
Western Placer ARC	1,798	4
Western Tidewater RA	1,040	1
Western WA DX Club	550	1
Westport Astro ARC & Housatonic ARC	1,687	1
Westside ARC	1,892	1
Wexaukee ARC	1,062	2
Whatcom Emergency Comm. Group/Mt. Baker ARC	1,950	1
Wheaton Community Radio Amateurs	2,210	4
Whidbey Island Trailblazers	2,390	1

The Gloucester County Amateur Radio Club, W2MMD, in New Jersey, operated at night during the 2021 ARRL Field Day, with antennas for the 15-, 20-, and 80-meter CW stations. The antennas were supported by a portable aluminum military mast, which takes about an hour to deploy. [Vincenzo Sallustio, N4NYY, photo]

White Rock ARC	168	1
White Rock Lake ARC	1,848	3
Whitewater Valley ARC	1,466	1
Whitley Co. ARC	4,594	1
Whitman ARC	2,834	1
Whitman Co. ARES/RACES	90	1
Wichita ARS	1,046	1
Wilderness Road ARC	1,488	2
Willamette Valley DX Club	2,358	3
Williamsburg Area ARC	9,146	3
Williamson Co. ARC	142	1
Williamson Co. ARES	826	1
Wilson ARC	3,498	2
Wilsons Wonders	5,210	1
Windmill Amateur Radio Grp	2,400	1
Winnipeg ARC	734	1
Winona ARC	4,904	2
Wireless Assn. of South Hills ARC	4,464	2
Wireless Operators of Winsted/CQ RC	408	1
Wireless Soc. of Lorain Co.	1,335	1
Wireless Soc. of S. Maine	7,710	2
Wisconsin ARC	3,554	7
Wisconsin River Gang	6,520	1
Wisconsin Valley RA	1,324	1
Wistaria Wireless Soc.	1,608	1
Wood Co. ARC	2,568	3
Wood Co. ARES/RACES	2,848	1
Wood Co. Emergency Comm.	3,108	1
Woodbridge Wireless	24,092	4
Woodchuck ARC	1,214	1
Woodford Co. ARC	768	2
Workshop88	2,895	1
WPA FIELD DAY Assn.	3,266	2
WRAET	626	2
WVØH FD Group	2,058	1
WVARC-AZ	804	6
XRX & Monroe Co. ARES RC	4,114	1
XWARN/DARA	3,868	2
Yadkin Valley ARC	1,152	1
Yankee Clipper Contest Club	7,416	3
Yavapai ARC	1,236	1
Yellow Thunder ARC	1,510	1
Yellowknife ARS	1,422	1
Yellowstone RC	1,272	3
YoloARS/MTVACA/SACARC/Yolo CO ARES/UCDARC	1,754	1
Yonkers ARC	2,288	1
Yooper Dupers	3,574	1
York ARC	1,360	1
York Co. Radio Soc.	630	1
York Co. (SC) ARS	8,320	2
York RC	7,763	5
York Region ARC	9,588	15
Young Co. ARC	602	1
Yuba-Sutter ARC	2,816	6
Yukon ARA	790	1
Zephyrhills Area ARC	1,348	1
Zuni Loop MEF	6,470	7

Please click here jump to page for full Class A, B, C, D, E, and F line scores.

Paul Bourque, N1SFE, n1sfe@arrl.org

2021 ARRL June VHF Contest Results

This year's ARRL June VHF Contest was held June 12 – 14, 2021.

Sponsored Plaque Winners

Thanks to the generous support of numerous clubs and individuals, we are pleased to list the winners of the Sponsored ARRL June VHF Contest plaques below. For more information on plaque sponsorship or to order a duplicate plaque, contact the ARRL Contest Program at 860-594-0232 or **contests@arrl.org**. Plaques cost $80, which includes all shipping charges.

Plaque Category	Plaque Sponsor	Winner
Overall Single Operator, High Power	Charles Dietz, W5PR	K1TEO
Overall Single Operator, Low Power	Jeffrey Klein, K1TEO	AF1T
Overall Single Operator, QRP Portable	Andrea Slack, K2EZ	W6TV (W6YEP, op)
Overall Single Operator, Three-Band	Northern Lights Radio Society	KO9A
Overall Single Operator, FM Only	Andrea Slack, K2EZ	N9UM
Overall Single Operator, Low Power, Rookie	W3ZZ First Log Award — Memorial by Tim, K3LR, and Dave, W9PA	KS1PPY
Overall Multioperator	Directive Systems and Engineering — in memory of W3ZZ and K3CB	W2SZ
Overall Limited Multioperator	Gene Zimmerman, W3ZZ, Memorial — Arizona VHF Society	K5QE
Overall Rover	Andrea Slack, K2EZ	N7GP/R
Overall Limited Rover	Andrea Slack, K2EZ	KA5D/R
Overall Unlimited Rover	Andrea Slack, K2EZ	K5SRT/R
Atlantic Division Single Operator, High Power	Potomac Valley Radio Club	K1RZ
Atlantic Division Single Operator, Low Power	Potomac Valley Radio Club	N2WK
Atlantic Division Multioperator	Al Oldfield, W9KXI, and Ken Kent, KA2LIM	W3CCX
Atlantic Division Rover	George Molnar, KF2T	KF2MR/R
Central Division Single Operator, High Power	Society of Midwest Contesters	K9CT
Central Division Single Operator, Low Power	Society of Midwest Contesters	K2DRH
Central Division Single Operator, QRP Portable	Society of Midwest Contesters	W9SZ
Central Division Single Operator, Three-Band	Society of Midwest Contesters	KO9A
Central Division Rover	Society of Midwest Contesters	K9JK/R
Dakota Division Single Operator, Low Power	Northern Lights Radio Society	W0AUS
Dakota Division Rover	Matt Holden, K0BBC	W0ZF/R
Dakota Division Limited Rover	Matt Holden, K0BBC	KA0RYT/R
Delta Division Single Operator, High Power	Memorial to Mike Bruck, W5MRB, from his friends	W5ZN
Hudson Division Single Operator, Low Power	Matthew Ryffel, K2NUD	WA2VNV
Pacific Division Single Operator, Low Power	Northern Lights Radio Society	KE6GLA
Roanoke Division Single Operator, High Power	Potomac Valley Radio Club	N3MK
Roanoke Division Single Operator, Low Power	Potomac Valley Radio Club	N4LAZ
Southwestern Division Single Operator, FM Only	Arizona VHF Society	W6HIP
Canada Single Operator, Low Power	Neil Macklem, VE3SST	VE3DS
Canada Limited Multioperator	Peter Prabucki, VA3ELE	VE3MIS
Canada Rover	Neil Macklem, VE3SST	VE3OIL/R
Canada Limited Rover	Peter Prabucki, VA3ELE	VE3GKT/R
Canada Unlimited Rover	Neil Macklem, VE3SST	VE7AFZ/R

Full Results Online

You can read the full results of the contest online at **http://contests.arrl.org**. You'll find detailed analysis and more play-by-play, along with the full line scores. Improve your results by studying your log-checking report, too.

Top Ten

Classic Rover

N7GP/R	264,704
K6VHF/R	137,973
K2EZ/R	101,790
VE3OIL/R	99,990
KF2MR/R	85,595
KJ7JC/R	67,232
N7DSX/R	48,600
AC7FF/R	45,864
N7OW/R	41,526
W0ZF/R	41,085

Limited Rover

KA5D/R	84,876
W5TN/R	63,180
NV4B/R	37,570
AL1VE/R	27,324
K5ND/R	25,877
N6GP/R	21,774
W9YOY/R	17,286
K2QO/R	15,879
AA5PR/R	12,640
KC7OOY/R	10,736

Unlimited Rover

K5SRT/R	150,336
N0LD/R	110,313
K6MI/R	75,468
KD5IKG/R	65,040
KG6CIH/R	32,028
W4NF/R	11,520
KE6QR/R	11,040
KJ1K/R	4,309
KI6ARW/R	2,967
KD1RX/R	2,925

Single Operator, High Power

K1TEO	508,348
W5ZN	232,559
K1RZ	228,160
N2JMH	149,445
N1AV	148,575
K5TR	142,814
N3MK	134,420
K1KG	125,904
K9CT	119,250
N3RG	98,384

Single Operator, Low Power

AF1T	150,102
WB1GQR (W1SJ, op)	119,966
N2WK	95,524
NF3R	86,275
K2DRH	69,391
K9KLD	67,158
N0LL	56,363
VE3DS	53,376
W3LL	49,256
K3TEF	42,570

Single Operator, Portable

W6TV (W6YEP, op)	20,539
W7JET	6,290
W3CJD	4,797
WB2AMU	4,488
KD8RTT	4,060
WR6Z	2,684
KD7WPJ	2,232
KK6MC	2,044
K7ATN	1,748
W9SZ	1,710

Single Operator, Three-Band

KO9A	86,907
N3AAA	69,719
KE3JP	52,001
NS4T	46,766
WN3A	45,847
AB5EB	36,855
WQ5L	35,796
W5TRL	35,475
K6RO	29,640
N3DGE	24,934

Single Operator, FM Only

N9UM	4,025
KG7AZY	1,876
N7KN	1,625
VE3RWJ	1,188
N6NFB	792
WG4I	770
W6HIP	637
AF6GM	603
KK6OTK	531
KN6IOC	440

Limited Multioperator

K5QE	302,869
AA4ZZ	279,558
N2NT	220,220
K1WHS	171,600
AD4ES	140,361
W3SO	136,213
NV9L	82,264
W2LV	76,209
KZ9O	67,680
VE3MIS	66,444

Unlimited Multioperator

W2SZ	372,324
W3CCX	271,040
N4SVC	170,400
WQ0P	167,300
K3CT	121,923
W4ZST	117,298
WD9EXD	101,990
KD2LGX	86,199
W4IY	85,280
N8GA	69,561

Affiliated Club Competition

Club	Score	Entries
Unlimited		
Potomac Valley Radio Club	885,466	74
Medium		
Mt. Airy VHF Radio Club	1,800,372	41
Arizona VHF Soc.	789,601	13
Rochester VHF Group	557,259	22
Society of Midwest Contesters	538,087	41
Florida Contest Group	433,335	18
North East Weak Signal Group	431,117	19
Roadrunners Microwave Group	371,501	7
Carolina DX Assn.	359,114	8
Frankford Radio Club	353,048	25
Yankee Clipper Contest Club	345,215	18
Fourlanders Contest Team	343,062	10
Northern Lights Radio Soc.	263,813	20
Northern California Contest Club	233,124	33
Contest Club Ontario	208,459	15
Pacific Northwest VHF Soc.	191,616	37
Florida Weak Signal Soc.	184,872	4
Arizona Outlaws Contest Club	154,731	22
South East Contest Club	142,779	10
Kentucky Contest Group	129,097	7
Southern California Contest Club	127,614	16
Central Texas DX and Contest Club	120,748	9
Northeast Maryland AR Contest Soc.	120,593	9
The Ontario VHF Assn.	114,970	10
DFW Contest Group	94,199	11
Badger Contesters	89,203	12
Texas DX Soc.	82,458	5
Swamp Fox Contest Group	81,888	4
Grand Mesa Contesters of Colorado	73,206	11
Tennessee Contest Group	48,754	8
Arkansas DX Assn.	48,044	5
Michigan VHF-UHF Soc.	46,747	5
Minnesota Wireless Assn.	32,120	12
New Mexico VHF Soc.	28,791	5
Oklahoma City Autopatch Assn.	23,602	3
Mad River Radio Club	19,348	6
Wayne County ARC	15,326	4
South Jersey Radio Assn.	14,255	4
Hudson Valley Contesters and DXers	12,572	6
Radiosport Manitoba	11,629	3
Alabama Contest Group	10,337	5
Willamette Valley DX Club	8,694	5
Valley Amateur Radio Assn.	4,732	3
New Providence ARC	2,870	3
Orca DX and Contest Club	2,072	3
Alaska VHF-Up Group	1,105	3
Edmonds Woodway ARC	891	4
Big Sky Contesters	855	3
Local		
Chippewa Valley VHF Contesters	55,470	4
CTRI Contest Group	52,665	5
Nashoba Valley ARC	43,055	6
Niagara Frontier Radiosport	21,327	5
Meriden ARC	17,366	3
Bristol (TN) ARC	12,410	4
Silver Comet Amateur Radio Soc.	11,115	6

Brandon Clark, KL7BSC, operated using the Alaska VHF-Up Group call sign, KL7VHF, from this breathtaking location in Anchorage, Alaska, during the 2021 ARRL June VHF Contest. He made 38 contacts, placing him second in the Classic Rover category in the Northwestern Division. [Brandon Clark, KL7BSC, photo]

Division Winners

Classic Rover

Atlantic	KF2MR/R	85,595
Central	K9JK/R	10,011
Dakota	WØZF/R	41,085
Delta	AG4V/R	21,675
Midwest	WAØCNS/R	1,166
New England	WB2VVQ/R	2,929
Northwestern	K7MDL/R	5,363
Pacific	WB6HYD/R	29,640
Roanoke	KK4BZ/R	528
Southwestern	N7GP/R	264,704
West Gulf	K2EZ/R	101,790
Canada	VE3OIL/R	99,990

Limited Rover

Atlantic	K2QO/R	15,879
Central	W9YOY/R	17,286
Dakota	KAØRYT/R	6,728
Delta	WXØEMT/R	3,990
Great Lakes	K8JH/R	3,610
Hudson	N2DXT/R	5,332
Midwest	AL1VE/R	27,324
New England	AF1R/R	6,888
Northwestern	KC7OOY/R	10,736
Pacific	WB6HUM/R	1,760
Roanoke	KM4OZH/R	8,109
Rocky Mountain	AA5PR/R	12,640
Southeastern	NV4B/R	37,570
Southwestern	N6GP/R	21,774
West Gulf	KA5D/R	84,876
Canada	VE3GKT/R	240

Unlimited Rover

Atlantic	K2DH/R	756
Hudson	KA2YRA/R	935
Midwest	AF4JF/R	756
New England	KG6CIH/R	32,028
Northwestern	KD1RX/R	2,925
Pacific	K8MI/R	75,468
Roanoke	W4NF/R	11,520
West Gulf	K5SRT/R	150,336
Canada	VE7AFZ/R	1,541

Single Operator, High Power

Atlantic	K1RZ	228,160
Central	K9CT	119,250
Dakota	KAØPQW	18,180
Delta	W5ZN	232,559
Great Lakes	KE8FD	37,088
Hudson	N2GHR	55,622
Midwest	WØJW	17,160
New England	K1TEO	508,348
Northwestern	W7EW	23,772
Pacific	K6KLY	31,584
Roanoke	N3MK	134,420
Rocky Mountain	K7ULS	32,512
Southeastern	WA4GPM	77,280
Southwestern	N1AV	148,575
West Gulf	K5TR	142,814
Canada	VE3WY	32,488

Single Operator, Low Power

Atlantic	N2WK	95,524
Central	K2DRH	69,391
Dakota	WØAUS	30,591
Delta	WB5JJJ	20,580
Great Lakes	W5MX	13,135
Hudson	WA2VNV	39,600
Midwest	NØLL	56,363
New England	AF1T	150,102
Northwestern	K7YO	4,980
Pacific	KE6GLA	15,708
Roanoke	N4LAZ	21,060
Rocky Mountain	NØPOH	10,560
Southeastern	W4MAA	41,470
Southwestern	NA6MG	16,184
West Gulf	K5TRA	42,000
Canada	VE3DS	53,376

Single Operator, Portable

Atlantic	N3KCM	1,147
Central	W9SZ	1,710
Dakota	NØSUW	432
Delta	N4QX	12
Great Lakes	WA8RJF	120
Hudson	W3CJD	4,797
Midwest	KD8RTT	4,060
New England	AG1A	96
Northwestern	K7ATN	1,748
Pacific	W6TV (W6YEP, op)	20,539
Roanoke	AB8CI	364
Rocky Mountain	KK6MC	2,044
Southeastern	AB4DX	630
Southwestern	W7JET	6,290
Canada	VE3EG	315

Single Operator, Three-Band

Atlantic	N3AAA	69,719
Central	KO9A	86,907
Dakota	KØVG	21,944
Delta	WQ5L	35,796
Great Lakes	KM8V	24,610
Hudson	K2IW	11,856
Midwest	KØPHP	20,394
New England	N1API	12,792
Northwestern	KA6BIM	4,998
Pacific	W6KAP	15,785
Roanoke	KO4ECD	20,250
Rocky Mountain	WØBX	18,612
Southeastern	NS4T	46,766
Southwestern	K6RO	29,640
West Gulf	AB5EB	36,855
Canada	VE3PJ	20,962

Single Operator, FM Only

Atlantic	KD2VGM	51
Central	N9UM	4,025
Delta	K4NRT	30
New England	KC1OYG	2
Northwestern	N7KN	1,625
Pacific	N6NFB	792
Roanoke	KI4POT	98
Rocky Mountain	KG7AZY	1,876
Southeastern	WG4I	770
Southwestern	W6HIP	637
West Gulf	KG5UNK	93
Canada	VE3RWJ	1,188

Limited Multioperator

Atlantic	W3SO	136,213
Central	NV9L	82,264
Hudson	N2NT	220,220
New England	K1WHS	171,600
Pacific	N6RO	44,530
Roanoke	AA4ZZ	279,558
Rocky Mountain	K5LRW	7,540
Southeastern	AD4ES	140,361
Southwestern	WO1S	1,600
West Gulf	K5QE	302,869
Canada	VE3MIS	66,444

Unlimited Multioperator

Atlantic	W3CCX	271,040
Central	WD9EXD	101,990
Delta	N4QWZ	47,025
Great Lakes	N8GA	69,561
Midwest	WQØP	167,300
New England	W2SZ	372,324
Pacific	K6HS	33,616
Roanoke	W4IY	85,280
Southeastern	N4SVC	170,400
Southwestern	NI6E	26,746
West Gulf	KC5MVZ	17,622

The 2022 ARRL June VHF Contest will be held June 11 – 13, 2022.

The 2022 January VHF Contest

1900 UTC Saturday, January 15 – 0359 UTC Monday, January 17, 2022

A new season of VHF contesting begins during the third weekend of January with the 2022 ARRL January VHF Contest. Take advantage of enhanced propagation modes, such as meteor scatter, winter E-skip, aurora, EME, and tropospheric scatter/ducting on amateur frequencies of 50 MHz and above.

Whether you prefer CW, phone, or one of the newer digital modes, there are plenty of ways for hams of all experience levels to participate in the event.

Assistance is available to all entry classes, so stations can coordinate when to attempt contacts, whether they're at home, portable, or on the road. Coordinate with your local club or group and let them know when and where you'll be on the air for the event.

The contest exchange is your Maidenhead grid square. More information on grid squares can be found at **www.arrl.org/grid-squares**.

10-Day Log Deadline: Logs must be uploaded or postmarked no later than 0359 UTC January 27, 2022. Electronic Cabrillo-formatted logs must be uploaded to **http://contest-log-submission.arrl.org** or paper summary sheets and logs must be mailed to ARRL — January VHF Contest, 225 Main St., Newington, CT 06111.

During the 2021 ARRL January VHF Contest, Sidney Terry, K5SRT, operated in the Unlimited Rover category. He and Alexander Naas, KG9DUK, earned a first-place finish in the category. [S. Schieving, Jr., WØHG, photo]

Complete rules can be found at www.arrl.org/january-vhf

The 2022 ARRL International DX Contest

CW: 0000 UTC Saturday, February 19 – 2359 UTC Sunday, February 20
SSB: 0000 UTC Saturday, March 5 – 2359 UTC Sunday, March 6

Ricardo "Rick" Navarrete Lopez, EA4M, operated on 15 meters in the 2021 ARRL International DX CW Contest. He finished third in Spain in the Single Operator, 15 Meters category. [Ricardo "Rick" Navarrete Lopez, EA4M, photo]

Join thousands of amateurs worldwide as they compete in this exciting international contest. Whether you're looking for casual DX contacts, or pursuing new countries toward awards or your DXCC counts, this event has something for everyone.

New Categories for 2022: The Single Operator, Single Band (160, 80, 40, 20, 15, and 10 meters) categories now have three different power level subcategories (QRP, Low Power, and High Power) in both Non-Assisted and Assisted (Unlimited) categories.

- W/VE stations send signal report and state or province; DX stations send signal report and transmit power.
- Upload your Cabrillo-formatted log to the ARRL web app at **http://contest-log-submission.arrl.org** or send paper logs to ARRL — DX Contest, 225 Main St., Newington, CT 06111.
- Log submission deadlines are 7 days after the event. For this event, the CW deadline is 2359 UTC on February 27, and the SSB deadline is 2359 UTC on March 13.

Complete rules can be found at www.arrl.org/arrl-dx

January 2022 Kids Day

1800 UTC – 2359 UTC Saturday, January 1, 2022

The first Saturday in January is the time to encourage young people to get on the air and experience what amateur radio is all about!

Sponsored by the Boring (Oregon) Amateur Radio Club, this event has a simple exchange suitable for younger operators: first name, age, location, and favorite color. After that, the contact can be as long or short as each participant likes.

Kids Day is the perfect opportunity for you or your club to open your shack doors and invite kids over to discover the excitement of amateur radio.

Shea Moroney participated in the ARRL 2021 Kids Day along with her father, Michael Moroney, KD7RF. After making a few contacts, Shea felt comfortable calling CQ and handing out signal reports, and she's looking forward to receiving QSL cards from the stations they worked. [Michael Moroney, KD7RF, photo]

Complete rules can be found at **www.arrl.org/kids-day**

The 2022 ARRL Straight Key Night

0000 UTC – 2359 UTC Saturday, January 1, 2022

Start off the new year with the sounds of Morse code! Straight Key Night (SKN) is not a contest, so there's no need for quick exchanges. All you need is your favorite straight key or bug.

Many participants dust off their vintage rigs and keys, but all gear (new or old) is welcome. The number of contacts you make isn't important, and many new and longtime friends get together on the air for the event.

Send your list of stations worked and SKN stories and photos, along with your votes for Best Fist and Most Interesting QSO, to **straightkey@arrl.org** before January 31, 2022. A paper summary of your activity can be mailed to ARRL — Straight Key Night, 225 Main St., Newington, CT 06111. Be sure to post your story and photos at **www.arrl.org/soapbox**.

Complete rules can be found at
www.arrl.org/straight-key-night

ARRL Straight Key Night is the perfect opportunity to dust off your favorite key or bug, or use new gear for the event. [Paul Bourque, N1SFE, photo]

The 2022 ARRL RTTY Roundup

1800 UTC Saturday, January 8 – 2359 UTC Sunday, January 9

The 2022 ARRL RTTY Roundup begins Saturday, January 8. If you're new to digital modes, this can be your opportunity to explore the excitement of digital mode contesting. Getting on digital modes is now easier than ever — all you need is a computer, a transceiver, and a sound card interface. Many of the new HF rigs even have built-in interfaces that allow your PC to be connected directly to your transceiver. If you're new to digital contesting, visit **www.rttycontesting.com** for tips on how to get started.

Exchange: W/VE (US and Canada) stations send signal report and state; DX (outside US and Canada) stations send signal report and consecutive serial number starting with 001.

As specified in the contest rules, a control operator must be present to manually initiate and log each contact. Control may be either local or remote. FT8's Fox and Hound mode is not permitted.

Using modes in which more than one signal is decoded at a time, such as PSK31 and FT8/FT4, requires the participant to enter in the Single Operator, Unlimited or Multioperator category.

Bruce Smith, AC4G, placed second in the Delta Division in the Single Operator, RTTY Only, Low Power category of the 2021 ARRL RTTY Roundup. [Bruce Smith, AC4G, photo]

7-Day Log Deadline: All logs must be received via web app or postmarked no later than 2359 UTC on January 16, 2022. Upload your Cabrillo-formatted logs to **http://contest-log-submission.arrl.org** or mail paper logs to ARRL — RTTY Roundup, 225 Main St., Newington, CT 06111.

Complete rules can be found at **www.arrl.org/rtty-roundup**

Strays

HamSCI's December 2021 Antarctic Eclipse Festival

The Antarctic Eclipse Festival, sponsored by HamSCI, is taking place in December 2021. As the shadow of the moon passes across Antarctica on December 4, it will generate traveling ionospheric disturbances, which will in turn affect radio propagation. The unusual geometry of this year's eclipses will give researchers an opportunity to investigate complicated ionospheric dynamics over the poles, as the long daytime of polar summer is briefly interrupted by the ecliptical night.

You can explore the ionosphere from your home station by participating in Ham Radio Science Citizen Investigation's (HamSCI's) eclipse festivals. During these events, hams and citizen-scientists are asked to collect Doppler shift data from time standard stations, such as WWV. All you need to participate is an HF radio connected to a computer. A GPS-disciplined oscillator is helpful for collecting data, but is not required. Data collection will run from December 1 through December 10, and the results will be made available for scientific analysis.

All ham radio operators and shortwave listeners around the globe are invited to join, even stations that are far from the path of totality. Eclipse Festivals in 2020 included over 100 participants from 45 countries. Instructions are available in multiple languages.

HamSCI is an initiative of ham radio operators and geospace scientists, dedicated to advancing scientific research and understanding through amateur radio activities. Eclipse festivals are pilot campaigns for the Personal Space Weather Station (PSWS) — HamSCI's flagship project. The PSWS team seeks to develop a global network of citizen-science stations. Participants monitor the geospace environment in order to deepen scientific understanding and enhance the radio art.

To learn more about the Antarctic Eclipse Festival and how to participate, visit **www.hamsci.org/festivals**.

The December 2021 Antarctic Eclipse Festival QSL art. [Zo Linker graphic]

Bernie McClenny, W3UR, w3ur@arrl.org

How's DX?

The Changing Landscape of DXpedition QSLing

*For this month's column, seasoned DXer Gene Spinelli, K5GS (**k5gs@arrl.net**), talks about the impact that Logbook of The World (LoTW) has had on DXpeditions and confirmed contacts over the years.*

Before LoTW, DXpedition contacts were confirmed by mailing QSL cards to the QSL manager via a self-addressed envelope, which was also stamped if it was being mailed within the same country. Usually, money (known as "green stamps") or International Reply Coupons (IRCs) would be included to pay for the cost of the returned card and/or a donation to help with project expenses (this was typically about $2 or two "green stamps"). This process worked well for many years. In addition, free confirmations were often available using a QSL bureau.

A Positive Change

Some might say that LoTW and the Online QSL Request System (OQRS) have transformed the entire DXpedition contact confirmation process.

Today, many DXers (for DXpeditions or individual operations) upload their contacts to the OQRS, pay a small fee using PayPal, and process confirmations in LoTW, as well as on a QSL card, which is mailed to the operator. Even if you don't process a request to have your contact confirmed, many DXpeditions will upload their complete log into LoTW within 6 months, free of charge.

Here are some major improvements that the OQRS and LoTW have had on DXpeditions and confirmed contacts:

1 In most cases, QSL cards and envelopes no longer need to be mailed to the QSL manager.

2 In addition to the time saved, not purchasing postage, cards, and envelopes saves money.

3 Less waste is produced, which in turn helps the environment.

4 The QSL manager no longer has to sort through thousands of envelopes to account for money or IRCs, nor do they have to manually input contact information on thousands of QSL cards.

Increasing Costs

LoTW allows you to receive contact confirmations faster than ever before. It's hard to argue that the OQRS and LoTW aren't a tremendous benefit for the amateur radio community.

However, as treasurers of major DXpeditions to rare entities have noticed, it's not unusual for only about 15% of the logged call signs to directly support these projects with a donation. When asked about why they don't donate, many operators said that they wait for the free LoTW upload or QSL bureau cards.

These direct mail QSL cards are pre-sorted with postage, and assembled to receive a volume discount for mailing. [Tim Beaumont, MØURX, photo]

These cards are ready to be sent to QSL bureaus around the world. There are two shipments per year, and each one has about 25,000 cards and weighs approximately 180 pounds. [Tim Beaumont, MØURX, photo]

Over the years, while the confirmation process transformed, other changes were quietly under way. Many of the rare (and some not so rare) DX entities have been placed under administrative control by agencies in the countries that own them, such as the US Fish and Wildlife Service, French Southern and Antarctic Lands (TAAF), Parks Australia, New Zealand Department of Conservation (DOC), Pitcairn Islands Marine Reserve, marine protected areas in New Caledonia, and more.

Marine reserves encompass expanses of ocean that are now subject to landing conditions and permits. Some governments are even managing the number of DXpeditions to certain entities by limiting their frequency to once every 5 – 10 years. Additionally, DXpeditions to entities that are relatively easy to reach have incurred high costs because of requirements such as ship inspections (and/or special permits), significant insurance requirements, operator and equipment biosecurity inspections and quarantine, landing permit fees, a government observer participating at the team's expense, and more.

Despite the increasing costs, it's necessary to field a team large enough to organize a DXpedition to an entity on Club Log's DXCC Most-Wanted List. Covering the popular bands/modes might be possible with two or three operators, but unless they're prepared for a long-term expedition, they probably won't meet the demand for the large number of contacts that a DXpedition to a rare entity often generates.

QSL Policy Adjustments

To meet these new challenges, several DXpedition teams have changed their QSL policies, implementing one or more of the following:

1 Processing of QSL bureau cards may require a nominal fee and may be delayed by at least 12 – 18 months. This fee may not include LoTW, and requests for QSL bureau cards may only be processed through the OQRS. Some QSL managers may no longer accept incoming QSL bureau cards.

2 The DXpedition's complete LoTW upload may not occur until at least 12 months after the project.

3 QSL cards mailed directly to the QSL manager may require a fee and be processed after the OQRS cards.

4 An express LoTW option may deliver your confirmed contact without a QSL card.

5 QSL and LoTW special handling for clubs or foundations may be eliminated.

The DXpedition's leadership team, not the QSL manager, establishes the QSL policy. Not all teams and QSL managers are implementing these changes, so be sure to check the DXpedition team's website or Facebook page for specific instructions on how to request a QSL card confirmation.

It's reasonable to conclude that free QSL bureau cards and an LoTW upload of the DXpedition's full log within 6 months have changed the way people think about confirming their DXpedition contacts.

Requests for direct QSL card confirmations are in decline. Recent examples include the VP8PJ South Orkney DXpedition in 2020 and the VP6D Ducie Island DXpedition in 2018. With 20,519 unique call signs in the VP8PJ log, only 21% of them ordered a direct mail QSL card. Of the 24,934 call signs in the VP6D log, only 18% ordered a direct mail card.

The Importance of Donations

With such a small percentage (about 15%) of call signs in the log donating to the projects, expenses increase for the team. If you're interested in ways you can help, try to minimize duplicate contacts. Use the OQRS to confirm your contacts and donate to the project before it starts. If every call sign in the log applied for a QSL card using the OQRS and added a small donation, it would go a long way toward defraying the expenses of such a large operation, and would put a rare entity on the air for the community.

Wrap-Up

That's all for this month. A special thanks to Gene Spinelli, K5GS. Don't forget to send your DX news, photos, and club newsletters to **bernie@dailydx.com**. Until next month, see you in the pileups!
— Bernie, W3UR

Jon Jones, NØJK, n0jk@arrl.org

The World Above 50 MHz

Update on Noctilucent Clouds and 6-Meter Propagation

After receiving feedback from my October 2021 column on "High Solar Cycle 25 Activity and Noctilucent Clouds," an update was necessary regarding the occurrence of sporadic E and noctilucent clouds (NLCs). Some confusion arose as to whether NLCs propagate 6-meter signals.

Professor Cora Randall, from the University of Colorado's Lab for Atmospheric and Space Research, has made it clear that noctilucent clouds do not cause sporadic E and do not propagate 50 MHz signals. There does appear to be a connection between the amount of meteor dust, meteoric ions in the E layer, and sporadic-E formation. There may also be a connection between meteor dust, ions, and NLC formation. Thus, the abundant noctilucent clouds observed in 2021 may be due to higher levels of meteoric ions, and the meteoric ions may also enhance sporadic E. NLC occurrence may be a marker for sporadic E in the northern hemisphere.

2021 ARRL September VHF Contest

There was some interesting propagation for contestants in the ARRL September VHF Contest (see Figure 1), which was held on Saturday to Sunday, September 11 and 12, 2021. On Saturday afternoon, sporadic E developed from the Midwest to the eastern seaboard on 6 meters. From northeast Kansas grids, FM03 and FM14 were in for about an hour. On Sunday morning, meteor scatter on 50 MHz MSK144 was great for many. NØAN (EN22), K5QE (EM31), WY7DT (DN74), WTØDX (DM79), and others were in on many loud bursts on MSK144 to NØJK portable.

On Sunday afternoon, 6-meter sporadic E openings were present across the Gulf Coast and Florida to the Midwest for an hour. A rare opening popped up Sunday afternoon, and HC2FG (FI07) worked Gulf Coast stations and WA1EAZ (FN42), and he was spotted by WW1L (FN54) on 50.313 MHz on FT8 around 2130Z. This was probably multi-hop E_s (rather than F2), because the solar flux was only 92. K5ND (EM12) found a few California stations on E_s near the end of the contest.

The big news of the contest was the tropospheric propagation, which developed all day on Sunday over the eastern half of North America under a stagnant high-pressure system. On Sunday morning NØLD, operating as a rover on 144 and 432 MHz in the eastern part of EM17, was able to work AA4ZZ (EM96), a contest group operating from a mountaintop in North Carolina. Greg, WQ0P (EM19), also logged AA4ZZ on 144, 222, and 432 MHz. From eastern Oklahoma, K5SW (EM25) worked AA4ZZ on 144, 222, and 432 MHz. The tropo didn't make it to EM28 until Sunday evening. I (NØJK) found AA4ZZ with a solid signal on 144.206 MHz on SSB at 0110Z on September 13, and I logged them with my 10 W and single M2 seven-element Yagi.

W4IY(FM08) was in solid on 144.174 MHz on FT8. Andy, K1RA, was with the K8GP group from nearby FM09. They worked W5LUA and AA5AM (EM13) on 2 meters and W5LUA on 222 MHz. K8GP worked 61 grids on 2 meters and 33 on 222 MHz. Just one grid over, W4IY (FM08) was in well over 2 hours. The W4IY group seemed to be in the hot spot, working as far as EL09 and EM00 in south Texas on tropo.

Figure 1 — A DX map of 2 meters on the Sunday morning of the ARRL 2021 September VHF Contest. [**www.dxmaps.com**]

Oddly, 2-meter activity seemed down during the contest. WQØP and I both noted that, while 2 meters was wide open, only a small number of stations were showing up at any time. K5ND worked only four stations on 2-meter SSB, and the rest were on digital. William Hepburn's tropospheric propagation map predicted this opening well.

On the Bands

50 MHz. Lance, W7GJ (DN27), worked AG6EE/P (DN00) on moonbounce (EME) on September 5. AG6EE was using a single Yagi portable (see Figure 2).

On September 8, Ken, AC4TO (EM70), had an "early TEP opening" on 6 meters. Ken said, "I saw some bright traces on the FT8 waterfall that weren't decoding around 2310 UTC, so I CQ'd toward South America. Finally, at 2320 UTC, I had my first QSO with PY2XB, and it improved from there." Ken made 23 contacts with 21 different stations, one of them a new one for him. He worked LU5FF on FT8, CW, and Q65. Ken added, "There seem to be quite a few new stations on 6 meters in… parts of Brazil that I've not heard here before." Ken said the band closed at 0100Z.

Jim, NA6L, operated portable from rare grid DN78 on September 18 and 19 on MSK144, pleasing Fred Fish Memorial Award (FFMA) seekers.

Figure 3 — Gene, KB7Q, set up a portable 23-centimeter EME operation in Wyoming on September 30, 2021. [Gene Shea, KB7Q, photo]

144 MHz. Greg, WQØP (EM19), made seven EME contacts on 2 meters on September 22, including RX1AS. Greg runs 1 kW to a single 17-element M2 Yagi, which is "horizon only."

432 MHz. Gene Shea, KB7Q, made 13 EME contacts from DN82 on October 1. He said he had a "nice visible moon and no wind." Unfortunately, in the UK, G3LTF had high winds and could not keep his dish antenna aimed at the moon to work KB7Q. Gene's station on 432 MHz consists of a nine-wavelength Yagi and 500 W.

1296 MHz. KB7Q worked 31 stations on EME while portable in DN74 in Wyoming, using Q65C-60 mode on September 30 (see Figure 3). He also worked OK1KIR, G4CCH, SM6CKU, G3TLF, and SM2CEW on CW. Gene operated 23-centimeter EME from DN82 on October 2. He made 40 contacts, with five being on CW. On 23 centimeters, Gene uses a 2.4-meter dish antenna and 350 W.

Figure 2 — Petr, AG6EE, set up a portable EME station in the Black Rock Desert of northern Nevada (DN00) during the Burning Man Festival on September 5, 2021. [Petr Suchomel, AG6EE, and Lance Collister, W7GJ, photo]

Here and There

The Geminid meteor shower will peak on December 13 – 14, 2021. It is one of the strongest and most reliable meteor showers of the year, with a zenith hourly rate (ZHR) of up to 150. The meteors are medium speed at 34 kilometers/second. They are great for 28 and 50 MHz meteor scatter, and useable on 144 and 222 MHz. While December may be chilly, this a great shower to consider activating a rare grid. The best paths and times (local) are north to south at 2200 and 0500 – 0700.

Barry, K7BWH, shared an online "rover database." There are over 500 spots for rover locations in North America. He noted Petr, AG6EE, and Jim, NA6L, shared many of their favorite spots to operate. Jeff, WB8LYJ, added some great FM grid locations. Many others contributed to this database. Perhaps you can use this to plan a Geminid meteor shower grid activation. For more information, visit **https://coilgun.info/rover-us/home.htm**.

Special Event Stations

Working special event stations is an enjoyable way to help commemorate history. Many provide a special QSL card or certificate!

Dec. 4, 1500Z – 1900Z, KG4ARC, Atlanta, GA. Atlanta Radio Club and Atlanta Chapter, American Red Cross. **Commemorating the Birth of Clara Barton, Founder of American Red Cross**. 14.250 7.250 3.925. QSL. Atlanta Radio Club, 227 Sandy Springs Pl., Ste D-306, Atlanta, GA 30328. *Check spotting networks for frequencies.* **secretary@atlantaradioclub.org** *or* **www.atlantaradioclub.org/redcross**

Nov. 1 – Nov. 15, 0000Z – 2359Z, W8F, Livonia, MI. The Livonia Amateur Radio Club. **46th Anniversary, Sinking of the SS *Edmund Fitzgerald***. 14.040 14.240 7.040 7.240. Certificate. Mike Rudzki, N8MR, 14071 Fairway St., Livonia, MI 48154. *Saturday Nov. 13, W8F will operate live from the Dossin Great Lakes Museum, Detroit, MI, 1600 – 2030 UTC. See website for QSL information.* **www.qrz.com/db/w8f** *or* **www.livoniaarc.com**

Nov. 10 – Nov. 20, 1200Z – 2330Z, WO4L/W1G, East Berlin, PA. Robert Hess. **158th Anniversary of Lincoln's Gettysburg Address**. 7.185 14.288 3.830 18.155. Certificate & QSL. Robert Hess, 74 Curtis Dr., East Berlin, PA 17316. *Watch spotting nets to see where we are. See* **www.qrz.com/db/wo4l** *or* **www.qrz.com/db/w1g** *for QSL instructions.* **bigbob7388@gmail.com**

Nov. 13, 0800Z – 1800Z, WW1USA, Kansas City, MO. National World War I Museum and Memorial. **102nd Anniversary of Armistice**. 14.250 14.030 7.250 7.030. QSL. c/o Charles Van Way, N0CVW, National World War I Museum and Memorial, 2 Memorial Dr., Kansas City, MO 64108. **ww1usa@theworldwar.org** *or* **www.theworldwar.org/amateurradio**

Nov. 13, 0900Z – 1400Z, NB4RC, Deerfield Beach, FL. North Broward Radio Club. **Hillsboro Lighthouse Special Event Station**. 14.280 14.270 14.260 14.250. QSL. NB4RC, 4116 NW 1 St., Deerfield Beach, FL 33442. **www.joeyjet.com/index.php/amateur-radio/nb-radio-club**

Nov. 30 – Dec. 5, 1600Z – 2300Z, W5C, Carol Stream, IL. Cajun Navy Relief Amateur Radio Club. **Last Day of Hurricane Season 2021 and Volunteer Recognition**. 14.250 7.250 D-STAR DSC/XLX 256i JS8Call. QSL. Cajun Navy Relief Amateur Radio Club, 681 Paxton Pl., c/o Thomas Sarlitto, Carol Stream, IL 60188. **www.cajunnavyrelief.com/W5CNR**

Dec. 1 – Dec. 15, 0000Z – 2359Z, N7C/N7D/N7N, Parker, CO. Friends of Nevada Wing. **80th Anniversary of the Founding the Nevada Wing and the Civil Air Patrol**. 14.250 7.200 147.1; operating SSB in the General portion of the 40- and 20-meter bands, and 147.1 MHz for VHF, as well as FT8. QSL. N7C/N6YEL, 23612 Glenmoor Dr., Parker, CO 80138. *For card, please QSL by February 28, 2022. Other stations may be added.* **weaceves2@gmail.com**

Dec. 3 – Dec. 13, 1300Z – 2200Z, W2W, Baltimore, MD. Amateur Radio Club of the National Electronics Museum. **W2W Pearl Harbor Day Commemoration**. 14.241 14.041 7.241 7.041; operation on 80 meters (3.541, 3.841) and digital modes possible during event. Certificate & QSL. W2W Pearl Harbor, P.O. Box 1693, MS 4015, Baltimore, MD 21203. *Primary operation Dec. 3 – Dec. 7. Additional operation possible in the Dec. 8 – Dec. 13 period, as operator availability permits.* **www.ww-2.us**

Dec. 4, 1000Z – 1600Z, NE1PL, Fall River, MA. USNR. **Remember Pearl Harbor**. 14.258; 20- and 40-meter phone. Other bands and modes possible. QSL. Rick Emord, 135 Wareham St., Middleboro, MA 02346. **www.ne1pl.org**

Dec. 4 – Dec. 5, 1500Z – 2300Z, W9CAP, Saint Charles, IL. Illinois Wing Civil Air Patrol Amateur Radio Club. **80th Anniversary of the Civil Air Patrol**. 28.450 18.125 14.250 7.225. QSL. Lt. Col. Robert Becker, P.O. Box 4027, Saint Charles, IL 60174. **www.qrz.com/db/w9cap**

Dec. 4 – Dec. 11, 0001Z – 2359Z, W2MM, Apopka, FL. Quarter Century Wireless Association. **74th Anniversary**. SSB: 28.325 21.365 14.262 7.244 3.810; CW 28.050 21.050 14.040 7.035 3.540. Certificate. QCWA, John R. Kludt, 1972 Martina St., Apopka, FL 32703.

Dec. 11, 1700Z – 2359Z, NI6IW, San Diego, CA. USS *Midway* (CV-41) Museum Ship. **Pearl Harbor Remembrance Day**. 14.320 7.250; PSK and CW on various HF bands, D-STAR on various reflectors. QSL. USS *Midway* Museum Ship COMEDTRA, 901 N. Harbor Dr., San Diego, CA 92101. *Check spotting networks to find us on HF,* **www.dstarusers.org** *to find our call sign NI6IW, and Reporting Note to see what reflector we're using.* **www.qrz.com/db/ni6iw**

Dec. 11 – Dec. 18, 1200Z – 2300Z, W9VT, Hazel Crest, IL. Tri-Town Radio Amateur Club. **90th Anniversary**. 14.240 7.240, CW, FT8, and PSK31. QSL. Tri-Town Radio Amateur Club, P.O. Box 1296, Homewood, IL 60430. *Operating during the week as time permits.* **www.w9vt.org**

Dec. 17 – Dec. 19, 0000Z – 2359Z, W4A, Bluff City, TN. N9EN. **Edwin Howard Armstrong Commemoration Special Event**. 3.540 7.040 14.040 21.040. QSL. Brad Anbro, 1118 Walnut Grove Rd., Bluff City, TN 37618.

Dec. 18, 1700Z – 2200Z, WA4USN, Mount Pleasant, SC. Charleston Amateur Radio Society. **50th Anniversary from the USS *Yorktown* CV10**. 21.290 14.296 7.250. Certificate & QSL. William Dean, 30 Lombardi Ln., Hanahan, SC 29410. **www.wa4usn.org**

Dec. 18 – Dec. 24, 1300Z – 2359Z, KC5OUR, Belen, NM. Valencia County Amateur Radio Association. **Bethlehem on the Air**. 21.283 14.283 7.183 3.883. QSL. VCARA, P.O. Box 268, Peralta, NM 87042. **kc5our@arrl.net**

Dec. 23 – Dec. 26, 1500Z – 2359Z, NØT/NØR/NØA/NØI/NØN, Bates City, MO. **Christmas Train — Celebrate Christmas Time and Holiday Cheer through Ham Radio**. 10, 20, 40, and 80 meters; operating as time permits. QSL. Randy Booth, 7562 Copenhaver Rd., Bates City, MO 64011. **rwb22311@outlook.com**

Dec. 26 – Dec. 31, 0000Z – 2359Z, W2T, Trenton, NJ. Delaware Valley Radio Association. **American Revolution Battle of Trenton**. 14.250. Certificate* & QSL. DVRA, P.O. Box 7024, Trenton, NJ 08628. **www.w2zq.com**

Certificates and QSL cards: To obtain a certificate from any of the special event stations offering them, send your QSO information along with a 9 × 12 inch self-addressed, stamped envelope (three units of postage) to the address listed in the announcement. To receive a special event QSL card (when offered), be sure to include a self-addressed, stamped business envelope along with your QSL card and QSO information. *Note: Some clubs may ask for a nominal fee to cover the cost of the certificate or QSL. Request will be made on air during the event or on the club's website.

Convention and Hamfest Calendar

A = AUCTION
D = DEALERS / VENDORS
F = FLEA MARKET
H = HANDICAP ACCESS
Q = FIELD CHECKING OF QSL CARDS
R = REFRESHMENTS
S = SEMINARS / PRESENTATIONS
T = TAILGATING
V = VE SESSIONS

Abbreviations

Spr = Sponsor
TI = Talk-in frequency
Adm = Admission

Alabama (Locust Fork) — Jan. 8 D F H R T V
8 AM – noon. *Spr:* Blount County ARC. Locust Fork High School, 77 School Rd. *TI:* 146.70 (91.5 Hz). *Adm:* Free. **w4blt.org**

Florida (Orlando) — Jan. 8 D F H R T
6 AM – noon. *Spr:* South Conway Baptist Church, 6099 S. Conway Rd. Orlando, FL 32812. *Adm:* Free. **k4kdi.org**

VIRTUAL ARRL NEW YORK CITY LONG ISLAND SECTION CONVENTION

January 8, Online

S
7:30 AM, forums start at 9 AM. *Spr:* Ham Radio University ARC. *Adm:* Free. **www.hamradiouniversity.org**

To All Event Sponsors

Before making a final decision on a date for your event, you are encouraged to check the Hamfest and Convention Database (**www.arrl.org/hamfests-and-conventions-calendar**) for events that may already be scheduled in your area on that date. You are also encouraged to register your event with HQ as far in advance as your planning permits. See **www.arrl.org/hamfest-convention-application** for an online registration form. Dates may be recorded up to 2 years in advance.

Events that are sanctioned by ARRL receive special benefits, including an announcement in these listings and online. Sanctioned conventions are also listed in *The ARRL Letter*. In addition, events receive donated ARRL prize certificates and handouts. Once the form has been submitted, your ARRL Director will decide whether to approve the date and provide ARRL sanction.

The deadline for receipt of items for this column is the **1st of the second month preceding publication date**. For example, your information must arrive at HQ by **January 2** to be listed in the **March** issue. Information in this column is accurate as of our deadline; contact the sponsor or check the sponsor's website for possible late changes, driving directions, and other event details. Please note that postal regulations prohibit mention in *QST* of games of chance, such as raffles or bingo.

Promoting your event is guaranteed to increase attendance. As an approved event sponsor, you are entitled to special discounted rates on *QST* display advertising and ARRL web banner advertising. Call ARRL's toll-free number at 1-800-243-7768, or email **ads@arrl.org**.

Life Members

Elected September 13, 2021

Rondal D. Akers, W8BF
James A. Bacher, WB8VSU
Christopher M. Balz, KM6UYN
Yorke Brown, AC4E
John Burgess, AI6VM
Robert M. Chaikin, KB1YOW
Martin Chapman, W2FQ
Kendell Chilton, W1OT
Sabrina Cline, N2BIO
Todd C. Cline, N7KDT
Bruce D. Cram, KD4JFD
John Eckerd, KC3ROK
Jeff W. Emery, W8IP
Eric G. Engelke, K2SL
Kenneth M. Fairchild, KE0DUO
Corey J. Freeman, K5GTO
Timothy B. Harrison
Tom C. Hess, KD0HF
Michael J. Hildreth, WB4WDE
Darrell Hilliker, NU7I
Howard H. Holmes, KF5TK
Roger B. Hughes, AE6MI
Russell B. Hunt, WQ3X
Trent W. Johnson, K5TWJ
Joseph S. Kennedy, WQ6Q
Kristopher B. Kirby, KE4AHR
Shane P. Kuehl, W0SPK
Tamara M. Kuehl, W7TMK
Joe A. Lowenthal, WA4OVO
Michael J. MacKennedy, K1MMK
Wayne A. Mills, N7NG
Calvin W. Myer, AK4QP
Mark D. Pressley, KJ4IWK
Arthur Ricardo, VK1ALR
Annette Ruch, WD0FEU
Dave A. Ruch, NF0J
Kurt Sauer, KS5K
John C. Shirley, N8DX
Walter A. Shubin, K6WAS
Ronald E. Skovly, K7SSB
Kelley W. Sprout, KB3LR
James A. Stinson, KE8NBC
Richard J. Stirzaker, KB8MIS
Robert B. Tilkin, N3DDS
Jean Paul Vega, K6JPV
Isao Wachi, WF6W
Austin R. Walrabenstein, KJ4EOW
Guangxin Wang, N0BOY
Scott Randell Wilson, KE8SWC
David A. Zumbrunnen, KC4CR

Feedback

■ The "Microwavelengths" column in the October 2021 issue of *QST* contained a mistake in the UHF TV broadcast band listing. As of July 2020, the UHF television band is actually 470 – 608 MHz. *QST* regrets this error.

■ The article, "The DC2020 Receiver," by Harold Smith, KE6TI, from the October 2021 issue of *QST* contained an error in the schematic. The resistor R10 should be 1,500 Ω. *QST* regrets the error.

Certificate of Code Proficiency

Recipients

Sponsored by
VIBROPLEX
www.vibroplex.com

This month, ARRL recognizes merit and progress in Morse code proficiency on the part of the following individuals, who have achieved proficiency at the following rates, in words per minute.

June 2021

David O. Ausley, WB4NCT	10
Russell Calabrese, KR2NZ	10
Harold D. Craft, Jr., AA2J	10
Jere F. McAlister, N5DFW	10
Glenn E. Schnell, KC3LBI	10
Lawrence Schall, KB2MN	15
Thomas J. Warren, K3TW	35

July 2021

Stephen J. Banko, KI5IIL	10
Bert H. Berrong, WZ5L	10
Bill Durham, KG5ZCI	10
Bruce E. Friedline, N9XAU	10
Roy L. Schmiesing, KT6B	10
Richard J. Guerrera, KB1FGC	25
Richard J. Hubbard, Jr., WF4W	30
Dwight Edward Morrow, VE7BV	30
James B. Elkins, KG4IKQ	35
Johnny L. Welch, Sr., KE6K	35
Christopher G. Pearson, G5VZ	40

August 2021

Christopher E. Johnson, WB9FXW	10
Charles E. Ruotolo, KA8VYG	10
George A. Stickney, W7BXW	10
Kenneth G. Koenig, KK6XI	15
Donald W. Brown, WØAF	20
Victor Denisov, N6DVS	20
Ronald L. Edwards, KE8NCJ	20
David W. Hibbard, NKØK	20
Richard B. Dervan, N1RBD	25

September 2021

Mark D. Nill, W5AT	10
Joseph M. Pagurko, KA9IIE	10
Christopher E. Johnson, WB9FXW	15
Mark D. Nill, W5AT	15
Daniel A. Bostick, KG5SSB	20
George W. Fletcher, AD5CQ	20
William Howard, N4MU	20
Mark D. Nill, W5AT	20
John F. Wasciuk, WA8TON	20
Walter Bilous, K3DQB	25
Stan Dicks, W4AG	30

Congratulations to all the recipients.

December 2021 W1AW Qualifying Runs

W1AW, the Hiram Percy Maxim Memorial Station at ARRL Headquarters in Newington, Connecticut, transmits Morse code Qualifying Runs to assist ham radio operators in increasing and perfecting their proficiency in Morse code. Amateur radio operators can earn a Certificate of Code Proficiency or endorsements by listening to W1AW Qualifying Runs.

December Qualifying Runs will be transmitted by W1AW in Newington, Connecticut at the times shown at 1.802.5, 3.581.5, 7.047.5, 14.047.5, 18.097.5, 21.067.5, 28.067.5, 50.350, and 147.555 MHz. The West Coast Qualifying Runs will be transmitted by K6KPH on Saturday, December 18 at 2 PM PST (2200 UTC) on 3581.5, 7047.5, 14047.5, 18097.5, and 21067.5 kHz. Unless indicated otherwise, sending speeds are from 10 to 40 WPM.

Amateur radio operators who participate in Qualifying Runs may submit proof of 1 minute of the highest speed they have copied in the hope of qualifying for the Certificate of Code Proficiency, or an endorsement to their existing certificate.

Legibly copy at least 1 minute of text by hand, and mail the sheet to: W1AW Qualifying Runs, 225 Main St., Newington, CT USA 06111.

Include $10 (check or money order) if this is a submission for your initial Code Proficiency certificate; $7.50 if you are applying for an endorsement (available for speeds up to 40 WPM). Your test will be checked against the actual transmissions to determine if you have qualified.

Members of the North Fulton (Georgia) Amateur Radio League (**https://nfarl.org**) are offering to subsidize the total cost of a Code Proficiency certificate or endorsement submission for any individual age 21 years and younger, and who reside in either the US or Canada. Participants who wish to make use of this offer should indicate on their qualifying run submissions they are age 21 or younger, and certify as such via their signature. Eligible participants are not required to send any fee with their Code Proficiency submissions.

For more information about Qualifying Runs, please visit **www.arrl.org/qualifying-run-schedule**.

For information about how to qualify for the Certificate of Code Proficiency, please visit **www.arrl.org/code-proficiency-certificate**.

W1AW Qualifying Runs — December 2021
(All times are in Eastern Standard Time)

Monday	Tuesday	Wednesday	Thursday	Friday
12/6 4 PM – 2100Z 10 – 35 WPM	**12/7** 7 PM – 0000Z **(12/8 – UTC)** 35 – 10 WPM		**12/9** 10 PM – 0300Z **(12/10 – UTC)** 10 – 40 WPM	**12/10** 9 AM – 1400Z 10 – 35 WPM
	12/14 4 PM – 2100Z 10 – 35 WPM	**12/15** 7 PM – 0000Z **(12/16 – UTC)** 10 – 40 WPM	**12/16** 9 AM – 1400Z 35 – 10 WPM	**12/17** 10 PM – 0300Z **(12/18 – UTC)** 10 – 35 WPM
12/20 4 PM – 2100Z 10 – 40 WPM	**12/21** 9 AM – 1400Z 10 – 35 WPM	**12/22** 10 PM – 0300Z **(12/23 – UTC)** 35 – 10 WPM		**Christmas Eve**
12/27 10 PM – 0300Z **(12/28 – UTC)** 10 – 40 WPM		**12/29** 10 PM – 0300Z **(12/30 – UTC)** 10 – 40 WPM		**New Year's Eve**

ARRL VEC Volunteer Examiner Honor Roll

The ARRL VEC Honor Roll recognizes the top 10 Volunteer Examiners in each ARRL Division according to the total number of ARRL exam sessions in which they have participated since their accreditations. Considering each session requires an average time commitment of 2 to 4 hours or more, the thousands of hours these VEs have invested represent extraordinary dedication! Whether you are one of our VE Teams that tests once a week, once a month, or once a year, we want to express our warmest appreciation to all volunteers for your generous contribution to the ARRL VEC program.

If you are an ARRL VE, you can view your session stats online at **www.arrl.org/ve-session-counts**.
If you are not a VE, become one today! See **www.arrl.org/become-an-arrl-ve**.

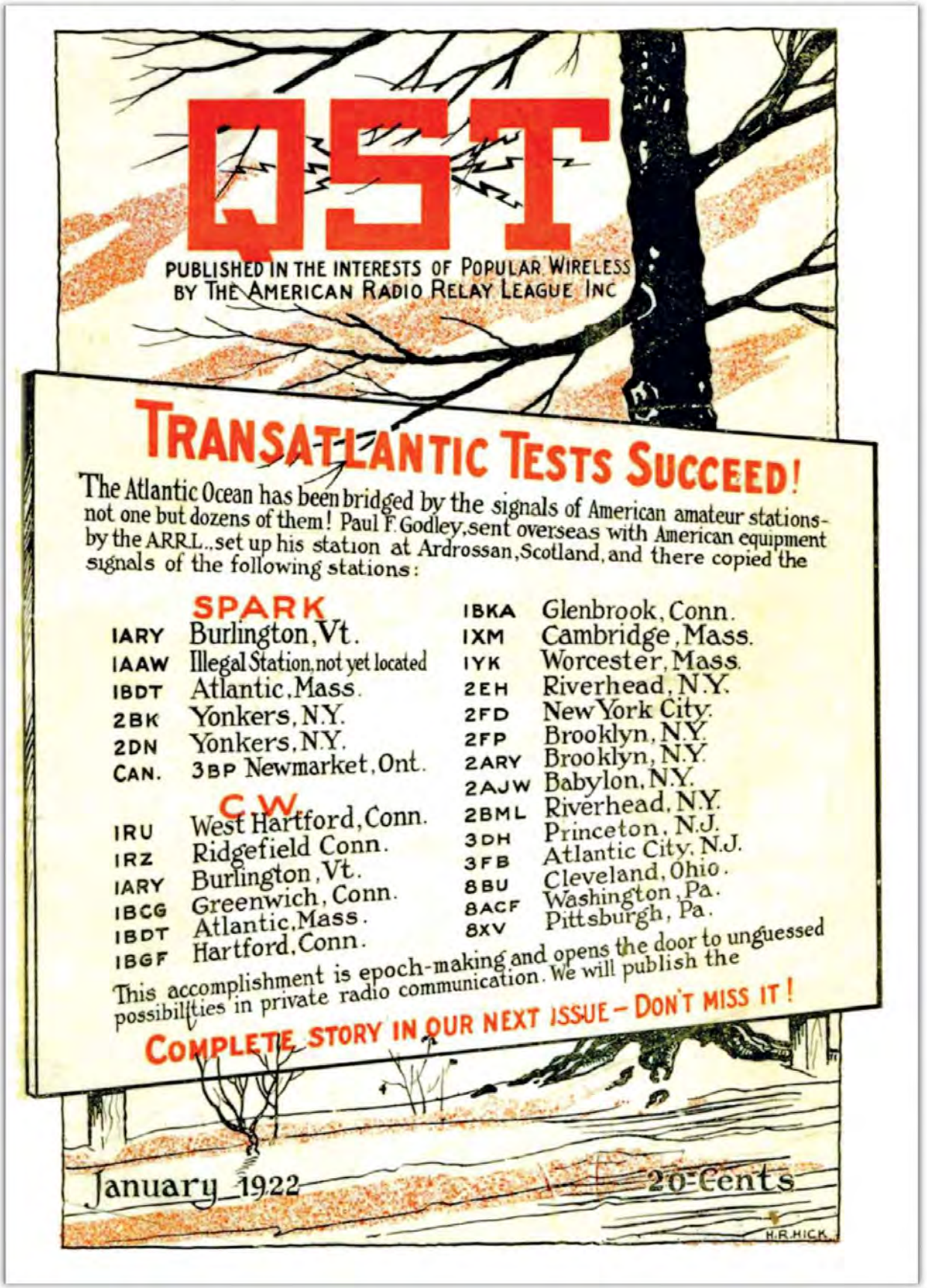
Examiner	Sessions	Accreditation Date
Atlantic		
Jobst Vandrey, AC0LP	324	23-Jun-08
James McCloskey, NS3K	320	14-Nov-94
Edward Genoino, WA2NDA	298	10-Jul-85
George Brechmann, N3HBT	288	01-Apr-91
William Klepser, Jr., WB2AIV	215	09-Jun-99
Cully Phillips, N3HTZ	205	01-Sep-91
Michael Harla, N2MHO	186	12-Apr-06
Ralph Abbott, WA3ELQ	170	30-May-05
Mark Miller, AK3M	165	20-Jan-03
Jeffrey Jones, ND3Z	164	18-Feb-94
Central		
Ed Wagner, AB9FN	376	01-Jul-02
Allan Bukowski, N9ZD	326	01-Jun-92
Eldon Boehm, NK9U	318	21-Nov-86
Donald Hlinsky, N9IZU	317	01-Mar-91
Brian Eder, WB9UGX	285	01-Jan-92
Thomas Gwaltney, N9PDC	263	03-Apr-07
Robert Begeman, W9KVK	257	01-Jun-92
David Nicolaus, W9DN	250	13-Feb-86
Frederick Baguhn, W9GOC	241	16-May-02
James Rinehart, K9RU	239	01-Aug-91
Dakota		
Jeffrey Goodnuff, W0KF	318	17-Jun-03
John Schwarz, Jr., AE0AL	309	26-Oct-94
Shep Shepardson, N0NMZ	268	12-Mar-01
Daniel Royer, KE0OR	239	01-Jul-91
Dennis Ackerman, KB0OQQ	221	15-Jul-96
Douglas Nelson, AA0AW	217	01-May-90
James Rice, II, N0OA	207	04-Dec-00
Larry Larson, KR0K	203	16-Mar-09
Robert Tracy, N0TC	183	30-Jul-86
Edward Van Cleave, Jr., W0VC	169	01-Jun-92
Karl Eriksen, WA2DEE	169	08-Jan-90
Delta		
Monvel T. Maskew, Jr., K9FQ	620	18-Jul-18
Arthur Parry, Jr., WB4BGX	270	01-May-91
Joe Lowenthal, WA4OVO	264	25-May-06
Roger Gray, N5QS	249	01-Mar-93
Bobbie Williams, W1BEW	241	01-Jun-92
Dawn Gray, N5QT	230	01-Mar-93
Daryl Stout, WX4QZ	209	17-Sep-07
William Easterday, KB8FU	209	01-Mar-91
Henry Mitchell, N5SEB	198	10-Nov-94
Robert White, AI4GI	187	18-Jul-05
Great Lakes		
David Potter, KE8OHG	813	03-Jun-20
Charles Tyrrell, KE8PCB	497	03-Sep-20
Charles Hall, W8HF	286	01-Jun-92
Lance Harvala, AB8Y	243	06-Nov-19
Archie Mack, Sr., AF4EB	236	19-Aug-97
Dale Pritchett, KC8HJL	223	26-Mar-98
Stanley Arnett, II, AC8W	223	06-Sep-84
Chris Anderson, K8VJ	220	09-Feb-90
William Bogle, Jr., KE8FZY	213	08-Jul-20
James Viele, W8JV	210	22-Mar-90

Examiner	Sessions	Accreditation Date
Hudson		
Paul Maytan, AC2T	706	06-Sep-84
Stanley Rothman, WA2NRV	477	01-Mar-85
Alan Crosswell, N2YGK	464	26-Oct-94
Fritz Boigris, KB2O	461	26-Oct-84
Sid Markowitz, K2GG	405	27-Sep-94
Gerald Miller, Jr., AA2ZJ	405	05-Dec-95
Daniel Calabrese, AA2HX	305	01-Nov-91
John Kiernan, KE2UN	287	01-Jul-91
Thomas Carrubba, KA2D	280	01-Sep-93
Walter Lesnowich, W2EE	259	06-Mar-08
Midwest		
David Bartholomew, AB0TO	745	22-Mar-02
Kevin Naumann, N0WDG	655	17-Nov-02
Harry Steger, Jr., W0HMS	586	26-Aug-08
Roland Kramer, W0RL	535	21-Jun-01
Jeanette Nordman, AB0YX	460	21-Aug-03
Harold Kunkee, K0KTZ	339	01-Jul-91
Kenneth Simila, KC0VMY	279	18-Feb-07
John Telker, N0TH	267	29-Aug-12
John Mountain, Jr., KJ0MTN	250	28-Sep-09
Ronald Lemons, KB0DIY	209	01-Oct-92
New England		
*Bob Phinney, K5TEC	1,430	20-Jan-14
*Paul Lux, K1PL	1,217	25-Jan-85
Phillip Temples, K9HI	516	12-May-89
Gregory Paul, KC1MND	486	03-Jun-20
Robert Beaudet, W1YRC	398	01-Aug-90
Bruce Anderson, W1LUS	356	11-Feb-88
Lawrence Polowy, KU1L	340	02-Jan-85
Stefan Rodowicz, N1SR	335	20-Nov-84
James Mullen, KK1W	335	01-Mar-91
Barbara Irby, KC1KGS	283	05-Aug-19
Northwestern		
Richard Morgan, KD7GIE	450	11-Aug-00
Loren Hole, KK7M	381	06-Sep-84
Scott Robinson, AG7T	369	01-Aug-91
S. Riley Mc Lean, W7RIL	316	02-Sep-99
David Brooks, N7HT	309	10-Jun-87
John Clarke, AC7WW	302	20-Jan-03
George Ftikas, N7TQZ	302	01-Dec-92
Joseph Barry, K7SQ	275	21-Jun-95
Donald Baune, AC0EX	259	19-Sep-06
Wayne Schuler, AI9Q	253	01-Sep-91
Pacific		
Morris Jones, AD6ZH	509	27-Nov-01
Brian Torr, N6IIY	499	06-Sep-00
Dieter Stussy, KD6LVW	434	27-Jan-94
Gordon Fuller, WB6OVH	359	06-Sep-84
Bill Nichols, NN7K	337	01-Sep-93
Robert Perlman, W6BP	305	26-Aug-08
Jim Brunk, N6BHX	287	13-Jul-95
Larry Loomer, KI6LNB	272	03-Dec-08
Dale Westerterp, WB6TMS	238	16-Jun-00
Kenneth Hall, WO6J	230	18-Mar-86

Examiner	Sessions	Accreditation Date
Roanoke		
Judy Friel, AC4RG	300	01-Feb-91
Alan Ronald Moeck, WA2RPX	264	27-Sep-94
David Snyder, W4SAR	251	01-May-93
Terry Sanner, WV8V	223	06-Sep-84
Thomas Hill, KJ4IV	201	01-Jun-91
Larry Withrow, AF4HX	197	17-Dec-98
Henry Wyatt, II, K4YCR	194	28-Jan-98
Thomas Lewis, W4SIS	191	14-Nov-97
David Poe, W8IW	191	13-Mar-07
Edwin Williams, KN4KL	180	01-Jan-92
Rocky Mountain		
Robert Hamilton, N0RN	399	19-May-87
Jeffrey Weinberg, W0QO	309	01-Apr-93
David Avery, N0HEQ	302	13-Jan-88
David Sharpe, KI0HG	258	02-Feb-98
Martin Soffran, NM5MS	234	21-Mar-94
Orlin Jenkins, K0OJ	233	01-Mar-85
Peter Brisbine, NM5PB	229	20-Jan-14
Gordon Smith, K7HFV	214	06-Sep-84
Gary Zabriskie, N7ARE	212	20-Nov-84
Michael Blenderman, K7IC	199	30-Apr-96
Southeastern		
***Gary Lee Pike, KA4KBX	4,408	03-Sep-09
***Collin Pike, KJ4AXB	3,179	26-Apr-11
***Justin Lee Pike, KJ4AXF	3,143	12-Nov-12
**Anna Grogan Pike, KD4PCU	2,168	18-Aug-09
*Ryan Krenzischek, W4NTR	1,729	04-Jan-13
*Patrick Wyatt Pike, KJ4AXD	1,326	13-Oct-15
Val Jacyno, AK4MM	388	08-Nov-11
Pablo Soto, KP4SJ	380	01-May-92
Robert Cumming, Sr., W2BZY	362	29-Jan-97
Joseph Patti, N4UMB	323	01-Sep-90
Southwestern		
*Bill Martin, AI0D	1,079	01-Nov-84
Fred Bollinger, AB7JF	541	17-Apr-95
David Morrill, N7TWT	453	20-Jul-00
Bruce Ziemienski, WA6BZ	321	25-Mar-02
Richard Buck, KC7OCT	314	21-May-97
Donald Kramer, Sr., WA6UVW	303	08-May-98
Ali Hassan, AA6WC	288	01-Jun-90
Arthur Hoffman, W7ART	278	20-Feb-98
Norman Pilawski, WT6Y	275	17-Feb-87
Scott Swanson, K6PYP	273	01-Dec-92
West Gulf		
*Franz Laugermann, K3FL	1,046	01-Dec-91
Daniel Quigley, N7HQ	793	24-Apr-20
Tanner Jones, W9TWJ	502	31-Jul-07
Gerald Grant, WB5R	499	04-Jan-85
Adolph Chris Koehler, K5VCR	488	29-Sep-95
Wilbert Cannonier, KK5JJ	469	03-Nov-95
David Fanelli, KB5PGY	458	01-Oct-91
Michael Nault, W5OFT	401	06-Sep-01
Barbara Laugermann, KA5QES	373	24-Aug-11
Doug Hutton, W5JUV	346	01-Jan-91

*Denotes participation in over 1,000 sessions. **Denotes participation in over 2,000 sessions. ***Denotes participation in over 3,000 sessions.

A Look Back



QST

PUBLISHED IN THE INTERESTS OF POPULAR WIRELESS
BY THE AMERICAN RADIO RELAY LEAGUE INC

TRANSATLANTIC TESTS SUCCEED!

The Atlantic Ocean has been bridged by the signals of American amateur stations—not one but dozens of them! Paul F. Godley, sent overseas with American equipment by the ARRL., set up his station at Ardrossan, Scotland, and there copied the signals of the following stations:

SPARK

1ARY	Burlington, Vt.
1AAW	Illegal Station, not yet located
1BDT	Atlantic, Mass.
2BK	Yonkers, N.Y.
2DN	Yonkers, N.Y.
CAN.	3BP Newmarket, Ont.

C W

1RU	West Hartford, Conn.
1RZ	Ridgefield Conn.
1ARY	Burlington, Vt.
1BCG	Greenwich, Conn.
1BDT	Atlantic, Mass.
1BGF	Hartford, Conn.
1BKA	Glenbrook, Conn.
1XM	Cambridge, Mass.
1YK	Worcester, Mass.
2EH	Riverhead, N.Y.
2FD	New York City.
2FP	Brooklyn, N.Y.
2ARY	Brooklyn, N.Y.
2AJW	Babylon, N.Y.
2BML	Riverhead, N.Y.
3DH	Princeton, N.J.
3FB	Atlantic City, N.J.
8BU	Cleveland, Ohio.
8ACF	Washington, Pa.
8XV	Pittsburgh, Pa.

This accomplishment is epoch-making and opens the door to unguessed possibilities in private radio communication. We will publish the

COMPLETE STORY IN OUR NEXT ISSUE — DON'T MISS IT!

January 1922 — 20 Cents

H.R. HICK

QST

A Magazine Devoted Exclusively to the Radio Amateur

Transatlantic Tests Successful

OH, Mr. Printer, how many exclamation points have you got? Trot 'em all out, as we're going to need them badly, because WE GOT ACROSS!!!!!!

As we prepare the copy for this issue of QST our Transatlantic Tests are in progress and we have the highly gratifying news from Paul F. Godley, our special listener in Scotland, that the A.R.R.L. has spanned the Atlantic! For the first time in history the signals of United States and Canadian amateur stations have been heard across the ocean on schedule.

Mr. Philip R. Coursey, in charge of arrangements in Great Britain, radioed us on Dec. 13th as follows:

"Many your stations heard by British amateurs. Details later."

We are most impatiently awaiting receipt of Mr. Coursey's detailed report, the compilation of which necessarily will have to await the collection and examination of the individual logs from the British listeners. It is this phase of the tests in which we are particularly interested—we want the British amateurs, with their normal receiving apparatus, to hear our signals if they can, so that we may hope to move amateur traffic to them on schedule. We trust that Mr. Coursey's report will be received in time for our next issue.

Paul F. Godley, special representative of the A.R.R.L., with special American equipment, located his station at Ardrossan, a small fishing village some twenty miles to the west of Glasgow, Scotland, after experimenting with various locations, and there listened for our signals thruout the ten day period, reporting nightly via radiogram from MUU which was repeated on this side by WII. To date twenty-six stations have been reported by him, as listed on the cover of this issue—six sparks and twenty-two C.W. stations. These are mostly in the eastern part of the country, rather contrary to expectations, the westernmost one being in Cleveland, Ohio. There is but one Canadian reported, 3BP, Rogers of Newmarket, and on his spark at that, but Mr. Coursey's report may show more of our cousins in the Dominion.

Station 1BCG at Greenwich, Conn., was reported on two consecutive nights and indications are that it had the greatest signal strength of any heard. This station was especially erected for the tests and was jointly owned and operated by Messrs. Minton Cronkhite, E. H. Armstrong, George Burghard, John Grinan, Ernest Amy, and Walter Inman. In its testing it has been reported from the Pacific Coast and must have kicked up considerable of a rumpus. Encouraged by the report of their signals, these men attempted to transmit an actual message, and to their credit be it said that they succeeded in putting across the ocean the first private radiogram ever transmitted across this span by an amateur station. The message was transmitted on the night of Dec. 11th, and acknowledged by a cablegram to A.R.R.L. Headquarters by Godley, reporting its reception at 3 a.m. G.M.T. on the 12th. The message read as follows:

"Nr 1 NY ck 12 to Paul Godley, Ardrossan, Scotland. Hearty congratulations. Burghard Inman Grinan Armstrong Amy Cronkhite."

Thus not only have amateur signals been heard overseas in astounding number, but a coherent message has been put over by the same means.

This is all the news we can give you at this writing, fellows. We got over, as we said we would, and our A.R.R.L. did it. It opens the door to big things and the scientists of the world are of course gasping and marvelling that such small powers on such short wave lengths could cover such distances. It will take some weeks to get the official story of the Transatlantics in final form, as we must now await Godley's return and Coursey's detailed report, but we will present it just as quickly as possible. And there will be some more call letters in the British report, you bet!

QST

A Magazine Devoted Exclusively to the Radio Amateur

The Story of the Transatlantics

By The Editor

THE signals of some thirty-odd American amateur radio stations, working on the short wave lengths and low power permitted amateurs, were heard across the Atlantic Ocean in the second series of Transatlantic Sending Tests conducted by the American Radio Relay League in December, 1921. This is a story of that achievement.

The First Attempt

The possibilities of transatlantic tests were first presented to the amateur world in 1920 by Mr. M. B. Sleeper, at that time radio editor of "Everyday Engineering". It is a subject that intrigues the amateur —his greatest desire in life is to get "distance" with his equipment. It has wonderful possibilities, too, in opening the way to world-wide amateur radio. The arrangements for the first tests in February of 1921 were going merrily along, then, when "Everyday Engineering" unfortunately was obliged to suspend publication. Mr. Sleeper requested the A.R.R.L. to take over the management of the tests, which it did in order that his splendid idea might not be lost. In the limited time remaining after our Operating Department took over the management it was not possible to perfect arrangements as we would have liked, and the tests failed. Looking back at them now we believe we can ascribe this to two causes: the length of time assigned the transmitting stations was altogether too short, and most of them were spark stations. At any rate no signals were received which unquestionably could be attributed to American stations.

American ship-operators on transatlantic runs had heard our signals on the other side, however, and we of the A.R.R.L. were still firmly of the belief that signals could be got over on schedule. Gradually the determination crystallized to try it again, and we even made the boast in print that if a dyed-in-the-wool American ham could be sent across the water with a good American regenerator we knew signals could be copied; in fact, we bet our new spring hat on it. Ever since then we have been answering inquiries from England as to just what a "ham" is, particularly one who has been dyed while still in the wool. But we're used to questions.

To Try Again

And so the matter of additional tests was taken up with Mr. Philip R. Coursey, assistant editor of "The Radio Review", London, who had managed the British end of the first tests, and he, finding British amateurs desirous of giving the game a second go too, kindly agreed again to look after the reception end, which this year was perhaps to include France and Holland too. Plans went forward during 1921 and a brief announcement appeared in July QST, while an open invitation to all amateurs to enroll for the preliminary tests was published on page 12 of QST for September, in which the plan was explained and registration form appended.

About this time our First National A.R.R.L. Convention was held in Chicago and our Board of Direction had a meeting there at which plans for the forthcoming tests were considered. Since we were tackling the job we wanted to do a real good job of it and avoid any chances of a second failure. The desirability arose, then, of sending an American listener to Britain to supplement the efforts of the British amateurs, not only so that we might have a double chance of success and so that some comparisons might be made of the relative sensitivity of American and British amateur apparatus but also for a much more important reason—it would then be possible to make the tests really democratic,

as befits our organization, for if only picked stations were to transmit on schedule, obviously the number would be limited, whereas if we could have an A.R.R.L. man there, one used to twirling a mean variometer all night long, the tests could be made a great popular event with free-for-all periods in which the whole country could be invited to participate. This idea was favorably considered and funds were appropriated to send a man to England to make it possible. An invitation was extended Mr. Paul F. Godley, of Montclair, N. J., to undertake the mission in the name of American Amateur Radio, and he was kind enough to accept. Mr. Godley is the man who first adapted the Armstrong regenerative circuits to short-wave work; he originated the variometer regenerators which have made possible the wonderful short-wave DX work of American amateurs since 1914; and he was chosen to go overseas because in the unanimous opinion of the Board he was America's most expert operator in the practical reception of short wave signals. Let it be clearly understood that an American representative was not sent merely because we feared the English amateurs weren't seasoned operators or weren't able to get us with their equipment; instead it was in order that the tests might be expanded into a big popular event without asking the British amateurs to stay up *all* night every night; and Mr. Godley went over as an auxiliary to the British efforts. The French magazine "La T.S.F. Moderne", commenting on the arrangements, suggests that we feared the British weren't sufficiently the hard-boiled owls, but that wasn't it. Incidentally, fellows, you ought to see the French for boiled owls: "des oiseaux nocturnes durs a cuire", literally, "nocturnal birds hard to cook". Have a hi wid us on tt, you tough nocturnal ornithic persons! The big idea was to make sure that American signals got thru to Britain, so that the possibilities of transocean amateur work might be helped along, and that is why Godley was sent.

The Preliminaries

Altho it was decided to divide part of each test night into free-for-all periods it was obviously desirable to give our best stations individual schedules of considerable duration so that careful tuning could be done in Britain and positive reception be recorded. To pick the best stations which would be assigned such individual schedules, eliminating tests were conducted, and the announcement in September QST was an invitation to enter these preliminaries, the books being kept open until Oct. 12th. The hours being limited, there was time for only the better stations in these individual final schedules, and the preliminary qualification was that the stations cover 1000 miles overland. Seventy-eight stations were entered in the preliminaries, which were conducted Nov. 1st to 5th, inclusive, an advance over the original dates made necessary by Mr. Godley's earlier sailing. The time being quite limited, arrangements for the preliminaries were conducted entirely by mail, without chronicle in QST. Instructions were given the transmitters and a thousand copies of the schedules distributed to picked receiving stations thruout our Operating Department with instruction to notify the Traffic Manager direct of all reception. Nov. 10th was set as the final date for the reception of qualifying reports, as the schedules had to be made up in advance of Mr. Godley's sailing. A station did not have to be reported by an official recorder to be eligible in the finals, however—any evidence that it had covered the requisite 1000 miles was sufficient. A number of stations participating in the prelims were heard over a thousand miles and have cards to prove it but still did not qualify, as the cards either came to them instead of to this office, so that no proof was offered, or came to this office too late. Some excellent stations, such as 1UN for example, failed of qualification thru such an accident. Other stations qualified at the last minute by rushing evidence to us, among which was 1AFV who, altho not reported a thousand miles by any of the recorders, filed a card with the Traffic Manager which showed he had covered the DX. Everyone who could show by Nov. 10th that they had made the grade was give a place in the finals, but for fairness' sake the Operating Department held rigidly to the original announcements.

The Finals

The complete scheme for the tests was published on pages 29-32, inclusive, of October QST. For six hours each night for ten successive nights, December 7th to 16th, inclusive, transmission took place and watch was kept on the other side. Each six-hour schedule was divided into two parts, the first part, from 7 p.m. to 9:30 p.m., Eastern Standard Time, being the free-for-all, consisting of ten periods of 15 minutes each and in each period of which all the amateurs in a given inspection district called "Test" and signed. The periods were rotated so that every night a district sent at a different time, sometimes early in the evening, sometimes late, so that if the hour mattered all would have an equal chance. The schedule for these periods appeared on page 30 of QST for October.

Then the second part of each of the six nights, from 9:30 p.m. Eastern Standard Time to 1:00 a.m. of the following date, was devoted to the individual stations who qualified in the preliminaries. Sealed secret

cypher combinations were assigned these stations, with a request that they not be opened until the first night of the tests, and no information was given out as to who had qualified except to the successful contestants themselves.

The following table lists the entrants in the finals:

Call	Location	Type	Wave	Cypher
1AFV	Salem, Mass.	C.W.	200	YLPMV
1TS	Bristol, Conn.	C.W.	200	AOTRB
1RU	W. Hartford, Ct.	C.W.	200	BPUSC
1DA	Manchester, Mass.	C.W.	200	CQVTD
1AW	Hartford, Conn.	Spk.	210	DRWUF
1BCG	Greenwich, Conn.	C.W.	230	GODLY
2BML	Riverhead, L. I.	C.W.	200	FSXVG
2FD	New York City	C.W.	200	GTYWH
2FP	Brooklyn	C.W.	200	HUZXJ
2OM	Ridgewood, N. J.	Spk.	200	JVAYK
2EL	Freeport, L. I.	C.W.	200	KWBZL
3DH	Princeton, N. J.	C.W.	210	LXCAM
4GL	Savannah, Ga.	C.W.	200	MYDBN
3BP	Newmarket, Ont.	Spk.	200	NZFCO
8DR	Pittsburgh, Pa.	C.W.	200	OAGDP
9KO	St. Louis, Mo.	Spk.	200	PBHFQ
9AW	Toronto, Ont.	C.W.	200	QCJGR
1ZE	Marion, Mass.	C.W.	375	RDKHS
2ZL	Valley Stream, L. I.	C.W.	325	TGMKU
3ZO	Parkesburg, Pa.	C.W.	360	UHNLV
5ZZ	Blackwell, Okla.	Spk.	375	VJOMW
6XH	Stanford U., Cal.	C.W.	375	WKPNX
7ZG	Bear Creek, Mont.	Spk.	375	XLQOY
8XK	Pittsburgh, Pa.	C.W.	375	YMRPZ
9ZY	Lacrosse, Wis.	C.W.	260	RZQMY
9ZN	Chicago, Ill.	Spk.	375	ZNSQA
9XI	Minneapolis.	C.W.	300	SFLJT

The three and a half hours for individual schedules was divided into fourteen periods of 15 minutes each, and times assigned to each station, the periods again rotating for fairness. At a suggestion from Mr. Godley the individual stations for the most part transmitted in groups on the same wave length, two stations sending at once permitting double the time for each without jeopardizing the chance of either to be heard. Most of the special schedule stations transmitted in pairs, three being the maximum going in any one period.

In England

These arrangements were by no means for the special benefit of Mr. Godley but were to govern the entire tests. The arrangements in England were entirely in Mr. Coursey's hands and the data on the schedules was communicated only to him. To avoid all criticism Mr. Godley was told nothing except the free-for-all schedule, which was public information, but Mr. Coursey supplied him with a schedule of the times and wave lengths on which to listen, the same as he broadcasted to all British listeners, and kept strictly to himself the identity and cyphers of the various stations. Mr. Coursey being in complete charge, Mr. Godley was on practically the same status as any British listener and was required to submit his reception to Mr. Coursey for verification and to report thru him.

Meanwhile the greatest enthusiasm seems to have greeted the preparations for the tests, on the other side. The EX Nederlandsche Vereeniging voor Radiotelegrafie (Holland) wrote us for particulars and published them in their magazine, "Radio Nieuws", together with recommended Armstrong circuits for short-wave reception; and "La T.S.F. Moderne" did the same thing for the French amateurs. "Wireless World" was the bulletin for the British amateurs, and it was here, of course, that the highest interest centered. Many amateurs seem to have gone to great lengths in their preparations, making special sets with many stages of tuned-output radio amplification—and we are very happy that the outcome of the tests justified their labor.

Godley Prepares

While these arrangements were progressing "Paragon Paul" was busy too, building special amplifiers, testing various tuning arrangements, and experimenting with different aerials. When he succeeded in making 5ZA work a relay in New Jersey without interference from New York amateurs he felt he had things around where they belonged.

On Nov. 14th, the night before he sailed, a very impressive little dinner was given for him at The Engineers' Club in New York City, where our A.R.R.L. officers and our directors within hailing distance and the officials of other radio organizations gathered to wish him success and bid him Godspeed. While the trial was to be a severe one and no man could with surety predict the outcome, optimism was distinctly the keynote and everybody was certain that if it could be done at all Paul would get signals. At this meeting credentials and written instructions were given him, together with a sealed packet for Mr. Coursey in which the secret codes and final schedules were given. There were but two copies of these documents in existence and the duplicate was locked in the Hartford safe. Until the writing of the article it was seen by no eyes in this country save those of our Traffic Manager—not even by the present writer.

Godley sailed on the "Aquitania" on Nov. 15th, amid cheers and waving handkerchiefs of assembled radio friends and relatives, and for a couple of nights out the amateur air was thick with farewells and good wishes for 2ZE, Godley's home call, for everybody knew he would be in the static-room on the "Aquitania".

The second day out we radioed him:

"Bon voyage The entire radio world is pulling for you"—to which he replied:

Confidence increases as distance squared Broadcast my heartfelt appreciation".

Arrangements had already been made with the British authorities thru the kind co-operation of our own State Department and Department of Commerce for special authorization to Mr. Godley to bring in

Read the full February 1922 article, "The Story of the Transatlantics" at **arrl.org/transatlantic**.

Congratulations

September 2021
QST Cover Plaque Award Winner

David De Coons, WO2X, and Michael Walker, VA3MW

In their article, "Node-RED for Ham Radio," David De Coons, WO2X, and Michael Walker, VA3MW, use a graphical programming environment to connect Internet of Things devices and software. You can install Node-RED on a variety of computer platforms.

QST Cover Plaque Awards are given to the author or authors of the most popular article in each issue. *You* choose the winners by casting your vote online at

www.arrl.org/cover-plaque-poll

Log in now and choose your favorite article in this issue!

Node-RED for Ham Radio

Use this graphical programming environment for device-to-device communications.

David De Coons, WO2X, and Michael Walker, VA3MW

Node-RED is a low-code graphical programming environment created by IBM to connect Internet of Things (IoT) devices and software. The need for machine-to-machine communications was part of the catalyst for developing Node-RED. To get started using Node-RED, you must install Node-RED on a Raspberry Pi, a Windows PC, or a computer running Debian Linux (see "Getting Started with Node-RED" at **www.arrl.org/qst-in-depth**, and the CTR2 blog at **https://lynovation.com**).

About 5 years ago, Andreas Junge, N6NU, wanted to create a graphical interface between his SteppIR antenna and his FlexRadio FLEX-6700. Using Node-RED, he built a *flow* — a predefined set of instructions to perform certain tasks. The flow interfaced these two devices using the FlexRadio TCP application programming interface (API). Node-RED can run a single flow or multiple flows. Andreas shared his flows with Mike Walker, VA3MW. Mike and Andreas expanded the use of Node-RED to include interfacing to the Elecraft wattmeter and KPA500 amplifier.

A few years ago, I started using Node-RED as a way to remotely control my station. I am not a programmer, but I do like to tinker, so I started writing flows in Node-RED for my Elecraft KPA1500 amplifier, rotator, and the Digital Loggers web power switch. This enabled me to remotely control my station, having full control of my amplifier, rotator, antenna switching, and other devices while simultaneously interacting with my FlexRadio FLEX-6700 radio. Other hams have used our flows as a starting point to integrate other model radios, amplifiers, rotators, wattmeters, antenna tuners, antenna switches, and programs like electronic logbooks (see sidebar, "Benefits of Using Node-RED").

"The need for machine-to-machine communications was part of the catalyst for developing Node-RED."

Benefits of Using Node-RED

Neal Pollack, N6YFM

- Node-RED can easily interface to and control a wide array of dissimilar hardware, often using simple and inexpensive hardware interfaces.
- It is very low cost.
- You communicate using any web browser. Handicap access can be added using Google *Alexa*.
- Modifications or additions can be made from any location using the web-based editor.
- The continuously expanding community shares their flows. For newcomers, the development time will be considerably easier and shorter. The community is eager to assist new members.

About Node-RED

Node-RED uses the Node JavaScript programming language. Flow creation is simplified by using a web browser-based editor. The flows are placed and wired together. When Node-RED is running, the input, output, and status nodes are visible in a dashboard viewable from any web browser, locally or remote. A Node-RED server can run on an inexpensive Raspberry Pi, a Windows PC, a Linux or Android environment, or on a cloud-based server. Because you would want the Node-RED server to be running continuously, the Raspberry Pi is a low-energy, low-cost solution. Node-RED will run on a Raspberry Pi 3B or newer Pi. I recommend a Pi model 4 for future expansion.

Write for *QST*

The membership journal of ARRL is always open to manuscript submissions from ham radio operators.

QST looks for material that appeals to a broad cross-section of readers within the diverse amateur radio community. Feature articles published in *QST* fall into one of two broad categories: *technical* and *general interest*.

Technical articles outline a construction project or a technical concept. General interest articles are "everything else" that's not technical: recaps of DXpeditions, grid expeditions, or public service activities; personal accounts of trying a new mode or style of operating — anything relating to operating or the ham radio avocation.

Whether your manuscript has a technical or general focus, a strong "how-to" component will make it stand out. Readers should come away from the article with specific ideas for recreating your experience.

Please note that *QST* only considers complete manuscripts — we do not evaluate concepts or ideas for manuscripts. The best way to find out whether the editors of *QST* are interested in your idea is to write the article and send it in for consideration via postal mail or email (no phone calls, please).

For more information on what *QST* is looking for, and how to submit manuscripts, see our Author Guide at **www.arrl.org/qst-author-guide**.

Celebrating Our Legacy

A Radio Journey Set Forth by Pearl Harbor

It's been 80 years since the attack on Pearl Harbor. I remember being 7 years old and living in Hawaii. That morning, my father received a phone call stating that Pearl Harbor had been attacked. We immediately tuned in to KGMB AM and listened to Webley Edwards of the radio series "Hawaii Calls" instruct the public to stay off the roads for the sake of the military.

I began listening to shortwave broadcasts of World War II from BBC News (British Broadcasting Corporation) and the Japanese all-female English-speaking radio broadcasters called Tokyo Rose, as well as broadcasts from other countries.

After World War II, a family member gave me an old radio that no longer worked, so I built a crystal set using the antenna coil and the tuning capacitor, as well as some superheterodyne receivers — a one-tube, a two-tube, and eventually a five-tube.

At the age of 13 I learned Morse code, and earned my Novice-class license 3 years later. I got on the air with a 6AG7/6L6 radio that I built from scratch, which ran 25 W on 80 and 40 meters. A few months later, I built a 6AG7/807 transmitter running 70 W and upgraded to my General-class license.

I went to New York City to attend RCA Institutes (which changed its name to TCI College of Technology in 1974, but eventually closed in 2017), where I enrolled in a 2-year program for advanced electronic technology. My first job after graduation was at Bell Telephone Laboratories, where I worked on solid-state physics as part of a group with Dr. William B. Shockley, who, along with John Bardeen and Walter Brattain, invented the first transistor.

I continued my education at the University of Hawaii, where I majored in physics and mathematics, as well as performed graduate work in physics. I had a 35-year career in the aerospace industry, working at Kaena Point Satellite Tracking Station (now known as Kaena Point Space Force Station), in Oahu, Hawaii, as well as Onizuka Air Force Base in Sunnyvale, California.

Ham radio has kept me busy for more than 70 years, and I've loved every minute of running CW, SSB, and numerous digital modes (right now I mostly operate FT8). I'm a DXer at heart, but enjoy running low power or QRP with only wire antennas, such as dipoles, inverted V antennas, or verticals. I've confirmed 275 DX countries and made many friendships along the way.

Elmer Harger, N7EL
Queen Creek, Arizona
Life Member

Discovering DX

In the late 1960s, my parents bought me a General Electric portable multiband radio, and I was introduced to the world of Broadcast Band (BCB) DXing. It was fascinating to contact stations from all over the east coast of the US, just by using the rod antenna inside the small cabinet. I then discovered the shortwave band on the tiny 9 V transistor radio, and began listening to hams on 80 and 40 meters with the telescoping antenna.

In my junior and senior years of high school, I purchased an inexpensive Monarch Ham-1 receiver from a local radio shop, and my shortwave listening (SWL) really took off. Although the Ham-1 was a little microphonic, I was excited to have more shortwave coverage and a bandspread control to improve the tuning. I enjoyed listening to broadcasters from around the world, sending reception reports, and collecting QSL cards. I was well-known at the local post office for purchasing so many International Reply Coupons (IRC).

I went to college in 1971 and met two fellow students who were also hams. Dan Gustafson, WB4PYL, introduced me to many aspects of amateur radio, including mobile 2-meter operation. He modified an old Motorola 80D tube transceiver and installed it in his car. When he built a 2-meter repeater in the dorm room, he had a small rack cabinet full of vacuum tubes in the middle of the floor — parts and tools were everywhere.

I earned my Novice-class license during my junior year of college. The following year, I visited an engineer named Jack, W1CWC (SK), who worked with my dad. He gave me a tour of his shack, which included a Heathkit HW-100 and SB-200, and an old National Radio Company receiver. Later that year, I assembled a Heathkit HW-101 and built my station at my parents' house, which included Hallicrafters SX-71 and BC-348 receivers.

After college I began my first engineering job in southeast Georgia and became active in the local amateur radio club. I set up my HW-101, along with inverted V antennas, for 80 and 40 meters. I also managed to erect a 15-meter dipole on the steep roof of our two-story rental house. I operated CW on the Novice bands every night and weekend, increasing my code speed so I could earn my General- and Amateur Extra-class licenses. Once I did, I immediately began operating voice on the HF bands.

About a month later, I made my first real DX contact. I was working CW on the 15-meter band when I copied a strange call sign that answered my CQ. I didn't recognize the call sign prefix, but I soon realized that it was a German station!

The thrill of operating DX has never left me, and I continue to enjoy making friends from all over the world.

John Kelly, WA4IGL
Webster, Florida

Send reminiscences of your early days in radio to "Celebrating Our Legacy," ARRL, 225 Main St., Newington, CT 06111 or **celebrate@arrl.org**. Submissions selected for publication will be edited for space and clarity. Material published in "Celebrating Our Legacy" may also appear in other ARRL media. The publishers of *QST* assume no responsibility for statements made in this column.

George J. Misic, KE8RN, ke8rn@comcast.net

Classic Radio

The Collins KWM-380 Transceiver

The Collins KWM-380 (see Figure 1) was the last product Collins made for radio amateurs. It was a nice solid-state transceiver with a built-in ac power supply and speaker. It became available in 1979 and was available until 1983. Art Collins was still alive and affiliated with the company when the KWM-380 was released for sale, but Rockwell International — who had purchased Collins — was fully in charge of the company. It was surprising that an amateur radio transceiver project was done at this time, but it was a lightly modified version of a transceiver Rockwell made for government and military use.

Figure 1 — The Collins KWM-380. [Image courtesy of the *Collins KWM-380 Owner's Manual*]

The unit measured 15.5 × 7.5 × 18 inches without considering the knobs, connectors, or rubber feet. It weighed 50 pounds with the internal power supply and speaker. The unit was tan and brown, rather than the more common gray or black of the time.

The radio included a general-coverage receiver covering 1.60 to 30 MHz, with full sensitivity and performance, and 500 kHz to 1.60 MHz with reduced performance. The digital LED readout showed MHz, kHz, 100 Hz, and the nearest 10 Hz with seven digits. Unlike the Heathkit SB-104, where flicker of the 100 Hz digit was often an issue, Collins seemed to have solved the issue of flicker in the 100 and 10 Hz digits. In the Collins KWM-380, they appeared to be quite stable.

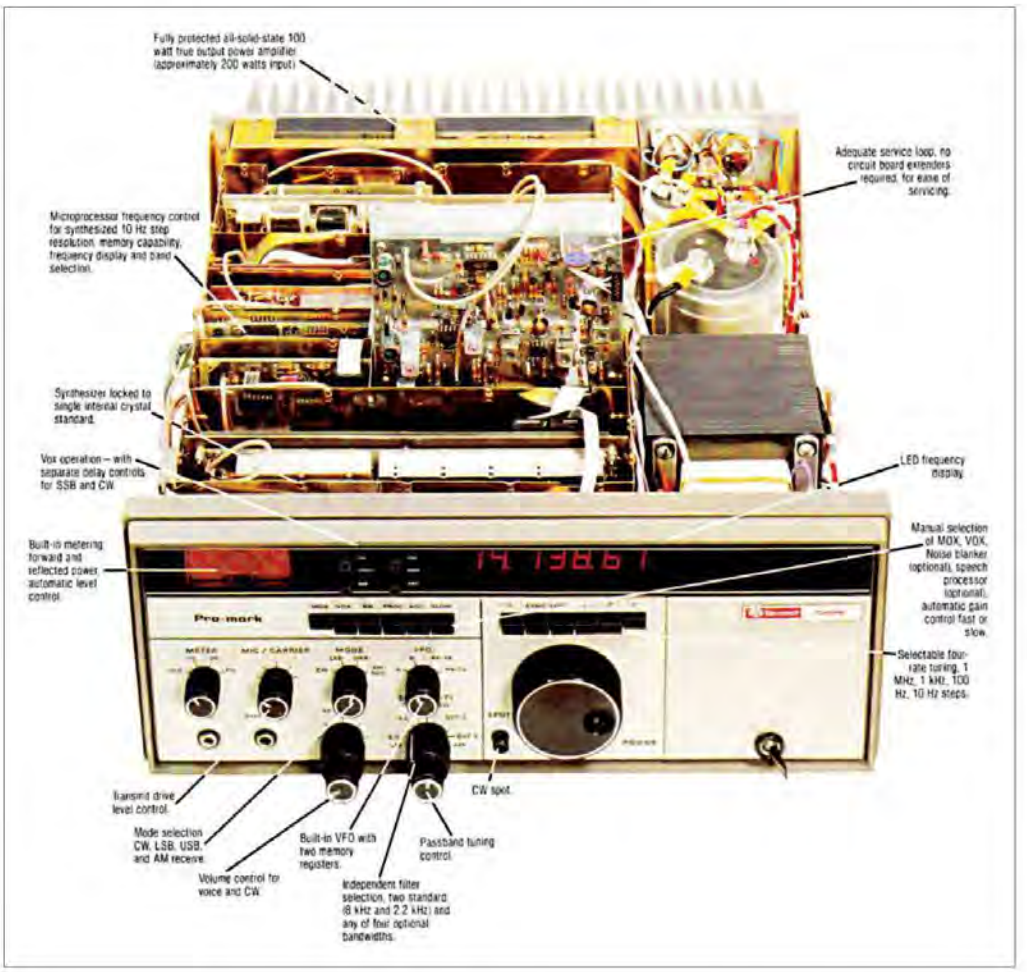


Figure 2 — The internal view of the Collins KWM-380. [Image courtesy of **universal-radio.com**]

Technical Summary

As delivered, the KWM-380 would only transmit on the amateur radio bands, but Collins manufactured a version of the radio for government and military service called the HF-380. The KWM-380 (see Figure 2) could transmit anywhere from 1.60 to 30 MHz with the full 100 W of RF output power into a good 50 Ω load. The radio would deliver full power into a load with a voltage standing-wave ratio (VSWR) of 2.0:1 and automatically ramped down the output power if the VSWR is higher. The unit would receive from 0.5 to 30 MHz, with reduced performance from 0.5 to 1.6 MHz.

The receiver came with a 2.2 kHz bandwidth SSB filter. The bandwidth of 8 kHz came without the benefit of a filter (other than one four-pole filter built in as part of the circuitry). This was the bandwidth with no 455 kHz filter in use, which should have worked for AM signals. The KWM-380 allowed the installation of up to three optional filters of the four available. The first intermediate frequency (IF) used in the KWM-380 was 39.145 MHz, and the second IF was 455 kHz.

Upconversion was not commonly used when the KWM-380 came onto the market in 1979. A frequency of 6.255 MHz was used as the shuttle frequency for the passband tuning feature. The KWM-380, like most other Collins equipment, featured both a product detector for SSB and CW and an equivalent diode detector for AM reception.

The transmitter operated making LSB, USB, CW, and RTTY signals. The ability for AM transmit was not included in the KWM-380, as was typical of Collins SSB-CW equipment. Nominal power of 100 W was available everywhere that the transmitter operated. High VSWR or long duty cycles would cause the KWM-380 to partially shut down to prevent overheating of, or damage to, the RF power amplifier.

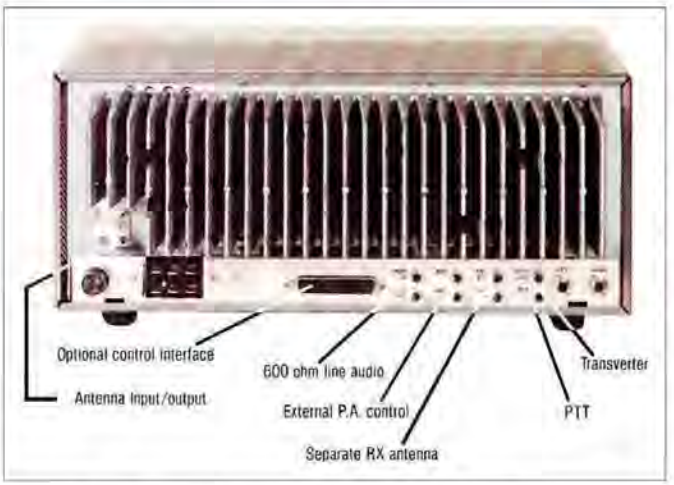


Figure 3 — The rear view of the Collins KWM-380. [Image courtesy of **universal-radio.com**]

The KWM-380 was frequency synthesized to establish the operating frequency. Two independent frequencies could be selected. One was for the receive mode, and the second was for the transmit mode to enable working of DX stations that operated outside the US phone band. The tuning rate could be selected from 10 Hz steps, going up to 1 MHz. The steps were 10 Hz, 100 Hz, 1 kHz, 10 kHz, 100 kHz, and 1 MHz. The frequency synthesizer was accurate to within 5 Hz of the frequency set. Drift was essentially zero. An accessory keypad was available to enter a desired frequency.

Additional Options

For an extra cost, the KWM-380 could be personalized with accessories such as a cooling blower, a handheld microphone, a receive noise blanker, a 6 kHz wide AM receive bandwidth filter, a 1,700 Hz RTTY filter, a 500 Hz CW filter (wider), a 250 Hz CW filter (narrow), and a desk microphone.

The unit had a ¼-inch, two-circuit phone jack on the front panel for inserting headphones. Using headphones muted the internal speaker and the external speaker jack. A 3/16-inch, three-circuit phone jack on the front panel accepted a push-to-talk (PTT) high- or low-impedance microphone with a PTT pushbutton. The specific input impedance of the microphone input is 3,300 Ω, which was considered low for a high-impedance microphone and high for a low-impedance microphone. A crystal or ceramic microphone would have been inappropriate to use with the KWM-380. Manual transmit via a PTT pushbutton or voice-operated transmit (VOX) could be used to select receive or transmit.

The antenna connector was the commonly used SO-239, which mates with the popular PL-259. A ¼-inch, two-circuit phone jack was provided on the rear panel (see Figure 3) for an external speaker (it could be used, but it was not needed). A second jack was provided for a CW key or keyer. The power connector was a Cinch Jones S-406-CCT, and the power input could be 50 or 60 Hz. Voltages could range from 105 to 250 V ac, and a dc input of 12 to 15 V dc could also be used. The unit could draw up to 100 W on receive and up to 600 W on transmit.

Reviews from owners varied from disappointing to exceptional. Personally, I like the KWM-380 and am very impressed with its capabilities, especially when one considers that it entered the amateur radio market in 1979.

Al Brogdon, W1AB

100, 50, and 25 Years Ago

December 1921

- The cover art by Clyde Darr, 8ZZ, heralds the "Transatlantic Tests This Month," and shows hams on both sides of the Atlantic getting ready.
- The editorials cover a variety of subjects, including "The Radiophone." The editor says, "We look forward to that day when every home will have its radio installation — when powerful central stations will broadcast news, concerts, lectures, entertainments, and everyone may get them without stirring from his living room."
- "The Second Transatlantic Tests" outlines the preparations that had been made for the tests.
- Cyril M. Jansky, Jr., describes "A High Efficiency C.W. Transmitter."
- Sumner B. Young, 1AE, discusses "Improving the Relay Spark Transmitter."
- The "New Apparatus" column takes a careful look at the new shortwave R.F. amplifier offered by the Radio Instrument Co.
- The new column, "With The Radiophone Folks," provides an overview of activity on this new medium. It lists the schedule of current radiophone stations KDKA, WBZ, WJZ, 1XE, 6XC, 6XG, and 6XAK. Most of those stations broadcast for 1 hour daily.

December 1971

- The cover photo shows the entrance to ARRL Headquarters, with snow on the ground and the greeting, "Merry Christmas from the ARRL Headquarters Gang!"
- The editorial, "Transatlantics — 1921" looks back on ARRL, the efforts made, and the highlights of the Transatlantic Tests.
- Ben Lowe, K4VOW/WA5UVM, presents "A 15-Watt-Output Solid-State Linear Amplifier for 3.5 to 30 MHz."
- Robert M. Myers, W1FBY, provides Part II of "A C.W. Man's Kilowatt."
- Charles B. Andes, WB2VXR, uses a new twist to give readers a better selectivity, in "Threshold Detectors in a C.W. Audio Filter."
- Edward P. Tilton, W1HDQ, explains how to build "A 5-Over-5 Stacked-Yagi Array for 50 MHz."
- Doug DeMaw, W1CER, presents "Some Thoughts About 220-MHz Operation."
- W. E. English, W6WYQ, describes how to build "A 40-Meter DDRR Antenna."
- Larry Nickel, K3VKC, shares how to build a "Simple Integrated-Circuit Square-Wave Source."
- Irvin M. Hoff, W6FFC, shares information on "Pi and Pi-L Network Design for Amplifiers."

December 1996

- The cover photo shows an EIMAC 3-400Z RF power tube among some Christmas decorations.
- The editorial comments by Robert W. Jones, VE3CTM (elected Director of the International Telecommunication Union's Radiocommunication Bureau in 1994), tells readers they should "Speak With One Voice."
- Bruce L. Kelley, W2ICE, and Donald G. Hudson, KA1TZR, relive the heady days of 50 years ago, in "Hams Span the Atlantic on Shortwave!," complete with an array of historic photos.
- Jacob Makhinson, N6NWP, explains how to build "A Drift-Free VFO."
- James Millner, WB2REM, offers ideas on connecting amateur radio and the web, in "A New 'Band' for Your Radio."
- William Sheets, K2MQJ, and Rudolf F. Graf, KA2CWL, provide Part 3 of "Get on 440-MHz ATV!"
- Garry V. Hammond, VE3XN, talks about a domestic adventure that felt like a DXpedition — "The 1996 *Polar Bear Express* DXpedition."
- In "30 Minutes on 432," Steve Ford, WB8IMY, spins the tale of his introduction to terrestrial UHF operation.
- Donald Cox, AA3EK, urges readers to "Explore HF/VHF Digital and Image Modes on the Cheap."

Silent Keys

It is with deep regret that we record the passing of these radio amateurs:

W1CMF **Francer**, Charles M., Boca Raton, FL
•KC1DD **Carpenter**, Hervey B., Kennebunk, ME
WB1DSP **Pilsbury**, Chandler T., Pittsfield, MA
•W1FKI **McTeague**, William J., South Windsor, CT
•AC1FS **Benulis**, Gregory A., Boxford, MA
KA1GKJ **Taylor**, Donald D., Oakville, CT
♦K1PKZ **Caputo**, Paul J., Van Alstyne, TX
KB1SIN **Brooks**, William H., Yalesville, CT
K2FX **Kolacki**, Paul Jason, Ocala, FL
KD2MGU **Nishina**, Masayoshi "Iggy," Brentwood, NH
KU2P **Rule**, Hollis C., Jr., Nashville, TN
K2SCW **Copenhagen**, Susan, Pittsford, NY
KC2VHU **Gueldenpfennig**, Klaus, Penfield, NY
K2VJF **Green**, James R., Carbondale, PA
KB2WPD **Towsley**, Michael J., Ellsworth, ME
W2WS **Szymko**, William E., Marcy, NY
♦KB2XI **Fox**, Robert D., Rochester, NY
W3CRK **Heydt**, William H., Jr., Millersville, MD
♦W3EKT **Bruns**, Edward L., Glenwood, MD
♦♦♦K3IO **Clark**, Thomas Arvid, Columbia, MD
♦W3IUU **Rasmussen**, Lloyd, Kensington, MD
N3KYZ **Law**, George S., Berwick, PA
N3LGN **Rothwell**, Paul C., Dixmont, ME
N3MPL **Gravelle**, Sally A., Lexington Park, MD
W3OEP **Mertz**, Eugene, Potomac, MD
N3OGT **Ketner**, Andrew J., Mount Union, PA
KC3QO **Snyder**, Tim G., Bath, PA
KJ3R **Bersch**, Charles A., Bethlehem, PA
WA3RR **Ratcliffe**, Robert H., Bethesda, MD
WU3V **Moore**, James Carlton, Damascus, GA
K3VPZ **Nemec**, Chuck C., Jr., Baltimore, MD
KI4AIF **Gardner**, Danny E., Kings Mountain, NC
W4AKG **Grey**, Ansel K., Easley, SC
KN4FEO **Martins**, John, Boca Raton, FL
KB4GKI **Holbrook**, Jimmy L., Ronda, NC
•WA4HMI **Zuercher**, Roger M. "Buddy," Mountain City, TN
AF4J **Conaway**, Donald P., Wilmington, NC
K4JUZ **Alderman**, Maines "Hatz," Shalimar, FL
KD4LIR **Mort**, Robert C., Minersville, PA
K4LOD **Swancara**, John W., Pisgah, NC
KC4LOW **Lowe**, Carroll D., Jr., Millers Creek, NC
K4LQ **Perkins**, Frederick M., Jr., Lake Placid, FL
W4MZP **Horne**, W. Henry, Red Springs, NC
KN4NG **White**, George T., Morrow, GA

KK4PVX **Negrich**, Dennis H., Jr., Port Charlotte, FL
•KJ4PXL **Miller**, Bruce, Louisville, KY
N4QYL **Brown**, Larry D., Montgomery, AL
WA4TCS **Hamm**, Wilford P., Henrico, VA
KI4TGN **McElroy**, Donald A., Heflin, AL
KK4UCC **Muse**, Max H., Carthage, NC
KK4WS **Parsons**, Tim J., Lexington, KY
W5ADY **Price**, Barbara R., Albuquerque, NM
W5GPO **Byars**, Charles "Charlie" T., Wichita Falls, TX
WD5GXO **Engel**, Steven P., Rockford, MI
♦W5JYK **Pulitzer**, Stanley M., New Orleans, LA
♦N5KDR **James**, Thomas W., Ellinger, TX
KF5QIQ **Abramson**, Lawrence R., Olive Branch, MS
KD5RZU **Asebedo**, Roland, Highland Village, TX
KW5T **Kemp**, Paul C., II, Pearl, MS
KE5TOB **Firth**, William C., Albuquerque, NM
WA5VMS **Borovetz**, Joe S., Muskogee, OK
KB5YJF **Enis**, Michael W., Starkville, MS
KA6CMD **Laherty**, James L., San Mateo, CA
KD6CRL **Bruchey**, John D., Tucson, AZ
•K6EHH **Hullette**, Elayne, Arroyo Grande, CA
W6GR **Smith**, Robert W., Madera, CA
N6NPG **Ryan**, Thomas H., Ridgecrest, CA
N6RA **Gallagher**, Thomas A., Santa Barbara, CA
KO6RU **Hanna**, Claude B., Cameron Park, CA
KK6TS **Person**, Jerry K., Los Angeles, CA
W6WTF **Cook**, Matthew E., Antelope, CA
KH6XM **Dragon**, Douglas, Makawao, HI
N7DLT **Hisaw**, Jean A., Clayton, TX
KG7EHR **Pringle**, Steven D., Brookings, OR
K7GCO **Glanzer**, Kenneth W., Bridgewater, SD
WA7GTU **Blanchard**, Don L., Cedar City, UT
KE7GVE **Finnell**, Jerome D., Nampa, ID
W7JAY **Carlson**, Robert D., Tangent, OR
•KG7OY **Tuinstra**, William A., Methow, WA
N7UJF **De Wolf**, Penny A., Portland, OR
K7WST **Davenport**, Arthur K., Bainbridge Island, WA
KB8CQH **Gergal**, Dixie J., New Carlisle, OH
K8DVK **Thomas**, Jack K., Brookville, OH
W8GAZ **Weisbrod**, Stephen P., Minnetonka, MN
N8HKJ **Sweeney**, Ronald D., Troy, OH
♦K8MZH **Hubbell**, Leland, Johnstown, OH
KB8NNS **Gum**, Bradley A., Elkins, WV

•KC8PMC **Cromwell**, Peter M., Reading, MI
K8TAG **Grieger**, Thomas A., Slanesville, WV
•KC9AGX **Zach**, Robert F., New Berlin, WI
W9GIV **Yanney**, William S., Beavercreek, OH
WD9IEJ **James**, Marlena D., Ridgeville, IN
AK9J **Rogers**, Lee, Lone Tree, CO
AA9KB **Wasmuth**, John P., Jr., Columbia City, IN
•N9WBI **Skidmore**, Barry C., Elroy, WI
KC9QBY **Keely**, Charles C. "Chuck," Neenah, WI
KB9RDO **Baringer**, Michael L., Jamestown, IN
N9WLB **Bonahoom**, Michael J., III, Warsaw, IN
WBØAAT **Brewer**, Harvey D., Durango, CO
WØAES **Ellison**, Jim M., Funk, NE
WØELM **Woelm**, David, Blaine, MN
KØJMN **Pickering**, Donald J., Nebraska City, NE
AKØL **Mosier**, Ricky A., Chattanooga, TN
KCØLRE **Wesley**, Gary L., Toledo, OH
ACØNS **Yedlik**, Edwon G., Vinton, IA
KBØQMF **Cobb**, Michael E., Parsons, KS
KCØSKD **Schaffer**, Donna, Grand Forks, ND
KAØTHW **Marquez**, Robert, Lakewood, CO
KBØVTK **Doran**, Paul, Saint Louis, MO
NØVY **Thompson**, Mack, Boulder, CO
KGØXR **Gilbert**, Frank, Jr., McKinney, TX
♦WXØY **Walters**, Travis, Jr., Anamosa, IA
VE3DBL **Titley**, Gary A., Waterdown, ON, Canada
VE3GIX **Kulbacki**, Marc, Windsor, ON, Canada
VA3HNZ **Reinert**, Heinz G. Kingsville, ON, Canada
♦F9AP **Pettelat**, Andre, Les Angles, France

♦ Life Member, ARRL
♦ Maxim Society
♦ Current Diamond Club
• Former call sign

For information on how to list a Silent Key in *QST*, please visit **www.arrl.org/silent-key-submission-guidelines**.

Note: Silent Key reports must confirm the death by one of the following means: a copy of a newspaper obituary notice, a copy of the death certificate, or a letter from the family lawyer or the executor. Please be sure to include the amateur's name, address, and call sign. Allow several months for the listing to appear in this column.

Strays

QST Congratulates...

ARRL member and professional engineer Les Kramer, WA3SGZ, will be among the 2020 inductees into the Florida Inventors Hall of Fame on November 5. The Hall of Fame, at the University of South Florida in Tampa, recognizes approximately seven Florida inventors every year for significant contributions to technology and society. Kramer holds 17 US patents and two overseas patents, spanning lower-limb prosthetic devices to advances in electric power generation, IED detection, optical coatings for industrial processes, and dynamic electronic tagging using a sticky polymer. "One of my primary inventions is a prosthetic foot that returns energy to both the heel and the toe of the amputee, thereby giving the user a very lifelike feeling and natural control of the foot," said Kramer, who is Vice President of Engineering and Manufacturing at TaiLor Made Prosthetics, LLC, in Orlando. The prosthetic foot is used by some 3,000 people worldwide, including two Boston Marathon bombing victims. Kramer said amateur radio has played a key role in his success as an inventor. He has been a ham since 1959 and an ARRL member for more than 50 years.

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• 50W Reliable Output Power • Real Dual Band Operation (V+V, U+U, V+U, U+V) • 2-inch High-Res Full Color TFT Display • Band Scope • Built-in Bluetooth • WiRES-X Portable Digital Node/Fixed Node with HRI-200

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• 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

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• 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 ±0.5 ppm

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

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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

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Fully featured flexible dual channel DSP noise cancelling unit - 8 Filter levels 9 to 40dB - 3.5mm mono or stereo inputs - Line level input/output - 7 watts mono speaker output - Headphone socket - Suitable for all types of radio incl' SDR - Easy to use controls for quick and easy operation - Enjoy clear intelligble "noise-free"speech from your radio - Replacement for bhi NEIM1031 In-Line

New In-Line Module

New

8 noise filter levels 8 to 40dB - Tone reduction up to 65dB - 5W audio with latest bhi DSP noise cancellation - Audio bypass feature - 3.5mm mono inputs and outputs - Headphone socket - Audio input overload feature - DC power 10 to 16V DC - Dims 135mm x 65mm x 46mm - Replacement for bhi ANEM MKII and NEIM1031MKII

NES10-2MK4

New improved design

- 5W audio - Latest bhi DSP noise cancelling
- 8 filter levels 8 to 40dB
- Three position switch for off/audio bypass mode, power on and DSP filter on - LEDs for Power on, filter on and audio overload
- Headphone socket

Read the excellent NES10-2MK4 review in May QST page 48

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Latest bhi DSP noise cancelling technology for even better receive audio

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For medium communications arrays up to 15 sq. ft. wind load area. 5-second brake delay, Test/Calibrate function. Low temperature grease permits normal operation down to -30 degrees F. Alloy ring gear for extra strength up to 100,000 PSI for maximum reliability. *Precision* indicator potentiometer. Ferrite beads reduce RF susceptibility. Cinch plug plus 8-pin plug at control box. Dual 98 ball bearing race for load bearing strength and electric locking steel wedge brake prevents wind induced movement. North/South center of rotation scale on meter, low voltage control, max mast $2^{1}/_{16}$".

HAM-VI **$909.95** with DCU-2

HAM-VII **$999.95** *with DCU-3*

TAILTWISTER SERIES II

T-2X **$969.95**

T-2XD2 **$1079.95** with DCU-2

T-2XD3 **$1139.95** with DCU-3

For large medium antenna arrays up to 20 sq. ft. wind load. 5-second brake delay, Test/Calibrate functions. Low temp grease, tough alloy ring gear, indicator potentiometer, ferrite beads on potentiometer wires, weatherproof AMP connectors plus 8-pin plug at control, triple bearing race (138 ball bearings) for large load bearing, electric locking steel wedge brake, North/South center of rotation scale meter, low voltage control, $2^{1}/_{16}$" mast.

MSHD, $149.95. Above tower heavy duty mast support. Accepts $1^{7}/_{8}$-$2^{5}/_{8}$" OD.

CD-45II

CD-45II **$519.95**

For antenna arrays up to 8.5 sq. feet mounted inside tower or 5 sq. ft. with mast adapter. Low temperature grease good to -30 F degrees. *New* Test/Calibrate function. Bell rotator design gives total weather protection, dual 58 ball bearing race gives proven support. Die-cast ring gear, stamped steel gear drive, heavy duty, trouble free gear train, North center scale, lighted directional indicator, 8-pin plug/socket on control unit, snap-action control switches, low voltage control, safe operation, takes maximum mast size to $2^{1}/_{16}$ inches. MSLD light duty lower mast support included.

HAM IV and HAM V Rotator Specifications	
Wind Load capacity (inside tower)	15 square feet
Wind Load (w/mast adapter)	**7.5 square feet**
Turning Power	800 in.-lbs.
Brake Power	**5000 in.-lbs.**
Brake Construction	Electric Wedge
Bearing Assembly	**dual race/96 ball bearings**
Mounting Hardware	Clamp plate/steel U-bolts
Control Cable Conductors	**8**
Shipping Weight	26 lbs.
Effective Moment (in tower)	**2800 ft.-lbs.**

TAILTWISTER Rotator Specifications	
Wind load capacity (inside tower)	20 square feet
Wind Load (w/ mast adapter)	**10 square feet**
Turning Power	1000 in.-lbs.
Brake Power	**9000** in.-lbs.
Brake Construction	Electric Wedge
Bearing Assembly	**Triple race/138 ball brngs**
Mounting Hardware	Clamp plate/steel U-bolts
Control Cable Conductors	**8**
Shipping Weight	31 lbs.
Effective Moment (in tower)	**3400 ft.-lbs.**

CD-45II Rotator Specifications	
Wind load capacity (inside tower)	8.5 square feet
Wind Load (w/ mast adapter)	**5.0 square feet**
Turning Power	600 in.-lbs.
Brake Power	**800 in.-lbs.**
Brake Construction	Disc Brake
Bearing Assembly	**Dual race/48 ball brings**
Mounting Hardware	Clamp plate/steel U-bolts
Control Cable Conductors	**8**
Shipping Weight	22 lbs.
Effective Moment (in tower)	**1200 ft.-lbs.**

Hy-Gain Programmable DCU-3
Digital Rotator Controller
DCU-3 -- $519.95

Hy-gain DCU-3 Digital Controller lets you program 6 beam headings! Gives you full automatic or manual control of your hy-gain HAM or Tailtwister Rotators.

Press a memory button or dial in your beam heading or let *Ham Radio Deluxe* (or other) take control. Your antenna auto rotates precisely and safely to your DX.

DCU-3 automatically jogs your antenna free and safely unlocks it before rotating begins *(great for older rotators with "sticky" brakes)* then turns off your motor before reaching its final heading. Your antenna *gently* coasts to a stop before the brake re-locks -- greatly reducing damaging overshoots and extending rotator life. Simply press *Left* and *Right* buttons for *full* manual control and fine tuning. Bright blue LCD shows current, dialed-in and computer controlled beam headings in one degree increments and your call.

Calibrate lets you accurately match your display to your *true* beam heading. Has USB/RS-232 ports for computer control. Adjustable LCD sleep time. Field upgradeable firmware. 8.5Wx4.3H x9D".

110 VAC. Order DCU-3X for 220 VAC.

DCU-2 Digital Rotator Controller --$479.95

$479.95. Like DCU-3, but less programmable memories. 110 VAC. Order DCU-2X, for 220 VAC.

AR-40 -- $419.95

For compact antenna arrays and large FM/TV up to 3.0 square feet wind load area. Dual 12 ball bearing race. Automatic position sensor never needs resetting. Fully automatic control -- just dial and touch for desired location. Solid state, low voltage control, safe, silent operation. $2^{1}/_{16}$" max mast. MSLD low mast included.

AR-40 Rotator Specifications	
Wind load capacity (inside tower)	3.0 square feet
Wind Load (w/ mast adapter)	**1.5 square feet**
Turning Power	350 in.-lbs.
Brake Power	**450 in.-lbs.**
Brake Construction	Disc Brake
Bearing Assembly	**Dual race/12 ball bearings**
Mounting Hardware	Clamp plate/steel bolts
Control Cable Conductors	**5**
Shipping Weight	14 lbs.
Effective Moment (in tower)	**300 ft.-lbs.**

Replace your Yaesu Rotator Controller

YRC-1 - $399.95

Hygain YRC-1 -- more features, more robust, far less prone to lightning damage. Costs less than repairing!

Easy-to-use -- dial in your beam heading and tap GOTO button, Exclusive 180 degree *AutoReversal*™ for fast longpath operation. All DCU-2 features. Bright blue LCD shows current, dialed-in, computer controlled beam headings, call. USB port for computer control. Extra heavy-duty AC power supply. Fast variable DC motor minimises overshoot. Intuitive menu. Field upgradeable. For Yaesu G-800/1000/2800/G450/650. AC or DC motors.

YRC-3, $499.95. Like YRC-1 and adds 6 memories.

AR-500 Rotator/Controller -- $199.95

UHF/VHF/6-Meter, MFJ-1886 Rotator/Controller and Remote. For use of small VHF/UHF/6M, TV, FM, the MFJ-1886 wide band receiving loop and other lightweight ham antennas. Rotator is built in a weather proof one piece cast aluminum housing with precision metal gears, steel thrust bearings and automatic braking. Includes rotator, controller, remote, clamps, and all hardware. AR-500 remembers up to 12 directions even after a power outage! Use remote control or direct console. Displays location and relative position.

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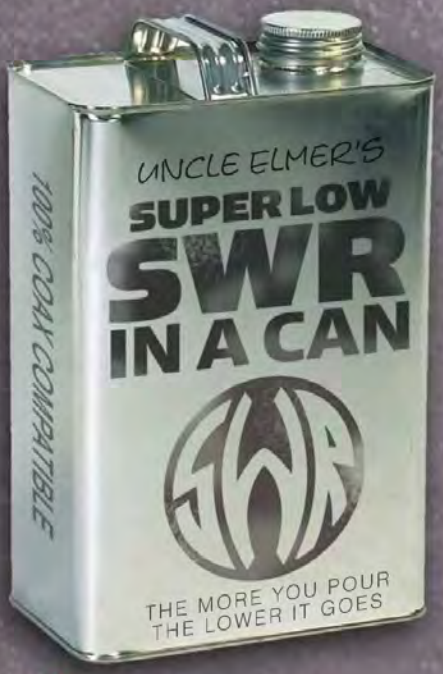

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MFJ-1025, $239.95. Like MFJ-1026, less the built-in active antenna. Use external antenna connection.

MFJ *Ultrasonic* Receiver with parabolic reflector *pinpoints* power line noise

HF and VHF operation can be affected by noise, makes it hard to hear weak stations, adds to fatigue. Often, noise comes from power lines. Power companies are willing to help with issues, but don't have equipment or trained personnel to locate it. MFJ aids in finding noise generated by corona discharge and arcing components. Acoustic receiver is tuned to 40 KHz. 18" diameter plastic dish gives a narrow beamwidth to pinpoint noise sources less than 12" at 50 feet. Also listen to nature: bats, birds, and insects!

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Clearly hear signals 50 KHz to 30 MHz you never knew existed. Power line noise and static disappears. Rotating the MFJ-1886 eliminates interfering signals or greatly peaks desired signals. Excellent antenna and preamplifier balance gives deep null. Gives excellent strong and weak signal performance without overload. Fully protected state-of-the-art push-pull Gali MMICs preamplifier gives high dynamic range, low IMD and 25 dB of low noise gain. Use inside or outside.

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Suppress TVI, RFI, telephone, other interference by reducing unwanted harmonics to your antenna. Your HF signal still passes through with low loss so you snag that rare DX! *Keep the wife and neighbors happy!*

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MFJ Clamp-on RF Ammeters

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Clamp-On RF Ammeters quickly snap over wires and cables to measure RF currents flowing in antenna elements, radials, ground wires and on outside of coax. Tune counterpoises, radials, ground systems. Study/optimize antennas for peak performance. Find peaks/nulls. MFJ-854 has five calibrated ranges to 3 Amperes, including sensitive 30 mA range.

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Filters and reduces AC power line RFI, hash, noise, transients, surges generated by computers, motors, RF transmitters, static/lightning by 30 db and up to 60-80 dB with ground. Fast, *nano-second* overvoltage protection. Provides inductive isolation, capacitive decoupling, RFI rejection, overvoltage protection of common mode, differential signals. Rejects/shunts undesired signals to ground. 12Wx3½Hx2D".

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MFJ-1708B-SDR-S, $149.95. SMA connector for your SDR.

New B series improvements . . .

The original MFJ-1708 series used one relay and wires to connect the SO-239s. The *new B-series* uses *four* relays and connectors on a *single* pc board. This gives you > 50 dB isolation at 300 MHz and > 68 dB at 50 MHz. SWR < 1.16:1 at 50 MHz and < 1.75:1 at 450 MHz at the transmit port. Mute output is a selectable short or open to ground. Use "boat anchors" or modern receivers or key a linear amplifier. Receiver input protection prevents overload from nearby high power signals and from receive to transmit. A hybrid splitter on SDR models reduces loading effect and gives > 15 dB isolation between the SDR REC and XCVR ports to reduce interference. The original MFJ-1708 series is still available.

MFJ Low Noise VLF/HF Receiving Loop

Pull weak signals out of static crashes, atmospheric, man-made and power line noise!

Hear signals 50 KHz to 30 MHz cleaner, quieter than ever before! Power line noise disappears. Rotate its figure 8 pattern and its extremely deep null to completely eliminate an interfering signal or greatly peak a desired one. Fully protected state-of-the-art Gali MMICs in push-pull gives you a preamp with extremely high dynamic range, low IMD and 25 dB of low noise gain. Excellent performance on strong and weak signals without overload. 36-inch dia. loop. 1-in. OD 6061 aluminum.

MFJ-1886
$319.95

MFJ-1886TR
$359.95
with built-in Transmit/ Receive switch

MFJ *wideband* SDR *Discone* Antenna

Receives 25-1300 MHz

MFJ ultra wide-band *Discone* Antenna receives 25-1300 MHz. Perfect for all band SDR reception. Covers 10, 6, 2 Meters, 220 and 440 MHz and 33/23 CM ham bands and everything in between. It is excellent for monitoring multiple bands simultaneously using multiple SDRs and a multi-coupler. Also test any transmitter 50-1300 MHz using a single discone and single coax. Handles 200W. Includes 50 feet coax, stainless steel elements and mounting hardware.

MFJ-1866, $64.95. Like MFJ-1868 but transmits 144-1290 MHz. Coax and mounting hardware not included.

Tuned Indoor SDR Active Antenna

Make your SDR receiver come alive with HF signals, .3-40 MHz, while rejecting interference with MFJ-1020C *tunable* indoor active antenna! Gain control, telescoping whip.

MFJ-1020C
$139.95

Untuned Indoor SDR Active Antenna

MFJ-1022, $99.95. Hear weak, noisy VLF to UHF signals. Noise-less feedback gives excellent low noise reception. Handles strong signals.

Active OutdoorAntenna

MFJ-1024
$209.95

World Radio TV Handbook says "MFJ-1024 is a *first rate, easy-to-operate active antenna, quiet, excellent dynamic range, good gain, very low noise factor, broad frequency coverage, excellent choice . . .*"

Outdoor mounted 54-inch whip/preamp gives maximum signal and minimum noise. Covers .05-30 MHz.

Indoor unit: 20 dB attenuator, gain control, 2 receiver and 2 antenna switches.

HF SDR Preselector

Tuneable MFJ-1040C lets you copy **weak**, noisy SDR signals from 1.8 to 54 MHz. Greatly tunes out and reject out-of-band interference. Up to 20 dB gain. Has gain control. Cascode FET/bipolar transistor gives low noise, high gain without overloading. Switches for 2 antennas and 2 receivers. SO-239s. Has 20 dB attenuator. Automatically bypasses when transmitting or use PTT. 6½Wx2½Hx4D inches.

MFJ-1040C
$159.95

MFJ LW/MW/SW SDR Preselector/Tuner

Highly rated series-tuned MFJ boosts your desired signals while greatly rejecting interference and preventing serious overload.

MFJ-956
$109.95

Greatly improves reception 0.15 to 30 MHz. Incredibly effective below 2 MHz.

Super easy to operate, select band and tune!

Bypass tuner and ground receiver switch positions.

Compact 2x3x4 inches. SO-239 connectors.

MFJ RF Sense Transmit/Receive Switch

MFJ-1708B
$139.95.

Switches your antenna from receiver to transmitter using a relay. Shorts your receiver to ground during transmit. Use RF sensing with adjustable delay or PTT line. Has selectable open/short mute.

Auto switch XCVR between 2 antennas

MFJ-1707B
$139.95.

Automatically switches separate transmit and receive antennas on transceivers with only one antenna port. *Example:* Efficient 75M dipole for XMIT and low noise MFJ loop for receive -- *no static crashes!*

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Boost battery voltage as low as 9 Volts back up to 13.8 VDC! Keeps your transceiver at full power output, compensates for run down battery, wiring voltage drop, car off . . .

MFJ-4416C **$229.95** **Keeps** your transceiver at full power output, provides full performance, high efficiency, prevents output signal distortion and transceiver shutdown. Compensates for run-down battery, wiring voltage drop or when car is off. Provides up to 25 Amps peak with 90% efficiency. Selectable 9/10/11 Volts minimum input voltage prevents battery damage from over-discharging. RF sense turns MFJ-4416C off during receive to save power, increases efficiency and reduces noise. Adjustable 12 to 13.8 VDC output pass-through improves efficiency and lets transceiver run cooler. Has output over-voltage crowbar protection. *Anderson PowerPoles*(R) and high-current 5-way binding posts for DC input, regulated output. 7¾Wx4Hx2⅛D inches. **MFJ-4416BRC, $119.95.** Booster Remote Control.

Super Heavy Duty Battery Booster

MFJ-4418 **$279.95**

Super robust with heavy duty transistors, rectifier, improved switch-mode transformer, larger heatsink. Input and output EMI filters reduce noise to minimum. Rugged construction. *Power-Poles*™ and 5-way binding posts. MFJ software adjusts output voltage, measure load current, set minimum voltage level, over-current trip level, ignition control, more. External boost enable, remote input/output voltage sampling, remote controllable with MFJ-4416BRC.

RFI Filter for DC power

MFJ-1142 **$89.95**

Connects between rig and 12/ 24/50 VDC power supply/battery. Reduces RFI, hash, transients, motor noises, alternators, fuel pump whine, power windows, more! Binding posts/*PowerPoles*(R).

Digital Volt/Amp Meter

MFJ-4422 **$69.95**

Connect in-line. Displays 4.5-30 VDC and up to 30A simultaneously. .01-.1V resolution. Dual .28" red/blue LED digits. *Anderson PowerPoles*™. Reverse polarity protection. 3x2x1 inches.

RFI Ferrite Chokes

MFJ-700A4 **$21.95**

Suppress RFI. Snap and locks on DC power line, coax, wires. Effectively removes RFI and noise. Install end-to-end or loop multiple turns for more suppression. .275" hole dia. 4 in package.

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MFJ-1104 **$69.95**

One fused 30 Amp input and 25, 10, 5 Amp fused outputs *with Anderson PowerPoles*™. Has open fuse indicator. Sturdy metal construction, 2¾Wx3¼Hx1½D inches.

MFJ Low Pass Filter

MFJ-704 **$124.95**

High attenuation above 40 MHz. 1.5kW, 1.8-30 MHz. SWR<1.3. Nine Chebyshev poles, *Teflon*(R) dielectric capacitors, high-Q inductors, ground plane shielding, RF tight.

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Protect your expensive equipment from lightning induced surges on 50 Ohm coax. Use for transceivers up to 400 Watts, 1000 MHz. **MFJ-272, $44.95.** 1.5 kW.

MFJ 30-Amp Power Supply

MFJ-4230MV **$144.95**

World's most compact 30 Amp switching power supply. Switchable Volt/Amp meter. Adjustable 4 to 16 VDC output. Select 120/240 VAC input. 5Wx2½Hx6D in., 3 lbs.

High-efficiency Loop Tuner

New! MFJ-935C **$299.95**

Instantly turn wire or coax into a small, high-efficiency multi-banded loop antenna. 150W, 5.3-30 MHz. Tripod/mast mount included. **MFJ-936C, $349.95.** Relative RF antenna current and Cross-needle SWR/Wattmeter. **MFJ-933C, $249.95.** Like MFJ-935C, no meter.

MFJ Field Strength Meter

MFJ-801 **$44.95**

Relative field-strength readings .1-500 MHz. Sensitivity control, 1¾ inch meter. 20-inch telescoping whip. Finger contact increases sensitivity.

Tuned Indoor Active Antenna

MFJ-1020C **$129.95**

Rival outside wire antennas hundreds of feet long and pick up signals loud and clear all over the world. 0.3-40 MHz.

25-1300 MHz Discone Ant

MFJ-1868 **$99.95**

Receives 25-1300 MHz. Transmits 50-1300 MHz up to 200 Watts. Test various X-mitters on one coax. 50 ft. coax, stainless steel elements.

17-foot Telescopic Whip

MFJ-1979 **$79.95**

17-foot stainless steel whip collapses to 27". Full 1/4 Wave on 20/17 Meters, 30-160 Meter operation with loading coil. Fits any standard 3/8-24 threaded mount.

Telescopic Fiberglass Mast

MFJ-1906HD **$269.95**

Super-strong heavy-duty mast with *QuickClamps*™. 38 ft. ext., 6 ft. collapsed. 2½" OD bottom, 1" OD top. .125" thick wall. Supports "*real*" weight.

Giant 2½ inch LED Clock

MFJ-117 **$27.96** New Low Price!

Giant 2½ inch super bright LEDs -- see from across the street day or night. 12/24 switch, 110VAC, 9V battery backup.

MFJ 2-Position *Remote* Antenna Switch

MFJ-4712 **$109.95**

MFJ 2-position *remote* antenna switch uses a *single* coaxial feedline to feed two antennas, DC power and control signals. Remotely switch HF and/or VHF antennas. Covers 1.8 MHz to 150 MHz. Handles 1500W. Impedance is 50-75 Ohms. Compact 4Wx2⅝Hx1½D". *Outside Switch Box* is fully enclosed and weather protected. Three quality *Teflon*(R) SO-239 connectors for transmitter, antenna one and antenna two. Stainless steel 1½" tall bracket with a U-bolt for masts up to 1½ in. O.D. *Inside biastee* control is 2¼Wx2½Hx1¼ in. Use 12 VDC or 110 VAC with MFJ-1312D, $26.95.

MFJ Artificial RF Ground

MFJ-931 **$149.95**

By tuning out ground wire reactance RF hot spots disappear and your rig is at actual earth ground. Improve signals by resonating a wire into a tuned counterpoise.

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MFJ Magnetic Loop Antennas

MFJ 36-inch magnetic loop antenna lets you operate 7 to 22 MHz or 10 to 30 MHz continuously -- including the WARC and MARS bands! Easily handles a full 150 Watts on SSB/CW/Digital for any transceiver.

Ideal for limited space. Apartments, small lots, motor homes, attics, trailers.

Work exciting DX with low angle radiation and local close-in contacts with high angle radiation when mounted vertically.

Super easy-to-use! MFJ remote control auto tunes to your desired band. Fast/slow tune buttons, Cross-Needle SWR/Wattmeter lets you quickly tune to your exact frequency. No control cable needed.

***World's** most efficient small loop antenna has all welded construction, welded butterfly capacitor with no rotating contacts, large 1.050 inch diameter aluminum radiator -- gives you highest possible efficiency.*

Every capacitor plate is welded for extremely low loss and polished to prevent high voltage arcing. Nylon bearing, anti-backlash mechanism, limit switches, continuous no-step DC motor gives smooth precision tuning. Heavy-duty ABS plastic housing has ultraviolet inhibitor protection.

MFJ-1782, $609.95. Like MFJ-1786 but has fast/slow tune manual control.

MFJ-1780, $399.95. 20-10 Meters, 150 Watt *Portable* *24x24x24" box fan loop with carry handle.* Fast/slow tune control. *See QST July 2019.*

***New* 40-15M and 30-10M 300W *High Efficiency* Welded Loop Antennas**

Carry it anywhere! Easy carry handle, fold-out feet, tripod mount bracket. Portable, lightweight 36x36x4". Deluxe semi-auto controller with SWR/Wattmeter, no control line needed. Welded Low loss *butterfly* air-variable capacitor. 300W SSB.

MFJ-1784, $719.95. 40-15 Meters.

MFJ-1783, $669.95. 30-10 Meters.

Build your own Mag loop!

Motorized Butterfly Capacitors

Super low loss butterfly capacitors, no rotating contacts, all plates welded with no mechanical electrical contacts. Anti-backlash mechanism. DC motor with gear reduction box. Handles at least 150 Watts SSB/CW/Digital.

1. p/n: 282-1786, $189.95. 11-128 pF.

2. p/n: 282-1788, $249.95. 15-260 pF.

3. p/n: 80-1786-2SM, $249.95. Auto band selecting remote controller with SWR/Wattmeter.

4. p/n: 80-1782-2, $79.95. Manual remote control, fast/slow tune buttons.

Butterfly Capacitors

5. MFJ-19, $79.95. 12-67 pF.

6. MFJ-23, $109.95. 18-136pF.

7. p/n: 729-0142, $19.95. 6:1 vernier gear reduction drive for loop tuning capacitor.

8. 36-inch Aluminum Circular Loop with Integrated welded capacitor and mast mounting brackets
p/n: 10-1786-11, $129.95. 1.05 inch OD heavy duty tubing.

MFJ Magnetic Loop Tuners, 150 Watts

Turns wire or coax into a small, high efficiency multi-band transmitting magnetic loop antenna!

Work the world 3.5 to 30 MHz with a *full 150 Watts* SSB/CW/Digital. No ground, radials or counterpoises needed.

New larger matching capacitor is 313 pF. Increases matching range. Butterfly capacitor has no rotating contacts.

Very quiet receiving antenna -- you'll hardly notice static crashes. High-Q reduces QRM, overloading, harmonics. Perfect for apartments, antenna restricted areas and portable operation.

A 13' wire loop covers 30-20 Meters (4' for 17-10M; 7' for 20-15M; 28' for 60-40M; 50' for 80M). Tune *any* shape loop -- circle, square, rectangle, *etc.*

A wire length gives about 1.5 to 1 frequency range (i.e.7-10, 18-28 MHz).

Easy-Carry handle. Mount for PVC Cross loop support on cabinet top. Included tripod/mast mount.

A. MFJ-936C, $359.95. Antenna current meter, Cross-Needle SWR/Wattmeter. 9¼Wx5½Hx9½D".

B. MFJ-935C, $309.95. Antenna current meter. 6¼Wx5½Hx9½D".

C. MFJ-933C, $259.95. 6¼Wx5½Hx9½D".

MFJ Low-Noise Receiving Mag Loop

Clearly hear signals 50 KHz to 30 MHz you never knew existed. Power line noise and static disappears. Rotating MFJ-1886 eliminates interfering signals or greatly peaks desired signals. Excellent antenna and preamplifier balance gives deep null. Gives excellent strong and weak signal performance without overload. Fully protected state-of-the-art push-pull Gali MMICs preamplifier gives you high dynamic range, low IMD and 25 dB of low noise gain. Use inside or outside.

QRP Mag Loop Tuner

MFJ-9232
$79.95

Turns wire around a bookcase, window, tree, etc. *into a small, high efficiency transmitting loop antenna!* Operate 40-10 Meters with included flexible wire loop (80/60 Meters with your bigger loop). No counterpoises, radials, ground needed. 25 Watts. Very quiet reception. Hi-Q reduces QRM, overload, harmonics. Great for apartments, antenna restrictions, portable ops.

VIDEOS: https://m.youtube.com/results?search_query=MFJ-9232

Antenna Rotator

Perfect for magnetic loops, VHF/UHF, small HF beams, TV, FM antennas. Weather-proof cast aluminum housing with precision all metal gears, steel thrust bearings and automatic braking. Includes rotator, controller, remote control, clamps, hardware. 12 Memories. Digital display. 110/220 VAC.

$199.95

MFJ Tripods/Masts

Strong, black *steel* triangular braced base. Non-skid feet, strong mast locks.

MFJ-1919, $129.95, Supports 100 lbs. Extends a *whopping* 7.8 ft. Base spreads up to 4.8 sq. ft. 1.4" dia. mast. Collapses to 54" by 6" diameter. 9¾ lbs.

MFJ-1919EX, $199.95. Tripod *plus* mast. 18' extended. 5' collapsed. 1/8" wall, 3/4" dia. top, 1½" dia. bottom.15 lbs.

MFJ-1918, $89.95, 6'extended. 38" collapsed, 6¾ lbs.

MFJ-1918EX, $129.95. Small tripod with extension mast. 9½', 3.8 ft. collapsed. ¾"top, 1" bottom. 6.5 lbs.

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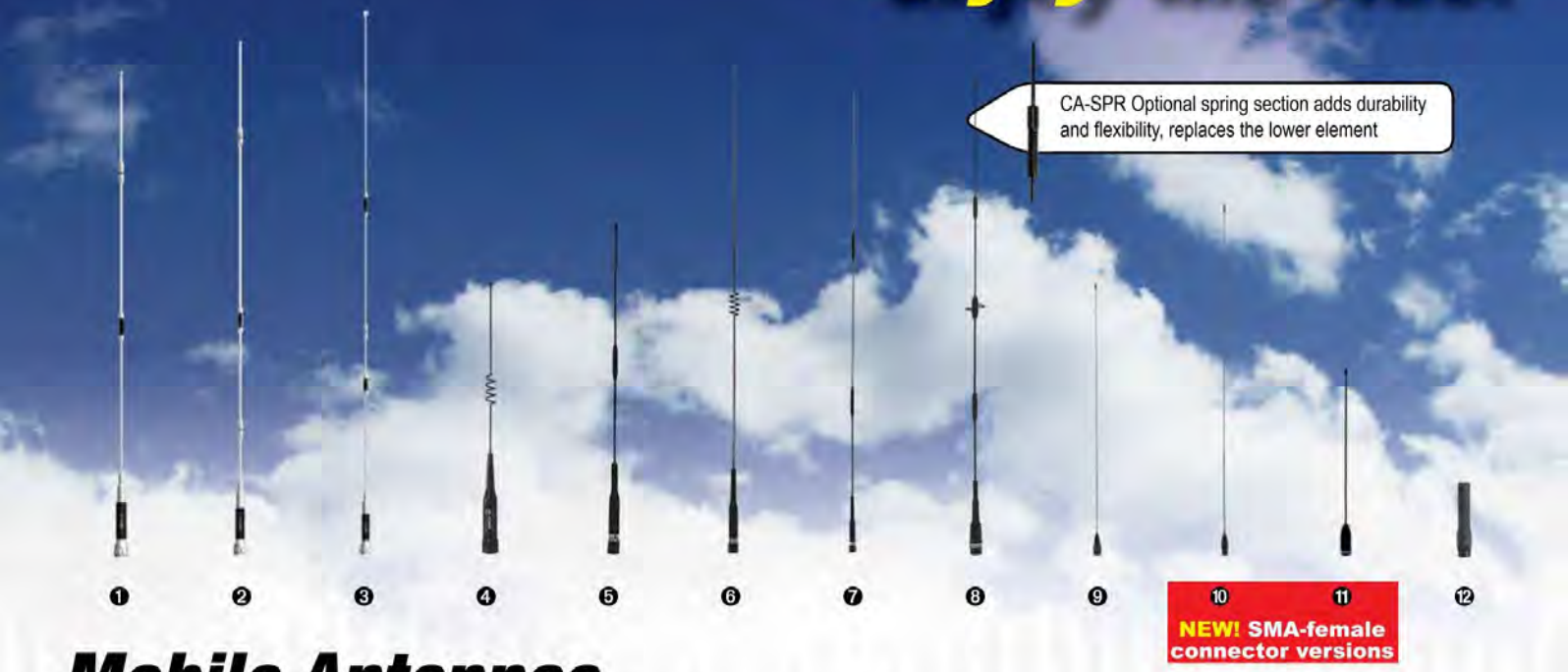

Mobile Antennas

❶ **COMET CSB-750A** DUAL-BAND 2M/440MHz w/FOLD-OVER
2M: 1/2 wave • 440MHz: 5/8 wave x 2 • VSWR: 1.5:1 or less • Length: 42" • Conn: PL-259 • Max. Pwr: 150W

❷ **COMET CSB-770A** DUAL-BAND 2M/440MHz w/FOLD-OVER
2M: 5/8 wave center load • 440MHz: 5/8 wave x 2 center load • VSWR: 1.5:1 or less • Length: 51" • Conn: PL-259 • Max Pwr: 150W

❸ **COMET CSB-790A** DUAL-BAND 2M/440MHz w/FOLD-OVER
2M: 7/8 wave center load • 440MHz: 5/8 wave x 3 center load • VSWR: 1.5:1 or less • Length: 62" • Conn: PL-259 • Max Pwr: 150W

❹ **COMET B-10/B-10NMO** DUAL-BAND 2M/440MHz
2M: 1/4 wave • 440MHz: 1/2 wave • Length: 12" • Conn: B-10 PL-259, B-10NMO - NMO style • Max Pwr: 50W

❺ **COMET SBB-2/SBB-2NMO** DUAL-BAND 2M/440MHz
2M: 1/4 wave • 440MHz: 5/8 wave center load • VSWR: 1.5:1 or less • Length: 18" • Conn: SBB-2 PL-259, SBB-2NMO - MNO style • Max Pwr: 60W

❻ **COMET SBB-5/SBB-5NMO** DUAL-BAND 2M/440MHz w/FOLD-OVER
2M: 1/2 wave • 440MHz: 5/8 wave x 2 • Length: 39" • Conn: SBB-5 PL-259, SBB-5NMO - NMO style • Max Pwr: 120W

❼ **COMET SBB-7/SBB-7NMO** DUAL-BAND 2M/440MHz w/FOLD-OVER
2M: 6/8 wave • 440MHz: 5/8 wave x 3 • Length: 58" • Conn: SBB-7 PL-259, SBB-7NMO - NMO style • Max Pwr: 70W

❽ **COMET CA-2X4SR/CA-2X4SRNMO** WIDE-BAND 140-160MHz 435-465MHz w/FOLD-OVER
2M: 5/8 wave • 440MHz: 5/8 wave x 3 • Length: 40" • Conn: CA-2x4S PL-259, CA-2x4SRNMO NMO style • Max Power: 150W

❾ **COMET BNC-24** DUAL BAND 2M/440MHz HT ANTENNA
RX range: 100-1200MHz • Length: 17" • SuperFlex featherweight whip • Conn: BNC

❿ **COMET SMA-24** NEW! **SMA-24J** DUAL BAND 2M/440MHz HT ANTENNA
RX range: 100-1200MHz • Length: 17" • SuperFlex featherweight whip • Conn: SMA-24: SMA-male / SMA-24J: SMA-female

⓫ **COMET SMA-503** NEW! **SMA-503J** DUAL BAND 2M/440MHz HT ANTENNA
RX range: 100-1200MHz • Length: 8.75" • Conn SMA-503: SMA-male, SMA-503J: SMA-female

⓬ ***Maldol*** **MH-209, MH-209SMA** DUAL BAND 2M/440MHz HT ANTENNA
Length: 3" • Conn: MH-209 BNC, MH-209SMA: SMA-male • Soft rubber cover, good performance in a small package!

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G5RV -- *Most popular antenna in the world!*

Operate 80-10 or 40-10M with tuner. 14 gauge, 7-strand copper antenna wire. 1.5kW. 32.5' ladder line matching section with SO-239 for coax.
MFJ-1778, $89.95. 80-10M. 102 feet long.
MFJ-1778M, $79.95. 40-10M. 52 feet long.

End Fed Half Waves

Operate 80-10 or 40-10M with one support/no tuner.
80-10 Meters, 132 feet:
MFJ-1982HP, $129.95. 800 Watts.
MFJ-1982MP, $99.95. 300 Watts.
MFJ-1982LP, $79.95. 30 Watts.
40-10 Meters, 66 feet:
MFJ-1984HP, $109.95. 800 Watts.
MFJ-1984MP, $89.95. 300 Watts.
MFJ-1984LP, $69.95. 30 Watts.

Off Center Fed Dipoles

Lightweight, virtually invisible. Gives you directivity and gain (*see MFJ website*).
MFJ-2012, $109.95, 40/20/10/6 Meters, 1500 Watts. 67 ft.
MFJ-2010, $89.95. 40/20/10/6 Meters, 300 Watts. 67 ft.
MFJ-2014, $139.95. 75/40 Meters, 1500 Watts. 122 ft.
MFJ-2016, $169.95. 160/75/40 Meters, 1500 Watts. 240 ft.
MFJ-2013, $109.95. 60/30 Meters, 300 Watts. 86 ft.

Dual Band 80/40 or 40/20 Dipoles, 1.5 kW

MFJ-17758, $129.95. 80/40 Meters, 95 feet long, ultra-efficient end-loading on 80 Meters. No tuner needed. Super-strong center insulator, built-in SO239, hanghole.
MFJ-17754, $89.95. 40/20M, 42 ft.

MFJ All Band Doublet

MFJ-1777, $99.95.102 foot, 160-6 Meters with tuner/balun. *Extremely low feedline loss.* Super strong fiberglass center insulator provides stress relief for included 100 feet ladder line. *Ceramic* end insulators. 1500 Watts SSB/CW/Digital.

MFJ 1.5 kW Dipoles

7-strand, 14-ga. copper wire.*Ceramic* insulators. Center insulator with SO-239
MFJ-1779C, $59.95. 20-6M, 35 feet.
MFJ-1779B, $79.95. 80-40M,135 feet.
MFJ-1779A, $99.95. 160M, 265 feet.

20M Extended Double Zepp

MFJ-1742, $114.95. See web for gain. 90 ft. long, 100 ft. ladder line. 7-strand, 14-ga. wire. 80-10M with tuner/balun. 1500 Watts SSB/CW/Digital.

80M End-Fed Zepp

MFJ-1748, $114.95. 125 feet long, 100 foot ladder line included. 7-strand, 14-ga. wire. Use tuner/balun. 1500 Watts SSB/CW/Digital.

MFJ Vertical Mounted Antennas

MFJ 6-Band Cobweb Antenna

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Octopus *antenna hub turns hamsticks into four balanced* HF/VHF/UHF *dipoles!* Rotate for maximum signal, minimum QRM/noise. Mount low for local NVIS, high for DX. Perfect for portable, limited space, HOAs, camping, ARES. Balun. No tuner needed.
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MFJ-1799X, $429.95. Like MFJ-1799, but less 80M.

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MFJ-2990,$429.95. High performance 43 foot vertical operates 160-6 Meters, 1500 Watts SSB/CW/Digital. 2 square feet wind load. Self-supporting, no guy wires needed. 6063 aircraft aluminum tubing, bottom section 2" OD, .120" wall thickness. 20 lbs. Requires antenna tuner, ground/counterpoise.

BigStick ™ Vertical

MFJ-2286, $149.95. 7-55 MHz, *full 1/4 wave* 20-6M, 40M coil. 17 ft. extended, 28" collapsed. 2 lbs. 1 KW. Mount, radial kit included.

BigEAR ™ Dipole

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Determine velocity factor, coax cable loss in dB, length of coax and distance to short/open.

Read SWR, return loss and reflection coefficient at any frequency simultaneously.

Read inductance (uH) and capacitance (pF) at RF frequencies.

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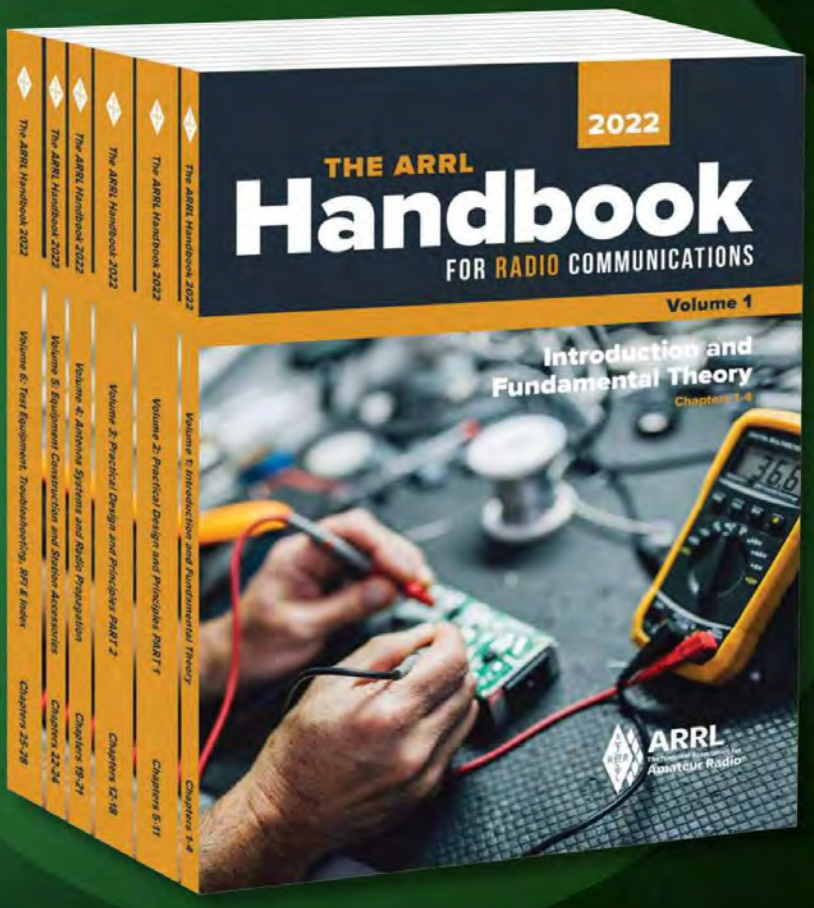

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MFJ-9201 **$74.95**

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MFJ-921/924 **$124.95**

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Eliminates RF hot spots, RF feedback, TVI/RFI, weak signals caused by poor RF grounding. Creates artificial RF ground or electrically places far away RF ground directly at rig. **MFJ-934, $279.95**, Artificial ground/300 Watt Tuner/Cross-Needle SWR/Wattmeter.

MFJ-931 **$139.95**

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MFJ Cobweb Antenna

6-Bands: 20/17/15/12/10/6 M . . . Outstanding Performance!

Restricted space spoiling your operating fun? MFJ Cobweb puts your call back on the map!

This six-band (20, 17, 15, 12, 10, 6 Meters) full half-wave *Cobweb Antenna* is perfect for restricted space or portable operation. Sky-gray fiberglass spreaders and *nearly invisible* wire elements (flat 9x9x1/2 feet square. 8 pounds), blend in with your surroundings while standing tough against nasty weather.

Outstanding performance! Horizontally polarized for less local noise pickup plus solid gain over verticals will allow you to work DX easily -- even on QRP. Omni-directional. No radials needed! Works great at low heights. Low SWR is due to MFJ's exclusive *Spider-Match*™ broadband network. Use lightweight TV hardware to mount on your chimney, balcony, mast.

Low in cost, but big on performance. MFJ *Cobweb Antenna* turns your space problem into a stack of QSL cards from far away places.

MFJ-1836HK34, $169.95. Add-on kit adds 40/30 Meters to MFJ-1836/1836H cobwebs.

MFJ-1838
$489.95

40-6 Meter Cobweb Super Heavy-Duty, 1.5 kW

New! Super heavy-duty 40-6 Meter Cobweb Antenna. Built to survive harsh northern winters, heavy snow, ice and strong winds -- has super-strong large diameter fiberglass and heavy-duty 14 gauge stranded hard copper wire. 8-bands: 40, 30, 20, 17, 15, 12, 10, 6 Meters, 1500 Watts. 12 feet, 23 lbs.

MFJ 20/17/15/12/10/6 Meter Hexbeam

***New* MFJ HexBeams** deliver solid gain and directivity on 20/17/15/12/10/6 Meters with two elements on each band.

MFJ uses an updated G3TXQ element configuration for excellent gain, improved bandwidth, superior front-to-back ratio and low SWR!

MFJ takes the HexBeam's unique balanced-tension framework to a new level with rugged mounting hardware, exceptionally durable spreaders and sliding antenna wire guides -- designed to ensure years of reliable service.

MFJ-1846, $599.95. 6 Bands: 20/17/15/12/10/6M, 2-elements per band, full 1500W. 25 lbs. 11 ft. turning radius.

MFJ-1848, $809.95. 8 Bands: 20/17/15/12/10/6M, 2-elements per band; 40/30M, single elements, full 1500W. 28 lbs. 14 ft. turning radius.

3-Element Hexbeam

MFJ-1856 is ***six*** individually stacked monband yagis!

6 Bands: 20/17/15/12/10/6M. Full 1500 Watts.

Three *full-size* elements on each band gives high gain, high front-to-back ratio and wide bandwidth. Works great at 20 feet. 30 lbs. 17 feet turning radius. Ideal for a small rotator like hy-gain's CD45 II, $449.95.

MFJ Isolator and 1:1 Balun

MFJ-915, $59.95. Stop *RF* traveling down coax line, painful RF "bites" and erratic operation. 1.5 kW 1.8-60 MHz. 2Wx5H". SO-239s.

MFJ-918, $59.95. True 1:1 Current balun & center insulator forces equal antenna currents in dipole elements.

MFJ Dry Dummy Load

MFJ-260C, $59.95. Air-cooled, 300 Watt dry dummy load with a non-inductive resistor in a perforated metal housing.

SO-239 connector. Full load 30 seconds. Silk-screened derating curve to 5 minutes. SWR below 1.1:1 to 30 MHz, 1.5:1 from 30 to 650 MHz.

MFJ 2-Pos. Antenna Switch

MFJ-1702C, $74.95. 2-Position antenna switch has center ground, auto grounding of unused positions, handles 2.5 kW PEP and works to over 500 MHz. Lightning surge protection. Quality SO-239 connectors, heavy duty diecast.

MFJ-1704, $129.95. Like MFJ-1702C but has 4 positions.

MFJ G5RV Antenna

MFJ-1778, $89.95. G5RV antenna covers 160-10 Meters with antenna tuner. 102 ft. long.

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However, in a study under the auspices of the U.S. Department of Energy utilizing the satellite FORTE carrying VHF lightning discharge sensors, it was determined that there can be damaging lightning energy emissions throughout the 30-300 MHz VHF spectrum. Therefore the damage threat can be anywhere from VLF through VHF.

Through careful design of the **Alpha Delta Model TT3G50 series broadband** precision constant impedance thru-line and ARC-PLUG™ module, allowing proper firing characteristics, this state of the art surge protector design allows effective protection throughout this entire spectrum.

- **Depending** on the connector style we provide excellent broadband performance through **3 GHz**, compared to narrowband DC blocked designs.
- **The impedance** compensated thru-line cavity design allows control voltages to pass through the device, instead of the "wire around" requirement of DC blocked designs. Our design also allows in circuit cable sweeps.
- **The innovative** field replaceable gas tube ARC PLUG™ module can be removed and replaced in the field with no tools required and without removing the surge protector from the circuit. The knurled knob does the trick. Connectors and knob are O ring sealed for environmental protection.
- **DC blocked** designs require the entire unit to be removed and discarded if hit with a surge beyond its rating. They are not field repairable.
- **As a result** of extensive testing and approvals within the military agencies, the Defense Logistics Agency (DLA) has assigned NSN numbers to our devices. Cage Code 389A5. All of our products are manufactured in the U.S.A. in our ISO-9001 certified facility for highest quality. Various connector styles available.

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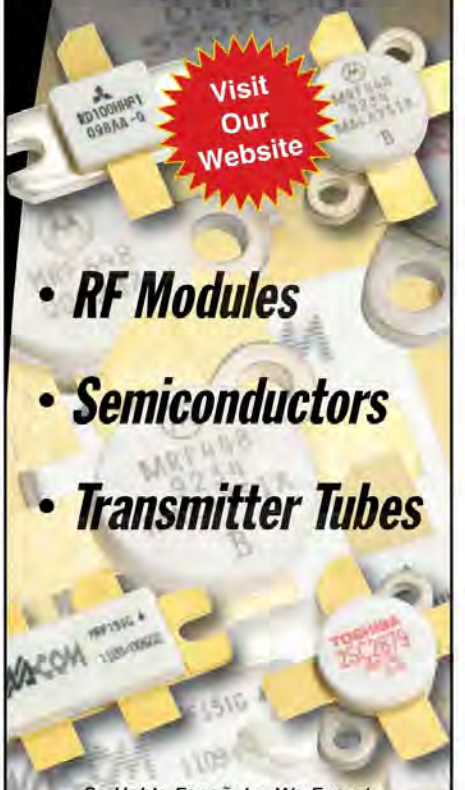

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Scores (continued from page 71)

Score listings are grouped according to the number of transmitters in simultaneous operation and their entry class. The listings show club or group name, call sign(s) used, total number of QSOs, number indicating power output used (5 is less than 5 W, 2 is less than 150 W, 1 is more than 150 W), number of participants, and total score including bonus points and ARRL Section. Entries are listed from highest to lowest claimed score in each class. Class A stations are clubs or groups portable with three or more participants. Class B stations are portables with one or two participants. When there are two operators, the other operator's call is listed in parentheses, if it is known. Class C stations are mobiles. Class D stations are home stations using commercial power. Class E stations are home stations using emergency power. Class F stations are EOC stations.

Three or More Person Club/ Non-Club Portable

1A

Not Case ARC
W3USA 1,753 2 3 8,134 OH
Hellgate ARC
W7PX 2,262 2 5 8,090 MT
Blazing Paddles FD Team
AB9YC 1,644 2 6 8,004 IL
NCAARS/Brock Mtn. CG
NG5M 1,582 2 5 7,218 AR
Mui's Marauders
W2RA 1,717 2 3 7,218 WNY
Lafayette DX Assn.
W9LDX 1,475 2 11 6,226 IN
Bedlington Terrior ARC of Tucson
WA7NB 1,510 2 3 6,008 AZ
Clayton Radio Dawgs
WØD 1,149 2 5 4,842 MO
Souris Valley ARC
KØAJW 1,064 2 12 4,806 ND
Dr. Loomis Memorial Junior Mechanics League
W3KDR 1,129 2 11 4,398 MDC
Benton ARS
K5NE 1,445 2 11 4,138 AR
California DX Assn.
AJ2J (+K6K) 1,087 2 10 4,014 LAX
Assoc. Radio Amateurs of So. New England
W1AQ 1,293 2 11 3,878 RI
Belews Cove Minions
N4CWZ 1,184 2 3 3,774 NC
3730 Group
VE3ORF 686 2 10 3,634 ONE
Page Valley ARC
K4PMH 981 2 10 3,506 VA
Bass Hill Repeater Group
W1KX 624 2 9 3,330 ME
HP Alumni RC
W1HP 695 2 4 3,306 ME
NV4H FD Group
NV4H 1,116 2 3 3,256 KY
Clinton Co. Contesters
W9PC 643 2 4 3,230 IN
Athens Co. ARA
W8MHV 585 2 11 3,194 OH
Fidelity ARC
W1MB 832 2 12 3,114 RI
Jupiter Tequesta Repeater Group
W4J 687 2 75 2,914 SFL
Anaconda ARC
W7VNE 772 2 6 2,856 MT
Ottawa ARC
VE3RC 492 2 10 2,828 ONE
Falmouth ARA
K1RK 863 2 32 2,676 EMA
New England Radio Discussion Soc.
K1A 412 2 16 2,542 ME
Stamford ARA
W1EE 529 2 20 2,536 CT
Williamsburg Area ARC
K4MRZ 506 2 6 2,518 VA
Explorer Post 599
WA2DFI 642 2 3 2,266 AZ
Crawford Mountain Boys and One Girl
KS3F 708 2 4 2,248 VA
Ham Assn. of Mesquite
KG5AUU 358 2 4 2,192 AR
Middle Peninsula ARC
W4HZL 454 2 31 2,084 VA
Eastern Michigan ARC
K8EPV 357 2 16 1,982 MI
Collins ARC
N5CXX 272 2 15 1,912 NTX
The Megamachine Repeater
K2XD 301 2 4 1,894 ENY
Bring Back the Band
ND7T 376 2 4 1,872 EWA
Motorola ARC
K9MOT 354 2 4 1,850 WI
Juneau ARC
KL7JRC 522 1 30 1,843 AK
SCAN/Red Ant Annihilators
KR6AL 703 2 4 1,760 LAX
Lake Agassiz RC
NØLAC (+WXØND) 343 2 11 1,674 ND
Edgefield Co. ARC
WR4EC 332 2 15 1,656 SC
Palm Bay ARC
K4DCS 413 2 6 1,654 SFL
ARC at University of Arkansas
W5YM 260 2 10 1,640 AR
Narwhal ARS
K3QB 146 2 17 1,634 WWA
Reno Co. ARA
WØWR 280 2 10 1,476 KS
NHRC A.R.S.
W1CUM 600 2 7 1,450 VT
Club Groupe Radio Amateur Amical
VA2RGA 521 2 8 1,392 QC
Hamfesters RC
W9AA 285 2 4 1,374 IL
Three Amigos
WS4Y 301 2 3 1,354 LA
Mt. Airy VHF Club
W2KV 475 2 3 1,348 NNJ
Warren Co. EmComm Group
AA4WC (+N4PSS) 149 2 7 1,318 VA
Montgomery ARC
W4AP 383 2 26 1,316 AL
Telluride ARC
KFØR 1,138 1 3 1,308 CO
Long Tail RC
NT3S 285 2 3 1,288 EPA
Valley and Massanutten ARA
KO4CTF 510 2 5 1,288 VA
Matagorda Co. Arc
W5WTM 277 2 7 1,242 STX
Crooked River Contest Club
K8VUS 251 2 3 1,208 OH
Hellgate ARC
K7BG 265 2 6 1,176 MT
Santa Clara Co. ARA
AC6YY 231 2 3 1,174 SCV
New Mexico BCARES Team
KC2LM 37 2 3 1,170 NM
Arizona ARC
W7IO 422 2 3 1,126 AZ
Fort Madison ARC
WFØRT 66 2 14 1,122 IA
Transit On The Rubicon Family FD Excursion
K6SB 200 2 3 1,112 SV
Club Radio Amateur Sorel-Tracy
VE2CBS 225 2 10 1,050 QC
Assoc. Radio Amateurs of Long Beach
W6RO 112 2 3 1,050 LAX
Western Tidewater RA
WT4RA 395 2 10 1,040 VA
Niagara RC
W2QYV 296 2 8 1,010 WNY
FBOM International
N6QB 191 2 10 1,004 SV
Newton ARA
WØWML 36 2 6 996 IA
Plattsmouth ARC
KBØSMX 89 2 18 986 NE
Central Valley Amateur Radio Enthusiasts
N6OOA 300 2 3 950 SJV
Highline ARC
NC7G 84 2 25 948 WWA
Fox Cities ARC
W9ZL 156 2 28 920 WI
Pella ARC
KØPEA 67 2 28 920 IA
Hidden Springs Field Day Site
WØFQ 223 2 3 916 IL
Lambert Family
AB7YQ 229 2 6 904 WNY
Comox Valley ARC
VA7VF 25 2 7 900 BC
Garden School ARC
K2GSG 23 2 25 896 NLI
603 ARC
N1PTT 206 2 10 862 NH
Lemhi ARC
K7A 96 2 4 862 ID
Mizpah Shrine Radio Unit
W9FEZ 127 2 3 856 IN
Central Dakota ARC
WØZRTR 301 2 24 852 ND
Fredericton ARC
VE9ND 150 2 4 840 MAR
Northwest Ohio ARC
W8EQ 160 2 22 824 OH
AR Tower Trailer Team
KG6JEI 179 2 3 808 SDG
Mine Canyon Contest Club
WR6E 322 2 5 794 SCV
Yukon ARA
VY1DX 72 2 18 790 NT
New Mexico BCARES Team
KI5FGJ 37 2 3 788 NM
Orrville ARS
KD8SQ 267 2 12 784 OH
Wood Co. ARC
K5TXQ 58 2 8 766 NTX
Mayerthorpe Flying Tigers
VE6FT 233 1 3 764 AB
Caribbean AR Group
WP4CRG 204 2 25 758 PR
Lambton Co. RC
VE3CFK 150 2 3 750 ONS
Sci-Tech ARS
K1MKD 80 2 7 750 MO
VA2LPQ et al.
VA2LPQ 139 2 4 706 QC
Front
NØIRN 92 2 3 692 MO
Renfrew Co. ARC
VE3YX 111 2 3 672 ONE
Kendallville Contesters/21 Repeater Group
N9VI 159 2 12 668 IN
Wasco AR Service
WC7EC 9 2 5 668 OR
Radio Club of Redmond
W7DM 147 2 3 666 EWA
Novi ARC
N8OVI 83 2 3 662 MI
Maury River Rain Dogs
WD8MQN 135 2 7 638 VA
Northeast Tarrant ARC
N5R 90 2 4 634 NTX
Outagamie ARES/RACES
K9OUT 96 2 12 634 WI
West Kootenay ARC
VE7CW 125 2 3 632 BC
Keeping Amateur Radio Fun
KØARF 190 2 3 630 MN
Franklin Springs Hams
WF2V 124 2 3 626 WNY
Upsher Area ARC
K5UAR 203 2 27 626 NTX
Nanaimo ARA
VE7NA 58 2 15 622 BC
Ocean State ARG
K1OS 100 2 4 600 RI
Emergency ARC of Hawaii
KH6CE 17 2 40 584 PAC
Indy Midtown ARC
NE9T 30 2 3 570 IN
Fond du Lac ARC
W9EBV 208 2 4 566 WI
Kingman Amateur Radio CW Operators Club
K7KGM 104 2 6 566 AZ
Stillwater ARA
WØJH 153 2 12 556 MN
Paul Bunyan ARC
WØBJI 81 2 15 512 MN
Garland ARC
KE5RFZ 30 2 4 510 NTX
NS1T Field Day
NS1T 124 2 3 504 CT
Douglas Co. Radio Responders
WA9KLM 20 2 4 490 WI
Spring Hill ARC
N5II 77 2 7 478 LA
Ko'olau ARC
KH6J 58 2 39 476 PAC
Lakewood ARC
KK6NXT 63 2 3 428 LAX
Boeing Employees AR Operators North Soc.
W7FLY 75 2 3 420 WWA
Weld ARS
KCØKWD 84 2 8 418 CO
M.A.R.C
WØW 70 2 5 390 SD
Atchison Co. ARS
KSØAT 69 2 5 388 KS

During the 2021 ARRL Field Day, an unlicensed camper from a nearby campground visited the Parker Radio Association's, KØPRA, event location in Colorado, to learn more about the event and ham radio. [Mike Bywater, ADØWB, photo]

University of Texas ARC
N5XU 8 2 6 382 STX
AA3TL 88 2 3 376 EPA
AR Caravan Club
W5CSY 37 2 35 364 NM
San Juan Co. ARS
AF4PM 54 2 3 358 WWA
North Country ARA
K8TTE 102 2 3 354 MI
Canton ARC
K5VZC 98 2 3 350 NTX
Tri-County ARA (CA)
K6AGF (+AG6YS)
50 2 5 350 LAX
DCT ARC
WA5DCT 28 2 3 338 NTX
Ancient Modulators
KØAMC 42 2 5 334 MO
Cowichan Valley ARS
VE7CVA 72 2 3 322 BC
Hi-Line ARC
W7HAV 27 2 7 304 MT
Seattle ACS
NK3E 12 2 4 298 WWA
South Jersey Radio Assn.
W2EA 14 2 9 278 SNJ
Trine Amateur RC
KD9SHK 113 2 4 276 IN
San Juan Co. ARS
K9QJS 9 2 4 268 WWA
Community ARC
K2SRV 6 2 5 262 WNY
WØBDP 1 2 3 252 MN
Jim's Farm Group
WØBJ 50 2 5 250 MO
Batesville Area RC
KI5EDP 44 2 3 238 AR
Luke-Jack Searchers
N3FP 21 2 3 212 GA
Chesapeake Bay Radio Assn.
WD3E 19 2 3 188 MDC
Manila Creek Stake ERC
AD6ZR 7 2 4 164 UT
Milton ARC
KN4VGY 6 2 3 162 NFL
KC5MVZ 5 2 3 160 WTX
Balihoo ARC
KC7LHV 15 2 8 80 ID
New Mexico BCARES Team
W5CBP 11 2 3 76 NM

1A — Battery

Chew's Ridge Gang
K6MI 816 5 7 9,190 SCV
Ridge Runners RC
W6BX 681 5 4 7,160 SCV
New England QRP Group
K1DFT 486 5 3 5,160 ME
Hunt Co. Packet Club
N5T 377 5 5 4,420 NTX
DeKalb Co. ARC Ed Ringer Memorial FD Team
W4DGH 371 5 10 4,160 AL
Montezuma Valley AR Operators
AI8Z 288 5 3 3,630 CO
Marconi ARC of Newfoundland
VO1MRC 109 5 5 2,135 NL
Saguaro Nights ARC
NS7F 58 5 4 1,550 AZ
Bill, Ken, and Marty
K4RET 98 5 3 1,460 VA
Alberta Clippers
VE7QF/6 110 5 5 1,350 AB
Pin Pals
KA5D 101 5 4 1,210 STX
Three Ammonites
K7ARJ 100 5 3 1,150 ID
Turkey Heaven Mtn. Repeater Assn.
KF4DVW 54 5 3 890 AL
American Legion Post 33 ARC
W9TAL 3 5 6 880 IL
Comox Valley ARC
VE7CVW 16 5 3 830 BC
York Co. Radio Soc.
N4ARI 18 5 3 630 VA
OCAPA
N3CI 58 5 3 575 OK
Stanwood-Camano ARC
K7LTZ 17 5 3 505 OR
Orange Co. Radio Amateurs & Durham FM Assn.
N4GF 4 5 5 410 NC
Colorado QRP Club
WØCQC 39 5 4 345 CO

1A — Commercial

Brainerd Area ARC
KØFVF 795 2 3 3,330 MN
WV0H FD Group
WV0H 502 2 8 2,058 CO
Cedar Grove ARC
WW2G 559 2 3 1,968 NNY
Ozaukee RC
AB9PN 448 2 3 1,790 WI
Southeast KS ARC
KØSEK 534 1 12 1,060 KS
Federación de Radio Aficionados de PR
KP4FRA (+WP4RSA)
85 2 8 920 PR
Marshall Co. ARC
K9ZLQ 235 2 21 520 IN
Ohio Valley Experimenters Club
KD8LBS 117 2 12 484 OH
Mackenzie Regional RC
VE6MRF 96 1 9 360 AB
Oro Valley ARC
K7T 67 2 3 298 AZ
Cascades ARS
W8JXN 106 2 5 262 MI
Swan Ham RC
NJ3B 38 2 3 202 WPA
Tri-County ARC (NC)
NC4AR 31 2 11 162 NC
Peninsula Radio Operators
W3PRO 19 2 15 126 MDC
EVQRP
K7JLF 30 2 3 110 AZ

2A

Radio Amateurs of Northern Vermont
W1NVT (+W1PU)
4,945 2 16 15,900 VT
Muskogee ARC
K5CM (+KK5I)
3,047 2 8 13,110 OK
Newport Co. RC
NE1RI (+W1SYE)
3,385 2 40 12,482 RI
Greer ARC
K4SV 3,098 2 14 10,012 SC
MSU ARC, Magnolia ARC, Lowndes Co. ARC, MFJ ARC
W5YD (+K5MFJ)
2,288 2 30 9,418 MS
McHenry Co. Wireless Assn.
K9RN (+KA9CAR)
2,020 2 16 8,848 IL
Tom's Garage ARC
N6MI (+N7DA)
2,358 2 7 8,774 SB
CTRI Contest Group
KE1S 2,204 2 9 8,526 CT
Minnesota Wireless Assn.
NØAT 1,687 2 14 8,198 MN
Mountain AR Contest Org.
N4NX (+W4IZT)
1,548 2 7 7,544 GA
Cape Fear ARS
K4MN (+KF4JDR)
1,900 2 25 6,800 NC
Berger's Bandits RC
K3II 1,689 2 5 6,682 EPA
W/K ARC of Greater Milwaukee
W9I 1,344 2 12 6,600 WI
Wisconsin River Gang
W9AV 1,570 2 3 6,520 WI
Williamsburg Area ARC
K4RC (+AI4WU)
1,702 2 58 6,360 VA
Mountaineer ARA
W8SP 1,487 2 21 6,246 WV
Nashoba Valley ARC
N1NC (+WU3C)
1,271 2 22 6,142 EMA
Greater Norwalk ARC
N1EV 1,474 2 21 6,046 CT
Trojan ARC
NWØK 1,216 2 5 5,800 KS
Montrose Co. ARC
KØIIT (+KCØQXX)
1,194 2 67 5,540 CO
Rochester (MN) ARC
KØT 1,422 2 27 5,504 MN
Alamance ARC
N4MIO 1,234 2 6 5,222 NC
Big Bend ARC
K5FD (+N5CET)
1,320 2 9 5,166 WTX
Central Oregon DX Club
N7LE (+N7XU)
1,343 2 14 5,054 OR
First State ARC
K3F 1,062 2 23 5,052 DE
Reelfoot ARC
K4RFT (+N4MJ)
808 2 9 5,014 TN
Crawford ARS
W3MIE (+N3QQH)
1,125 2 25 4,936 WPA
Monroe Co. Radio Communications Assn.
W8PI (+W8DWL)
1,288 2 21 4,716 MI
Carbon Co. DXCC
N7W 1,083 2 8 4,510 WY
Massillon ARC
W8NP (+KC8WVH)
879 2 43 4,368 OH
Candlewood ARA
W1QI 989 2 14 4,352 CT
Nittany Contest Club
KC3R 2,824 1 5 4,300 WPA
Northeast Wisconsin ARC
K9TIT 957 2 7 4,248 WI
Del Mar CERT
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769 2 4 4,226 SDG
Rogue Valley ARC
K7MFR 1,440 2 10 4,164 OR
Spartanburg ARC
K4II 849 2 20 4,046 SC
Waldo Co. ARA
N1TN 1,075 2 19 3,936 ME
Susquehanna Valley ARC
W3VPJ (+KD3MC)
687 2 26 3,798 EPA
Garden State ARA
W2GSA 890 2 34 3,700 NNJ
Lancaster Co. ARES
WE4LC 739 2 4 3,684 VA
Peekskill/Cortlandt ARA
W2NYW 1,366 2 25 3,662 ENY
Muscle Shoals ARC
W4JNB (+WX4CC)
879 2 50 3,618 AL
Hancock ARC
W9ATG (+N9TT)
789 2 26 3,610 IN
Tallahassee ARS
K4TLH 943 2 50 3,564 NFL
Mecklenburg ARS
W4BFB (+NC4DP)
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N2NC 1,097 2 4 3,516 WV
West Virginia Amateur Radio
WV8AR 871 2 9 3,420 WV
Maui ARC
KH6RS 1,693 1 19 3,407 PAC
Trident ARC
N4EE 1,206 2 15 3,386 SC
Charlotte ARS
WX4E 570 2 24 3,328 WCF
Story Co. ARC
WØYL 816 2 30 3,318 IA
Blackstone Valley ARC
W1DDD (+NA1Q)
634 2 35 3,258 RI
ARC EmComm Srvc.
WB2QBP (+K2ARC)
667 2 15 3,180 NLI
Boulder ARC
WØDK (+WØDK)
1,034 2 25 3,174 CO
Canton ARC
W8AL (+NX8J)
643 2 26 3,164 OH
Schaumburg ARC
N9RJV (+KD9HIL)
822 2 37 3,144 IL
ARTS of Louisville
W4CN (+KY4DX)
663 2 20 3,078 KY
Davie/Cooper City ARC
NA4DC 361 2 18 2,978 SFL
Otsego Co. ARA
NC2C 720 2 3 2,916 WNY
Wood Co. ARES/RACES
W9WCA (+KD9IFV)
448 2 15 2,848 WI
Pine State ARC
N1ME 787 2 22 2,836 ME
Radio Operadores Del Este
KP3RE 562 2 18 2,820 PR
Desertores FD Squad
NP4WW 680 2 8 2,816 PR
Los Angeles ARC
W6PCH 447 2 30 2,812 LAX
ARA of Nebraska
WØWWV (+KØVZ)
532 2 18 2,802 NE
Radio Soc. of Ohio
K8RSO (+KD8EXA)
639 2 10 2,776 OH
Tippecanoe ARA
W9REG 474 2 20 2,718 IN
Lighthouse ARA
K4LM 973 2 6 2,710 SFL
Vienna Wireless Soc.
NT8B (+K3NHT)
475 2 6 2,688 VA
Bonac ARC
K2EC 1,110 2 5 2,670 NLI
Tri-County Radio Assn.
K2FO 834 2 3 2,646 ENY
Northeast Wireless RC
NW2C 552 2 9 2,612 NLI
Missouri Outdoor Club
WØMOC 703 2 5 2,582 MO
Anderson RC
N4AW 561 2 33 2,572 SC
Vermilion Range ARC
KØVRC 489 2 6 2,502 MN
WPA Field Day Assn.
KS3N 634 2 8 2,496 WPA
Butler Co. (OH) ARA
W8WRK 645 2 20 2,494 OH
The Villages ARC
K4VRC 1,231 1 38 2,493 NFL
Baton Rouge ARC
W5GIX (+K5LSU)
521 2 30 2,452 LA
Whidbey Island Trailblazers
W7WIT 689 2 4 2,390 EWA
Kentucky Colonels ARC
KY4BG 688 2 18 2,388 KY
Littleton Area RC
W1A (+KC1AEM)
445 2 17 2,358 NH
Powhatan Area RC
N4POW 827 2 40 2,336 VA
Independent Radio Crew
K3ODX 600 2 3 2,326 EPA
King Harbor Yacht Club Radio Fleet
K6HYC (+K6UU)
460 2 8 2,324 LAX
Orange Park ARC
K4BT 322 2 24 2,284 NFL
Disney EARS
WD4WDW1,033 1 8 2,255 NFL
South East Metro ARC
WØCGM 383 2 10 2,240 MN
St. Mary's Co. ARA
K3HKI (+KF7AWC)
472 2 22 2,220 MDC
Kingsport/Bays Mountain ARC
W4TRC 416 2 10 2,178 TN
CQ805
N6EOF 631 2 12 2,172 SB
Northeast Tarrant ARC
N5EOC (+K5WZS)
354 2 24 2,132 NTX
Batesville Area RC
K5BRC 616 2 25 2,122 AR
Ogden ARC
W7SU 362 2 63 2,122 UT
Radio Amateurs of Skagit Co.
N7AN 421 2 20 2,110 WWA
Eastern PA ARA
N3IS 385 2 25 2,104 EPA
Columbia ARS
NF4CQ 257 2 22 2,104 NFL
Kent Co. ARC
KC3ARC (+KC3BTV)
415 2 18 2,096 DE
New Jersey Antique RC
W2RTM 670 2 15 2,096 NNJ
Emergency Repeater System
N5ERS 457 2 4 2,092 NTX
Phillips Co. ARC
WØZXN 407 2 7 2,080 KS
Calhoun Co. ARA
W4S 344 2 20 2,066 AL
Escondido ARS
N6SD 380 2 8 2,032 SDG
Oak Ridge ARC
K4PJ 332 2 8 1,986 TN
Ellsworth Amateur Wireless Assn.
W1TU 288 2 3 1,970 ME
Draper Ham RA
K7DPR (+NA7C)
120 2 40 1,968 UT

Whatcom Emergency Comm. Group/ Mt. Baker ARC
W7ECG (+W7JIM) 152 2 77 1,950 WWA
Kitsap Co. DX Club
W7CD 370 2 3 1,930 WWA
Indiana Co. ARC
W3BMD 571 2 9 1,928 WPA
Lake Co. (OH) ARA
N8BC 479 2 7 1,924 OH
Utica ARC
K2IQ 309 2 8 1,914 WNY
Lake Conroe ARC
AC5LC 261 2 18 1,900 STX
Charleston ARS
WA4USN (+KW4XQ) 328 2 17 1,896 SC
Decatur ARC
W4ATD (+KD4TGC) 439 2 36 1,872 AL
Lake of the Ozarks ARC
N0ZS (+KD0SB) 440 2 20 1,854 MO
Walton Co. Repeater Group and Walton Co. ARES
WC4RG 195 2 13 1,820 GA
Pamlico ARC
K4BCH (+K4OTH) 463 2 10 1,816 NC
N0SFF 564 2 9 1,806 IA
Hamilton (OH) ARC
W8AJT 515 2 14 1,800 OH
F.A.R.G.
W7A 353 2 3 1,790 AZ
Jim Bell Wireless Assn.
K4TNS 215 2 19 1,786 AL
Cambridge ARA
W8VP 260 2 18 1,760 OH
KA3PVM and family plus N3DRL
KA3PVM 398 2 4 1,758 MDC
YoloARS/MTVACA/SACARC/Yolo Co. ARES/UCDARC
W6YAR 233 2 15 1,754 SV
Eastern Panhandle ARC
K8EP 471 2 8 1,730 WV
Mike & Key ARC
K7ANE 683 2 3 1,716 EWA
Blossomland ARA
W8MAI (+W8KIT) 212 2 25 1,716 MI
Traveling AR Team
AC7YT 1,346 1 4 1,696 UT
N0OH Field Day
N0OH 434 2 8 1,694 MN
Pueblo West ARC
NA0PW 305 2 4 1,670 CO
Raytown CERT
WA0TTS 218 2 23 1,660 MO
Paso Robles ARC
W6R (+W6T) 287 1 41 1,658 SB
Oakland Radio Communication Assn.
WW6OR 603 2 18 1,656 EB
Eastern Fulmont ARC
W2F 180 2 3 1,654 NNY
Sierra Blanca ARC
KR5NM 297 2 8 1,646 NM
Thibodaux ARC
W5YL 259 2 20 1,642 LA
Muncie Area ARC
N9RI (+K9HMX) 220 2 21 1,632 IN
McMinn Co. ARC
K4RST 380 2 22 1,630 TN
Washington Area ARC
W0ARC 159 2 11 1,618 IA
Santa Fe ARC
KS0KS (+W9UA) 418 2 15 1,574 KS
Cross Roads Ham RC
W5LCR 249 2 8 1,540 STX
Kootenai ARS
K7ID 249 2 28 1,526 ID
Poway ARS
N6PWY (+N6WST) 189 2 30 1,518 SDG
Yellow Thunder ARC
WB9FDZ (+W9ET) 183 2 5 1,510 WI
Hiawatha Valley ARC
AA0RW 322 2 17 1,506 MN
Jasper RC
K4ACW (+KG4YOL) 53 2 15 1,494 GA
East Penn ARC
W3LP 201 2 4 1,490 EPA
North Georgia ARC
W4QQ (+W4PYM) 235 2 9 1,422 GA
Yellowknife ARS
VE8YK 414 2 4 1,422 NT
Apple City ARC
W7TD 305 2 21 1,410 EWA
Randolph Co. Emergency RC
K4RAN (+WB4UKY) 154 2 16 1,398 AL
Atlantic Region Repeater Legion
W2XTV 372 2 8 1,394 NNJ
Barron Co. ARA
KD9EJA 255 2 8 1,388 WI
Delaware Valley RA
W2ZQ 359 2 6 1,348 SNJ
Jamestown ARC
W0FX 216 2 3 1,346 ND
Addison Co. ARA
N1FS 198 2 8 1,332 VT
Helena ARC
W5HAR (+W5HAR) 83 2 14 1,316 AR
Theodore Roosevelt ARC
K0ND 206 2 25 1,314 ND
Soc. Of Newfoundland Radio Amateurs
VO1VON 15 2 20 1,304 NL
Valencia Co. ARA
K5OUR 189 2 35 1,302 NM
Morrow Co. AR Service
W8NL 247 2 5 1,294 OH
The Ohio 337 Ragchew Crew
W6VM 406 2 3 1,290 OH
Boerne ARC
AB5UE 109 2 10 1,288 STX
Delaware Lehigh ARC
W3OK 266 2 39 1,282 EPA
Elk River Ham Group
W0A 252 2 4 1,276 MO
ARC of Parker Co.
W5PC (+N5GMJ) 188 2 13 1,270 NTX
Cedar Creek ARC
K5CCL 56 2 20 1,266 NTX
Yavapai ARC
W7YRC 193 2 73 1,236 AZ
Knox Co. ARC
W9GFD 164 2 12 1,232 IL
Kitsap Co. ARC
KC7Z 210 2 25 1,224 WWA
Ashe Co. ARC
K4J 197 2 10 1,220 NC
Midwest ARC
W0QJ 315 2 5 1,214 MO
WCARC-TX
K5NCO 4 2 4 1,204 STX
North Shore (BC) ARC
VE7NSR 424 2 8 1,198 BC
Mountain ARC
W6BW 105 2 29 1,178 SJV
Palouse Hills ARC
KD7PH (+AG7CC) 92 2 23 1,160 ID
Metuchen RC
K2YNT 384 2 7 1,156 NNJ
Barstow ARC
K6UO 186 2 10 1,154 ORG
Wheaton Community Radio Amateurs
N0MO 201 2 3 1,152 IL
Peace River Radio Assn.
W4DUX 258 2 10 1,128 WCF
WD6BNY 220 2 3 1,112 WI
Kansas/Nebraska ARC
N0GJ 74 2 33 1,110 KS
Island Co. ARC
K7W 198 2 11 1,108 WWA
Mics & Beers
WJ7H 140 2 4 1,098 WWA
Stanly Co. ARC
K4OGB 128 2 18 1,098 NC
Twin City FM Club
W0EF 124 2 12 1,090 MN
White Rock Lake ARC
WA5WRL 66 2 40 1,086 NTX
Central Alberta ARC
VE6QE 206 2 17 1,084 AB
Warren ARS
W0IND 211 2 14 1,070 IA
Laurel ARC
W3LRC 109 2 7 1,068 MDC
Western Carolina ARS
W4MQE 130 2 4 1,040 NC
Fullerton RC
W6ULI 192 2 10 1,034 ORG
Ascension ARC
K5ARC 36 2 15 1,022 LA
WB0YLA 148 2 4 1,014 IA
North Franklin ARS
N2NNY 215 2 8 1,000 NNY
Great River ARC
W0DBQ 173 2 22 996 IA
Martinez ARC
KF6HTE 70 2 7 990 EB
Spa ARA
WB5SPA 139 2 16 988 AR
Clarksville ARS
KF4L 157 2 10 978 TN
Antelope Valley ARC
K6OX 46 2 30 970 LAX
Key City ARC
KC5OLO 147 2 25 964 WTX
3 Rivers ARC
N7ELI 151 2 22 952 ID
Statesboro ARS/Southeast ARA
KF4DG (+AB7HA) 190 2 14 950 GA
Larkfield ARC
W2LRC 48 2 10 928 NLI
American Legion Post 1 ARC
KI5NNG 83 2 3 920 OK
Coast Side ARC
WA6TOW 176 2 20 920 SCV
South Halton ARES Group
VE3OKV 181 2 6 916 GTA
Big Island ARC
KH6EJ 103 2 4 910 PAC
Lincoln Co. (OR) ARC
N7OY 67 2 20 884 OR
Dade RC of Miami
W4E 214 2 10 878 SFL
Rich and Ron's Field Day
KJ6HRO 135 2 9 870 SV
Sooland ARA
K0TFT 128 2 5 862 IA
Sun City Peachtree AR Group
W4SCP 56 2 15 858 GA
America West ARC
K7AWA 170 2 3 854 AZ
DeKalb Co. ARC Ed Ringer Memorial FD Team
KK4ICU 148 2 20 846 AL
Tri-County ARC (WI)
W9MQB 123 2 7 840 WI
Brownwood ARC
K5BWD 128 2 11 832 NTX
Albemarle ARC
KG4EIF 140 2 4 830 VA
Denver Radio League
KE0NRE 20 2 6 828 CO
Los Alamos ARC
W5PDO 84 2 15 826 NM
W5ZW 235 2 4 820 AR
Arkansas Radio Emergency Services
N5AT 93 2 12 810 AR
Mid-Atlantic ARC
W3NWA (+WB3JOE) 124 2 18 802 EPA
Berks Amateur Radio Contest Club
W3EV 187 2 3 798 EPA
Pahrump Amateur Radio Repeater Assn.
W7NYK 78 2 27 794 NV
Gainesville ARS
K4GNV 72 2 23 794 NFL
Pictou Co. ARC
VE1UW 104 2 13 786 MAR
Rhode Island ARES
W1RIA 116 2 8 780 RI
Boaz-Albertville ARC
KN4UPN 53 2 7 776 AL
KSC ARC
N1KSC 101 2 5 752 SFL
South West Louisiana Amateur Repeater Club
W5BII 29 2 9 744 LA
Cabarrus ARS
K4WC 142 2 10 734 NC
Club Radioamateur de Drummondville
VE2CRD 73 2 8 730 QC
Club Radioamateur de la Vallée du Richelieu
VE2CVR 209 2 20 714 QC
Palestine Anderson Co. ARC
K5PAL 79 2 9 708 NTX
Santa Clarita ARC
W6JW 97 2 15 706 LAX
Beaufort Radio Amateur Group
W4BFT 46 2 11 696 SC
Gaston RC
WG4RC 161 2 7 692 NC
Seward ARC
KL7SWD 47 2 12 686 AK
University of Southern California ARC
W6YV 100 2 3 650 SB
Victoria ARC
W5DSC 41 2 12 632 STX
Coweta RC
N4CRC 101 2 20 624 GA
Education Alliance for Amateur Radio
KE3AAR 83 2 3 616 EPA
Club de Radio Amateur Outaouais
VA2EP 127 2 3 612 QC
Detroit Lakes ARC
W0EMZ (+KA0Q) 70 2 20 608 MN
Bolingbrook ARS
WA9EAT 129 2 3 608 IL
Young Co. ARC
KI5JZM 13 2 6 602 NTX
ACARES
W5AWP 153 2 10 596 MS
Greenwood ARC
VE1ARC 17 2 25 592 MAR
Delmarva DX Assn.
W3PP 100 2 3 586 DE
Collins Melbourne Comm/Nav
KM4YRI 17 2 3 584 SFL
Hickman ARC
KG5A 12 2 4 574 AR
Renton EmComm Service
K7FDF 62 2 6 574 WWA
Sandia Vista ARC
WV5X 105 2 6 560 NM
Valley RC of Oregon
K7YL 118 2 3 546 OR
Natchaug ARC
N1NUG 44 2 3 538 CT
MIT Radio Soc.
W1MX 89 2 8 528 EMA
Roanoke Valley ARC
K9CMS 92 2 4 516 VA
Steubenville-Weirton ARC
W8CWO 129 2 6 508 OH
N3RRDS
N3PPD 84 2 3 498 MDC
Atlanta RC
W4DOC 63 2 6 488 GA
Oroville ARS
W6AF 116 2 15 486 SV
Clallam Co. ARC
W7FEL 32 2 3 478 WWA
Springfield RACES Club
KC1FID 60 2 6 470 WMA
Boomer Bill ARC
W6AFS 107 2 3 464 SJV
Pocatello ARC
N7PI (+KJ7KPP) 41 2 20 452 ID
Emporia ARS
W0EMP (+KE0GXX) 35 2 4 446 KS
Miamisburg Wireless Assn.
WA8PLZ 30 2 12 440 OH
Englewood ARS
N4EAR 36 2 6 422 WCF
Wireless Operators of Winsted/CQ RC
WB1DJU 29 2 7 408 CT
Foothill Flyers RC
W6FHF 25 2 8 400 LAX
Spirit Valley Amateurs
N0EO 63 2 7 388 MN
Bainbridge Island ARC
W7NPC (+K7EXP) 48 2 18 366 WWA
Almaden RC
KN6NUA 32 2 16 324 SCV
White Rock ARC
VE7DB 42 2 10 168 BC

2A — Battery

510 RG
NE1C 748 5 5 8,330 WMA
Wilsons Wonders
WA7NCL 418 5 4 5,210 EWA
Club KC5NX
KC5NX 295 5 35 3,545 NTX
Workshop88
AC9VC (+KD9PII) 256 5 4 2,895 IL
Gateway ARC
K4GAR 305 5 4 2,770 GA
Mountain Group
N2PA 136 5 3 1,710 WNY
NE TX QRP Contest Fed.
KA5CJJ 143 5 3 1,680 NTX

2A — Commercial

Lynchburg ARC
K4CQ (+W3CQ)
1,873 2 88 7,946 VA
Radio Central ARC and Order of Boiled Owls of NY
W2RC 1,940 2 20 7,140 NLI
Henry Co. ARC
W9OB 588 2 21 2,390 IN
Southwest Dallas Co. ARC
W5WB (+W5AUY)
452 2 26 2,244 NTX
Cleveland Co. Amateur Radio Service
NA4CC 367 2 11 2,210 NC
Shreveport ARA
K5SAR (+KC5PQL)
577 2 6 2,166 LA
Vieques Island ARC
NP3VI 375 2 13 2,150 PR
North Shore (IL) RC
KV3T 515 2 4 2,088 IL
Sumter ARA
WZ4O 666 2 20 2,084 SC
Azalea Coast ARC
AC4RC 468 2 24 1,986 NC
Michigan Amateur Radio Alliance
W8USA 490 2 9 1,802 MI
Cascade RC
W7EK 300 2 16 1,750 WWA
TLSC Amateur Radio Group
KC3TL 409 2 13 1,702 WPA
Greater Nebraska ARL
K0GNE 575 2 4 1,620 NE
East Pasco ARS
K4EX 407 2 14 1,584 WCF
MOBARC
N9NIX 290 2 3 1,558 IL
West Texas ARC
NT5EE 364 2 3 1,542 WTX
Alpha RC
WD4ARC 385 2 20 1,444 GA
Geauga ARA
K8WHB 341 2 30 1,076 OH
Mountain State Transmitters
K8VNQ 96 2 10 956 WV
Eastern Ontario ARC
VE3SAU 451 2 11 952 ONE
Valley RC of Oregon
W7PXL 277 2 50 924 OR
Skyline Tower ARC
W7DTV 235 2 4 764 OR
Wexaukee ARC
K8CAD 149 2 10 734 MI
Manhattan Area ARS
KS0MAN 228 2 25 718 KS
Tri-States ARC
W4GTA 69 2 75 708 GA
Toccoa ARS
K4TRS 32 2 22 664 GA
North Mason ARES
NM7E 88 2 12 656 WWA
Hancock-Hawkins Amateur Radio Team
N2H 39 2 9 628 TN
NEPA Emergency Services ARC
W3LAK 149 2 3 600 EPA
Toledo Mobile RA
W8HHF 213 2 7 596 OH
Magnolia DX Assn.
K5MDX 149 2 7 528 MS
Technology in ARC
K8TAR 191 2 5 514 MI
Healing Springs Mtn. VHF Soc.
W4PAR 65 2 10 502 NC
Pine Bluff ARC
K5DAK 124 2 3 498 AR
Coastline ARA
N1EG 134 2 20 418 CT
Northeast Arkansas RC
K5NEA 149 2 15 348 AR
Richfield RC
W0RRC 51 2 10 338 MN
Brazoria Co. Amateur Radio Service
K5BRZ 66 2 22 318 STX
Edison Amateur Radio Network
W6SCE 45 2 5 286 ORG
Watertown ARC
W9TTN 20 2 6 190 WI
Porterville ARA
KE6WDX 17 2 5 34 SJV

3A

Indy United ARC
W9SU (+W9RCA)
5,342 2 32 19,666 IN
W3AO PVRC
NR4M 3,132 2 7 12,878 VA
Port City ARC
K1R 3,831 2 25 12,348 NH
Mississippi Valley ARA
W9MVA (+W9FCC)
3,336 2 15 12,344 WI
Prairie Dog ARC
W0OJY (+W0EJ)
3,143 2 27 12,150 SD
Randallstown ARC
N3IC (+K3MZ)
3,310 2 16 11,870 MDC
Fulton Co. ARC
K9ILS 3,115 2 15 11,852 IL
North Fulton ARL
K4JJ (+NF4GA)
2,791 2 141 11,110 GA
OH-KY-IN ARS
K8SCH (+N8YC)
2,889 2 20 10,296 OH
Signal Hill ARC
K4NN 2,816 2 7 9,882 WV
Livonia ARC
K8UNS 2,762 2 36 9,684 MI
Central West Virginia Wireless Assn.
K8DF (+WV8HC)
2,662 2 23 8,788 WV
ARES of Douglas and Elbert Co.
W0RDR (+WA0DE)
2,132 2 38 8,352 CO
Columbus ARC
W4CVY (+W4FIZ)
2,217 2 35 7,914 GA
Wireless Soc. of Southern Maine
WS1SM (+N5QYQ)
1,784 2 25 7,422 ME
Paducah ARA
W4NJA 2,419 2 14 7,376 KY
Tennessee Valley DX Assn.
KM4EA 1,653 2 24 7,044 TN
Utah ARC
W7SP 1,702 2 15 6,914 UT
Utah Valley ARC
K7UVA (+K7GSL)
1,930 2 58 6,764 UT
Rocky Mountain Ham Radio
N0SZ (+W0KVA)
1,730 2 31 6,754 CO
Dial RC of Middletown
K8PI (+W8BLV)
1,536 2 17 6,498 OH
Oakland Co. ARS
W8TNO (+KD8TXZ)
1,486 2 10 6,466 MI
Hampden Co. Radio Assn.
W1NY 2,508 2 23 6,384 WMA
York Co. SC ARS
K4YTZ (+N4YTZ)
2,311 2 20 6,010 SC
Fauquier ARA
W4VA (+KW4VA)
1,485 2 27 5,972 VA
Barnstable ARC
W1MA 1,850 2 11 5,786 EMA
El Dorado Co. ARC
AG6AU 1,461 2 10 5,694 SV
Calgary ARA
VE6NQ (+VE6NRO)
1,319 2 11 5,536 AB
Radio Farm
N0MMA 1,628 2 15 5,520 IA
Mt. Vernon (OH) ARC
K8EEN 1,321 2 20 5,390 OH
Greater Beloit ARC
K9BY 1,184 2 16 5,248 WI
N4N Field Day Group
N4N 1,024 2 5 5,244 GA
Lincoln ARC
K0KKV (+K0NEB)
1,171 2 129 5,160 NE
San Mateo RC
W6UQ 1,242 2 32 5,158 SCV
Fayette Co. ARC
W4JB 1,337 2 20 5,040 GA
The 415 ARC
N9WH 1,154 2 27 5,012 IL
Albany ARA
K2CT 1,118 2 32 4,930 ENY
Truckee Radio Amateur Soc. Hams
K6NV 1,004 2 11 4,910 SV
Clearwater ARS/St. Petersburg ARC/ Upper Pinellas ARC
W4TA 1,187 2 60 4,846 WCF
Forx ARC
N0GF 1,240 2 16 4,818 ND
Cumberland Plateau ARC
N4T (+NV1T)
988 2 63 4,804 TN
Monkey Lover's Radio Consortium
K6MMM 975 2 44 4,744 SCV
Stanwood-Camano ARC
W7PIG (+K7UDG)
867 2 53 4,666 WWA
Okaw Valley ARC
AD9OV (+AD9RR)
910 2 40 4,656 IL
L'Anse Creuse ARC
N8LC 1,265 2 15 4,656 MI
Bella Vista RC
N5BVA 1,047 2 35 4,608 AR
Whitley Co. ARC
WC9AR (+KC9ANF)
1,039 2 19 4,594 IN
VBARC-VADXCC
W4UG 1,189 2 19 4,592 VA
The FPL Group
K8ESQ 1,099 2 4 4,438 MI
Central Idaho ARC
W7TID 809 2 21 4,300 ID
Springhill Repeater Assn.
W4C (+WT4CC)
877 2 20 4,164 TN
Blue Ridge ARC
W4YK 1,002 2 16 4,128 NC
XRX & Monroe Co ARES RC
W2XRX (+WB2EOC)
947 2 47 4,114 WNY
Parker RA
K0PRA (+K0TNG)
1,224 2 63 4,110 CO
West Chester ARA
WC8VOA 1,248 2 18 4,110 OH
University of Arizona ARC
K7UAZ 793 2 11 4,060 AZ
ARESLAXNW
N6VI (+W1EH)
737 2 29 4,024 LAX
Uniontown ARC
W3PIE 959 2 25 4,024 WPA
Nassau ARC
K2VN 1,059 2 40 4,016 NLI
Murray State Univ. ARC
K4MSU (+W4GZ)
904 2 25 3,910 KY
Hambuds
AF5M 670 2 29 3,736 STX
Hernando Co. ARA
K4BKV 1,009 2 12 3,710 NFL
Palo Alto ARA
N6A 1,109 2 3 3,686 SCV
Shenandoah Valley ARC
W4RKC 813 2 17 3,622 VA
Cuyahoga Falls ARC
W8VPV 802 2 15 3,616 OH
Madison Co. Ohio ARC
KE8RV 586 2 17 3,578 OH
SPARK/HPT/PARC
W4QR 747 2 48 3,576 VA
Tamiami ARC
W4AC (+W2XYZ)
1,133 1 19 3,570 WCF
Central Michigan ARC
W8MAA 837 2 37 3,552 MI
Coshocton Co. ARA
W8CCA 612 2 18 3,522 OH
Mining ARC/St. Paul RC
W0MR (+K0AGF)
749 2 45 3,510 MN
Arkansas River Valley ARF
K5PXP (+NE5S)
639 2 24 3,488 AR
Saratoga Co. ARA
K2DLL (+KG2H)
687 2 11 3,478 ENY
Cherokee ARS
W1J (+KB4MG)
626 2 27 3,452 GA
Tri-County Radio Assn.
W2LI 637 2 29 3,452 NNJ
Shelby ARC/ARES of Clev. Co
KM4C 828 2 46 3,430 NC
West Fork ARC
K5YW 1,173 2 15 3,380 NTX
Lincoln Co. (ME) ARC
K1LX (+K1NI)
805 2 12 3,370 ME
Tellico Lake ARC
KN4DUA (+KK6OKU)
714 2 35 3,346 TN
Panoramaland ARC
K7JAR (+KF7SYS)
521 2 20 3,324 EWA
Sandhills ARC
K2C 898 2 6 3,316 NC
Clark Co. (WA) ARC
W7AIA (+N7HR)
830 2 26 3,230 WWA
Brightleaf ARC
W4AMC 636 2 13 3,094 NC
Alliance ARC
W8LKY (+KE8OWD)
537 2 46 3,088 OH
High Sierra Field Day Group
K6HS 586 2 7 3,086 SV
Ski Country ARC
K0RV 656 2 44 3,032 CO
Heritage Hunt Hams
WA4HH 647 2 17 2,904 VA
Martin Co. ARA
K4ZK (+WX4MC)
609 2 40 2,894 SFL
McKinney ARC
W5MRC 611 2 32 2,876 NTX
Owensboro ARC
K4HY 591 2 15 2,872 KY
South Orange ARA
K6SOA 655 2 69 2,864 ORG
Des Moines Radio Amateur's Assn.
W0AK (+W0SCI)
618 2 36 2,848 IA
CRES ARC
W8ZPF 876 2 33 2,842 OH
Chesapeake Bay Radio Assn.
WA3SFJ (+AC2BI)
526 2 37 2,810 MDC
Arlington ARC
K5SLD 511 2 53 2,736 NTX
Sci-Tech ARS
W1STR (+NE1AR)
469 2 30 2,682 EMA
Pilot Knob ARC
W0EBB (+K0AWW)
457 2 24 2,676 KS
Anoka Co. RC
W0YFZ 480 2 13 2,670 MN
Kilocycle Club of Fort Worth, TX
W5SH 479 2 11 2,616 NTX
Davis Co. ARC
K7DAV (+W7VQ)
521 2 41 2,610 UT
Northern Arizona DX Assn.
W7YS 535 2 8 2,606 AZ
Black River ARC
K8BRC 494 2 20 2,604 MI
Clinton Co. ARA
W8GO 495 2 11 2,604 OH
Rip Van Winkle ARS
WD2K 486 2 15 2,598 ENY
Gaston Co. ARS
N4GAS (+NC4GC)
743 2 12 2,592 NC
Bama Ham'ers
AI4AL 435 2 6 2,568 AL
Austin ARC
W5KA 445 2 27 2,562 STX
Sask Alta RC
VE5RAC 674 2 11 2,550 SK
Ole Virginia Hams
W4OVH 411 2 25 2,526 VA
Redstone Rockets
K4R 349 2 17 2,524 AL
Fluvanna ARES Group
W4XR 594 2 12 2,438 VA
Cumberland Valley ARC
W3ACH 616 2 17 2,436 WPA
Southern Pennsylvania Communications Group
K3AE 535 2 24 2,430 EPA
Central Massachusetts ARA
W1BIM 507 2 24 2,408 WMA
Medina Co. Amateur Radio Corporation
KD5DX 431 2 12 2,404 STX
Coastal ARS
W4LHS 902 2 25 2,366 GA
Easton ARS
K3EMD 372 2 27 2,352 MDC
Mich-A-Con ARC
KC8VC 468 2 8 2,340 MI
Lebanon Valley Soc. of Radio Amateurs
K3LV 362 2 10 2,320 EPA
Laguna Mountain WFD
WW6CC 516 2 12 2,316 SDG
Maple Grove RC
K0LTC (+K0YTH)
342 2 21 2,300 MN
Kansas Antenna Club in Johnson Co.
K0ANT 438 2 14 2,290 KS
Yonkers ARC
W2YRC (+KF2FK)
492 2 58 2,288 ENY

721st Mechanized Contest Battalion
WC2FD 721 2 22 2,276 NNJ
La Mirada RC
N6MPO 549 2 8 2,248 LAX
Newton/McPherson ARC
N0NK (+W0BZN)
451 2 10 2,234 KS
Kennehoochee ARC
W4BTI 579 2 20 2,216 GA
National Electronics Museum RC
N3YPJ 748 2 3 2,210 MDC
North Penn ARC
W3BTN 329 2 5 2,202 EPA
David M. Fiedler Memorial ARC
K4WAR 451 2 20 2,196 GA
Sun Country ARS
KB4KP 555 2 19 2,158 NFL
Macoupin Co. ARC
K9M (+N9LQF)
241 2 24 2,144 IL
Iowa City ARC
W0JV 325 2 15 2,134 IA
Central Vermont ARC
W1BD (+N1LED)
563 2 20 2,130 VT
Ruckerville Amateur Transmitting Soc.
N4CVG 506 2 21 2,128 KY
Fort Wayne RC
W9TE 413 2 25 2,126 IN
Clay Co. (IN) AuxComm
N9CCA 335 2 7 2,126 IN
Nashville ARC
K4CPO (+K9FQ)
292 2 55 2,104 TN
Faulkner Co. ARC
W5AUU 365 2 27 2,082 AR
Daytona Beach CERT AR Team
N4DAB 323 2 11 2,054 NFL
Bryan ARC
W5BCS (+W5AC)
354 2 65 2,050 STX
New River Valley ARC
N4NRV 451 2 7 2,020 VA
Red River Radio Amateurs
W0ILO 511 2 14 2,006 ND
Central Missouri RA
K0SI 279 2 17 1,950 MO
DeForest ARC
K8GE 302 2 11 1,948 OH
Cape May Co. ARC
N2CMC 497 2 25 1,944 SNJ
Red River Radio Amateurs
K0RQ 524 2 7 1,906 ND
Westside ARC
WA6RC 225 2 3 1,892 LAX
Western PA Wounded Hams
KA3PMW 598 2 7 1,886 WPA
Clark Co. (IN) ARC
W9WWI (+W9JBQ)
265 2 29 1,880 IN
Northeastern Indiana ARA
W9OU 356 2 28 1,862 IN
South Central RC
K3SCR 277 2 17 1,814 EPA
Lenoir ARC
N4LNR 275 2 12 1,806 NC
St. Clair ARC
K9GXU 466 2 17 1,782 IL
Clay Co. (NC) AuxComm
K4E 88 2 3 1,750 NC
Tri-City Radio Amateur Club
N0NEB (+KC0QNB)
236 2 30 1,750 NE
Troy ARA
NY2U 293 2 26 1,740 ENY
North Hills ARC
K3T 575 2 10 1,734 WPA
Valley of the Moon ARC
W6AJF 312 2 15 1,722 SF
Beaver Valley ARA
W3SGJ 353 2 25 1,698 WPA
Twin Cities Repeater Club
W0BU 337 2 13 1,670 MN
Chattanooga ARC
W4AM 399 2 20 1,648 TN
Magic Valley ARC
K7MVA (+K6UDA)
269 2 25 1,644 ID
Hoosier Hills Ham Club
W9GUS 83 2 15 1,620 IN
Monessen ARC
W3CSL 287 2 14 1,602 WPA
Edmonds Woodway ARC
N7EDW 96 2 10 1,594 WWA
Mt. Magazine ARC
W5MAG 315 2 10 1,586 AR
KARO-ECHO
W6ECK (+W6CUS)
73 2 22 1,548 EB
Cove Repeater Assn.
K5CRA 327 2 23 1,538 NTX
Moose Pirates
N3MM 235 2 5 1,522 VA
North East Iowa Radio Amateur Assn.
W0MG 119 2 22 1,496 IA
Lincoln Hills AR Group
W6LHR 183 2 3 1,490 SV
Bledsoe Co. ARC
N4BCT (+KN4CTG)
138 2 12 1,490 TN
SMARTS RC
WB0RMK 484 2 8 1,484 MN
Denver RC
W0TX 282 2 60 1,474 CO
Whitewater Valley ARC
N9JM 303 2 12 1,466 IN
Tamaqua Wireless Assn
W3TWA 258 2 20 1,460 EPA
Sabin Field Day 2021
KB0KML 254 2 7 1,448 MN
Bishop ARC
K7D 304 2 6 1,444 NV
Rueda Del Bengay
KP4RBG 247 2 3 1,434 PR
Lake Area Amateur Radio Klub
K5LRK (+N5FKU)
135 2 8 1,414 NTX
Morocco Mole Contest Club
N8IVE 384 2 4 1,406 OH
Indian Peaks RC
W0NED 428 2 16 1,406 CO
Brunswick Shores ARC
N4GM 109 2 21 1,378 NC
Sun City Summerlin ARC
W6MW 172 2 12 1,370 NV
Monroe Co. ARS
N4MCH (+KK4JPG)
66 2 19 1,364 GA
Zephyrhills Area ARC
W1PB 235 2 7 1,348 WCF
Delaware Repeater Assn.
KC3AM 317 2 15 1,346 DE
Princeton Ham RC
W4KBL 36 2 9 1,328 KY
Wisconsin Valley RA
W9NA 87 2 8 1,324 WI
Juniata Valley ARC
K3DNA 217 2 15 1,296 WPA
Barrow ARC
WR4BC 289 2 15 1,288 GA
Lamorinda Area Radio Interest Group
K6ORI 67 2 10 1,284 EB
Elmore Co. ARES
WA7ZAF 338 2 8 1,268 ID
South Wake ARC
N4SWC 114 2 3 1,268 NC
Yuba-Sutter ARC
W6KJ 199 2 27 1,268 SV
Amateur Radio Of Churchill Co.
K7F 103 2 6 1,256 NV
Queen City Emergency Net
W8VND 234 2 10 1,252 OH
Cass Co. Area AR Operators
N0UMP 288 2 3 1,252 MO
Sachse ARA
W5SRA 43 2 23 1,246 NTX
Skyline ARC
K2IWR 264 2 12 1,236 WNY
San Gorgonio Pass Amateur Club
W6PRC (+KJ6UUS)
22 2 24 1,234 ORG
Southern Berkshire ARC
W1BAA 142 2 10 1,228 CT
Nixa ARC
K0NXA 216 2 6 1,198 MO
Middle Tennessee ARC
W4UOT 121 2 15 1,194 TN
ARC of Augusta
W4DV 205 2 6 1,180 GA
Eaton Co. ARC
K8CHR 211 2 7 1,174 MI
Sweetwater ARC
WY7U 111 2 5 1,172 WY
Metrocrest ARS
W5N 179 2 7 1,164 NTX
Golden Spike ARC
K7UB 301 2 28 1,156 ID
Hurst ARC
W5HRC 200 2 14 1,138 NTX
Kay Co. ARC
N5PC 153 2 20 1,132 OK
Lakes Region Repeater Assn.
W1BST 98 2 30 1,126 NH
Reading RC
W3BN 125 2 38 1,096 EPA
Sussex ARA
W3LF 80 2 15 1,074 DE
Piscataquis ARC
K1PQ 179 2 5 1,068 ME
Ramona Outback ARS
N6ROR 163 2 9 1,056 SDG
Wichita ARS
N5WF 38 2 10 1,046 NTX
Volusia ARES and West Volusia ARS
W4V 29 2 22 1,026 NFL
N5CST
K5O 187 2 10 980 OK
Jayhawk ARS
W0LB 133 2 8 978 KS
Bay-Net ARC
K6SRA 169 2 4 962 SCV
Austin Area ARC
W0AZR 156 2 15 956 MN
Anderson Island ARC
WA7AI 32 2 3 956 WWA
3 Guys with Radios ARC
KM3GWR 14 2 3 900 MO
Central New York Contesters
KD2ETT 63 2 5 882 WNY
American Legion Post 91 ARC
KG7SPL 147 2 8 876 MT
West Point Fire CERT
W6WPT 111 2 4 872 SJV
Mountain Top ARA
WA6MTN 75 2 52 850 ORG
Issaquah ARC
W7BI 135 2 12 850 WWA
Elmore Co. ARC
K7ECI 119 2 4 832 ID
Oak Forest ARC
KE5TRB 19 2 12 798 STX
Green Bay Mike & Key Club
K9EAM 117 2 32 784 WI
Hall of Science ARC
WB2JSM 9 2 11 776 NLI
Southern Pennsylvania ARC
K3IR 132 2 6 768 EPA
Shore Points ARC
K2B/W2HRW52 2 5 754 SNJ
WCARS-Murphy/Cherokee Co. ARES
WC4NC 94 2 6 736 NC
Greenwood ARC
VE1NM 37 2 5 724 MAR
Metropolitan ARC
K8NOW 109 2 4 680 MI
Framingham ARA
W1FY 44 2 17 678 EMA
North Ottawa ARC
W8CSO (+WR8W)
128 2 13 666 MI
Carolina ARES
WX4SC 53 2 9 656 SC
Lake Country AR Service
W4LCA 142 2 6 634 VA
North Yellowstone ARC
KJ7ARB 69 2 13 628 MT
The Great White North II
VA3RRR 237 2 4 624 ONE
Charlotte Co. ARC
NA4RC (+NA4RC)
68 2 3 586 VA
Trilogy ARC
N7TRC 14 2 6 578 WWA
Florence ARC
W4ULH 15 2 15 530 SC
KX4PR FD Group
KX4PR 36 2 3 422 OH
Lake Area Amateur Radio Klub
N5FKU (+N5FKU)
36 2 8 422 NTX
Carroll Co. ARC
K3PZN 122 2 5 416 MDC
Arkansas Diamond ARC
KE5FSY 36 2 7 122 AR

3A — Battery

Tulsa Digital RC
KT5DIG 520 5 13 5,985 OK
Tenn Rose
KD4PBJ 396 5 6 4,710 TN
South Plainfield ARC
NJ2SP 387 5 15 4,670 NNJ
West Valley ARA
K0XI 173 5 3 2,180 SCV
Snake River ARC
K7SI 61 5 3 1,310 ID
Ed and Joe Tech Club
W7P 26 5 3 1,185 AZ
EVQRP
AC7FF 76 5 3 810 AZ
TicBite ARA
N4ENC 23 5 3 765 NC
Masters of Reception
K3MRX 37 5 3 760 WPA
PA Ridge Runners United
N3RSY 23 5 3 580 EPA

3A — Commercial

Splitrock ARA
N2XP 1,243 2 20 5,640 NNJ
Seneca RC
W8ID (+W8IES)
1,209 2 41 5,052 OH
Grayson Co. ARC
K5GCC 822 2 22 3,708 NTX
Drake ARC
K8UU 849 2 7 3,702 OH
High Point ARC
W4UA (+N4TLC)
844 2 26 3,514 NC
Pottstown Area ARC
W3U (+K3ZMC)
974 2 25 3,242 EPA
Winona ARC
W0NE 678 2 15 3,030 MN
Mobile ARC
W4IAX 605 2 4 3,022 AL
Southern Counties ARA
K2BR 438 2 25 1,984 SNJ
Keowee Toxaway ARC
K4WD 803 2 9 1,774 SC
Westport Astro ARC & Housatonic ARC
K1WAS 536 1 11 1,687 CT
Columbia (OR) ARA
N7EI 472 2 13 1,594 OR
Orlando ARC
K1AA 363 2 35 1,590 NFL
Chautauqua AR Service
N2MQ 539 2 23 1,494 WNY
Rockingham Co. ARC
N4IV 406 2 15 1,418 NC
Longmont ARC
W0ENO 232 2 15 1,190 CO
Portsmouth RC
N8QA 235 2 9 1,020 OH
Lakeshore RC
W9LRC 241 2 6 940 WI
Richmond Amateur Telecommunications Soc.
W4RAT 274 2 10 846 VA
Radio Assn. of Western New York
W2PE 128 2 22 842 WNY
Cross Co. ARC
WA5CC 28 2 6 656 AR
Douglas Co. ARC
W0UK 133 2 10 616 KS
Indian River ARC
AJ4IR 319 1 11 616 SFL
Southington ARA
W1ECV 300 1 9 598 CT
GEARS
W6RHC 22 2 9 530 SV
CANAMARA
W2WLR 102 2 5 526 NNY
Carteret Co. ARS
W4YMI 34 2 10 518 NC
Southern Indiana Tri-County ARC
KC9OLF 111 2 4 478 IN
Western Piedmont ARC
KM4VIQ 65 2 6 380 NC
Seneca Area Radio Amateurs
K5UUU 64 2 6 360 KS

4A

Huntsville ARC
K4BFT (+N4CNY)
5,229 2 85 18,138 AL
Portage Co. Amateur Radio Service
K8BF (+KD8WZS)
3,548 2 48 12,046 OH
Westchester Emergency Communications Assn.
N2SF (+W2ECA)
3,083 2 25 11,344 ENY
Johnson Co. Radio Amateurs Club
W0ERH (+W0AR)
3,107 2 62 10,658 KS
Ozaukee RC
W9GA 2,263 2 25 8,490 WI
Edmond ARS
K5EOK 1,685 2 56 7,832 OK
Fort Collins CW
K0DIT 2,021 2 6 7,634 CO
Nashua Area Radio Soc.
N1FD 1,892 2 32 7,398 NH

Medina Co. ARC
W8HN (+K2RWO) 1,801 2 23 6,608 OH
Hazel Park ARC
W8HP 1,457 2 36 6,060 MI
Lake Monroe ARS
N4EH 1,621 2 56 5,696 NFL
Glynn ARA
K4B 1,490 2 6 5,184 GA
South Lyon Area ARC
N8SL 1,177 2 12 4,572 MI
NC Tri-Club
W4HS (+W4GOL) 1,424 2 47 4,398 NC
Ocean Monmouth ARC
N2MO 915 2 25 4,336 NNJ
Orange Co. (NY) ARC
W2HO 862 2 19 4,252 ENY
Sierra Foothills ARC
W6EK (+K6ABJ) 897 2 166 4,230 SV
Liverpool Amateur Repeater Club
W2CM 899 2 10 4,226 WNY
Bellbrook ARC
W8DGN 915 2 73 4,214 OH
Eastern CT ARA
KZ1M (+K1MUJ) 1,226 2 25 4,140 CT
Noise Blankers Radio Group
WR5P 696 2 5 3,934 AR
Union Co. ARC
K4N (+NC4UC) 820 2 15 3,926 NC
Wireless Assn. of South Hills ARC
W3D 957 2 20 3,910 WPA
Radio Amateurs of Greater Syracuse
W2AE (+KC2HO) 746 2 38 3,906 WNY
Genesee Radio Amateurs
W2RCX 1,122 2 9 3,822 WNY
Roanoke Valley ARC
W4CA 991 2 18 3,804 VA
Northeast ARC
N1ERC 1,272 2 13 3,804 EMA
Piedmont ARC
K4PAR (+K4P) 819 2 15 3,800 GA
Maryland Mobileers ARC
W3CU 679 2 21 3,784 MDC
Anne Arundel RC
W3VPR 967 2 27 3,676 MDC
Denton Co. ARA
W5NGU 696 2 50 3,532 NTX
Basin ARC
W7BAR 1,105 2 40 3,408 UT
Radio Amateur Soc. of Norwich
N1NW 517 2 36 3,182 CT
Granite State ARA
N1QC 789 2 11 3,016 NH
Culpeper ARA
W4CUL (+N4XI) 708 2 12 2,928 VA
Alexandria RC
W4HFH 628 2 38 2,880 VA
Great Bay RA
W1FZ 607 2 11 2,838 NH
PART of Westford
K1IG (+KB1OIQ) 438 2 39 2,824 EMA
Birmingham ARC
W4CUE (+KD4KZT) 641 2 30 2,776 AL
Two Rivers ARC
W3OC (+WA3AHC) 561 2 19 2,670 WPA
River City ARC
N6NA (+WB6YLK) 415 2 44 2,642 SV
Algonquin ARC & Waltham ARA
W1M 387 2 25 2,626 EMA
Wilson ARC
WC4AR 596 2 4 2,598 TN
Thousand Islands Radio Club
KC2TI 520 2 33 2,540 NNY
Haywood Co. ARC
KW4P 632 2 20 2,510 NC
Aero ARC
W3PGA 464 2 25 2,490 MDC
Smoky Mountain ARC
W4OLB (+W4LSM) 545 2 68 2,484 TN
Delta ARC Memphis
W4EM (+W4BS) 440 2 70 2,464 TN
Findlay RC
W8FT 637 2 10 2,434 OH
Windmill Amateur Radio Group
W3LTR 546 2 9 2,400 EPA
Highland ARA
W8O (+W8HO) 504 2 13 2,360 OH
Washington Amateur Communications
WA3COM (+KC3EDQ) 608 2 15 2,332 WPA
Maury ARC
W4GGM (+KO4HUO) 460 2 32 2,324 TN
Ellis Co. ARC
WD5DDH (+N1XAC) 414 2 15 2,296 NTX
Middlesex ARS
W1EDH 421 2 21 2,292 CT
North Richland Hills ARC
W5R 273 2 25 2,288 NTX
Parkersburg Amateur Radio Klub
W8PAR 457 2 34 2,258 WV
HP Boise ARC
AB7HP 411 2 9 2,254 ID
Silver Springs RC
K4GSO (+KN4MIV) 512 2 13 2,190 NFL
Huber Heights ARC
NO8I 317 2 16 2,144 OH
Mesilla Valley RC
N5BL 356 2 14 2,084 NM
Shelby Co. ARC
W4SHL 284 2 14 2,072 AL
Thunder ARC
K8PA 364 2 36 2,060 MI
Spout Springs Repeater Assn.
WF7S 300 2 21 2,042 EWA
Red Rose Repeater Assn.
W3RRR 370 2 8 2,036 EPA
Paulding ARC
W4TIY 511 2 13 2,014 GA
CRCRST
W7SA (+WN7BSA) 395 2 7 1,992 AZ
Eastside Amateur Radio Service
NE5TX (+W5WES) 288 2 8 1,942 STX
GOTAhams
WG6OTA 210 2 50 1,906 ORG
W6TRW Amateur Radio Club
W6TRW (+K6WMH) 313 2 14 1,836 LAX
HAMARS
W4H 372 2 5 1,806 NC
North Texas Radiosport Assn.
KN5TR 510 2 6 1,804 NTX
The Road Show ARC
WA4TRS 147 2 10 1,672 NC
St. Louis & Suburban RC
W0SRC 315 2 23 1,668 MO
South East Texas ARC
KD5MAM 291 2 10 1,630 STX
Elk Co. ARA
N3NIA 289 2 17 1,628 WPA
Bonner Co. ARES
K7BNR 254 2 12 1,616 ID
Snohomish Co. Hams Club
WA7LAW 252 2 34 1,590 WWA
Bloomington ARC
N2K (+K9DIY) 258 2 30 1,586 IN
Insurance City Repeater Club
W1DHT 260 2 20 1,570 CT
Mt. Diablo ARC
W6CX 101 2 20 1,528 EB
Northwest Arizona Travelers FD
K7E 438 2 6 1,526 AZ
San Antonio RC
W5SC 132 2 45 1,488 STX
Cherokee Capital ARS
K4WOC 113 2 15 1,478 GA
Oregon State Police ARA
K7OSP 433 2 4 1,472 OR
Southern Michigan ARS
W8DF 217 2 20 1,464 MI
Calvert ARA
K3CAL 250 2 10 1,462 MDC
Jay Co. ARC
W9JCA 315 2 18 1,434 IN
Northern Illinois Quad Co. AR Group
K9T 159 2 9 1,434 IL
Radio Amateur Club of Knoxville
W4B 208 2 22 1,392 TN
Heartland Hams ARC
W0HLH 297 2 4 1,380 IA
Grand Strand ARC
W4GS 228 2 29 1,374 SC

US and ARRL flags were prominently displayed at the 2021 ARRL Field Day location of the East Pasco Amateur Radio Society, K4EX. They set up their station at the San Antonio Railroad Depot Museum in San Antonio, Florida. [Chris Bloxsom, AA4CB, photo]

Newark Ohio ARA
N8ARA 121 2 25 1,292 OH
Elkhorn Valley ARC
W0OFK 209 2 30 1,194 NE
San Luis Valley ARA
K0SLV (+NA0ED) 78 2 12 1,166 CO
Jacksonville ARS
K9JX 29 2 10 1,136 IL
Central New York ARC
N2CNY 119 2 4 1,088 WNY
Saginaw Valley ARA
K8DAC 104 2 12 1,080 MI
Elmira ARC
VE3ERC 178 2 5 1,014 ONS
Lake Oswego ARES
WA7LO 32 2 10 1,014 OR
Kern Co. Central Valley ARC
W6LIE 30 2 4 1,010 SJV
Red River Valley ARC
W4W 175 2 15 1,000 NTX
Maxim Integrated Beaverton & Friends
N7QJ 183 2 8 958 OR
North Hills RC
K6IS 185 2 25 860 SV
Plano AR Klub
K5PRK 93 2 9 846 NTX
Grundy Co. ARC
W9G (+KB9SZK) 18 2 6 806 IL
Stillwater ARC (OK)

K5SRC 44 2 12 760 OK
Eastern Ozarks ARC
K0EOR 46 2 5 234 MO
Maple Ridge ARC
VA7SGY 11 2 4 172 BC
Peace Country ARC
VE6ARC 58 2 4 166 AB

4A — Battery

St. Louis QRP Soc.
N0A 562 5 12 6,765 MO
Vm Okla Nan Ola ARC
WI5ND 501 5 12 6,115 OK
Portland ARC
W7LT 249 5 20 2,930 OR
Boschveldt QRP Club
W3BQC 177 5 8 2,075 EPA

4A — Commercial

Brazos Valley ARC
KK5W (+WR5AAA) 1,587 2 67 5,966 STX
Beaumont ARC
W5RIN 733 2 20 3,638 STX
Macon Co. ARC
N0PR (+AB0C) 527 2 11 2,434 MO
West Essex ARC
W2EF 380 2 20 2,016 NNJ
Pioneer ARC
K0SW 441 2 15 1,660 NE
Jersey Shore ARS
NJ2AR 297 2 48 1,460 SNJ
All Things ARA
W8OBC 522 2 20 1,400 OH
Alamogordo ARC
K5LRW 309 2 6 1,344 NM
Patoka Valley ARC
KD9LLH 178 2 12 1,096 IN
Franklin (NC) ARC
KF4RC (+WD4NFT) 53 2 25 908 NC
Hocking Valley ARC
N8H 108 2 15 644 OH
Lower Arkansas Ham Operators Group
W5H 42 2 4 634 AR
Chester ARES
W4CHR 86 2 4 458 SC

5A

Lake ARA
K4FC (+N4FLA)
3,071 2 30 11,936 NFL
Black River Radio Ops
NW8S (+N8ESG)
2,954 2 22 11,864 OH
Orange Co. (CA) ARC
W6ZE (+W6NGO)
3,706 2 40 11,220 ORG
Warren ARA
W8VTD 2,014 2 20 6,646 OH
Tipton ARS
WW5M (+AI4K)
1,267 2 20 6,410 TN
Warren Co. NY RC
W2C (+W2WCR)
1,175 2 36 5,100 ENY
Lancaster RC
W2SO 1,116 2 12 4,950 WNY
LEFROG
W9FRG 1,023 2 12 4,704 WI
Butler Co. (PA) ARA
W3UDX (+AA3YW)
1,091 2 20 4,560 WPA
Terre Haute RC
K9ITK 856 2 5 4,092 IN
Misfits ARC
W4MIS 983 2 17 4,006 NC
Owatonna Steele Co. Amateur Radio
N0UW 836 2 21 4,000 MN
Central Louisiana ARC
N5AEX 925 2 40 4,000 LA
Alford Memorial RC
W4BOC (+KO4BND)
660 2 7 3,558 GA
Susquehanna Co. ARC
N3SRC (+W3GAA)
698 2 12 3,542 EPA
Cherryland ARC
W8TCM 783 2 20 3,378 MI
CARA/OBARC
K5M 760 2 19 3,320 MS
DuPage ARC
W9DUP 813 2 30 3,204 IL
Mahoning Valley ARA
W8QLY 506 2 21 3,194 OH
Wood Co. Emergency Communications
WC8EC 473 2 38 3,108 WV
Wayne Co. ARC
W3ARO 649 2 18 3,102 EPA
bcars.org
K3NQT 554 2 19 3,038 WPA
985 Users Field Day Event
W3QF 675 2 7 2,908 EPA
Fort Herkimer ARA
W2FHA (+KC2OJI)
583 2 18 2,836 WNY
Whitman ARC
NI1X 661 2 12 2,834 EMA
Cowtown ARC
K5COW 355 2 25 2,824 NTX
Andrew Johnson Radio ARC
W4WC 624 2 25 2,802 TN
NOARS-LCARA
K8KRG 493 2 33 2,782 OH
Butler Co. AR Public Srvc. Group
K3PSG 556 2 21 2,650 WPA
West Georgia ARS
W4D 352 2 24 2,648 GA
Sullivan ARC
N0E 458 2 35 2,642 MO
Sullivan Co. NY ARES
K2SUL 240 2 25 2,588 ENY
MGRA/CGARC
W4R (+WR4MG)
590 2 30 2,584 GA
King George AR Operators
K4GVA 378 2 40 2,574 VA
Marple Newtown ARC & Mobile Sixers RC
N3NZ (+W3AWA)
541 2 32 2,574 EPA
Silvercreek ARA
W8WKY 412 2 45 2,524 OH
Klamath Basin ARA
W7VW (+N2RSN)
336 2 15 2,472 OR
Chesapeake Amateur Radio Service
W4CAR 415 2 30 2,432 VA
Cherryville Repeater Assn. II
W2CRA 417 2 26 2,392 NNJ
Overlook Mountain ARC
N2LL (+K2KMM)
489 2 20 2,372 ENY
Fulton Co. ARC
K8BXQ 319 2 7 2,334 OH
North Okaloosa ARC
W4AAZ (+W4N)
207 2 22 2,252 NFL
Bear Bait RC
W2JST 364 2 13 2,246 NNY
Limestone ARES
N4SEV (+K4TRB)
283 2 75 2,226 AL
Lockport ARA
W2RUI 411 2 5 2,150 WNY
Cheshire Co. DX ARC
AD1T 628 2 25 2,126 NH
Bastrop Co. ARC
K5OQ 409 2 9 2,118 STX
MARC/DECT
W3M (+KV3B)
219 2 20 2,092 MDC
Vilas Co. Radio Club
W9VRC 1,147 1 5 1,797 WI
Meigs Co. ARC
KC4MC (+WR4RR)
353 2 17 1,776 TN
Riverland ARC
W9UP 237 2 20 1,738 WI
California City ARC
KE6RN 302 2 12 1,702 SJV
Kokomo ARC
W9GO 263 2 16 1,650 IN
Village 7 ARC
KC0RVS 175 2 41 1,582 CO
Warrensburg Area ARC
W0AU 421 2 8 1,548 MO
Western CO ARC
W0RRZ 318 2 21 1,470 CO
Sumner Co. ARA
W4LKZ 209 2 50 1,432 TN
Solivita Radio Club
N4SRC 320 2 9 1,424 WCF
Philmont Mobile RC
W3EM (+W3AA)
365 2 47 1,262 EPA
Two Rivers AR Group
WA5YHN 99 2 17 1,134 AR
San Francisco RC
W6PW 90 2 8 1,130 SF
Sedalia Pettis AR Klub
WA0SDO 23 2 21 1,100 MO
Carolina Airstream Club
WB4CAC 133 2 7 1,082 NC
Northern Colorado ARC
W0UPS 140 2 5 1,074 CO
Alameda Co. RACES
W6VOM 144 2 15 1,042 EB
David Sarnoff ARC
N2RE 12 2 5 598 NNJ

5A — Battery

North Coast ARC
N8NC 253 5 12 2,115 OH

5A — Commercial

National Trail ARC
K9UXZ (+AC9PA)
186 2 14 1,226 IL
Yadkin Valley ARC
KE4YVF 258 2 8 1,152 NC
Clark Fork Valley ARC
KO6UW 153 2 10 1,126 MT

6A

Central Kentucky ARS
AJ4A 3,528 2 52 11,798 KY
Raleigh ARS
W4DW (+W4RNC)
1,955 2 50 7,350 NC
Lake Area Radio Klub
W0WTN 1,534 2 28 6,542 SD
Panhandle ARC
W5WX 1,608 2 52 6,464 WTX
Franklin Co. (NC) ARC
AA4RV (+NY4NC)
1,521 2 25 5,504 NC
McKean Co. ARC
W3VV 947 2 13 4,604 WPA
Long Island Mobile ARC
W2VL 775 2 70 4,472 NLI
Antietam RA
W3CWC 892 2 41 4,352 MDC
Tusco ARC
W8ZX (+W8TCO)
748 2 44 4,272 OH
Stockton-Delta ARC
W6SF 784 2 27 3,998 SJV
Five Flags ARA
W4UC 692 2 10 3,788 NFL
Grande Ronde Radio Amateurs Assn.
W7GRA 762 2 20 3,688 OR
Penn Wireless Assn.
W3SK 600 2 27 3,624 EPA
Vero Beach ARC
W4OT 583 2 46 3,452 SFL
Hood Co. ARC
W5HCT 527 2 8 2,974 NTX
Stones River ARC
K4FUN (+W4OPS)
536 2 47 2,912 TN
Bridgerland ARC
W7IVM 292 2 72 2,394 ID
Fort Venango Mike and Key Club
W3ZIC 320 2 32 2,212 WPA
GVARC/SBCARA
W6GGF 175 2 14 2,192 SCV
San Fernando Valley ARC
W6S 236 2 20 2,150 LAX
Santa Rosa Co. ARES
K4SRC 219 2 12 2,130 NFL
N. New England Field AR Operators
NE1FO (+N1SFT)
242 2 12 1,936 NH
West Alabama ARC
KC4UG 178 2 20 1,856 AL
TCARES
K6TUO 257 2 12 1,684 SJV
Twin State RC
W1FN 351 2 25 1,576 NH
Northern Berkshire ARC
N1WM 209 2 6 1,352 WMA
Wood Co. ARC
K8TIH 91 2 10 1,332 OH
Kent ARS
K3ARS 97 2 7 1,082 MDC
Salem ARC
W7SAA (+K7DSG)
48 2 19 1,052 OR
Tompkins Co. ARA
AF2A 151 2 11 956 WNY

6A — Battery

NASA Ames Research Center ARC
NA6MF (+NA6MF)
24 5 4 870 SCV

7A

Gloucester Co. ARC
W2MMD 3,409 2 40 14,268 SNJ
Fox River Radio League
W9NE (+W9CEQ)
1,770 2 40 6,762 IL
Toledo Radio Amateur Club
W8MAL 528 2 15 3,004 OH
Sierra Nevada ARS
W7TA 304 2 60 2,472 NV
Tyler ARC
K5TYR 544 2 40 2,334 NTX
Shy-Wy ARC
KC7SNO 393 2 20 2,186 WY
Ad Hoc ARS
KD9EMV (+KC9VZA)
101 2 11 2,052 IN
Korean ARA
KF6JBN 100 2 28 1,886 LAX
Binghamton ARA
W2OW 258 2 14 1,846 WNY

8A

Rappahannock Valley ARC
K4TS (+KJ4MHD)
2,616 2 38 9,360 VA
G winnett ARS
W4GR 1,940 2 25 7,146 GA
Wabash Valley ARA
W9UUU (+KW0LF)
1,139 2 22 5,690 IN
VCARS- SSARC
N6R 1,306 2 54 4,608 SB
North GA QRP Club
NQ4RP 62 2 15 1,174 GA

8A — Commercial

Kanawha ARC
W8GK 2,281 2 8 4,728 WV

9A

Woodbridge Wireless
W4IY 4,737 2 34 18,650 VA
Ventura Co. ARC
K6MEP (+KB6JWN)
156 2 25 2,282 SB

11A

Forsyth ARC
W4NC (+W1LLO)
2,531 2 62 10,884 NC

14A

Conejo Valley ARC
AA6CV 776 2 22 3,820 SB

15A

Vaca Valley RC
W6VVR 185 2 35 3,060 EB

One or Two Person Club/ Non-Club Portable

1B — One Operator

Mad River RC
KW8N 1,721 2 1 7,434 OH
K1LT 1,387 2 1 5,798 OH
Mad River RC
K8RYU 1,042 2 1 4,258 OH
Frankford RC
NY3B 950 2 1 3,850 EPA
KB4CG 909 2 1 3,762 VA
Fox River Relay League
K9PW 839 2 1 3,482 IL
K7CAR 927 2 1 2,898 UT
Iowa Wireless Amateur Radio Network
KD0Q 650 2 1 2,830 IA
W6TED 565 2 1 2,810 ORG
Kings Co. and Annapolis Valley ARCs
VA1AVR 789 2 1 2,528 MAR
W1PID 203 5 1 2,480 NH
WA9Z 531 2 1 2,374 IA
Montgomery ARC
N4UZZ 475 2 1 2,150 AL
KN1H 164 5 1 1,790 NH
Contest Club Ontario
VE3SSR 404 2 1 1,766 ONS
London ARC
VA3YV 411 2 1 1,742 ONS
W8REA 155 5 1 1,700 MI
Portage Co. Amateur Radio Service
KB8UHN 700 2 1 1,650 OH
Mike & Key ARC
AG7T 295 2 1 1,630 WWA
Albemarle ARC
K4CGY 640 2 1 1,630 VA
W0RX 366 2 1 1,614 MN
W4WKU 426 2 1 1,552 KY
Parker RA
NN0G 300 2 1 1,550 CO
Morris RC/Hanover TWP OEM
W2GM 311 2 1 1,494 WNY
Butler Co. AR Public Srvc. Group
N3YAZ 113 5 1 1,480 WPA
W8AN 305 2 1 1,470 OH
W7C (+K0FTC)
250 2 1 1,450 WY
N0UY 325 2 1 1,450 MN
Rochester (NY) DX Assn.
KV2X 335 2 1 1,438 WNY
W0BX 363 2 1 1,438 CO
Club Radio Amateur de Québec
VA2VT 275 2 1 1,414 QC
SOTA LEOs
WA6LE (+WA9STI)
358 2 1 1,412 SJV
Signal Hill ARC
K3III (+N3BNA)
308 2 1 1,382 WV
AD7DD 206 2 1 1,374 EWA
WR9R 322 2 1 1,350 IN
North Shore (BC) ARC
VE7UTS 184 2 1 1,342 BC
AF6GA 289 2 1 1,304 SF
WB0SMX 236 2 1 1,294 AZ
Hannibal (MO) ARC
N0BPA 100 5 1 1,250 MO
W0AMT 22 2 1 1,238 NM
Clay Co. (NC) Auxcomm
KT4Q 285 2 1 1,182 WWA
KF7R 170 2 1 1,168 AZ
Panama City ARC
VA3ECO 137 2 1 1,128 ONN
N4NTO 266 2 1 1,114 NC
Florida Contest Group
K4QD 241 2 1 1,104 CO
W3AO PVRC
W4KAZ 225 2 1 1,100 NC
VE6FAR Cycle 25
VE6LQ 238 2 1 1,052 AB
MARCA
K7TV 220 2 1 1,030 AZ
PART of Westford
N1ECC 217 2 1 1,018 EMA
W3OY 214 2 1 964 WPA
Western Placer ARC
N3BEN 181 2 1 938 SV
Broughton Memorial Field Day Group
WB2SMK 171 2 1 926 ENY
K7KHC 264 2 1 926 MT

New Mexico BCARES Team
KC5QOC 56 2 1 874 NM
N7DLV 162 2 1 874 WWA
KDØYSD 362 2 1 874 KS
WCARES-TN
KK4AIZ 155 2 1 870 TN
WB1DMK 177 2 1 858 CT
AG4P 177 2 1 856 TN
KI5LKS 331 2 1 834 NTX
WØBNC 152 2 1 818 CO
Panama City ARC
W4GHG 113 2 1 802 AL
KEØVIM 157 2 1 802 ID
AD7KG 161 2 1 794 UT
W9ZK 218 2 1 786 IL
K7JSG 240 2 1 784 UT
W5JE (+K5JUC)
183 2 1 782 AR
W4TTT (+WB2REM)
131 2 1 774 SFL
VA6AN 261 2 1 774 AB
WCARES-TN
KM4PT 130 2 1 770 TN
El Dorado Co. ARC
WC6J 161 2 1 754 SV
Soc. Of Midwest Contesters
W8RZ 130 2 1 736 MI
VE2VIA 158 2 1 736 QC
Winnipeg ARC
VA4CQ 124 2 1 734 MB
San Diego ARES
K6AQ 36 2 1 694 SDG
Albemarle ARC
KN4TBG 215 2 1 694 VA
San Diego ARES
K6RJF 22 2 1 694 SDG
KB3LTT 117 2 1 684 EPA
AFØE 133 2 1 682 CO
Mt. Vernon (VA) ARC
AJ4YB 104 2 1 658 VA
Minnesota Wireless Assn.
KØYR 234 2 1 654 MN
Sonoma Co. Radio Amateurs
WW6RC 72 2 1 638 SF
Minnesota Wireless Assn.
NØBK 122 2 1 638 MN
Mound ARA
N8JXJ 43 2 1 636 OH
Eau Claire ARC
KB9S 118 2 1 622 WI
Metrocrest ARS
KG5E 131 2 1 612 NTX
Albemarle ARC
K4SHR 150 2 1 608 VA
AA4CS 129 2 1 608 SFL
Pentagon ARC
W9TCV 27 2 1 604 VA
Boulder ARC
WØIVJ 222 2 1 594 CO
Lakeland ARC
N6MRS 86 2 1 594 WCF
Long Island Mobile ARC
W2ASC 171 2 1 592 NLI
South Mountain Radio Amateurs
W3AND 110 2 1 590 EPA
Ocean Co. ARES
NJ2N 60 2 1 586 SNJ
Northern Illinois Quad Co. Amateur Radio Group
W9SAU 79 2 1 566 IL
KC1MIJ 54 2 1 566 EMA
Livermore Amateur Radio Klub
N8MOR 53 2 1 558 EB
West Baldwin City ARC
WVØA (+NRØP)
106 2 1 558 KS
KA4HHM 103 2 1 556 NFL
KD6RMS 146 2 1 542 LAX
Tri-County ARA (CA)
KA6CHX 45 2 1 540 AZ
KF7GGN 97 2 1 538 OR
North Shore (IL) RC
WD9GYM 96 2 1 534 IL
KI7TYU 44 2 1 526 WWA
WCARES-TN
KN4WDM 71 2 1 524 TN
Ozaukee RC
W9JI 91 2 1 514 WI
Loudoun Amateur Radio Group
KS1G 78 2 1 512 VA
KN6VNQ 68 2 1 506 SV
K1TTW 223 2 1 496 VT
AC9XX 119 2 1 490 IL
WB8U 219 2 1 488 KY
W5RJJ 218 1 1 486 NM
KM4IZZ 109 2 1 486 TN
NCØB 166 2 1 482 CO
White Rock Lake ARC
KG5VSR 15 2 1 480 NTX
KD3ANX 155 2 1 480 SNJ
Butler Co. AR Public Srvc. Group
N3WH 113 2 1 476 WPA
Bonner Co. ARES
K7BSV 62 2 1 474 ID
WI9Q 105 2 1 470 IN
Bonner Co. ARES
W7BID 57 2 1 464 ID
BEARS of Manchester ARC
K1SW 77 2 1 458 EMA
K2DMS 120 2 1 458 SJV
K5YZW 102 2 1 458 NTX
KC3DLL 104 2 1 458 WPA
Reynolds Brothers Expeditions
W2ACE 51 2 1 454 MT
N6NVO 15 5 1 450 SCV
WØXR 74 2 1 446 CO
Genesee Radio Amateurs
KD2PSC 48 2 1 442 WNY
WX5SKY 96 2 1 442 OK
WBØOFR 45 2 1 440 CO
KA2OEE 145 2 1 440 AR
WE8L 32 2 1 438 OH
KJ9B 43 2 1 436 AR
North Shore (IL) RC
KK9JEF 129 2 1 428 IL
N4TQX 103 2 1 418 TN
AC8RJ 68 2 1 406 OH
Ellsworth Amateur Wireless Assn.
W1DLC 76 2 1 402 ME
K6ABE 25 2 1 400 LAX
KA7OLK 12 2 1 398 OR
N4JAW 24 2 1 398 KY
VE6FXL 23 2 1 396 AB
York Region ARC
VE3IQ (+VE3IPS)
72 2 1 394 GTA
Radio Amateurs of Greater Syracuse
N2DM 60 2 1 390 WNY
KI6ETL 60 2 1 390 SCV
KB1RZA 120 2 1 390 VT
Ottawa Valley Mobile RC
VE3YY 69 2 1 388 ONE
W5ITR 16 2 1 386 NTX
Bedford ARC
N5TLE 67 2 1 384 NTX
KK4NUB 39 2 1 384 NC
KP4YB 117 2 1 384 PR
W7TAO 86 2 1 376 ID
KK6YGB 113 2 1 376 SCV
Garland ARC
W5GUS 12 2 1 374 NTX
N1IBQ 112 2 1 374 CT
Comox Valley ARC
VA7FB 9 2 1 368 BC
Ocean Co. ARES
KD2FFR 29 2 1 366 SNJ
Hampden Co. RA
N1JIE 8 2 1 366 WMA
Nittany ARC
W3KCK 69 2 1 364 WPA
San Francisco RC
KK6JJZ 6 2 1 362 SF
Pasadena RC/JPLARC/CITARC
K6ARV 56 2 1 362 LAX
North Okanagan RAC
VE7KPZ 5 2 1 360 BC
Crescenta Valley RC
WA6FEQ 5 2 1 360 LAX
MARC/DECT
K3LO 26 2 1 354 MDC
Clark Co. (IN) ARC
KD9LHF 52 2 1 354 IN
AG6QR 26 2 1 354 SF
Issaquah ARC
KI7RMO 1 2 1 352 WWA
Lakeland ARC
KB3VTY 51 2 1 352 WCF
N1GGA 47 2 1 344 VA
Snohomish Co. Hams Club
K7NWR 44 2 1 338 WWA
South Wake ARC
KN4GUS 93 2 1 336 NC
K1IMI (+N4CW)
71 2 1 334 ME
Western Placer ARC
KN6ONK 40 2 1 330 SV
KO4JBU 89 2 1 330 KY
KEØEBS 38 2 1 326 MN
KFØARE 87 2 1 324 MN
W2CVH 36 2 1 322 WNY
BayNet ARC
KK6LDH 27 2 1 318 SCV
W7LUX 13 5 1 315 AZ
Doghouse East
K7LU 67 2 1 314 VA
NO5V 19 2 1 314 STX
KF6YU 82 2 1 314 CO
K8TSG 32 2 1 314 OH
AE1E 16 2 1 314 NTX
Fair Lawn ARC
KA2YRA 31 2 1 312 NNJ
Palo Alto ARA
N6AJS 21 2 1 310 SCV
Palo Alto ARA
K6SV 30 2 1 310 SV
Yellowstone RC
KW7EET 41 2 1 310 MT
York Region ARC
VA3GKX 28 2 1 306 GTA
Vienna Wireless Soc.
K3NF 59 2 1 304 VA
KF6MUY 27 2 1 304 SCV
W2AGC 54 2 1 302 NNJ
KD8MSS 12 2 1 298 OH
AC8WW 73 2 1 296 OH
AG7TX 36 2 1 294 MO
San Jose ARES/RACES
AJ6DU 13 2 1 292 ORG
Muskegon Area Amateur Radio Council
KE8NWH 20 2 1 290 MI
Mid Island RA
VE7AX 10 2 1 288 BC
KI7RHJ 68 2 1 286 AZ
Granite State ARA
K1EHZ 115 1 1 285 NH
San Fernando Valley ARC
K6ATO 7 2 1 284 LAX
Nanaimo ARA
VE7PTN 16 2 1 282 BC
AC9YC 16 2 1 282 WI
White Rock Lake ARC
N5CSU 16 2 1 282 NTX
KM6YSS 66 2 1 282 ID
Richardson Wireless Klub
N5AJD 15 2 1 280 NTX
Yuba-Sutter ARC
KK6VZD 15 2 1 280 SV
South Bay ARA
KK6RSL 7 2 1 278 EB
KD8ODF 58 2 1 276 OH
Club Radio Amateur de Québec
VA2MN 12 2 1 274 QC
KØTJT 62 2 1 274 MN
W8FWY 31 2 1 274 OH
K5EC 12 2 1 274 EWA
KI7URL 10 2 1 270 SD
Williamsburg Area ARC
K4DXW 59 2 1 268 VA
K1THO 9 2 1 268 STX
Southern Pennsylvania ARC
W3RSH 7 2 1 264 EPA
Sierra Foothills ARC
N6UG 54 2 1 262 NM
Microhams ARC
N7CFO 56 2 1 262 EWA
W7AMC 56 2 1 262 NV
Pasadena RC/JPLARC/CITARC
KI6EPH 5 2 1 260 SB
Burlington ARC
VA3ZEV 4 2 1 260 ONS
NE6RD 5 2 1 260 SCV
North Okanagan RAC
VE7LWK 3 2 1 258 BC
KM4SS 4 2 1 258 AL
KE5DXX 52 2 1 256 STX
NR7Z 51 2 1 252 EB
Cleveland ARC
WA4YYM 50 2 1 250 TN
KD9CES 50 2 1 250 IN
San Diego ARES
ADØL 48 2 1 246 SDG
KD9KCK 43 2 1 244 IN
WU3U 40 2 1 230 WPA
San Diego ARES
K6KMH 32 2 1 228 SDG
Kings Point ARC
N1ARS 39 2 1 228 WCF
WK7P 38 2 1 226 OR
KE7BUA 28 2 1 224 AZ
KD7AKE 37 2 1 224 UT
Sun Coast ARC Soc.
VE7TBN 36 2 1 222 BC
Georgian Bay ARC
VE3DGY 17 2 1 218 ONS
Colorado QRP Club
K6LS 34 2 1 218 CO
Warminster ARC
W3FLH 21 2 1 216 EPA
KI5GPI 20 2 1 216 NTX
W4GO 31 2 1 212 VA
NA6F 30 2 1 210 ORG
Sierra Nevada ARS
KG7QXE 79 2 1 208 NV
VE8FAR Cycle 25
VE3BIC 27 2 1 204 ONE
Monroe Co. Radio Communications Assn.
KE8HCD 25 2 1 200 MI
W9SZ 48 2 1 200 IL
North Shore (ON) ARC
VE3IGX 12 2 1 198 GTA
KJ7UCF 22 2 1 194 OR
KD8KTN 22 2 1 194 MI
Meriden ARC
NZ1J 20 2 1 190 CT
Athens Co. ARA
N8VZ 41 2 1 184 OH
Valley and Massanutten ARA
KO4ELL 50 2 1 184 VA
N3GDS 17 2 1 184 WV
W5JOC 30 1 1 180 NM
KJ7BFQ 14 2 1 178 OR
Crescenta Valley RC
K6WJT 13 2 1 176 LAX
Foothills ARS (CA)
WB2URF 12 2 1 174 SCV
N2NKX 62 2 1 174 WNY
KM6HYX 11 2 1 172 SJV
KI5CYM 30 2 1 170 WTX
Garland ARC
W5CTD 4 2 1 166 NTX
Yuba-Sutter ARC
K6VNR 6 2 1 162 SV
W1JWM 6 2 1 162 EMA
Highlands Hams
KA4NDY 5 2 1 160 AL
VE7NLY 4 2 1 158 BC
KD2PFH 4 2 1 158 WNY
KJ7QZU 3 2 1 158 MT
W7TCT 3 2 1 156 EWA
KC5ANF 1 2 1 154 GA
N7LD 49 2 1 148 NV
K7XMD 14 2 1 128 NV
Falmouth ARA
W5IPA 19 2 1 126 EMA
WØPET 18 2 1 122 CO
KQ6RS 23 2 1 96 SDG
Lewisville ARC
WM1MM 22 2 1 94 NTX
N8VWY 9 2 1 86 OH
Santa Clara Co. ARA
N6TRU 3 2 1 76 SCV
WM2P 5 2 1 60 ID

1B — One Operator Battery

W3AO PVRC
K3ZZ 906 5 1 9,045 MDC
Frankford RC
K3WW 865 5 1 8,900 EPA
W3TS 616 5 1 6,710 EPA
KEØTT 470 5 1 4,950 MN
CVARC
K1MZM 390 5 1 4,050 VT
Boulder ARC
KXØR 325 5 1 3,600 WY
WCARC-TX
K5LN 343 5 1 3,580 STX
VE3KQN 290 5 1 3,250 ONE
Carolina DX Assn.
W1AJT 306 5 1 3,090 NC
First Class CW Operators Club USA
WG4FOC (+K3TW)
268 5 1 3,030 NFL
WA4NKL 242 5 1 2,720 GA
Socorro ARA
NA5N 225 5 1 2,500 NM
Hudson Valley Contesters and DXers
WB2FUV 225 5 1 2,500 ENY
4SQRP
NK8O 202 5 1 2,470 AL
Murgas ARC
N3RN 202 5 1 2,470 EPA
Valley and Massanutten ARA
K2HYD 219 5 1 2,340 VA
W9NJY 211 5 1 2,260 WI
Mohawk ARC
WB8PKK 206 5 1 2,210 WMA
AC7A 194 5 1 2,170 AZ
W3WT 179 5 1 2,140 EPA
Oxford Co. ARES
KA1SG 183 5 1 2,085 ME
Dupage ARC
KA9P 202 5 1 2,050 IL
WCARES-TN
N4OPI 190 5 1 2,050 TN
Orange Co. (CA) ARC
K6GTE 173 5 1 2,035 ORG
Tri-Town Radio Amateur Club
K9PMV 180 5 1 1,950 IL
VE3EDX 177 5 1 1,920 ONN

St. Charles ARC					
KB9LLD	171	5	1	1,860	IL
AA5VE	173	5	1	1,780	NTX
W0JD	156	5	1	1,710	MO
JANET Club					
AG6NS	127	5	1	1,705	SCV
Elgin ARS					
VE3CG	147	5	1	1,670	ONS
KY4AE	150	5	1	1,650	SC
W1LMS	98	5	1	1,630	LAX
K2KGJ	133	5	1	1,580	ENY
Twin City ARC					
KX9X	133	5	1	1,580	IL
KN2M	131	5	1	1,560	WNY
West Allis Radio Amateur Club					
WO9B	107	5	1	1,520	MI
KB4IRR	125	5	1	1,500	MO
VE2ZM	125	5	1	1,500	QC
KF9LI	125	5	1	1,500	NTX
Kemptville AR Group					
VE3DQN	92	5	1	1,470	ONE
WB8JAY	131	5	1	1,460	OH
KU4A	130	5	1	1,450	KY
Hidden Valleys ARC					
K9OT	129	5	1	1,440	WI
Barry ARA					
K8YE	141	5	1	1,420	MI
K1SWL	122	5	1	1,370	NH
York ARC					
K9PLX	121	5	1	1,360	WI
W3AO PVRC					
AC5XK	131	5	1	1,360	EMA
WD7Y	120	5	1	1,350	NV
Zuni Loop MEF					
KM6TNT	109	5	1	1,340	LAX
W3ATB	106	5	1	1,310	NH
Desert Radio Amateur Transmitting Soc.					
WB6RLC	109	5	1	1,290	ORG
AA1PL	114	5	1	1,220	RI
NK4Q	77	5	1	1,220	NFL
Warminster ARC					
K3FMQ	105	5	1	1,200	EPA
Elgin ARS					
VE3NRJ	101	5	1	1,160	ONS
K1PDY	81	5	1	1,160	NH
AC0SR	91	5	1	1,160	MO
Toronto ARC					
VE3GMZ	101	5	1	1,160	ONE
K6QV	61	5	1	1,135	SB
Burlington Co. RC					
K2QPN	28	5	1	1,130	SNJ
Zuni Loop MEF					
K0RGI	96	5	1	1,110	TN
W0CZ	75	5	1	1,100	ND
Ellsworth Amateur Wireless Assn.					
KQ1P	93	5	1	1,080	ME
Sterling Park ARC					
N8T (+W8ANT)	83	5	1	1,075	WV
Signal Hill ARC					
N3QKA	80	5	1	1,050	WV
Peel ARC					
VE3MVM	59	5	1	1,040	ONS
WB5IUG	73	5	1	1,030	NTX
Montgomery ARC					
W5NZ	57	5	1	1,020	AL
Zuni Loop MEF					
K6WHP	66	5	1	1,010	LAX
South Mountain Radio Amateurs					
W3KBG	75	5	1	990	EPA
K0JWQ	13	5	1	955	CO
Pasadena RC/JPLARC/CITARC					
N6ARA	61	5	1	950	LAX
WCARES-TN					
KO4DCO	80	5	1	935	TN
N5ESE	78	5	1	930	STX
KR8L	89	5	1	925	IL
WJ7S	66	5	1	910	UT
DFW Contest Group					
K5QR	55	5	1	900	NTX
KF0XV	65	5	1	900	KS
Wilson ARC					
W4DIT (+K4KO)	75	5	1	900	TN
Panama City ARC					
KK4DIV	41	5	1	895	NFL
Central Oregon Coast ARC					
K6RMP	14	5	1	880	OR
N4SD	73	5	1	880	VA
Peel ARC					
VE3EU	63	5	1	865	ONS
VE3GTM Field Day					
VE3GTM (+VE3EKN)	59	5	1	850	ONN
N5NAA	70	5	1	850	STX
Coquitlam ARC					
VA7ROH	67	5	1	835	BC
WE5MAG	48	5	1	830	SFL
VA3FN	67	5	1	820	ONS
WA2WMR	72	5	1	820	VA
Vienna Wireless Soc.					
K4WY	63	5	1	800	VA
W4MDV	51	5	1	760	NM
WU0L	50	5	1	750	IL
Newport Co. RC					
K1NPT	59	5	1	740	RI
Wheaton Community Radio Amateurs					
KG9H	70	5	1	740	IL
Contest Club Ontario					
VA3WB	66	5	1	725	GTA
WA5LHM	56	5	1	710	STX
WACOM					
KC3RN	64	5	1	690	WPA
W9IKU	53	5	1	680	WI
South Mountain Radio Amateurs					
NC3O	52	5	1	670	EPA
Barnstable ARC					
W1VKE	42	5	1	670	EMA
Panama City ARC					
K1OSE	32	5	1	670	AL
W8TV	47	5	1	655	WV
Coquitlam ARC					
VE7TL	50	5	1	650	BC
W8QT	50	5	1	650	TN
Pasadena RC/JPLARC/CITARC					
NG6F	39	5	1	645	LAX
North Georgia QRP Club					
NO4GA (+W4QO)	38	5	1	630	GA
NX0P	95	5	1	625	MN
WD5HNI	52	5	1	620	STX
K2OTF	16	5	1	610	OH
KG6MWI	52	5	1	610	EB
Pasadena RC/JPLARC/CITARC					
AJ6KZ	25	5	1	600	SB
Barrie ARC					
VE3THR	48	5	1	590	ONS
4SQRP					
K6WS	43	5	1	580	SJV
Bergen ARA					
W2JEK	36	5	1	560	NNJ
Zuni Loop MEF					
W6MCH	41	5	1	555	LAX
KA4RUR	50	5	1	550	MO
AH6OC	20	5	1	550	PAC
San Juan Co. ARS					
AE7EL	18	5	1	540	WWA
KG8YT	49	5	1	540	MI
K0AIZ	52	5	1	540	NE
Bryan ARC					
W5HVS	16	5	1	510	STX
W2EB	16	5	1	510	WNY
Central Virginia Contest Club					
K4OSO	35	5	1	500	VA
Irvine Disaster EmComms					
AJ6LU	30	5	1	500	ORG
WB2ISS	37	5	1	500	SF
KF9VV	45	5	1	500	WI
KE5EN	24	5	1	490	NTX
N7NKR	28	5	1	490	CO
KM5VZ	5	5	1	490	NTX
Georgia Auxcomm					
KI4ASK	7	5	1	485	GA
AG7KJ	6	5	1	480	WWA
Wood Co. ARC					
KJ4UL	44	5	1	470	OH
Pasadena RC/JPLARC/CITARC					
KS6PKY	24	5	1	465	SB
Radio Club of Tacoma					
AG7WI	21	5	1	460	WWA
Columbia (MD) ARA					
NN3I	21	5	1	460	MDC
Palos Verdes ARC					
KM6YGS	42	5	1	460	LAX
KR6AI	41	5	1	460	SJV
WA4HWT	61	5	1	455	GA
WE3Q	20	5	1	450	MDC
N5EP	30	5	1	450	WI
Palos Verdes ARC					
KM6YGM	39	5	1	445	LAX
Milwaukee Radio Amateurs' Club					
N9EEE	17	5	1	445	WI
Warminster ARC					
K2ULR	18	5	1	430	EPA
Palo Alto ARA					
KJ6IWI	35	5	1	425	SCV
NG0E	28	5	1	425	MN
North Okanagan RAC					
VE7JAR	34	5	1	420	BC
KO4BNB	14	5	1	420	GA
Frankford RC					
K3PP	16	5	1	410	EPA
KM4VHX	36	5	1	410	VA
K1DCT	16	5	1	410	CT
K6EF	28	5	1	410	SCV
Pasadena RC/JPLARC/CITARC					
N6AN	26	5	1	405	EMA
Longmont ARC					
WB4FAS	25	5	1	400	CO
N8PN	17	5	1	395	MN
Gainesville ARS					
KM4JTE	3	5	1	380	NFL
North Georgia QRP Club					
W4JDS	13	5	1	380	GA
Regina ARA					
VE5DLD	15	5	1	375	SK
South Pasadena ARC					
KI6ZKM	5	5	1	375	LAX
Zuni Loop MEF					
N6GA (+N6MST)	14	5	1	375	LAX
Socorro ARA					
AC5BX	32	5	1	370	NM
QRP ARC International					
KE1L	27	5	1	365	EMA
Pasadena RC/JPLARC/CITARC					
KG6MWQ	23	5	1	365	SB
W4YN	42	5	1	365	NC
Radio Central ARC and Order of Boiled Owls of NY					
KD2MU	36	5	1	360	NLI
Highlands Hams					
WX4P	22	5	1	360	AL
K0CD	21	5	1	360	WI
W7HMT	11	5	1	360	EWA
Pasadena RC/JPLARC/CITARC					
AE6NH	20	5	1	355	SB
WB7S	20	5	1	350	WY
Richardson Wireless Klub					
K5NJM	18	5	1	340	NTX
WW0WB	38	5	1	340	CO
VA2IDX	19	5	1	340	QC
VE6ZC	11	5	1	335	AB
Ottawa Valley Mobile RC					
VE3LAF	26	5	1	330	ONE
KO6FE	27	5	1	320	SF
KI6NAZ	8	5	1	315	LAX
Faulkner Co. ARC					
K5DRU	12	5	1	310	AR
Superstition ARC					
KG7NSP	16	5	1	310	AZ
W1XH	26	5	1	310	WMA
VE7EFK	12	5	1	310	BC
Desert Radio Amateur Transmitting Soc.					
WA6MZW	11	5	1	305	ORG
North Georgia QRP Club					
NZ2Z	15	5	1	300	GA
KJ7IEA	30	5	1	300	EWA
K2BCM	5	5	1	300	WNY
AC3BQ	15	5	1	300	SNJ
Boston ARC					
KC1OIP	6	5	1	290	EMA
W3AO PVRC					
W3EK	13	5	1	280	DE
North Georgia QRP Club					
W0RON	5	5	1	275	GA
Condo Valley ARC					
KA9WMI	5	5	1	275	SB
Truro ARC					
VE1CWJ	5	5	1	275	MAR
VE7VIE	4	5	1	270	BC
KE2GE	34	5	1	270	WNY
KC3KPC	22	5	1	265	EPA
Baton Rouge ARC					
N5DGK	2	5	1	260	LA
Anne Arundel RC					
KB3IAI	2	5	1	260	MDC
Bishop ARC					
W7KRF	21	5	1	255	ORG
Ellsworth Amateur Wireless Assn.					
K1WJY	1	5	1	255	ME
KI4PJM	1	5	1	255	AL
NR8Z	10	5	1	250	VA
AC8JW	9	5	1	240	MI
VY2DP	19	5	1	240	PE
Arizona Outlaws Contest Club					
KK7AC	17	5	1	235	AZ
N8XA	24	5	1	220	OH
KM4AHP	7	5	1	220	SC
K4IZN	12	5	1	210	AL
Tri State ARS (IN)					
W9FHA	16	5	1	210	IN
Columbia-Montour ARC					
WA4THR	7	5	1	200	EPA
WA9TKK	5	5	1	200	AZ
North Okanagan RAC					
VA7SZ	9	5	1	195	BC
Ottawa Valley Mobile RC					
VA3WEX	8	5	1	190	ONE
VE2IRF	4	5	1	190	QC
Irvine Disaster EmComms					
N0ZL	6	5	1	180	ORG
North Shore (IL) RC					
WB9UVJ	6	5	1	180	IL
South Mountain Radio Amateurs					
K3RTK	3	5	1	180	EPA
NV1P	6	5	1	180	ENY
KJ7JJZ	5	5	1	175	WWA
VA7TEV	5	5	1	175	BC
Cupertino ARES					
KI6GCX	4	5	1	170	SCV
KO4NAI	4	5	1	170	GA
KD0STU	4	5	1	170	NE
KI4DEF	2	5	1	170	NC
4SQRP					
N9AC	11	5	1	160	WI
W8BFX	2	5	1	160	ID
K7TAY	2	5	1	160	OR
AF7FS	2	5	1	160	NV
Aerospace Employees Assn. ARC					
KM6WBU	1	5	1	155	LAX
Ottawa Valley Mobile RC					
VA3VGR	1	5	1	155	ONE
Four Lakes ARC					
KD9KJV	1	5	1	155	WI
N4IX	21	5	1	155	SC
Ottawa Valley Mobile RC					
VA3JYK	10	5	1	150	ONE
Gwinnett ARS					
KN4FWN	9	5	1	140	GA
N4RRT	9	5	1	140	EPA
AI5N	8	5	1	130	STX
Kemptville AR Group					
VE3VSK	7	5	1	115	ONE
KD5AUH	1	5	1	105	NM
Wellesley ARS					
KC1FSZ	11	5	1	105	EMA
K9IDQ	1	5	1	105	IL
Desert Radio Amateur Transmitting Soc.					
KM6HWX	7	5	1	85	ORG
Desert Radio Amateur Transmitting Soc.					
KJ6FYY	6	5	1	80	ORG
K0ARG	6	5	1	80	CO
Gwinnett ARS					
N4TRB	4	5	1	75	GA
KJ0P	2	5	1	70	MN
Radio Assn. of Western New York					
KD2TFB	3	5	1	65	WNY
Cupertino ARES					
KJ6ZKU	3	5	1	65	SCV
KD2UXF	3	5	1	65	NNJ
Montachusett ARA					
W1FSH	2	5	1	60	WMA
Six Meter Club of Chicago					
WD9GDB	1	5	1	55	IL
New Providence ARC					
WB2QOQ	1	5	1	55	NNJ

1B — One Operator Commercial

Sierra Foothills ARC					
WU6X	510	2	1	2,090	AL
Mila's Field Day Group					
N4YDU	623	2	1	2,064	NC
Missouri Illinois ARC					
AD0JA	926	2	1	1,902	MO
N4NTO	266	2	1	1,114	NC
Florida Contest Group					
K4QD	241	2	1	1,104	CO
Oak Hill ARC					
N5YHF	171	2	1	1,032	NTX
AB8AC	473	2	1	996	OH
K7BWC	205	2	1	832	UT
Gwinnett ARS					
AK4AM	400	2	1	850	NC
Mississippi Valley ARA					
N9CIQ	142	2	1	718	WI
Wireless Assn. of South Hills ARC					
K3GW	126	2	1	554	WPA
Keuka Lake ARA					
KC2YTD	104	2	1	546	WNY
WD4LSS	110	2	1	490	NC
Bryan ARC					
AA5W	105	2	1	470	STX
WI9Q	105	2	1	470	IN
VE3SHO	116	2	1	470	GTA
N4KHI	100	2	1	448	SFL
Keuka Lake ARA					
W2JTC	106	2	1	442	WNY
Keuka Lake ARA					
N2FMS	170	2	1	390	WNY
KX4ZC	102	2	1	372	AL
REDXA/MARS					
N6YEU	83	2	1	350	SV
Skyview Radio Soc.					
WA9QXY	50	2	1	350	WPA
Bolingbrook ARS					
K9GLM	125	2	1	300	NV

N7DS 60 2 1 290 OR
Ewephoria RC
N8NN 18 2 1 222 NFL
Nittany ARC
K3CWP 20 2 1 190 WPA
Club de Radio Amateur Outaouais
N0JJO 32 2 1 178 KS
VE2IES 32 2 1 178 QC
NT5PH 54 2 1 158 NTX
KB3SPH 53 2 1 156 MDC
Ewephoria RC
KC8MLB 2 2 1 154 NFL
Keuka Lake ARA
W2RMT 29 2 1 108 WNY
Peel ARC
VA3KHH 17 2 1 106 GTA
South Jersey Radio Assn.
WA2WTF 22 2 1 94 SNJ
W9RDA 10 2 1 40 IL

1B — Two Operator

Richard Olson K9BWI Memorial FD Club
KØAV (+K7TD)
1,205 2 2 4,970 CO
Great Lakes CWops Club
WR4T 1,025 2 2 4,250 OH
Northeast Maryland AR Contest Soc.
N3HCN 976 2 2 4,014 EPA
Yooper Dupers
N9EZ (+WA1UJU)
856 2 2 3,574 MI
Mile Lake Radio Assn.
K0IEX (+N0STL)
589 2 2 2,406 MN
K5VBF 504 2 2 2,062 AR
Lakeland ARC
K1DU (+W4EMT)
397 2 2 2,030 WCF
Carbon Co. DXCC
WM8O (+WY7GAL)
139 5 2 1,740 WY
W0NLK (+W0KEN)
387 2 2 1,698 CO
Radio Artisans
K3NG 411 2 2 1,626 EPA
Wistaria Wireless Soc.
K6TY (WB6MLI)
265 2 2 1,608 SJV
WB6VRN) York RC
N9ZE 339 2 2 1,586 MI
Gratiot Co. Old Timers
W8AWE (+W8DCQ)
388 2 2 1,472 MI
Clearwater ARS/St. Petersburg ARC/Upper Pinellas ARC
WA4ATF (+W4WYR)
197 2 2 1,240 WCF
Utah DX Assn.
WR7Q 326 2 2 1,224 UT
Sleeping Bag Portables
KD2PWL (+WA2FON)
443 2 2 1,136 ENY
Monroe Co. Radio Communications Assn.
W8MCW (+KE8RXC)
139 2 2 858 MI
KJ7PJV 160 2 2 822 AZ
Panama City ARC
N4KGL (+NZ2I)
166 2 2 812 GA
Palms West ARC
KW4WA (+N2JB)
17 5 2 810 SFL
KG6DTZ 305 2 2 760 SJV
NH6JC 496 1 2 754 PAC
Desert Creek DX Dogs
KB7XL (+W6AAE)
293 2 2 736 NV
W0KU (+W0PER)
139 2 2 692 CO
Ellsworth Amateur Wireless Assn.
W8HAP 130 2 2 680 ME
GLARB
WT7B (+KD7GFR)
169 2 2 668 OR
N0DR 199 2 2 668 SD
Harris Family
K1MSH (+KB1NKU)
91 2 2 640 SFL
Palos Verdes ARC
K6ASN (+KN6FQL)
72 2 2 604 LAX
Columbia (MD) ARA
KS3O (+K3TBD)
123 2 2 596 MDC
KC5MM (+KI5QJS)
13 2 2 576 AR
W8AKR (+NV3Y)
204 2 2 558 OH
W3DO (+W3CGE)
113 2 2 490 WPA
N0MFD 106 2 2 464 MO
AI5C (+KF7MFN)
39 2 2 430 SF
North Okanagan RAC
VE7WBM 22 2 2 414 BC
KV5MD (+KD5RCR)
80 2 2 410 NM
W1GRY 115 2 2 406 NH
220 MHz Guys
K9ACM (+KD9LGI)
117 2 2 398 MI
Alaska Airlines ARC
N3ARC (N7CPM, KG7MPF)
14 5 2 365 EWA
WA7RJ (+KJ7ZNX)
52 2 2 354 WWA
Knob Hill Krew
K5ANR (+KE5ET)
67 2 2 350 NTX
North Okanagan RAC
VE7TMZ 26 2 2 322 BC
KK4WXK (+KM4CCB)
53 2 2 308 WV
KI5IWS 12 2 2 298 AR
Santa Clara Co. ARA
KG6UO (+KJ6ER)
23 2 2 296 SCV
KD5BPR (+N5OGW)
20 2 2 290 LA
KE6JZF (+N6ZOL)
11 2 2 272 ORG
Southwest Iowa ARC
N0BHB 56 2 2 262 IA
BayNet ARC
K6BEZ 24 2 2 234 SCV
OH-KY-IN ARS
KE8JTM (+KE8JTL)
27 2 2 204 OH
WA7TPB 20 2 2 190 WWA
KG7WPM (+KE7UDV)
15 2 2 180 ID
Pretty Good Ham Club
WOØGIE (K9TY, N6XWD)
5 2 2 164 MN
Peel ARC
KC2TXO/VE3
18 2 2 86 GTA

1B — Two Operator Battery

W2NTN (+N2OT)
424 5 2 4,225 EMA
Hilltop Transmitting Assn.
N3CU (+K3MSB)
375 5 2 4,000 EPA
Neighbor Kids
KE3V (+WB3CEG)
354 5 2 3,690 WPA
N3ZP (+KG9Z)
233 5 2 2,370 EPA
Sierra ARC of the High Mojave
WA6ARA (+N6VGW)
165 5 2 2,100 SJV
Metro Atlanta Telephone Pioneer ARC
W4PME (+K4PQC)
167 5 2 1,920 GA
Georgia Tech ARC
W4ATL 164 5 2 1,790 GA
West Valley ARA
K6XM (+KM6VHG)
122 5 2 1,315 NV
K0WOI (+N0WOI)
72 5 2 975 IA
Ottawa Valley QRP Soc.
VA3RKM (+VA3AMX)
29 5 2 940 ONE
Club de Radio Amateur Outaouais
VA2LOJ (+VA2OJP)
67 5 2 785 QC
N3OFR (+N3RLX)
45 5 2 575 EPA
Bristol ARC
W4BCU 39 5 2 445 TN
WA4A 23 5 2 335 VA
Ottawa Valley Mobile RC
VA3PYT 12 5 2 210 QC

1B — Two Operator Commercial

Twin Ops Warriors
N4IQ (+AC4Q)
444 2 2 1,614 SC
Clearwater ARS/St. Petersburg ARC/Upper Pinellas ARC
WA4ATF (+W4WYR)
197 2 2 1,240 WCF
W3AO PVRC
AC3U (+W4RN)
139 2 2 606 MDC
Greensboro Digital RA
NC4DR (AJ4TW, AB3KC)
163 2 2 446 NC
Snohomish Co. Hams Club
KD7JB 167 2 2 384 EWA
Crookston Pirates
AD0FJ (+KDØUWZ)
61 2 2 378 MN
Charleston ARS
AA2BB (+KN4NIT)
60 2 2 270 SC
VA7ES 48 2 2 146 BC
Ham Assn. of Mesquite
KF5VAV 18 2 2 106 NTX

2B — One Operator

Pasadena RC/JPLARC/CITARC
AC6X 787 2 1 2,850 LAX
WD9HNZ 392 2 1 2,062 WI
W3AO PVRC
KZ1O 515 2 1 1,896 NFL
Bolingbrook ARS
KD9RYP 100 2 1 950 IL
Radio Activity of Savannah
K7UWR 68 2 1 620 GA
Aerospace Employees Assn. ARC
KK6KC 49 2 1 414 LAX
Big Island ARC
AH6V 56 2 1 406 PAC

2B — One Operator Battery

Cuyahoga Falls ARC
K8ZT 425 5 1 4,465 WV
VE3YTP 158 5 1 1,995 ONS
Aerospace Employees Assn. ARC
AI6DO 133 5 1 1,725 LAX
WCARES-TN
KA5WMF 152 5 1 1,680 TN
N1XRR 74 5 1 1,035 SC
Signal Hill ARC
K4LXY 21 5 1 560 VA
Signal Hill ARC
K3NLT 11 5 1 360 VA

2B — One Operator Commercial

Wisconsin ARC
N9SD 408 2 1 1,698 WI

2B — Two Operator

K8MEJ 933 2 2 3,782 OH
W6WU 570 2 2 2,180 MDC
W3SW (+KB2ZWZ)
543 2 2 2,052 WNY
KD5BBR 390 2 2 1,762 OK
KB1AWM (+KA8JCC)
401 2 2 1,606 SC
K0MPH 366 2 2 1,584 WI
N9SZ (+KB8RTB)
265 2 2 1,410 OH
Inverhuron Ham RC
VE3IHR (VE3PCP, VA3AQZ)
178 2 2 1,370 ONS
Sand Springs Wireless Assn.
WT8WV (+WR8S)
312 2 2 1,322 WV
W0WH (+KG9OC)
245 2 2 1,312 NE
Seattle ACS
NN7M (+W7FCL)
174 2 2 1,304 EWA
Camp Trouten
K9DJT 320 2 2 1,268 WI
Snoring Beagle Field Day Dogs
K4DKW 231 2 2 1,174 MI
K4JBL (+W4GLK)
201 2 2 1,154 TN
Farrell-Gray
K0W (W2IQW, AC0QG)
38 2 2 872 CO
KE7F 401 1 2 751 OR
North Fulton ARL
WO1VEN (+W4JEW)
36 2 2 652 GA
Club de Radio Amateur Outaouais
VE2FTX 160 2 2 570 QC
VA2LRA (+VE2ENN)
136 2 2 522 QC
WW4NET 102 2 2 482 KY
Gordon PA Field Day Group
WR1B (+KC1CWM)
41 2 2 466 EPA
618 Comms
K9AI 30 2 2 410 IL
KK7DS (+KJ7NBM)
71 2 2 392 OR
Hoodview ARC
K7DTS (+K7JPX)
5 2 2 360 WWA
Club de Radio Amateur Outaouais
VE2JCA 125 2 2 300 QC
KC8QVO 11 2 2 272 OH
W7GG 37 1 2 87 WWA

2B — Two Operator Battery

San Diego ARES
W6C (KG6IYN, KM6ZBE)
535 5 2 5,540 SDG
N3A (K3WWP, KC2EGL)
303 5 2 3,280 WPA

NC4RT (+K2ONN)
130 5 2 1,650 NC
N0SUW 86 5 2 1,510 MN
Wireless Soc. of Lorain Co.
KB8ZUN (+KE8KBT)
97 5 2 1,335 OH
Palo Alto ARA
W6JTH 99 5 2 1,230 SV
NE6ET (+KA6PUW)
52 5 2 820 ORG
Huntsville ARC
AA2MA (+N5AYD)
25 5 2 800 AL
Mississauga ARC
VA3HES (+VE3MDX)
47 5 2 710 ONS
Roanoke Valley ARC
KN4AJQ (+KN4NLU)
33 5 2 535 VA
W4KEL (+W4KEL)
20 5 2 400 VA
Vienna Wireless Soc.
W4DOE 12 5 2 270 VA
Tortolita RC
K7GAF (+N7LRK)
2 5 2 80 AZ

2B — Two Operator Commercial

WW4NET 102 2 2 482 KY
TX Emergency Amateur Communicators
K5K (N5KWD, KB5KN)
87 2 2 324 STX
Runestone ARC
KC0TAF (+KI6AZI)
40 2 2 272 MN

3B — One Operator

KE8KIK 74 2 1 500 OH

Mobile Stations

1C

W1JCW 1,136 5 1 5,930 STX
WW5X 870 2 1 3,630 AL
W8UE 728 2 1 3,078 MI
Smith Chart ARS
N4XD 714 2 1 3,006 NC
Niagara Frontier Radiosport
K2NV 500 2 1 2,146 WNY
SC4ARC
AJ6X 169 5 1 2,075 SCV
Not Quite Workable Contest Club
WB8DC 447 2 1 1,938 OH
Wahkiakum Co. ARC
WB6AGE 283 2 1 1,378 WWA
Mid-MO ARC
KD0GY 118 2 1 914 MO
Wahkiakum Co. ARC
W7ERY 67 5 1 905 WWA
W7CGA 130 2 1 770 ND
Fort Wayne RC
AC9EZ/M 163 2 1 700 ND
Central Kansas ARC
KS0FD 237 2 1 624 KS
Addison Co. ARA
N1TRK 166 2 1 610 VT
Jefferson Co. (TX) ARC
KI5OLV 122 2 1 594 STX
Benicia ARC
NR5NN/M 108 2 1 570 EB

Kitchener-Waterloo ARC
VE3RKS 132 2 1 550 ONS
Burlington ARC
VA3OBO 111 2 1 494 ONS
SC4ARC
KN6CZD 13 2 13 476 SCV
FD Philips NEO
N8AGU 73 2 1 442 WPA
Long Island CW Club
KD9QYP 19 5 1 440 IL
NØGN 61 2 1 432 NE
WA4MLD 94 2 1 426 SFL
HP Alumni RC
NF1A 39 2 1 384 ME
Rome RC
N2MG 49 2 1 346 WNY
Frankford RC
AB1P 69 2 2 318 DE
KØMKL/M 65 2 2 284 MN
KT5LA/MM 39 2 1 272 LAX
New Jersey Institute of Technology ARC
WW2I 43 2 1 236 NNJ
K1FJM/M 38 2 1 226 SB
Ventura Co. ARS
N6ZE/M 38 2 1 226 SB
Six Meter Club of Chicago
WA9FIH 35 2 1 220 IL
Jefferson Co. (WA) ARC
KI7T 35 2 1 220 WWA
Valley and Massanutten ARA
K4DJG 16 2 1 214 VA
KN6NZN 10 5 1 200 LAX
Coquitlam ARC
VA7VVR 19 2 2 196 BC
Club Radioamateur de Drummondville
VA2GJ 4 5 1 190 QC
Potomac Valley RC
N4QX 17 2 1 184 NNJ
Northeastern Indiana ARA
KD9QDL 7 2 1 178 IN
Half Moon Bay ARC
N6JSO 11 2 1 172 SCV
Comox Valley ARC
VE7NDE 4 5 1 170 BC
Smith Chart ARS
W4FEY 3 5 1 165 NC
Cuyahoga ARS
K8SHB 5 2 1 160 OH
Trident ARC
W4ZBR 5 2 1 160 SC
NFLARC
KC2ARX 1 5 1 155 NFL
Holiday City ARC
KC2OQF 1 2 1 154 AL
Warren Co. NY RC
AF2V 2 2 1 154 ENY
N9JPG 17 2 1 118 WI
Orange Co. (NY) ARC
K2GRI 33 2 1 116 ENY
KA3KSP 32 2 1 114 WPA
K5KMS 30 2 1 110 NTX
KJ7LVP 24 2 1 110 EWA
W6JLV 23 2 1 96 SB
K9NH 17 2 1 84 TN
Westcoast ARA
VA7HC 14 2 1 78 BC
Lake ARA
KV4I 26 1 1 76 OR
South Lyon Area ARC
N8HAM 13 2 1 76 MI
Bolingbrook Area Radio Contesters
NA9US 12 2 1 74 WI
Desert Radio Amateur Transmitting Soc.
KF9CI 3 5 1 65 ORG
Yuba-Sutter ARC
W6PNH 1 2 1 52 SV
KA1KNW 18 2 1 36 CT
VA3DLJ 8 2 1 16 ONE

2C

N8DNZ 219 5 2 1,820 AL
KB6VME/MM 276 2 2 1,064 SDG
Medina Co. Amateur Radio Corporation
WA5FRF 51 5 2 705 STX
KC2RTE 44 2 1 698 WNY
Fox River Relay League
W9XA 32 2 2 316 MN
Old Post ARS
KC9SEH 9 2 1 286 IN

4C

WCARC-OH
K8L 15 2 1 480 OH

Home Stations

Commercial Power

1D

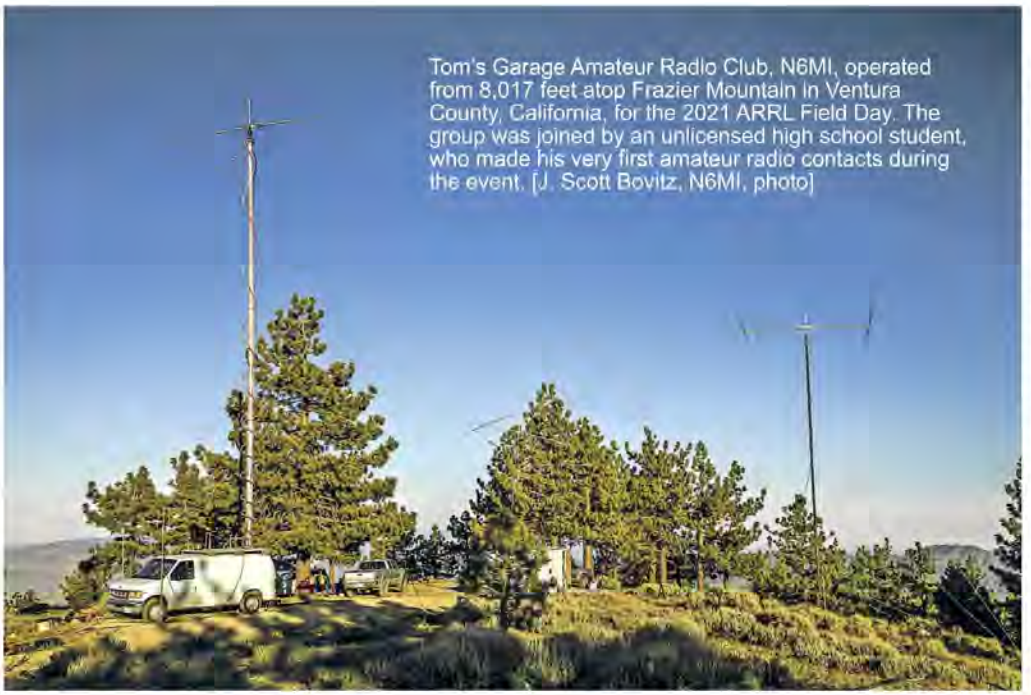
W3AO PVRC
K3RA 2,052 2 1 8,658 MDC
Fort Wayne DX Assn.
KC8ZH 1,912 2 1 7,698 IN
Southern California Contest Club
N7NR 2,231 2 6 7,308 ORG
Oak Hill ARC
K5TR 2,485 2 1 7,280 STX
Orange Co. Radio Amateurs & Durham FM Assn.
NC4KW 1,837 2 2 6,526 NC
Arizona Outlaws Contest Club
N4ZZ 1,585 2 1 6,390 TN
Arizona Outlaws Contest Club
K6LL 1,704 2 2 6,378 AZ
BEANOS
W4GJ 1,487 2 2 6,098 NFL
Orange Co. Radio Amateurs & Durham FM Assn.
WA4PSC 1,369 2 1 5,626 NC
K9LJN 1,304 2 1 5,266 IL
AA2BJ 1,468 2 2 5,012 NNY
W3AO PVRC
K3ZO 1,631 2 1 4,800 MDC
SAARS
W2OR 1,151 2 1 4,754 NFL
Boeing Employees ARS — St. Louis
WØTT 1,141 2 1 4,614 MO
Broughton Memorial Field Day Group
K2UF 1,136 2 1 4,594 ENY
Smith Chart ARS
W4KX 1,022 2 1 4,338 NC
REDXA/MARS
K6SRZ 1,017 2 1 4,218 SF
Potomac Valley RC
KP2M 1,011 2 1 4,094 VI
Pasadena RC/JPLARC/CITARC
NI6W 1,010 2 1 4,090 LAX
Gold Coast ARA
AI4WW 1,008 2 1 4,082 SFL
W3AO PVRC
K3MM 1,008 2 1 4,082 MDC
Cleveland Co. Amateur Radio Service
N4LQ 1,004 2 1 4,066 NC
Lake Co. (OH) ARA
K8BL 976 2 1 4,054 OH
Blossomland ARA
KE3K 952 2 1 3,958 MI
North Shore (IL) RC
W8LVN 975 2 11 3,936 IL
Kitchener-Waterloo ARC
VE3YT 1,045 2 1 3,878 ONS
Palos Verdes ARC
K6PV 1,286 2 1 3,854 LAX
Great Lakes CWops Club
KV8Q 944 2 1 3,820 OH
W3AO PVRC
WB3AVN 962 2 1 3,762 MDC
Cuyahoga ARS
W8MET 1,160 2 1 3,754 OH
W3AO PVRC
K3AU 844 2 1 3,732 MDC
Splitrock ARA
W2PJ 1,739 2 1 3,724 WNY
Bay Area DXers
W8ZDT 910 2 1 3,690 MI
WAØBJR 873 2 1 3,542 MO
Northwest Florida ARC
KE4FD 1,002 2 1 3,498 NFL
San Andreas Faultline Field Day Survivors
W6ML 1,023 2 1 3,476 SJV
Heartland DX Assn.
KVØI 941 2 1 3,472 NE
Cuyahoga ARS
K8RGI 832 2 1 3,462 OH
The World RC
W3WRC 917 2 1 3,458 SV
Kingston Amateurs
VE3PJ 1,546 2 1 3,422 ONE
South Texas Remote DX Club
K5Y 827 2 5 3,416 STX
Palo Alto ARA
N6RK 833 2 1 3,382 SV
Contest Club Ontario
VE3KP 804 2 1 3,366 ONE
Texas DX Soc.
N5XZ 1,652 1 1 3,354 STX
SARC-SEPAR
VE7SAR 974 2 20 3,310 BC
Carbon Co. DXCC
KØLW 806 2 1 3,274 MO
North Shore (IL) RC
K7CS 805 2 1 3,270 IL
CWOps
WN7S 801 2 1 3,254 VA
Wayne ARC
K8AJS 769 2 1 3,226 OH
AK6A 784 2 1 3,176 OR
Franklin Co. (MA) ARC
N1YL 750 2 2 3,146 WMA
Kentucky Contest Group
KM4TY 767 2 1 3,118 KY
Tri-Lakes ARC
NZØT 751 2 1 3,054 MO
KR2AA 1,491 1 1 3,032 NLI
West Valley ARA
W8RJL 742 2 1 3,018 SCV
Buckhead Contest Club
W4KJ 1,468 2 1 3,016 ME
Boulder ARC
NØTA 714 2 1 3,006 CO
VE5MX 735 2 1 2,990 SK
South Jersey Radio Assn.
WA2VYA 727 2 1 2,938 STX
W3AO PVRC
N4ZR 709 2 1 2,886 MDC
Deep Dixie Contest Club
KE8G 708 2 1 2,882 OH
St. Louis ARC
WØSLW 706 2 1 2,874 MO
Watauga ARC
NI4E 700 2 1 2,850 NC
WCARC-TX
W5TA 579 2 1 2,830 STX
Central West Virginia Wireless Assn.
NW8U 701 2 1 2,788 WV
Mid-MO ARC
NWØM 678 2 1 2,762 MO
St. Louis ARC
KØLIR 675 2 1 2,750 MO
Southwest Dallas Co. ARC
KB5NJD 672 2 1 2,738 NTX
LEFROG
W9KEY 758 2 1 2,730 WI
NØTT 670 2 1 2,730 MO
Orange Co. Radio Amateurs & Durham FM Assn.
N8BR 641 2 1 2,714 NC
Murgas ARC
K3YTL 841 2 2 2,688 EPA
W3AO PVRC
K3EW 652 2 1 2,658 MDC
NJ2OM 651 2 1 2,654 NNJ
Old Barney ARC
N2OO 702 2 1 2,650 SNJ
Tennessee Contest Group
K4AMC 642 2 1 2,618 TN
High Sierra Field Day Group
KJ7TEA 607 2 1 2,578 ID
Collins ARC
WA8ZBT 647 2 1 2,570 NTX
WD8DSB 630 2 1 2,570 IN
South Bay ARA
WT6K 627 2 1 2,558 EB
Contest Club Ontario
VE3EJ 627 2 1 2,558 GTA
Sun Parlour ARC
VE3SQ 627 2 1 2,558 ONS
Bullitt ARS
KE4KY 620 2 1 2,530 KY
K8ER 587 2 1 2,498 MI
KV1E 608 2 1 2,482 IA
Midland (TX) ARC
W5AJ 604 2 1 2,466 WTX
North Port ARC
N8DM 600 2 2 2,450 WCF
W3AO PVRC
N3JT 600 2 1 2,450 VA
AD8J 600 2 1 2,450 NC
DuPage ARC
KA9BHD 595 2 1 2,430 IL
W1ARY 597 2 1 2,412 CT
Palos Verdes ARC
NG6R 589 2 1 2,406 LAX
Georgian Bay ARC
VE3FP 562 2 1 2,398 ONS
Tri-County ARC (WI)
K9LGU 536 2 2 2,396 WI
Columbia-Montour ARC
K3QIA 585 2 1 2,390 EPA
Paso Robles ARC
KB6TAZ 1,169 2 4 2,388 SB
Oro Valley ARC
AK2L 558 2 1 2,382 AZ
South Carroll Amateur Radio Group
WA3FAE 580 2 1 2,370 MDC
Halifax ARC
VE1AI 579 2 1 2,366 MAR
K3JT 553 2 1 2,362 WV
Turkey Heaven Mtn. Repeater Assn.
K4PI 577 2 1 2,358 GA
W3AO PVRC
W3LL 577 2 1 2,358 MDC
Broughton Memorial Field Day Group
NM2R 572 2 1 2,338 ENY
KB3AAY 571 2 1 2,334 MDC
Spokane DX Assn.
K7GS 570 2 1 2,330 EWA
W3AO PVRC
WB2ZAB 1,030 2 1 2,324 MDC
Huron ARA
W7UT 540 2 1 2,310 SD
Peel ARC
VE3CWU 565 2 1 2,310 GTA
Minnesota Wireless Assn.
WØG 1,128 2 1 2,306 MN
Smoky Mountain ARC
KC4NX 1,125 2 1 2,300 TN
K7TQ 558 2 1 2,282 ID
Randolph Co. Emergency RC
KDØOAL 482 2 1 2,278 AL
W3AO PVRC
N3CKI 557 2 1 2,278 NC
K7DR 532 2 1 2,278 MI
K2MK 553 2 1 2,262 WCF

Jim Cluett, W1PID, operated his tiny radio station during the 2021 ARRL Field Day, using a roll-up solar panel and other tools. [Judy Cluett, photo]

Palos Verdes ARC
K6RO 633 2 1 2,232 LAX
Valley and Massanutten ARA
AD4TJ 475 2 1 2,212 VA
Salkehatchie ARS
KY4E 540 2 1 2,210 SC
Cuyahoga ARS
K8RJH 516 2 1 2,206 OH
Tri-County ARC (WI)
K9KEU 514 2 1 2,206 WI
W3AO PVRC
N3AM 538 2 1 2,202 MDC
Alabama Contest Group
K4PV 733 2 1 2,194 NFL
Pasadena RC/JPLARC/CITARC
N2JNR 525 2 1 2,168 LAX
Tennessee Contest Group
AF4T 513 2 1 2,168 TN
Sunnyvale ARES
WU6P 454 2 1 2,166 SCV
Nittany ARC
K3QP 530 2 2 2,162 WPA
MM Expeditionary Force
N9AU 502 2 1 2,158 WI
Niagara Frontier Radiosport
K2ZR 524 2 1 2,146 WNY
K2IW 525 2 1 2,142 ENY
K4BSK 524 2 2 2,136 VA
VA3GE 520 2 1 2,130 ONE
Downey ARC
N6QQ 517 2 1 2,118 LAX
N6OKU 1,031 2 1 2,112 ORG
Swamp Fox Contest Group
K4QQG 1,025 2 2 2,100 SC
Shreveport ARA
K5JAZ 511 2 1 2,094 LA
Mike & Key ARC
W7UDH 507 2 1 2,078 WWA
Mad River RC
K8BB 642 2 1 2,072 MI
AE1T 504 2 1 2,066 NH
W0AAE 498 2 1 2,062 WMA
St. Charles ARC
K4CM 502 2 1 2,058 MO
REDXA/MARS
N6IE 560 2 1 2,056 SF
N7ZZ 529 2 1 2,054 WI
Kings Co. and Annapolis Valley ARCs
VE1RSM 500 2 1 2,050 MAR
Paducah ARA
N4QS 500 2 1 2,050 KY
Monkey Lover's Radio Consortium
W6NN 500 2 1 2,050 SCV
Soc. Of Midwest Contesters
WD9CIR 500 2 1 2,050 IL
Central Virginia Contest Club
N3UA 500 2 1 2,050 VA
Adams Co. ARS
K3DQB 474 2 1 2,046 EPA
Dallas ARC
KG5EIU 424 2 1 2,042 NTX
Mother Lode Dx/Contest Club
K6OK 500 2 1 2,030 SV
K9SH 1,004 2 2 2,028 IN
Soc. Of Midwest Contesters
W9RN 489 2 1 2,006 WI
Half Moon Bay ARC
KØDTJ 435 2 1 1,990 SCV
Old Barney ARC
K2RET 486 2 1 1,982 SNJ
W3AO PVRC
N3HEE 483 2 1 1,982 SC
Clallam Co. ARC
K7NEW 482 2 1 1,978 WWA
L'Anse Creuse ARC
WU8C 481 2 1 1,974 MI
Club Radio Amateur de Québec
VE2EBK 375 2 1 1,970 QC
REDXA/MARS
WX6B 950 2 2 1,950 SF
Pasadena RC/JPLARC/CITARC
N6NO 450 2 1 1,950 LAX
Tortolita RC
NU7Y 475 2 1 1,950 AZ
York Region ARC
VE3NRT 435 2 1 1,938 GTA
Contest Club Ontario
VE3MA 470 2 1 1,930 ONS
Mansfield-Johnson ARS
WA5FWC 940 2 1 1,930 NTX
Morris RC/Hanover TWP OEM
NO2EL 444 2 1 1,926 NNJ
K6RBS 468 2 1 1,922 ORG
WY2U 393 2 5 1,918 NLI
London ARC
VE3OT 464 2 1 1,906 ONS
DuPage ARC
WB9UGX 436 2 1 1,894 IL
Raleigh ARS
WA4BPJ 666 2 2 1,894 NC
Twin City ARC
WB9HFK 460 2 1 1,890 IL
N9YLZ 457 2 1 1,876 IL
Winona ARC
KIØF 651 2 1 1,874 MN
K1USN RC
N1DC 468 2 1 1,866 EMA
Western IL ARC
N9JF 453 2 1 1,862 IL
Gloucester Co. ARC
WA2IBZ 452 2 1 1,858 SNJ
Orange Co. Radio Amateurs & Durham FM Assn.
KR4UB 426 2 1 1,854 NC
Cuyahoga ARS
WA8RR 426 2 1 1,854 OH
Holmesburg ARC
W3WHK 450 2 1 1,850 EPA
Delaware ARA
K8MP 425 2 1 1,850 OH
Kentucky Contest Group
KM4FO 445 2 1 1,830 KY
Anthracite Repeater Assn.
W3RC 450 2 3 1,830 EPA
South Wake ARC
N9PGG 443 2 1 1,822 NC
Valley and Massanutten ARA
W4PJW 452 2 1 1,818 VA
Orange Co. Radio Amateurs & Durham FM Assn.
N4KW 519 2 1 1,800 NC
Collins ARC
WØVX 435 2 1 1,790 NTX
SARC-SEPAR
VE7BC 436 2 1 1,776 BC
Cabarrus ARS
WZ4M 426 2 1 1,754 NC
OCAPA
WD5G 426 2 1 1,754 OK
Mound ARA
WE8R 400 2 1 1,750 OH
Dial RC of Middletown
N8AA 400 2 1 1,750 OH
Potomac Valley RC
N4CF 425 2 1 1,750 VA
Gwinnett ARS
KD4YDD 423 2 1 1,742 GA
K8BTU 420 2 1 1,730 OH
Palo Alto ARA
K6VVK 395 2 1 1,726 SCV
Frankford RC
AG2J 419 2 1 1,726 SNJ
GOTAHAMS
K6EV 419 2 1 1,726 LAX
Lake Co. (OH) ARA
AA8OY 388 2 2 1,722 OH
Central Oregon Coast ARC
N7GYL 318 2 1 1,722 OR
McKinney ARC
K5LY 417 2 1 1,718 NTX
Algoma ARC
VA3TMG 504 2 2 1,716 ONN
Lake Co. (OH) ARA
WB8SIG 416 2 2 1,714 OH
K4GM 415 2 1 1,710 VA
Bay Area DXers
W8JJ 413 2 1 1,702 MI
Franklin (NC) ARC
NS9I 413 2 1 1,702 WI
USS Kitty Hawk ARC
NZ4FF 413 2 1 1,702 NC
Watauga ARC
K2SD 412 2 1 1,698 NC
K9UQN 386 2 1 1,694 TN
VE2NTT 822 2 1 1,694 QC
Anonymous Contest Group
VE2FU 407 2 1 1,678 QC
W2UQ 406 2 1 1,674 VA
CorTek RA
KK9DX 405 2 1 1,670 TN
Montachusett ARA
KT1I 404 2 2 1,666 WMA
WCARC-TX
W2MN 307 2 1 1,664 STX
N4UOH 415 2 1 1,660 NC
Paducah ARA
KC4WPS 401 2 1 1,654 KY
OH-KY-IN ARS
AA8SW 400 2 1 1,650 OH
W4SK 400 2 1 1,650 TN
Central West Virginia Wireless Assn.
K8MAO 399 2 1 1,646 WV
Edmond ARS
W5CU 398 2 1 1,642 CO
Loudoun Amateur Radio Group
KE4S 393 2 1 1,622 VA
KF6I 405 2 1 1,622 ORG
NOARS-LCARA
W1PDI 396 2 1 1,616 OH
Montgomery ARC
W4CRS 390 2 1 1,610 AL
Oro Valley ARC
KE7AZ 365 2 1 1,610 AZ
Montvale OEM
K2FJ 390 2 1 1,610 NNJ
Niagara Frontier Radiosport
NN2NN 406 2 1 1,608 WNY
Boca Raton ARA
AB4LL 365 2 1 1,606 SFL
Florida Contest Group
N8KH 363 2 1 1,602 SFL
W3AO PVRC
WR3R 509 2 1 1,600 MDC
Salkehatchie ARS
KY4GS 362 2 1 1,598 SC
Delmarva DX Assn.
AA1K 385 2 1 1,590 DE
Club Radio Amateur de Québec
VE2XTD 282 2 1 1,578 QC
Orange Co. (NY) ARC
N2BEF 356 2 1 1,574 ENY
North Shore (IL) RC
WA9IVH 361 2 1 1,574 IL
Cumberland ARC
WA3KCP 354 2 1 1,566 EPA
Fort Wayne RC
WA9BBN 377 2 1 1,558 IN
Orange Co. (CA) ARC
N1BKB 568 2 1 1,556 ORG
McHenry Co. Wireless Assn.
N7US 351 2 1 1,554 IL
NA6MG 388 2 1 1,552 LAX
NEMO ARC
NR0Q 350 2 1 1,550 MO
Old Barney ARC
N2HM 331 2 1 1,548 SNJ
Montgomery ARC
NA4MM 374 2 1 1,546 AL
Cochise ARA
K7DTB 345 2 1 1,530 AZ
Kings Point ARC
W4TLA 368 2 1 1,522 WCF
Northeast Maryland AR Contest Soc.
N3FJP 551 2 2 1,522 MDC
Comox Valley ARC
VE7DX 413 2 1 1,516 BC
Frankford RC
W3FIZ 531 2 1 1,510 EPA
Dallas ARC
KF5ZBL 290 2 1 1,506 NTX
Algoma ARC
VE3ZDR 347 2 1 1,504 ONN
N2RI 337 2 1 1,498 NLI
Cuyahoga ARS
W8GC 335 2 1 1,490 OH
KD0OIX 344 2 1 1,490 MN
Northeast Maryland AR Contest Soc.
WA1HEW 358 2 1 1,482 EPA
South West Ohio DX Club
W9VNE 357 2 1 1,478 OH
KF0AIJ 357 2 1 1,478 IA
Anthracite Repeater Assn.
AI3Q 356 2 1 1,474 EPA
Club Radio Amateur de Québec
VE2WPL 255 2 1 1,470 QC
KG5RJ 355 2 1 1,470 NTX
W0UI 378 2 2 1,460 CO
North Augusta Belvedere RC
N4XL 361 2 1 1,456 SC
N4N Field Day Group
KT4XN 351 2 1 1,454 NFL
SARC-SEPAR
VA7XB 350 2 20 1,450 BC
Dial RC of Middletown
W3GP 325 2 1 1,450 NC
N2UU 350 2 1 1,450 SNJ
W9PA 348 2 1 1,442 IN
WB6HYH 695 2 1 1,440 ORG
N8II 597 2 1 1,438 WV
Sun Country ARS
KM4RL 346 2 1 1,434 NFL
Fallbrook ARC
KG6HSQ 344 2 1 1,426 SDG
K4HAL 344 2 1 1,426 AL
New Providence ARC
KC2WUF 342 2 1 1,422 NNJ
Florida Contest Group
KJ4LQX 318 2 1 1,422 SFL
Kingston Amateurs
VE3SCN 313 2 1 1,416 ONE
New Providence ARC
KB2FCV 341 2 2 1,412 NNJ
Smoky Mountain ARC
W4PCA 340 2 1 1,410 TN
W1FOX 340 2 1 1,410 VA
VE2HEW 327 2 1 1,406 QC
Coshocton Co. ARA
N8VV 338 2 1 1,402 OH
Bonac ARC
K4RUM 337 2 1 1,398 NLI
KC2NFJ 337 2 1 1,398 NNJ
NF9Z 673 2 1 1,396 IL
Village Hams
KE9SA 343 2 3 1,396 WI
Gwinnett ARS
NN4K 336 2 1 1,394 GA
VA6AKA 335 2 1 1,390 AB
Moose Jaw ARC
VE5KS 355 2 1 1,386 SK
North Shore (ON) ARC
VE3HYJ 333 2 1 1,382 GTA
Peel ARC
VA3PM 256 2 1 1,374 GTA
Lisbon Area ARA
NN8B 331 2 1 1,374 OH
NW2K 331 2 1 1,374 WNY
West Valley ARA
K6EI 305 2 1 1,370 EWA
Frankford RC
W2MKM 654 1 1 1,358 NNJ
Thunderbird ARC
N7SU 327 2 1 1,358 AZ
K6DBS 528 2 1 1,358 SV
Bristol ARC
AA4DD 326 2 1 1,354 TN
Kentucky Contest Group
AA4WW 326 2 1 1,354 KY
W1KMA 326 2 1 1,354 RI
Conejo Valley ARC
K7SDW 324 2 1 1,346 SB
AE2T 324 2 1 1,346 WNY
K3FMF 323 2 1 1,342 EPA
Ak-Sar-Ben ARC
KØIL 323 2 1 1,340 NE
Albemarle ARC
NØWP 311 2 1 1,334 VA
K6UF 321 2 1 1,334 SCV
Arrow Comm. Assn
N8SBE 295 2 1 1,330 MI
K4NMR 320 2 1 1,330 WCF
Gwinnett ARS
K4VBM 326 2 1 1,326 GA
Parker RA
KE0DC 318 2 1 1,322 CO
Broughton Memorial Field Day Group
K2AE 583 2 1 1,316 ENY
South Texas Remote DX Club
W7SST 316 2 1 1,314 GA
Orange Co. Radio Amateurs & Durham FM Assn.
KA5ETS 291 2 1 1,314 NC
W6ZQ 316 2 1 1,314 AZ
Kansas City Contest Club
KØVBU 355 2 1 1,308 KS
Border City RC
VE3CWP 314 2 1 1,306 ONS
Federación de Radio Aficionados de PR
NP2KW 316 2 1 1,300 VI
Androscoggin ARC
WT1A 312 2 1 1,298 ME
Five Flags ARA
KF4DVF 237 2 1 1,298 NFL
Bristol ARC
K4FJW 312 2 1 1,298 VA
AE7I 312 2 1 1,298 NV
KB1RVU 623 2 2 1,296 CT
NG3Y 311 2 1 1,294 MDC
Fort Smith Area ARC
W5TMC 620 2 1 1,290 OK
WA1FMM 339 2 1 1,288 CO
Kaw Valley ARC
KE0EK 309 2 1 1,286 KS
Western IL ARC
W9WE 309 2 1 1,286 IL
Club Radio Amateur de Québec
VE2PTB 208 2 1 1,282 QC
W4ORS 308 2 1 1,282 AL
WZ5M 614 2 1 1,278 LA
Jefferson Co. (WA) ARC
AH6EZ 278 2 1 1,276 WWA
Oro Valley ARC
W2HZ 306 2 1 1,274 AZ
Not Quite Workable Contest Club
AA8BV 315 2 1 1,262 OH

Kings Co. and Annapolis Valley ARCs
VE1BAB 303 2 1 1,262 MAR
Union Metropolitaine des Sans-filistes de Montréal
VE2WNF 278 2 1 1,262 QC
Union Metropolitaine des Sans-filistes de Montréal
VE2SYQ 289 2 1 1,260 QC
Central Louisiana ARC
WW5G 302 2 1 1,258 LA
Cuyahoga ARS
AC8NW 303 2 1 1,258 OH
K9GDF 302 2 1 1,258 WI
Great Southern DX Assn.
NF4J 330 2 1 1,254 AL
Gloucester Co. ARC
N2BRJ 301 2 1 1,254 SNJ
VE3TM 303 2 1 1,252 ONE
VE3GFN 310 2 1 1,252 GTA
WX7P 601 2 1 1,252 EWA
North Augusta Belvedere RC
KP2L 300 2 1 1,250 SC
Kansas City Contest Club
NX0I 315 2 1 1,250 MO
Davie/Cooper City ARC
WB4EHG 224 2 1 1,246 SFL
QSY Soc.
WA2JQK 350 2 1 1,244 ENY
Central West Virginia Wireless Assn.
KX8T 298 2 1 1,242 WV
Shreveport ARA
W5SUM 298 2 1 1,242 LA
Valdosta ARC
W4VS 578 2 1 1,242 GA
Lakeland ARC
W4TJM 284 2 1 1,236 WCF
AB1WG 295 2 1 1,230 VT
Minnesota Wireless Assn.
K0TC 291 2 1 1,214 MN
Coquitlam ARC
VE7WJ 506 2 1 1,212 BC
Halifax ARC
VA1RST 264 2 1 1,206 MAR
WA3AAN 315 2 1 1,200 EPA
Merrymeeting ARA
AA4AK 211 2 1 1,194 ME
Tri-Lakes ARC
K0UA 286 2 1 1,194 MO
Milky Way Wireless Club
KC7KFF 407 2 4 1,192 AZ
Halifax ARC
VE1NB 260 2 1 1,190 MAR
Mad River RC
AA8IA 351 2 1 1,190 OH
Niagara Frontier Radiosport
W2VM 285 2 1 1,188 WNY
WA2KLP 284 2 1 1,186 ENY
University of Alabama RC
KV4T 282 2 3 1,176 AL
Silver Springs RC
WA3LXD 337 2 1 1,170 NFL
Albany ARA
N2SQW 255 2 1 1,170 ENY
N4SFC 280 2 1 1,170 SFL
Niagara Frontier Radiosport
KM2L 279 2 1 1,166 WNY
Northwest Illinois ARC
W9HH 278 2 1 1,162 IL
Cuyahoga ARS
K8CKC 177 2 1 1,158 OH
VE2EZD 252 2 1 1,158 QC
KD8VCB 252 2 1 1,158 OH
KZ4KX 278 2 1 1,156 KY
Coweta RC
K4AFR 276 2 1 1,154 GA
Irvine Disaster EmComms
K6PB 253 2 1 1,152 ORG
South Mountain Radio Amateurs
N3SW 200 2 1 1,150 VA
Montgomery ARC
N4AU 275 2 1 1,150 AL
Palos Verdes ARC
KA6LJR 265 2 1 1,150 LAX
North Georgia ARC
KC4GCK 274 2 1 1,146 GA
Toronto ARC
VE3HEU 249 2 1 1,146 GTA
North Okanagan RAC
VA7ST 273 2 1 1,142 BC
Nelson Co. Post 42 American Legion ARC
N2GWK 224 2 1 1,140 KY
Reno Co. ARA
W0UY 272 2 1 1,138 KS
West Valley ARA
W6IA 267 2 1 1,138 SCV
KL7J 272 2 1 1,138 AK
Boca Raton ARA
W7GKF 278 2 1 1,130 SFL
Northeast Iowa Radio Amateur Assn.
AE0TB 244 2 1 1,126 IA
North Shore (ON) ARC
VE3LKS 384 2 1 1,122 GTA
K7VZ 295 2 7 1,122 AZ
VE2CH 268 2 1 1,122 QC
Metro DX Club
N2BJ 267 2 1 1,118 IL
Northwest Illinois ARC
KC9NVN 267 2 1 1,118 IL
Willamette Valley DX Club
NE7D 267 2 1 1,118 OR
KE5CDE 285 2 1 1,118 STX
Clark Co. (WA) ARC
AB7RW 266 2 1 1,114 WWA
N9OF 265 2 1 1,110 STX
North Richland Hills ARC
K5HTE 266 2 1 1,108 NTX
Montgomery ARC
KS4TAC 264 2 1 1,106 AL
Potomac Valley RC
K4HQK 264 2 1 1,106 VA
Platte Co. ARG
WA0TJT 239 2 1 1,106 MO
WO9LF 239 2 2 1,106 IL
KD1J 264 2 1 1,106 CT
Bristol ARC
KT4O 388 2 1 1,104 TN
Wahkiakum Co. ARC
WR8Z 238 2 1 1,102 WWA
San Diego ARES
AF5T 168 2 1 1,100 SDG
Emergency Communications Assn.
KB3HF 216 2 1 1,098 MO
Old Barney ARC
N2DSW 262 2 1 1,098 SNJ
Sangamon Valley RC
WA9AQN 262 2 1 1,098 IL
Sturdy Memorial Hospital ARC
N1UMJ 229 2 1 1,094 EMA
Haldimand Norfolk ARC
VE3RTL 333 2 1 1,092 ONS
CRCRST
N7FUL 235 2 1 1,090 AZ
N9NM 259 2 1 1,086 STX
Union Metropolitaine des Sans-filistes de Montréal
VE2HLS 233 2 1 1,082 QC
Northwest Florida ARC
N4UVR 264 2 1 1,080 NFL
Benton ARS
K5BKT 464 2 1 1,078 AR
Dickson Co. ARC
NA4C 232 2 1 1,078 TN
WCARC-TX
AA5DE 256 2 1 1,074 STX
WB9RRU 256 2 1 1,074 CT
WN6W 262 2 1 1,072 OR
Splinter Group ARC
N8BVD 255 2 7 1,070 OH
Brainerd Area ARC
N0KEN 230 2 1 1,070 MN
York Region ARC
VA3BOF 207 2 1 1,070 GTA
Kicked Back Contesters Club
WV5Y 230 2 1 1,068 STX
VE7CV 285 2 1 1,068 BC
Green Bay Mike & Key Club
WA7PVE 254 2 1 1,066 WWA
N8PFK 332 2 1 1,066 MI
Quinte & Prince Edward RCs
VE3FZ 265 2 1 1,062 ONE
St. Louis ARC
KG0KP 253 2 1 1,062 MO
K1USN RC
K1VUT 252 2 1 1,058 EMA
Niagara RC
K2KN 252 2 2 1,058 WNY
Arrow Comm. Assn
WA8TON 252 2 1 1,058 MI
N1CPL 252 2 1 1,058 CT
W4SEC 493 2 2 1,056 NFL
Baltimore Polytechnic Alumni RC
W3CDI 258 2 1 1,054 MDC
Texas DX Soc.
N5MT 251 2 1 1,054 LA
Albemarle ARC
K4DND 250 2 1 1,050 VA
Bergen ARA
K2ZC 250 2 1 1,050 NNJ
Minnesota Wireless Assn.
N0BUI 250 2 1 1,050 MN
W6TK 250 2 1 1,050 SB
Orange Co. (CA) ARC
AF6N 249 2 1 1,046 ORG
SK Contest Club
VE5GC 248 2 1 1,042 SK
King George Amateur Radio Operators
KW4XZ 247 2 1 1,038 VA
South Canadian ARS
N7WFK 246 2 1 1,034 OK
Westchester Emergency Communications Assn.
WB2NVR 262 2 1 1,034 ENY
Alamance ARC
KJ4UBL 208 2 1 1,022 NC
High Sierra Field Day Group
NK7I 192 2 1 1,018 ID
KB9HGI 242 2 1 1,018 IL
N6JF 217 2 2 1,018 ID
Wilderness Road ARC
KJ4ND 228 2 1 1,014 KY
W9LR 242 2 1 1,012 WI
Framingham ARA
W1VIV 240 2 1 1,010 EMA
Palos Verdes ARC
KA6MJR 238 2 1 1,010 LAX
Hazel Park ARC
K8GT 240 2 1 1,010 MI
Toledo Mobile RA
KD8WBZ 240 2 1 1,010 OH
Rochester (NY) DX Assn.
W2TZ 224 2 2 1,008 WNY
Ottawa Valley QRP Soc.
VA3AMX 217 2 1 1,008 ONE
Orange Co. Radio Amateurs & Durham FM Assn.
KX4P 239 2 1 1,006 NC
Orange Co. Radio Amateurs & Durham FM Assn.
W4KIL 213 2 1 1,002 NC
KD2JC 238 2 1 1,002 NNJ
W8TQM 237 2 1 998 MI
Smith Chart ARS
K4HA 239 2 1 994 NC
Denver RC
AD0YO 237 2 1 994 CO
North Shore (IL) RC
K9RE 236 2 1 994 MI
KR4EE 236 2 1 994 TN
AA0AW 209 2 1 986 MN
Tellico Lake ARC
KB4VL 237 2 1 984 TN
K4TZ 233 2 1 982 KY
Salkehatchie ARS
KK4EGZ 233 2 1 980 SC
Coastal Plains ARC
W4KN 232 2 1 978 GA
Cuyahoga ARS
K0KC 207 2 1 978 OH
Club Radio Amateur de Québec
VE2GHO 244 2 1 976 QC
Keuka Lake ARA
KS2YL 230 2 1 970 WNY
K1USN RC
K1DJ 460 1 1 970 EMA
Sheboygan Co. ARC
KD9TZ 230 2 1 970 WI
Niagara Frontier Radiosport
NS2N 247 2 1 968 WNY
OH-KY-IN ARS
W8TDA 229 2 1 966 OH
Southwest Dallas Co. ARC
N5VDQ 294 2 6 966 NTX
W1MI 204 2 1 966 WMA
North Fulton ARL
W4QO 203 2 1 962 GA
Splinter Group ARC
NI8Z 201 2 7 954 OH
First Baptist Church Huntsville RC
K4JAZ 226 2 1 954 AL
WCARES-TN
W3TB 226 2 1 954 TN
Granite State ARA
NE1F 254 2 2 952 NH
Central Washington ARC
W7WMO 225 2 1 950 EWA
Peel ARC
VA3QSL/P 200 2 1 950 ONS
W4UEF 225 2 1 950 NC
KA2ENE 235 2 1 950 WNY
South Jersey Radio Assn.
N2ATB 224 2 1 946 SNJ
Raritan Bay Radio Amateurs
K2PW 202 2 1 946 NNJ
Meriden ARC
N1API 223 2 1 942 CT
Dallas ARC
KE5JIT 172 2 1 938 NTX
North Shore (ON) ARC
VE3HIX 199 2 1 934 GTA
KC4TNQ 196 2 1 932 TN
Willamette Valley DX Club
WA8ZNC 233 2 1 926 WWA
NE8J 218 2 1 922 MI
N0OK 203 2 1 922 MN
Kings Point ARC
KQ0J 220 2 1 920 WCF
Ham Assn. of Mesquite
AB8YZ 202 2 1 918 NTX
Redondo Beach DCS
KI6RRD 217 2 1 916 LAX
Hamilton (ON) ARC
VE3RIA 216 2 1 914 ONS
Loren D Hayes Memorial ARC
K8CGE 215 2 1 910 OH
Broken Arrow ARC
W5BM 190 2 1 910 OK
Dallas ARC
KI5KMO 215 2 1 910 NTX
Stillwater ARA
KE0N 215 2 1 910 MN
Mississippi Valley DX/Contest Club
W0NFS 214 2 1 906 MO
Mohawk ARC
N1UZ 428 1 1 906 WMA
Niagara Peninsula ARC
VE3MM 214 2 1 906 GTA
SC4ARC
N6QAD 66 2 13 900 SCV
Halifax ARC
VE1GF 212 2 1 898 MAR
Club Radio Amateur de Québec
VE2CDC 112 2 1 898 QC
Broughton Memorial Field Day Group
W2IR 159 2 11 896 ENY
Fox Cities ARC
KD9QHQ 186 2 1 894 WI
Stanwood-Camano ARC
KD6TR 211 2 1 894 WWA
Spokane DX Assn.
AD7XG 216 2 1 892 EWA
Dial RC of Middletown
K8DSS 210 2 1 890 WCF
Ottawa Valley Mobile RC
VA3DEF 210 2 1 890 ONE
Peel ARC
VE3FOX 135 2 1 890 GTA
K3DFL 210 2 1 890 EPA
KO4MAG 290 2 1 890 AL
Fallbrook ARC
KC6MIE 250 2 1 888 SDG
Ak-Sar-Ben ARC
W0JG 418 2 1 886 NE
Potomac Valley RC
N3KN 210 2 1 884 VA
KE1AF 236 2 1 884 RI
Union City Wireless Assn.
W3CG 237 2 4 882 WPA
N4EK 208 2 1 882 NFL
The Villages ARC
W3US 216 2 1 880 NFL
Blue Springs ARC
KA0REN 207 2 1 878 MO
Quinte & Prince Edward RCs
VE3EP 221 2 1 878 ONE
Lakeland ARC
K7UPJ 207 2 1 878 WCF
West Chester ARA
AD8FD 207 2 1 878 OH
Northwest Florida ARC
K4LIX 178 2 2 876 NFL
Shy-Wy ARC
N7WY 206 2 1 874 WY
Hannibal (MO) ARC
K0CA 181 2 1 874 MO
K3DMG 206 2 1 874 OH
Columbia-Montour ARC
N3ATE 277 2 1 870 EPA
Garden State ARA
KA2F 200 2 1 870 SNJ
Platinum Coast ARS
KE0NRY 205 2 1 870 SFL
Binghamton ARA
NA2X 180 2 1 870 WNY
Cuyahoga Falls ARC
N8EW 205 2 1 870 OH
N7DB 214 2 1 870 OR
Minnesota Wireless Assn.
KB0EO 320 2 1 868 MN
Valley and Massanutten ARA
K4RBZ 409 2 1 868 VA
AA3CS 206 2 1 868 OH
Northern California Contest Club
K6KQV 196 2 1 866 SCV
Central West Virginia Wireless Assn.
W8AT 204 2 1 866 WV

Tellico Lake ARC
W4SSF 217 2 1 866 TN
W3AO PVRC
WK3A 204 2 1 866 MDC
W3AO PVRC
K3AJ 353 2 3 866 MDC
Yuba-Sutter ARC
N9BD 207 2 1 866 SV
Franklin (NC) ARC
ND1J 203 2 1 862 NC
Chesapeake Amateur Radio Service
N3WM 203 2 1 862 VA
Montgomery ARC
KK4GNG 203 2 1 862 AL
Utica Shelby Emergency Comms Assn.
N8KLX 153 2 1 862 MI
El Dorado Co. ARC
W6RC 202 2 1 858 SV
Bristol ARC
N4DW 202 2 1 858 TN
WB9TLH 202 2 1 858 IN
W4HAY 202 2 1 858 TN
Holland ARC
KB8QAP 195 2 1 856 MI
Niagara Peninsula ARC
VE3CKO 403 2 1 856 GTA
Mike & Key ARC
WA7DY 202 2 1 854 WWA
Iowa Wireless Amateur Radio Network
KØRKL 201 2 1 854 IA
GVARC/SBCARA
W6INO 176 2 1 854 SCV
Bolingbrook ARS
W9CY 210 2 1 854 IL
Club Radio Amateur de Québec
VE2ZWA 101 2 1 854 QC
Potomac Valley RC
WA4JUK 201 2 1 854 VA
VE2SG 191 2 1 854 QC
Nittany Contest Club
N3IW 194 2 1 852 WPA
Central Illinois RC
AC9S 200 2 1 850 IL
Livonia ARC
KB8TL 200 2 1 850 MI
Fresno ARC
W6NIF 200 2 1 850 SJV
Thunderbird ARC
K7HI 200 2 1 850 AZ
KB8TYJ 200 2 1 850 MI
Jackson Co. ARC
KKØQ 399 2 1 848 KS
Tri-Town Radio Amateur Club
KA9IUC 150 2 1 848 IL
Frankford RC
W2YR 199 2 1 846 NNJ
Chicago Suburban Radio Assn.
W9CHI 348 2 1 846 IL
Central Oregon Coast ARC
ACØWN 99 2 1 846 OR
K3WHD 219 2 1 846 WNY
Mohawk ARC
N1ERS 282 2 1 844 WMA
Lynchburg ARC
W3TAS 204 2 1 842 DE
Chandler Ham RC
K7NWF 198 2 1 842 AZ
Great Lakes CWops Club
AA8TA 173 2 1 842 OH
Central Montana ARC
KIØBJ 260 2 1 840 MT
Culver City ARES
K6CRW 206 2 1 840 LAX
Benton ARS
WD5C 171 2 1 834 AR
Sonoma Co. Radio Amateurs
W6GOL 369 2 1 832 SF
Orange Park ARC
NU4Y 195 2 1 830 NFL
Runestone ARC
WAØEBZ 202 2 1 826 MN
Boeing Employees ARS — St. Louis
NØAJ 194 2 1 826 MO
Niagara Peninsula ARC
VE3JDF 169 2 1 826 GTA
Mohawk ARC
KF4GAF 193 2 1 822 WMA
Northeast Tarrant ARC
WAØD 193 2 1 822 NTX
Santa Rosa Co. ARES
N4QEP 193 2 1 822 NFL
W7HRF 193 2 1 822 ID
Matagorda Co. Arc
KI5DRY 192 2 1 818 STX
Chicago Suburban Radio Assn.
W9SW 166 2 1 814 IL
South Bay ARA
K6VUG 191 2 1 814 EB
Sawnee ARA
W4DD 191 2 1 814 GA
Butler Co. AR Public Srvc. Group
N3OIK 191 2 1 814 WPA
Soc. Of Midwest Contesters
KD9OIN 191 2 1 812 IL
Soc. Of Midwest Contesters
KØTQ 190 2 1 810 IN
Clallam Co. ARC
N7KC 165 2 1 810 WWA
KP4JFR 190 2 1 810 PR
N3AS 165 2 1 810 EPA
Ocean Co. ARES
N2LD 189 2 1 806 SNJ
Minnesota Wireless Assn.
WAØLIF 188 2 1 802 MN
PART of Westford
WG1V 188 2 1 802 EMA
MARCA
KD7KDO 167 2 1 800 AZ
G.R.E.A.T. Club
AK4I 236 2 3 800 TN
Ste. Genevieve Co. ARC
NR9A 138 2 1 800 MO
Hilltop Transmitting Assn.
W3ZGD 201 2 3 798 EPA
Mohawk ARC
K6IPO 187 2 1 798 WMA
N8XI 200 2 1 794 MI
PODXS 070
K9DEB 184 2 1 786 IL
Kitsap Co. ARC
KC7SVI 184 2 1 786 WWA
WA7FLY 160 2 1 786 WWA
MicroHAMS ARC
AG7NB 183 2 1 782 WWA
Gloucester Co. ARC
K2ATX 183 2 1 782 SNJ
KI7ID 183 2 1 782 NTX
K8NGW 172 2 1 782 MI
KD4ACG 183 2 1 782 WCF
Kansas City Assn. for the Blind ARC
K5POU 203 2 2 780 MO
Nodaway Co. Contesters
NØR 182 2 1 778 MO
K5BG 183 2 1 778 NTX
North Richland Hills ARC
KB5WCK 181 2 1 774 NTX
Contest Club Ontario
VA3UG 362 2 1 774 ONS
K4MX 181 2 1 774 VA
Warren Co. NY RC
KB1IVE 281 2 1 772 ENY
N5VF 192 2 1 772 VA
Columbia (MD) ARA
KE3VR 180 2 1 770 MDC
WPA Field Day Assn.
WA3WOM 180 2 1 770 WPA
W9AKS 179 2 1 766 WI
Rocky Mountain Ham Radio
NR5ON 154 2 2 764 NM
PODXS 070
WA5AMM 178 2 1 762 SC
Brunswick Shores ARC
NC4S 153 2 1 762 NC
W1NF 178 2 1 762 EMA
Waterton ARS
KJØI 178 2 1 762 CO
Delaware ARA
KD8YQO 177 2 1 758 OH
Central Oregon Coast ARC
K7AAT 176 2 1 754 OR
WO3T 235 2 2 754 WPA
Franklin Co. (NC) ARC
W8EMD 175 2 1 750 NC
London ARC
VE3FBZ 175 2 1 750 ONS
Kay Co. ARC
AG5VX 260 2 1 750 OK
Port Lavaca ARC
NA5YO 150 2 1 750 STX
N5MU 175 2 1 750 STX
N8CPA 175 2 1 750 OH
Reno Co. ARA
KØRCJ 203 2 1 748 KS
VE3ELL 174 2 1 746 ONS
Hellgate ARC
K7QA 173 2 1 742 MT
AG7WW 139 2 4 742 OR
KJ6VMH 177 2 1 740 SB
Niagara Frontier Radiosport
W2DXE 172 2 1 738 WNY
Northeast Maryland AR Contest Soc.
K3RLW 152 2 1 736 MDC
FARCE
W6UHQ 172 2 1 736 SV
Warminster ARC
KD3RF 182 2 3 736 EPA
Truro ARC
VE1CHL 188 2 1 736 MAR
El Paso ARC
WD5FVQ 171 2 1 734 WTX
Potomac Valley RC
K1BZ 179 2 1 734 MDC
Lenoir ARC
K3OS 171 2 1 734 NC
Barrie ARC
VE3FDZ 117 2 1 734 ONS
Orange Co. (NY) ARC
W2BCC 171 2 1 734 ENY
Union Metropolitaine des Sans-filistes de Montréal
VE2LG 171 2 1 734 QC
Potomac Valley RC
N3MK 170 2 1 730 VA
Mad River RC
KC8J 170 2 1 730 SDG
KBØJI 183 2 1 728 CO
Milwaukee School of Engineering ARC
W9HHX 258 2 3 726 WI
N3XZ 201 2 1 726 EPA
Stillwater ARA
KØGW 169 2 1 726 MN
Laughery Valley ARC
WA8QNN 170 2 1 724 IN
South Mountain Radio Amateurs
K3ZR 198 2 1 724 EPA
Masonic Village ARC
K3SU 144 2 1 722 EPA
Midland (TX) ARC
N5NA 143 2 1 722 WTX
St. Louis ARC
NØIS 168 2 1 722 MO
North Shore (IL) RC
N9TR 121 2 1 720 IL
North Augusta Belvedere RC
KQ4KK 335 2 1 720 SC
GOTAHAMS
KM6LJL 167 2 1 718 LAX
W3AO PVRC
K3ZIB 167 2 1 718 MDC
Big Island ARC
KH6RDO 141 2 1 716 PAC
K2CD 314 2 1 716 EPA
KP4YO 167 2 1 716 PR
Cherryland ARC
NU8A 166 2 1 714 MI
Fond du Lac ARC
N9EZF 166 2 1 714 WI
Smoky Mountain ARC
W7FKI 166 2 1 714 TN
Hampden Co. RA
KC1V 166 2 1 714 CT
Radio Club of Tacoma
WB4SPB 108 2 1 712 WWA
K5EEE 281 2 1 712 SFL
Central Montana ARC
K7CMI 165 2 1 710 MT
North Fulton ARL
KQ4JUK 165 2 1 710 GA
Half Moon Bay ARC
KN6IPE 140 2 1 710 SCV
SAARS
K8VA 165 2 1 710 MI
Northwest Florida ARC
W4SBM 135 2 2 710 NFL
W1WV 201 2 1 710 ENY
Clark Co. (IN) ARC
NJ9U 200 2 1 708 IN
North Shore (IL) RC
KC9IL 207 2 1 706 IL
North Fulton ARL
K4FPV 164 2 1 706 WCF
Hampstead Hams
N5VX 164 2 1 706 NC
Boulder ARC
KV5Y 164 2 1 706 CO
WCARC-TX
W9MC 169 2 1 706 STX
Seattle ACS
KD7DK 122 2 1 704 WWA
EVQRP
N7DSX 188 2 1 702 AZ
Victoria-Haliburton ARA
VE3MCF 163 2 1 702 ONE
KE8OPO 100 2 9 700 OH
Boeing Employees ARS — St. Louis
WB8EJN 162 2 1 698 MO
Albuquerque DX Assn.
AG5S 180 2 1 698 NM
WCARES-TN
W4UR 162 2 1 698 TN
Barrie ARC
VE3RRD 144 2 1 696 ONS
W4NLT 164 2 1 694 VA
Toledo Mobile RA
KD8EVN 161 2 1 694 OH
East Greenbush ARA
N2CJF 161 2 1 692 CT
K4RDU 167 2 1 690 VA
Lucas ARC
W5MT 160 2 1 688 NTX
Kingston Amateurs
VE3EAC 134 2 1 686 ONE
Metrocrest ARS
WA5LXS 159 2 1 686 NTX
NY9X 230 2 1 686 IL
The Villages ARC
K3ZGA 159 2 1 686 NFL
Alamance ARC
KJ4UBM 114 2 1 684 NC
Austin ARC
KE3D 123 2 1 682 STX
Somerset Co. ARC
NJ3T 203 2 1 682 WPA
WA6URY 180 2 1 682 LAX
WB2PJH 158 2 1 682 NNJ
Antietam RA
WA3PTV 157 2 1 678 WPA
W5TTX 263 2 6 676 AL
Ham Assn. of Mesquite
K5IBK 156 2 1 674 NTX
Club Radio Amateur de Québec
VE2JI 56 2 1 674 QC
Coastal Plains ARC
WD4LYV 156 2 1 674 GA
KC5DI 312 2 2 674 LA
KI5IO 156 2 1 674 NTX
VA3THP 131 2 1 672 ONE
Forsyth ARC
W4DCS 155 2 1 670 NC
Hiawatha Valley ARC
KØHD 155 2 1 670 MN
New Providence ARC
W2PTP 130 2 1 670 NNJ
Albany ARA
W2QCY 155 2 1 670 ENY
Union Metropolitaine des Sans-filistes de Montréal
VE2QV 130 2 1 670 QC
NE8P 155 2 1 670 MI
Milwaukee Radio Amateurs' Club
N9KQQ 155 2 1 668 WI
Arizona Outlaws Contest Club
N5MF 154 2 1 666 NM
Livermore Amateur Radio Klub
KI6OY 154 2 1 666 EB
Granite State ARA
AC1J 224 2 1 664 NH
Dallas ARC
KD5WJV 128 2 1 662 NTX
Central Louisiana ARC
WA5CAV 153 2 1 662 LA
Southern Berkshire ARC
WA1OTZ 153 2 1 662 CT
WCARC-TX
KF5PWN 53 2 1 662 STX
K6GB 153 2 1 662 ORG
Grayson Co. ARC
N5SLY 133 2 1 660 NTX
AD7MC 135 2 1 660 WWA
Runestone ARC
KGØDX 108 2 1 654 MN
CARA/OBARC
KHØDW 151 2 1 654 MS
South Lyon Area ARC
K8VT 151 2 1 654 MI
Forsyth ARC
NZ4N 173 2 1 654 NC
Arrow Comm. Assn
KB8U 151 2 1 654 MI
Orange Co. Radio Amateurs & Durham FM Assn.
KY4HU 128 2 1 652 NC
Quinte & Prince Edward RCs
VA3NGE 157 2 1 652 ONE
K3EFS 301 2 1 652 EPA
Arkansas River Valley ARF
KF5MLP 150 2 1 650 AR
Lubbock ARC
KS5Z 164 2 3 650 WTX
El Dorado Co. ARC
K6TQ 215 2 1 650 SV
Heritage Hunt Hams
K4FTO 150 2 1 650 VA
N9EA 213 2 1 650 IL
W1RM 150 2 1 650 CT



Tom's Garage Amateur Radio Club, N6MI, operated from 8,017 feet atop Frazier Mountain in Ventura County, California, for the 2021 ARRL Field Day. The group was joined by an unlicensed high school student, who made his very first amateur radio contacts during the event. [J. Scott Bovitz, N6MI, photo]

North Shore (IL) RC
KD9IXB 124 2 1 646 IL
Oak Hill ARC
K5TMT 149 2 1 646 STX
Ottawa Valley Mobile RC
VE3RXH 137 2 1 646 ONE
K2EKM 149 2 1 646 VA
Assoc. Radio Amateurs of Long Beach
NC6Q 152 2 1 644 LAX
K8MU 150 2 1 644 MI
Lake Area Amateur Radio Klub
WE5TR 98 2 1 642 NTX
Garland ARC
K5DHY 200 2 1 642 NTX
Musselshell ARC
K777KAR 123 2 1 642 MT
Eastern Arizona ARS
AF7EF 124 2 1 638 AZ
KA2FIR 165 2 1 634 NNJ
St. Louis ARC
AB0TO 182 2 1 632 MO
South Lyon Area ARC
KG8MM 290 2 1 630 MI
Mountaineer ARA
K8YYY 145 2 1 630 WV
Union Metropolitaine des Sans-filistes de Montréal
VA2EM 145 2 1 630 QC
Woodbridge Wireless
N4LJS 145 2 1 630 VA
West Georgia ARS
KK4OHF 145 2 1 630 GA
N5IY 145 2 1 630 NM
Radio Club of Tacoma
WE7P 144 2 1 626 WWA
Downey ARC
N6TEB 144 2 1 626 LAX
Northwest ARS
KB9KY 144 2 1 626 STX
MARCA
KC7KMP 153 2 1 626 AZ
River City AR Comms Soc.
KK6DCT 155 2 1 626 SV
N9EAX 216 2 2 626 WI
Valley RC of Oregon
K9JOY 150 2 1 624 OR
AA8KY 204 2 1 624 OH
Mississauga ARC
VA3EON 143 2 1 622 GTA
North Fulton ARL
W4RIN 118 2 1 622 GA
South East Metro ARC
N0BM 118 2 1 622 MN
Highlands Co. ARC
K1PJ 150 2 1 620 WCF
Midland (TX) ARC
WA5PFJ 142 2 1 618 WTX
Hudson Valley Contesters and DXers
N2SO 142 2 1 618 ENY
Calhoun Co. ARA
KY4CU 142 2 1 618 AL
Elgin ARS
VA3MD 91 2 1 614 ONS
GVARC/SBCARA
K6RFC 141 2 1 614 SCV
Peel ARC
VE3IID 141 2 1 614 ONS
Foothills ARC
KT4TC 141 2 1 614 NC
Sky Valley ARC
KA7BVS 66 2 1 612 WWA
Maury ARC
KM1Z 152 2 1 612 TN
Old Barney ARC
N2NF 140 2 1 610 SNJ
Club Radio Amateur de Québec
VE2CJP 40 2 1 610 QC
East Bay ARC
N6RLS 97 2 1 608 EB
Peconic ARC
KE2YK 139 2 1 606 NLI
Blue Ridge ARC
AI4GR 157 2 1 606 NC
Arkansas River Valley ARF
WB5BHS 89 2 1 606 AR
Orange Co. Radio Amateurs & Durham FM Assn.
KJ4VWG 154 2 1 604 NC
Radio Club of Redmond
K5TRI 138 2 1 602 WWA
Mid-MO ARC
KA0OUV 89 2 3 602 MO
Hampstead Hams
KA4SQN 138 2 1 602 NC
K0LAR 138 2 1 602 MN
W2EML 266 2 1 602 NNY
Shreveport ARA
N5WA 137 2 1 598 LA
Bainbridge Island ARC
AF7BO 259 2 1 598 WWA
Northeast Maryland AR Contest Soc.
KA3YJM 262 2 1 596 MDC
Kitchener-Waterloo ARC
VA3PAF 135 2 1 596 ONS
N6AKO 127 2 1 596 LAX
KD0LHI 122 2 2 594 ID
K4KPG 136 2 1 594 TN
Fort Smith Area ARC
K5CKS 202 2 1 592 AR
Kitchener-Waterloo ARC
VE3HZ 171 2 1 592 ONS
York Region ARC
VA3HDL 138 2 1 592 GTA
Bellbrook ARC
AC8ZU 135 2 1 590 OH
Saginaw Valley ARA
KE8QCO 135 2 1 590 MI
Houston ECHO Soc.
AG5T 110 2 1 590 STX
Old Barney ARC
KZ2I 220 2 1 590 SNJ
Sheboygan Co. ARC
KC9YL 135 2 1 590 WI
Cuyahoga ARS
AC8TN 112 2 1 590 OH
W3PLS 135 2 1 590 EPA
VE1BZI 135 2 1 590 MAR
K4FOY 146 2 1 588 VA
Halifax ARC
VE1GVY 168 2 1 586 MAR
Palos Verdes ARC
KA6JMR 136 2 1 586 LAX
Morris RC/Hanover TWP OEM
N1MID 142 2 1 580 NNJ
Assoc. Radio Amateurs of Long Beach
N6UTC 103 2 1 580 LAX
Easton ARS
W3WTD 132 2 1 578 MDC
Brightleaf ARC
W4JNC 132 2 1 578 NC
Federación de Radio Aficionados de PR
WP4QWH 82 2 1 578 PR
Great Southern DX Assn.
WD5BJT 107 2 1 578 MS
Austin ARC
KC6ARO 132 2 1 578 WWA
Club Radio Amateur de Québec
VE2BOL 32 2 1 578 QC
KV8S 132 2 1 578 LA
W4SPD 263 2 1 576 GA
Birmingham ARC
AG5AT 131 2 1 574 AL
Cleveland Co. Amateur Radio Service
W5DWA 131 2 1 574 NC
Intercity ARC
K8HF 131 2 1 574 OH
Old Barney ARC
KF2BQ 131 2 1 574 SNJ
Sun City Hilton Head ARC
KB3FW 131 2 1 574 SC
Northern California Contest Club
W6DMW 459 1 1 572 PAC
North Augusta Belvedere RC
WB5NHL 130 2 1 570 SC
Mansfield-Johnson ARS
K5WXY 260 2 1 570 NTX
Orange Co. (NY) ARC
KD2SSS 130 2 1 570 ENY
WA8SDA 130 2 1 570 EPA
VE4DL 150 2 1 570 MB
WA8SRA 130 2 1 570 EPA
Yellowstone RC
KD7HU 141 2 1 568 MT
Marple Newtown ARC & Mobile Sixers RC
WB3JAC 133 2 1 566 EPA
Rochester (NY) DX Assn.
AI2N 129 2 1 566 WNY
Delaware Lehigh ARC
N2LEC 135 2 1 566 NNJ
KD5ILA 129 2 1 566 AR
W3AO PVRC
AA3S 129 2 1 566 MDC
Orange Co. Radio Amateurs & Durham FM Assn.
AJ2X 207 2 1 564 NC
Maine Ham Radio Soc.
N1EP 98 2 1 562 ME
Pamlico ARS
N4PRS 64 2 5 562 NC
Albemarle ARS
K4VHV 128 2 1 562 NC
NM1J 128 2 1 562 EMA
North Shore (IL) RC
K9SS 136 2 1 560 IL
Desert Radio Amateur Transmitting Soc.
W9JXT 128 2 1 560 ORG
Halifax ARC
VA1CC 105 2 1 560 MAR
KD5RXP 104 2 1 560 NE
N3MWQ 104 2 1 560 DE
United Radio Amateur Club
NA6Q 132 2 1 560 LAX
Halifax ARC
VE1ZAC 127 2 1 558 MAR
El Dorado Co. ARC
K6LRN 127 2 1 558 SV
North Shore (ON) ARC
VA3WEB 138 2 1 558 GTA
Sonoma Co. Radio Amateurs
KM6GUO 102 2 1 556 SF
South Carroll Amateur Radio Group
N3DUE 240 2 1 554 MDC
Sky Valley ARC
W7BCW 107 2 2 554 WWA
Meriden ARC
KE1AU 129 2 1 554 CT
Club Station Répétitrice de Laval
VE2ZS 129 2 1 554 QC
W8DSI 126 2 1 554 NC
N9BOR 126 2 1 554 IL
Kendall ARS
KC6BAV 129 2 1 552 STX
West Valley ARA
AD6CL 88 2 6 552 SCV
Sawnee ARA
WB4GKI 125 2 1 550 GA
Ramapo Mountain ARC
N2KDZ 125 2 1 550 NNJ
Contest Club Ontario
VE3UZ 100 2 1 550 ONS
Desoto ARC
KN4YT 100 2 1 550 WCF
Metrocrest ARS
WB5QNG 125 2 1 550 NTX
South West Louisiana Amateur Repeater Club
WB5OZA 125 2 1 550 LA
Western WA DX Club
N7DX 125 2 1 550 WWA
Riverside Co. ARA
K6LG 139 2 1 548 ORG
Hiawatha ARA
W7DEG 124 2 1 546 MI
Orange Co. (NY) ARC
N2JAM 124 2 1 546 ENY
VY2DM 124 2 1 546 PE
St. Charles ARC
K0SCO 126 2 1 544 MO
Garden City ARC
N8TW 124 2 1 544 MI
AE0G 136 2 1 544 NE
Richardson Wireless Klub
W5BDJ 179 2 1 542 NTX
Paducah ARA
NU4N 138 2 1 542 KY
Peconic ARC
WM2Z 123 2 1 542 NC
Orange Co. Radio Amateurs & Durham FM Assn.
W4EZ 123 2 1 542 NC
Butler Co. AR Public Srvc. Group
KC3RHQ 123 2 1 542 WPA
Mizpah Shrine Radio Unit
AA9DU 123 2 1 542 IN
Potomac Valley RC
W4YE 123 2 1 542 VA

Austin ARC
AA5DF 145 2 1 540 STX
W7YG 140 2 1 540 WCF
Mad River RC
K8MR 126 2 1 538 OH
Bolingbrook ARS
N9TBD 122 2 1 538 IL
KO4FSZ 122 2 1 538 NC
KF7JZ 122 2 1 538 MS
KG7JWD 244 2 1 538 WWA
Reelfoot ARC
N4PWG 46 2 1 534 TN
Saginaw Valley ARA
N8EUI 96 2 1 534 MI
Heart of America RC
KA0YJE 121 2 1 534 MO
W4TLR 121 2 1 534 NC
Pasadena RC/JPLARC/CITARC
KF6RRR 141 2 1 532 LAX
W7KRS 102 2 1 532 WWA
VE6KK/7 124 2 1 532 AB
Bullitt ARS
NC9W 70 2 1 530 KY
North Shore (IL) RC
W9PI 98 2 1 530 IL
Ottawa ARC
VE3QO 120 2 1 530 ONE
NW5H 120 2 1 530 NV
W0GN 120 2 1 530 IA
Tortolina RC
K7EAZ 120 2 1 530 AZ
AG5HC 120 2 1 530 AR
W7FED 120 2 1 530 NM
Monroe Co. Radio Communications Assn.
WA8YZB 120 2 1 528 MI
Kendall ARS
W6TIR 120 2 1 528 STX
AK2U 128 2 1 528 WV
WA2BMH 127 2 1 528 NNJ
Florida Contest Group
W4EE 119 2 1 526 SFL
GSBARC
N2ADC 119 2 1 526 NLI
IWARN
K0FM 119 2 1 526 IA
Delaware Repeater Assn.
WB3LGC 94 2 1 526 DE
NU0T 119 2 1 526 CO
WCARC-TX
N5CWA 119 2 1 526 STX
K3NP 119 2 1 526 NC
Great Southern DX Assn.
KM4LRH 118 2 1 524 MS
K5TIA 237 1 1 524 STX
Jefferson Co. (WA) ARC
W7PT 119 2 1 522 WWA
Irvine Disaster EmComms
W6QN 118 2 1 522 ORG
Richardson Wireless Klub
WB5HSI 118 2 1 522 NTX
Irving ARC
N5BB 74 2 1 522 NTX
AA6VX 123 2 1 522 SB
Gwinnett ARS
WB2RIS 98 2 1 520 GA
Comox Valley ARC
VE7XF 125 2 1 520 BC
Villanova University ARC
W3YP 103 2 2 520 EPA
KK4DZP 126 2 1 520 NFL
Albemarle ARS
NO4Y 117 2 1 518 NC
Ottawa Valley Mobile RC
VA3LJS 125 2 1 518 ONE
Texas DX Soc.
AF5J 117 2 1 518 STX
KE8OTO 122 2 1 518 MI
VE6FAR Cycle 25
VA3QN 117 2 1 518 GTA
Hamilton (OH) ARC
N8SDR 118 2 1 516 OH
Columbia (MD) ARA
W2WCF 113 2 6 516 MDC
Batesville Area RC
KB9ELS 116 2 1 514 AR
Desert Radio Amateur Transmitting Soc.
K6GAV 116 2 1 512 ORG
Seaway Valley ARC
VE3AIH 105 2 1 512 ONE
North Richland Hills ARC
K5NCB 136 2 1 512 NTX
Dallas ARC
AE5FM 115 2 1 510 NTX
Brunswick Shores ARC
KI4JM 90 2 1 510 NC
Smoky Mountain ARC
K4DXV 115 2 1 510 TN
Columbia (MD) ARA
AD5XI 115 2 1 510 MDC
Maury ARC
N4MCC 215 2 1 510 TN
Hattiesburg ARC
KG5DKG 116 2 1 510 MS
Boeing Employees ARS
NS7O 90 2 1 508 WWA
K8GQ 129 2 1 508 WV
West Valley ARA
AE6JV 119 2 1 508 NH
Orange Co. Radio Amateurs & Durham FM Assn.
W1KES 114 2 1 506 NC
Redondo Beach DCS
K5LAX 114 2 1 506 LAX
K5ZE 114 2 1 506 CO
KK4TSS 64 2 1 506 KY
Texas DX Soc.
N5WW 114 2 1 506 STX
Cumberland ARC
K3EYK 127 2 1 504 EPA
ARC of Butts Co.
K3GWK 189 2 1 504 GA
Comox Valley ARC
VE7PEY 114 2 1 504 BC
Broughton Memorial Field Day Group
K2UYK 115 2 4 502 ENY
N5PA 113 2 1 502 MS
Palos Verdes ARC
AB9A 85 2 1 500 LAX
Carbon Co. DXCC
W0CW 225 2 1 500 MO
W1OHM 124 2 1 500 NH
Kitchener-Waterloo ARC
VA3NNW 77 2 3 498 ONS
Forsyth ARC
WB4DOC 112 2 1 498 NC
Midland (TX) ARC
KG5KUQ 87 2 1 498 WTX
W3AO PVRC
KB8HRT 112 2 1 498 MDC
AA8MA 119 2 1 498 OH
Sky Valley ARC
KB7GFL 64 2 1 496 WWA
Ottawa Valley Mobile RC
VE3QN 111 2 1 494 ONE
Federación de Radio Aficionados de PR
WP4RBS 111 2 1 494 PR
Endless Mountains ARC
N3GTH 120 2 1 494 EPA
FVFD21
AI4DX 111 2 1 494 NFL
AZ DARC
AG7EM 86 2 1 494 AZ
West Valley ARA
KZ2V 111 2 1 494 SCV
N8ERV 111 2 1 494 MI
Issaquah ARC
W7ETZ 111 2 1 492 WWA
Lake Co. (OH) ARA
WA8TWM 221 2 1 492 OH
San Fernando Valley ARC
WA6KYR 110 2 1 490 LAX
Cochise ARA
KX6X 110 2 1 490 AZ
Old Barney ARC
N2XW 110 2 1 490 SNJ
South Bay ARA
N6EFF 110 2 1 490 EB
Four Lakes ARC
NQ9A 116 2 2 490 WI
Macon Co. ARC
KC0ELC 110 2 1 490 MO
Palo Alto ARA
W6NEV 110 2 1 490 SCV
Tortolita RC
AE9Q 110 2 1 490 AZ
WD9EMF 110 2 1 490 SFL
W5DDS 110 2 1 490 STX
AI2U 110 2 1 490 WNY
WRAET
KD2SGM 113 2 1 490 NNJ
WA4YJY 110 2 1 490 NFL
AD2BO 437 1 1 487 NLI
Dartmouth ARC
VE1GA 109 2 1 486 MAR
Lake Monroe ARS
KC4GO 109 2 1 486 NFL
Kendall ARS
KI5AIU 109 2 1 486 STX
Hamfesters RC
N9ZD 167 2 1 484 IL
KT4WX 42 2 1 484 WCF
N9UN 70 2 1 484 IN
Contest Club Ontario
VA3EC 108 2 1 482 GTA
Smoky Mountain ARC
KR4FK 156 2 2 482 TN
Oregon Tualatin Valley ARC
K7YIC 83 2 1 482 OR
N0TXW 101 2 1 482 MN
N8PWM 154 2 1 482 MI
VE2TSM 108 2 1 482 QC
Hamilton (ON) ARC
VE3BK 165 2 3 480 GTA
Newton ARA
N0NC 108 2 1 480 IA
Northwest Indiana DX Club
KC9OYE 108 2 1 480 IN
Fair Lawn ARC
W2DLT 156 2 1 480 EPA
Westchester Emergency Communications Assn.
N2EJI 107 2 1 478 ENY
Stillwater ARA
N5LB 109 2 1 478 MN
Central Ohio Operators Klub
W8FD 57 2 3 476 OH
Lake Area Amateur Radio Klub
K5YX 107 2 1 476 NTX
OCAPA
WB5YBZ 212 2 1 474 OK
Pine Bluff ARC
KI5JXR 106 2 1 474 AR
Albany ARA
WA3AFS 81 2 1 474 ENY
Garden State ARA
W2KQ 106 2 1 474 NNJ
Guelph ARC
VE3KTB 110 2 1 474 ONS
Clarksville Amateur Radio and Pilots Assn.
N4CKV 137 2 1 474 TN
Wilderness Road ARC
K4FT 106 2 1 474 KY
San Fernando Valley ARC
KM6LBW 81 2 1 472 LAX
K7VIT 115 2 1 472 OR
KI5BUV 82 2 1 472 STX
N7WS 161 2 1 472 AZ
Snohomish Co. Hams Club
W9LD 105 2 2 470 ID
Manhattan Area ARS
WS0I 210 2 3 470 KS
Radio Club of Redmond
WC7Q 210 1 1 470 WWA
Brazos Valley ARC
K5IZO 105 2 1 470 STX
L'Anse Creuse ARC
N8FYL 80 2 1 470 MI
Southwest Mississippi ARC
K5JNT 105 2 1 470 MS
Orange Co. Radio Amateurs & Durham FM Assn.
KO4TXN 160 2 1 470 NC
York RC
AC9WN 105 2 1 470 IL
NA2CC 105 2 1 470 EB
York Region ARC
VA3TYB 105 2 1 470 GTA
WD6DX 105 2 1 470 SCV
Halifax ARC
VE1BB 209 2 1 468 MAR
KO4HRD-NS2X Team
KO4HRD 156 2 2 468 TN
Silvercreek ARA
AB8OU 107 2 1 468 OH
Maui ARC
AH6SZ 104 2 1 466 PAC
David Sarnoff ARC
N2LO 104 2 1 466 SNJ
KB0TUA 104 2 1 466 MO
North Shore (IL) RC
NJ9R 104 2 1 464 IL
Corona PD CSV Group
KG6MXE 105 2 1 464 ORG
Club Radio Amateur de Québec
VE2MHV 7 2 1 464 QC
NQ0M 82 2 1 464 KS
W3AO PVRC
W3MAM 180 2 1 464 MDC
ARC of Columbia Co.
N4MI 103 2 1 462 GA
Greer ARC
WN4AFP 133 2 1 462 SC
Northeast Maryland AR Contest Soc.
N3FM 144 2 1 462 MDC
Columbia ARC (SC)
W1GTT 53 2 1 462 SC
Lynchburg ARC
N4IW 103 2 1 462 VA
Baldwin Co. ARC
KE4WKH 78 2 1 462 AL
Genesee Co. RC
N8MME 103 2 1 462 MI
Addison Co. ARA
KE1VT 103 2 1 462 VT
Saratoga Co. ARA
W5BN 103 2 1 462 ENY
K4CV 103 2 1 462 TN
York Region ARC
VE3BWV 103 2 1 462 GTA
K7HPN 104 2 1 460 AZ
Falmouth ARA
W1CN 102 2 1 458 EMA
Haldimand Norfolk ARC
VE3DYY 195 2 1 458 ONS
Federación de Radio Aficionados de PR
WP4MXM 102 2 1 458 PR
Pamlico ARS
K1CBI 102 2 1 458 NC
Orange Co. (NY) ARC
W2LGB 102 2 1 458 ENY
W4ELP 102 2 1 458 VA
First Baptist Church Huntsville RC
AK4WO 203 2 1 456 AL
Central Missouri RA
AA0B 103 2 2 456 MO
Milwaukee Radio Amateurs' Club
W9RH 203 2 2 456 WI
Desert Radio Amateur Transmitting Soc.
KS6F 86 2 1 456 ORG
WB2AOZ 103 2 1 456 NTX
AC2IK 114 2 1 456 WNY
Paducah ARA
AB4IQ 101 2 1 454 KY
North Fulton ARL
W5JR 101 2 1 454 GA
Mid-MO ARC
AD0YM 101 2 1 454 MO
Club de Radio Amateur Outaouais
VE2KZW 101 2 1 454 QC
Northeast Maryland AR Contest Soc.
W2QFV 101 2 1 454 MDC
Desert Radio Amateur Transmitting Soc.
KD6SEC 108 2 1 454 ORG
Mizpah Shrine Radio Unit
N9MR 101 2 1 454 IN
Crescenta Valley RC
KC6YIH 101 2 1 454 LAX
Stillwater ARC (OK)
N5YFA 101 2 1 454 OK
Columbia (MD) ARA
W3GJN 109 2 2 452 MDC
CenTor ARC
VA3SXP 146 2 1 452 GTA
N1XL 201 2 1 452 NC
N4NVG 113 2 2 452 VA
VE2KYP 201 2 1 452 QC
N8HWV 101 2 1 452 WI
Fort Madison ARC
KC9PL 100 2 1 450 IL
Kendall ARS
W5QLF 100 2 1 450 STX
Bitterroot ARC
K5MH 100 2 1 450 MT
Monkey Lover's Radio Consortium
NG6O 155 2 1 450 SCV
Boston Valley Simplex Club
N2EJT 150 2 1 450 WPA
Montvale OEM
K2TWI 100 2 1 450 NNJ
PODXS 070
N9JCA 100 2 1 450 IN
Adams Co. ARS
K3DCS 150 2 1 450 EPA
Florida Contest Group
AA8R 100 2 1 450 WCF
Arizona Outlaws Contest Club
W0RIC 50 2 1 450 AZ
Georgian Bay ARC
VE3PQ 100 2 1 450 ONS
Chicago Suburban Radio Assn.
WA9GQK 200 2 1 450 IL
W8XY 100 2 1 450 OH
Tamiami ARC
K4EU 100 2 1 450 WCF
KA2FHN 110 2 1 450 WNY
Sun Parlour ARC
VE3SPR 200 2 1 450 ONS
K0UU 100 2 1 450 MN
Sunnyvale ARES
AI6SL 100 2 1 450 SCV

WCARES-TN
N4CSV 100 2 1 450 TN
Arizona Outlaws Contest Club
N9NA 211 1 1 449 AZ
Barry ARA
KE8RAJ 151 2 1 448 MI
WJ0Z 101 2 1 448 NE
Fair Lawn ARC
WI2W 99 2 1 446 NNJ
Kingston Amateurs
VE3UIN 99 2 1 446 ONE
Tompkins Co. ARA
NE2T 99 2 1 446 WNY
NZ7Q 99 2 1 446 NM
Cupertino ARES
KN6PE 66 2 1 444 SCV
McMinnville ARC
AA1AO 99 2 1 444 OR
Brazos Valley ARC
W5JEF 196 2 1 442 STX
Florida Contest Group
N4LF 98 2 1 442 DE
Elmira ARC
VE3TRQ 98 2 1 442 ONS
Kalamazoo ARC
WA8MCD 100 2 1 442 MI
Lodi ARC
N6ZDH 99 2 1 440 SJV
ARC EmComm Srvc.
N2LDV 145 2 1 440 NLI
Boca Raton ARA
KB4EE 87 2 1 440 SFL
K5NTT 106 2 1 440 AR
Meriden ARC
WB1GYZ 97 2 1 438 CT
PODXS 070
KN4ZXG 97 2 1 438 VA
N4LKB 97 2 1 438 VA
District 3 AR Group
K0B 60 2 3 436 IA
Southeast Louisiana ARC
KE5KMM 96 2 1 434 LA
VA7PK 192 2 1 434 BC
W9SE 96 2 1 434 IL
Bootheel ARC
W0PF 95 2 1 430 MO
San Jose ARES/RACES
KE6JAC 95 2 1 430 SCV
Niagara Peninsula ARC
VE3GGR 45 2 1 430 GTA
Estes Valley ARC
KE0SDV 74 2 1 430 CO
KA0CSW 95 2 1 430 MN
Toronto ARC
VE3TCV 104 2 1 430 GTA
N3FD 140 2 1 430 EPA
Broughton Memorial Field Day Group
KB2WZT 139 2 1 428 ENY
AB4NH 132 2 1 428 TN
Great Southern DX Assn.
KA5EPR 94 2 1 426 MS
Lighthouse Point BBQ Club
K4JJL 66 2 13 426 SFL
Northeastern Indiana ARA
W9GOO 94 2 1 426 IN
PODXS 070
NA8W 94 2 1 426 OH
OCAPA
WA9AFM 44 2 1 426 OK
Somerset Co. ARC
AK3J 94 2 1 426 WPA
North Fulton ARL
K4YJJ 188 2 1 426 GA
KM4VI 102 2 1 426 TN
KN4EWI 106 2 1 426 NC
K7QI 142 2 2 426 LA
HRO Milwaukee Employees ARC
W9AWX 112 2 1 424 WI
KK4HQT 95 2 1 424 AL
Cherryville Repeater Assn. II
KD2OAP 136 2 1 422 NNJ
Old Barney ARC
KA2YNH 93 2 1 422 SNJ
PART of Westford
K1JBD 110 2 1 422 EMA
Alexandria RC
KW4UJ 125 2 1 422 VA
Twin Rivers ARC
KC9RFO 93 2 1 422 IL
Fresno ARC
KI6QEL 92 2 1 418 SJV
St. Charles ARC
W0PC 101 2 1 418 MO
Great Southern DX Assn.
KF5BA 92 2 1 418 MS
Red Mountain Radio Amateurs
KB7AWG 184 2 2 418 NTX
Putnam Emergency Amateur Repeater League
W2CX 134 2 1 418 ENY
KI4TXP 92 2 1 418 DE
Kings Point ARC
W1WAB 17 2 1 416 WCF
NK4T 183 2 1 416 AL
WD0END 102 2 1 416 MN
Morris RC/Hanover TWP OEM
WA2VQF 91 2 1 414 NNJ
St. Clair ARC
KE0YI 70 2 1 414 IL
WB7CYO 91 2 1 414 ID
K4SWE 91 2 1 414 TN
AA4FB 91 2 1 414 WCF
Oregon Tualatin Valley ARC
AD7OG 94 2 1 412 OR
K7JQ 96 2 1 412 AZ
W1AVK 181 2 1 412 CT
Trident ARC
KE4VA 181 2 1 412 SC
South Bay ARA
WX5A 90 2 1 410 SCV
RF Hill ARC
WS2K 90 2 1 410 EPA
Gold Coast ARA
KD4HGR 90 2 1 410 SFL
Albemarle ARC
K4JZQ 180 2 1 410 VA
Reading RC
N8EUL 40 2 1 410 EPA
KC8AFW 90 2 1 410 MI
KE5PYF 90 2 1 410 NTX
Hamfesters RC
W9JPR 129 2 1 408 IL
Indy United ARC
WB9KVD 91 2 1 408 IN
FVFD21
N3JUY 102 2 1 408 NFL
Fort Wayne RC
AC9XS 89 2 1 406 IN
Meriden ARC
N1BRL 89 2 1 406 CT
CenTor ARC
VE3EEI 89 2 1 406 GTA
Northeast Maryland AR Contest Soc.
KC3QVQ 142 2 1 404 MDC
Paducah ARA
NW9W 88 2 1 402 IL
Pasadena RC/JPLARC/CITARC
NO6B 176 2 1 402 LAX
Richardson Wireless Klub
W5FDD 63 2 1 402 NTX
Marple Newtown ARC & Mobile Sixers RC
N3FG 63 2 1 402 EPA
K5BSS 90 2 1 402 LA
N3GTG 88 2 1 402 VA
Sterling Park ARC
KM4SK 125 2 1 400 VA
Cleveland Co. Amateur Radio Service
KE4ZUN 174 2 1 398 NC
Hamilton (ON) ARC
VE3RYI 174 2 1 398 GTA
Aerospace Employees Assn. ARC
K7DF 89 2 1 396 AZ
Halifax ARC
VE1SQ 173 2 1 396 MAR
W5TAF 103 2 1 396 VA
WA4PTZ 99 2 1 396 TN
W6WDS 86 2 1 394 ORG
Yellowstone RC
WN7Y 108 2 1 394 MT
Saratoga Co. ARA
K2LM 66 2 1 392 ENY
Putnam Emergency Amateur Repeater League
K2DXU 91 2 1 392 ENY
Downey ARC
KB6WKT 113 2 1 392 LAX
Border City RC
VA3XT 170 2 1 390 ONS
Cumberland ARC
K3EYL 70 2 1 390 EPA
GMARC
N8KDL 85 2 1 390 MI
South Canadian ARS
WG5T 85 2 1 390 OK
Tortolita RC
W7BV 85 2 1 390 AZ
N1ABY 170 2 1 390 CT
AI9Q 85 2 1 390 WWA
N4UFP 120 2 1 390 SC
VE3WEJ 85 2 1 390 ONS
Anne Arundel RC
K3JSJ 109 2 1 388 MDC
Niagara Peninsula ARC
VE3DVK 86 2 1 388 GTA
N0RC 14 2 1 388 KS
South East Contest Club
NE4S 84 2 1 386 GA
Emergency Communications Assn.
WD0EFP 92 2 1 386 MO
Jefferson (LA) ARC
W5CMM 77 2 1 386 LA
K2PAL 84 2 1 386 NLI
N5MCB 84 2 1 386 NTX
VE2IMS 61 2 1 386 QC
VA3UKR 85 2 1 384 GTA
Kingston Amateurs
VA3KGB 58 2 1 382 ONE
BEANOS
K8IJ 83 2 1 382 KY
Niagara Frontier Radiosport
K2RSK 83 2 1 382 WNY
Southern Counties ARA
K2DKN 83 2 1 382 SNJ
Niagara Peninsula ARC
VE3XC 102 2 1 382 GTA
KD7HGL 79 2 1 382 WWA
W3NRJ 86 2 1 382 MDC
K1MC 165 1 1 380 EMA
Central Missouri RA
N0SSM 82 2 1 378 MO
Soc. of Midwest Contesters
WA9PND 163 2 1 376 WI
VE6SPS 120 2 1 376 AB
AD6RH 88 2 1 376 EB
Jackson Co. (MS) ARA
W5DUI 81 2 1 374 MS
London ARC
VE3EI 152 2 5 374 ONS
Coastal Plains ARC
KK4WX 87 2 1 374 GA
Verde Valley ARA
W7JLC 92 2 1 374 AZ
W1WIU 114 2 1 374 RI
N1SEP 81 2 1 374 CT
KW4LU 112 2 1 374 TN
Tamiami ARC
KN4BAR 23 2 1 372 WCF
AG7WR 80 2 1 370 AZ
KA4JRY 80 2 1 370 GA
K0VW 55 2 1 370 WI
Forsyth ARC
AK4D 109 2 1 368 NC
Central Illinois RC
KC9UJS 85 2 1 368 IL
N2OMD 159 2 1 368 WNY
USECA
N8KZ 87 2 1 368 MI
Ottawa Valley Mobile RC
VE3EUS 79 2 1 366 ONE
Onslow ARC
KV7D 158 2 1 366 NC
Cherokee ARS
K4OTX 96 2 1 366 GA
Pahrump Amateur Radio Repeater Assn.
KG7CL 79 2 1 366 NV
Davie/Cooper City ARC
NG2A 29 2 1 366 SFL
PAPA System
AB6MB 79 2 2 366 EB
W4ZST 158 2 1 366 GA
Central Illinois RC
AC9TN 157 2 1 364 IL
Atlanta RC
N4BFR 56 2 1 362 GA
North Fulton ARL
AE4CW 156 2 1 362 GA
KC4KZR 53 2 1 362 NC
K7TTK 79 2 1 362 OR
Cape Ann ARA
AB1XK 66 2 1 360 EMA
Putnam Emergency Amateur Repeater League
AC2SR 155 2 2 360 ENY
KX4AV 145 2 3 360 KY
South West Louisiana Amateur Repeater Club
KI5EE 52 2 1 358 LA
Hannibal (MO) ARC
WB2UFO 77 2 2 356 MO
Kitchener-Waterloo ARC
VA3IJK 80 2 1 356 ONS
South Bay ARA
K6WW 82 2 1 356 EB
Kern Co. Central Valley ARC
K6JLL 76 2 1 354 SJV
Northern California Contest Club
NC6D 76 2 1 354 SF
Kansas Antenna Club in Johnson Co.
WB0KSL 76 2 1 354 KS
W7WIA 86 2 1 354 AZ
W3AO PVRC
W3FA 86 2 1 354 MDC
Anderson RC
KY4MAK 101 2 1 352 KY
WA8LIV 101 2 1 352 OH
Union Metropolitaine des Sans-filistes de Montréal
VE2FAB 95 2 1 352 QC
VA7BIX 101 2 1 352 BC
North Richland Hills ARC
WE9N 75 2 1 350 NTX
Metrocrest ARS
K5GIL 75 2 1 350 NTX
Heritage Hunt Hams
KK4ADQ 150 2 1 350 VA
Port Lavaca ARC
K5SBR 75 2 1 350 STX
Eastern Fulmont ARC
KB2RSK 77 2 1 350 NNY
AZ DARC
KC7AC 50 2 1 350 AZ
St. Charles ARC
W0TRR 75 2 1 350 MO
Sandy ARC
K7DOD 75 2 1 350 UT
London ARC
VA3DAE 150 2 1 350 ONS
West Seattle ARC
W7GFW 75 2 1 350 WWA
AG3X 75 2 1 350 EPA
W8NOR 75 2 1 350 AZ
K0LAF 87 2 1 350 MO
AF0H 75 2 1 350 AZ
N1NN 75 2 1 350 EMA
Lenoir ARC
K4HRM 99 2 1 348 NC
K9GX 149 2 1 348 IN
Falmouth ARA
N1AM 75 2 1 346 EMA
PODXS 070
VA7GEM 74 2 1 346 BC
Florida Contest Group
KQ4R 74 2 1 346 NFL
Alexandria RC
W7VOA 83 2 1 346 VA
Delta ARS
VE7LO 76 2 2 346 BC
Edmond ARS
WD5CSK 108 2 1 346 OK
Victoria-Haliburton ARA
VE3PC 148 2 1 346 ONE
N3TWX 74 2 1 346 CO
Radio Central ARC and Order of Boiled Owls of NY
W2YK 79 2 1 344 ENY
Mile Highlanders Group
WB4GHZ 85 2 1 344 TN
Northeastern Indiana ARA
N9HRA 100 2 1 344 IN
Desert Radio Amateur Transmitting Soc.
KN6IUW 124 2 1 344 ORG
W2CHZ 103 2 1 344 WNY
Antietam RA
N3ODE 73 2 1 342 MDC
Downey ARC
KC6YPV 73 2 1 342 LAX
Nittany ARC
W3SWL 48 2 1 342 WPA
Motor City RC
WA8FRD 146 2 1 342 MI
W3DQT 73 2 1 342 MDC
London ARC
VE3IDT 145 2 1 340 ONS
Orca DX and Contest Club
VA7TU 144 2 1 338 BC
Halifax ARC
VE1CNS 144 2 1 338 MAR
Motor City RC
N8ZFH 83 2 1 338 MI
Pamlico ARS
KO4MHM 77 2 1 338 NC
Plano AR Klub
NT5TT 72 2 1 338 NTX
ARC of Augusta
N8PPZ 72 2 1 338 SC
North Shore (ON) ARC
VA3AG 136 2 1 338 GTA
San Gorgonio Pass Amateur Club
KJ6NRR 47 2 1 338 ORG
K8CTR 72 2 1 338 MI
Marple Newtown ARC & Mobile Sixers RC
K2HA 143 2 1 336 EPA
Kings Co. and Annapolis Valley ARCs
VE1LG 19 2 1 336 MAR
N2YG 143 2 1 336 NLI

Southern California Contest Club
N6VH 77 2 1 334 SDG
Silver Comet ARS
K4SHW 84 2 1 334 GA
Crooked River Contest Club
W8PN 71 2 2 334 OH
Montgomery ARC
KU4PY 71 2 1 334 AL
South Canadian ARS
K5VL 142 2 1 334 OK
AA0TR 71 2 1 334 MN
WW2BSA 142 2 1 334 NNJ
Assoc. Radio Amateurs of Long Beach
AG6RS 101 2 1 332 LAX
N7MU 72 2 1 332 WWA
NU7I 71 2 1 332 AZ
KJ7YSL 72 2 1 332 NV
K7STU 141 2 1 332 NV
W2CN 141 2 1 332 SNJ
Endless Mountains ARC
KB3LLD 90 2 1 330 EPA
North Okaloosa ARC
N4DPM 70 2 1 330 NFL
REDXA/MARS
WW6D 45 2 1 330 SF
Milford (OH) ARC
WS6K 85 2 1 330 OH
Carolina DX Assn.
KI4TZ 70 2 1 330 NFL
Estes Valley ARC
W0LI 70 2 1 330 CO
WB9EL 134 2 1 330 IL
KP4AJ 70 2 1 330 PR
University of Alabama RC
KI4GGJ 106 2 3 330 AL
Club Station Répétitrice de Laval
VE2LPS 72 2 1 328 QC
Wexaukee ARC
N8NJA 82 2 1 328 MI
Survivors Of Broadcast
W8BO 78 2 4 328 OH
Tri-County ARA (CA)
K6AHT 80 2 1 328 LAX
Kitsap Co. ARC
K7ALM 69 2 1 326 WWA
Chautauqua And Erie ARC
N2JYG 69 2 1 326 WNY
Hilltop Transmitting Assn.
W3SLW 138 2 1 326 EPA
Paso Robles ARC
W6YOY 69 2 1 326 SCV
Garden State ARA
N2MN 69 2 1 326 NNJ
Woodford Co. ARC
AG4BC 44 2 1 326 KY
Victor Valley ARC
K6GZ 69 2 1 326 ORG
N9UNX 69 2 1 326 IN
Central Michigan ARC
W8EO 70 2 1 324 MI
KB7HDX 115 2 1 324 EWA
Monkey Lover's Radio Consortium
WB6RJH 18 2 1 322 SCV
Niagara Peninsula ARC
VA3OV 41 2 1 322 GTA
Federación de Radio Aficionados de PR
KP4GC 68 2 1 322 PR
Ramapo Mountain ARC
KB2SSE 133 2 1 322 NNJ
Communications Support Team
N7UFC 35 2 1 322 WWA
Shreveport ARA
KD5DE 68 2 1 322 LA
WA4OFW 127 2 1 322 VA
KW4EE 68 2 1 322 NC
KI5PLT 119 2 1 322 ND
Bolingbrook ARS
KD9SSG 68 2 1 320 IL
South Pasadena ARC
KR6CV 35 2 1 320 LAX
Lakeland ARC
KQ4KX 71 2 1 320 WCF
KB6A 83 2 1 320 ORG
W6FA 84 2 1 320 SV
Framingham ARA
K1NDF 134 2 1 318 EMA
New Providence ARC
K2UI 67 2 1 318 NNJ
Gold Coast ARA
N4TUR 108 2 1 318 SFL
Prescott-Russell ARC
VE3WPZ 84 2 2 318 ONE
K8AEF 67 2 1 318 NFL
Wayne ARC
N8GZ 67 2 1 318 OH
N8XMS 67 2 1 318 MI

Don Boyer, W7AIN, and Budd Churchward, WB7FHC, with the Amateur Radio Emergency Service® (ARES®) communications van and information table, during the 2021 ARRL Field Day. [Jim McCabe, AE7UQ, photo]

High Point ARC
KN4OCX 83 2 1 316 NC
Kemptville AR Group
VE3CVG 67 2 1 316 ONE
Clark Co. (WA) ARC
NS7U 69 2 3 316 WWA
K4FAN 94 2 1 316 NFL
WA5IEK 44 2 1 316 MS
W4HRL 105 2 1 316 VA
N5OF 78 2 1 316 NTX
Adams Co. ARS
WB3JKT 82 2 1 314 EPA
Sheboygan Co. ARC
W9TA 132 2 1 314 WI
KB8ZR 88 2 1 314 OH
Willamette Valley DX Club
WR7T 66 2 1 314 OR
Northwest Florida ARC
N4VSP 66 2 1 312 NFL
Peel ARC
VE3DRS 84 2 1 312 GTA
Garden State ARA
KB2RTI 65 2 1 310 ME
Alexandria RC
W8B 56 2 1 310 WV
Montgomery ARC
KJ6MTJ 65 2 1 310 AL
East Greenbush ARA
W2RBJ 70 2 1 310 ENY
El Dorado Co. ARC
KG6PNP 130 2 1 310 SV
San Andreas Faultline Field Day Survivors
W6SW 80 2 1 310 LAX
Watertown ARC
KD9LVR 65 2 1 310 WI
AG5QX 68 2 1 310 STX
WA2PCN 65 2 1 310 SC
K0WB 65 2 1 310 MO
Tortolita RC
W7HD 65 2 1 310 AZ
KD2REH 130 2 1 310 NLI
Orange Co. (NY) ARC
KC2VTM 79 2 1 308 ENY
Western Placer ARC
KG6FCT 79 2 1 308 SV
Sky Valley ARC
N7SRR 64 2 1 306 WWA
PODXS 070
KI5GX 64 2 1 306 AL
VA3SRV 68 2 1 306 ONS
KC5GOI 64 2 1 306 NTX

Monkey Lover's Radio Consortium
W6AJR 76 2 1 304 SCV
Snohomish Co. Hams Club
K7BA 127 2 1 304 WWA
Scarborough ARC
VE3CNA 127 2 1 304 ONS
Paducah ARA
ND4X 63 2 1 302 KY
Meriden ARC
K1LHO 63 2 1 302 CT
Mike & Key ARC
N7BRR 63 2 1 302 WWA
Northeast Tarrant ARC
W5JP 63 2 1 302 NTX
Fox River Radio League
KC9EOQ 126 2 1 302 IL
United Radio Amateur Club
K6NT 63 2 1 302 LAX
AB4WL 69 2 1 302 AL
K7ING 63 2 1 302 AZ
KU4FX 113 2 1 302 WCF
Haldimand Norfolk ARC
VE3GCK 125 2 2 300 ONS
Rome RC
K2LRV 96 2 1 300 WNY
N0PE 125 2 2 300 CO
WA7YNU 64 2 1 300 MT
AA9UF 43 2 1 300 IL
Cochise ARA
W5OBT 62 2 1 298 AZ
ARC of Butts Co.
KA3SME 124 2 1 298 GA
KM4OOD 62 2 1 298 SFL
KE5LQ 92 2 1 298 STX
KK7ZD 58 2 2 298 WWA
Wayne ARC
N8YM 62 2 1 298 OH
W3GRL 37 2 1 298 EPA
Hampstead Hams
W4CWO 73 2 1 296 NC
Splinter Group ARC
N8TCP 49 2 7 296 OH
Reading RC
W3WJC 123 2 1 296 EPA
Tortolita RC
KJ7KNW 62 2 1 296 AZ
Valley RC of Oregon
N6KHO 107 2 1 296 OR
Healing Springs Mtn. VHF Soc.
W4EXT 61 2 1 294 NC
David Sarnoff ARC
N2EIM 61 2 1 294 NNJ

Greenwood ARC
VE1VEI 61 2 1 294 MAR
Milwaukee Radio Amateurs' Club
WB9BWP 122 2 1 294 WI
Cupertino ARES
KJ6OHF 11 2 1 294 SCV
FD Philips NEO
WE8T 61 2 1 294 OH
David Sarnoff ARC
K2PAT 22 2 1 294 NNJ
Rockwall ARC
W5WDY 61 2 1 294 NTX
W4NWB 61 2 1 294 SC
WD1H 61 2 1 294 EMA
AA1EA 22 2 1 294 EMA
TLSC Amateur Radio Group
KC3JAS 122 2 1 294 WPA
Radio Club of Tacoma
AB7DG 21 2 1 292 WWA
MARC/DECT
W3TMS 121 2 1 292 MDC
VE6DDD 121 2 1 292 AB
North Augusta Belvedere RC
WM4RT 60 2 1 290 SC
Antietam RA
KA3CZY 78 2 1 290 WV
Hannibal (MO) ARC
N9MAF 120 2 1 290 MO
Murgas ARC
KC3HLT 80 2 1 290 MS
Mining ARC/St. Paul RC
KB0UAZ 60 2 1 290 MN
Peterborough ARC
VE3PTA 120 2 1 290 ONE
Palos Verdes ARC
KO6MD 15 2 1 290 LAX
Columbia (MD) ARA
WA4GUD 60 2 1 290 MDC
KE0UNV 120 2 1 290 MO
KJ7RFN 64 2 1 290 NV
K0OOK 60 2 1 290 NTX
W4VG 60 2 1 290 VA
KR3DX 120 2 1 290 WPA
KM4FLU 120 2 1 290 NC
KA6GMA 60 2 1 290 AZ
Big Sky Contesters
NX7W 119 2 1 288 MT
North Fulton ARL
N4TOL 44 2 1 288 GA
K9UW 62 2 1 288 WI
WS2N 35 2 1 288 NLI
N8JFJ 119 2 1 288 MI
DuPage ARC
WB9TRJ 71 2 1 286 IL
Brunswick Shores ARC
ND2O 59 2 1 286 NC
N4JKO 118 2 1 286 KY
Longmont ARC
N0RQV 117 2 1 284 CO
Benicia ARC
AA6AM 117 2 1 284 EB
AE0IB 76 2 1 284 MO
N0MQL 87 2 1 284 MN
Smoky Mountain ARC
K4TAK 37 2 1 282 TN
Manitoulin ARC
VE3WVA 232 1 1 282 ONN
KD5JHE 58 2 1 282 MS
WCARC-TX
N5DFW 14 2 1 282 STX
KD3SB 116 2 1 282 WPA
K9JRW 58 2 1 282 NC
Texas DX Soc.
N5DTT 58 2 1 282 STX
Radio Assn. of Western New York
KA2IWK 65 2 1 280 WNY
Peterborough ARC
VE3RVZ 115 2 1 280 ONE
VE6FAR Cycle 25
VE6ORM 115 2 1 280 AB
Conejo Valley ARC
AD6SF 114 2 1 278 SB
South Bay ARC
KK6BY 39 2 1 278 LAX
Club de Radio Amateur Outaouais
VE2IOT 58 2 1 278 QC
Montachusett ARA
NZ1D 57 2 1 278 NFL
Motor City RC
K8HV 114 2 1 278 MI
Holmesburg ARC
N3ZZK 114 2 1 278 EPA
Nittany ARC
WX2DX 7 2 1 278 WPA
Macon Co. ARC
KC0AMJ 139 2 1 278 MO

AC4G	57	2	1	278	TN
KM6PRP	80	2	1	278	SB
Toronto ARC					
VA3TRK	114	2	1	278	ONS
Hamilton (ON) ARC					
VE3QEE	98	2	1	276	GTA
Midland (MI) ARC					
KC8ITI	80	2	1	276	MI
SAARS					
K4KEW	32	2	1	276	NFL
W6BP	60	2	1	276	SCV
WP4RF	113	2	1	276	PR
Wellesley ARS					
WA1VIL	58	2	1	276	EMA
Old Barney ARC					
W2TCR	56	2	1	274	SNJ
Metro ARC					
WA9FZB	56	2	1	274	IL
Lake ARA					
N4PCC	112	2	1	274	NFL
Carolina DX Assn.					
W3SA	56	2	1	274	NC
Conejo Valley ARC					
AI6MW	56	2	1	274	SB
Franklin Co. (VA) ARC					
N6DW	56	2	1	274	VA
K6YUL	56	2	1	274	LAX
VE3QC	56	2	1	274	ONE
KG7MYX	31	2	1	274	WWA
W0CER	56	2	1	274	KS
Cochise ARA					
KD7PCE	111	2	1	272	AZ
Potomac Valley RC					
K4KZ	59	2	1	272	NC
Iroquois Co. ARC					
N9OQC	40	2	1	272	IL
Laurel ARC					
KD3H	111	2	1	272	MDC
Wisconsin ARC					
KC9PIF	111	2	1	272	WI
Utica Shelby Emergency Comms Assn.					
K8JEH	61	2	1	272	MI
Boston ARC					
WA1GXC	78	2	1	270	RI
Hancock-Hawkins AR Team					
KJ4JPV	55	2	1	270	TN
Lake Area Amateur Radio Klub					
NA5W	55	2	1	270	NTX
Cupertino ARES					
KT6JK	10	2	1	270	SCV
Albany ARA					
WK2H	55	2	1	270	ENY
Greer ARC					
N0DIM	110	2	1	270	SC
Jackson Co. (MS) ARA					
KI5OAL	55	2	1	270	MS
NF4AC					
W5APO	55	2	1	270	NFL
KA4NXP	110	2	1	270	KY
WM4P	110	2	1	270	WCF
Stillwater ARC (OK)					
AI5DD	55	2	1	270	OK
N6BXO	55	2	1	270	CO
WU1N	55	2	1	268	OH
Toledo Mobile RA					
KA9IVY	109	2	1	268	OH
Queen Anne's ARC					
K3RRP	108	2	1	266	MDC
Downey ARC					
K6ICS	76	2	1	266	LAX
Emergency Communications Assn.					
WS0Z	106	2	2	266	MO
Columbia-Montour ARC					
N3JPV	108	2	1	266	EPA
Great Southern DX Assn.					
AE5MI	54	2	1	266	MS
N8JK	54	2	1	266	OH
Stillwater ARA					
KB9TBB	54	2	1	266	WI
West Valley ARA					
KK6VF	108	2	1	266	SCV
NB7B	54	2	1	266	UT
N0KJI	54	2	1	266	CO
W2EQ	54	2	1	266	SNJ
Meriden ARC					
W1EDX	87	2	1	264	CT
Eastern Shore ARC					
KJ4UF	87	2	3	264	VA
ARC Panama City					
W1GWL	107	2	1	264	NFL
WCARES-TN					
KN4RHI	54	2	1	264	TN
North Shore (IL) RC					
N9AEP	100	2	1	262	IL
Ottawa Valley Mobile RC					
VE3VIG	53	2	1	262	ONE
Raytown ARC					
W0AJ	53	2	1	262	MO
Chicago Suburban Radio Assn.					
WB9NLO	106	2	1	262	IL
W9BJA	100	2	1	262	IL
W1SAV	121	1	1	262	LAX
Sun City Peachtree AR Group					
WA0LJM	53	2	1	262	GA
K2RCB	53	2	1	262	DE
Nashua Area Radio Soc.					
K1KA	142	1	1	261	NH
Tri-Lakes ARC					
KA0NXI	105	2	1	260	MO
N9JFK	105	2	1	260	WI
Chicago Suburban Radio Assn.					
AC9UV	52	2	1	258	IL
North Richland Hills ARC					
N5DN	52	2	1	258	NTX
SARC-SEPAR					
VA7VJ	52	2	1	258	BC
Adams Co. ARS					
W3HFT	104	2	1	258	EPA
AF2F	52	2	1	258	NNJ
Cape Fear ARS					
N4USB	103	2	1	256	NC
Foothills ARS (CA)					
K6YA	103	2	1	256	SCV
Barrie ARC					
VE3DLS	103	2	1	256	ONS
Philmont Mobile RC					
WA3GM	51	2	1	254	EPA
North Shore (IL) RC					
W9DEE	51	2	1	254	IL
Delta ARS					
VE7XH	51	2	1	254	BC
Black Diamond ARC					
N8CU	102	2	1	254	WV
Palatine ARES/RACES/AuxComm					
N9ITU	102	2	1	254	IL
AA5UZ	36	2	1	254	LA
W4BTW	102	2	1	254	NC
WCARES-TN					
W4PEZ	51	2	1	254	TN
N9NAZ	68	2	1	254	IL
WD4FMG	102	2	1	254	VA
ND6O	92	2	1	254	SV
Washington Area ARC					
KC0YHU	26	2	1	254	IA
West Chester ARA					
K8DEV	102	2	1	254	OH
Central Oregon Coast ARC					
KI7UPY	1	2	1	252	OR
Atlanta RC					
K4EAK	84	2	1	252	GA
South Jersey Radio Assn.					
N2SCJ	51	2	1	252	SNJ
Northeast Maryland AR Contest Soc.					
N3AML	52	2	1	252	MDC
KT4OO	101	2	1	252	SC
W4SNP	101	2	1	252	OH
Pamlico ARS					
K4ONC	100	2	1	250	NC
Franklin Co. (MA) ARC					
WA3EEC	50	2	1	250	WMA
Bergen ARA					
K2AMI	50	2	1	250	NNJ
Great Southern DX Assn.					
WM5DX	100	2	1	250	MS
Albemarle ARC					
KN4YNK	50	2	1	250	VA
Rochester (NY) DX Assn.					
K2RNY	50	2	1	250	WNY
Maury ARC					
KA4ZDR	100	2	1	250	TN
Lake Area Amateur Radio Klub					
KD2KW	25	2	1	250	NTX
Brunswick Shores ARC					
K6RM	50	2	1	250	NC
Hiawatha Valley ARC					
KE0TTK	100	2	1	250	MN
Burlington Co. RC					
N2VW	100	2	1	250	SNJ
South Lyon Area ARC					
NF8M	50	2	1	250	MI
Algoma ARC					
VE3DBM	70	2	1	250	ONN
WA9PYH	50	2	1	250	IN
VE2EJK	50	2	1	250	QC
VA6EPC	100	2	1	250	AB
AA3TK	50	2	1	250	WPA
N0NNE	100	2	2	250	NE
KC2JAV	100	2	1	250	OH
KB8VND	100	2	1	250	SNJ
AE0JR	100	2	1	250	NE
N9WG	50	2	1	250	IN
N6RH	50	2	1	250	NTX
WB6KDH	100	2	1	250	SB
York Region ARC					
VE3UB	100	2	1	250	GTA
Northern Lakes ARC					
WW0TT	99	2	1	248	MN
KO4AWC	51	2	1	248	AL
North Shore (IL) RC					
NR9H	49	2	1	246	IL
Minnesota Wireless Assn.					
WB8MIW	49	2	1	246	MI
Arctic ARC					
KL7R	49	2	1	246	AK
CRES ARC					
K8LE	49	2	1	246	OH
N3JNX	49	2	1	246	EPA
Mike & Key ARC					
KB7THX	96	2	1	244	ENY
Edmonds Woodway ARC					
K7RCH	50	2	1	244	WWA
Columbia-Montour ARC					
WA3GQA	52	2	1	244	EPA
K4EMF	52	2	1	244	GA
Fort Myers ARC					
KC0DE	48	2	1	242	SFL
Reno Co. ARA					
KA0NES	48	2	1	242	KS
Bolingbrook ARS					
K9NYO	65	2	1	242	IL
North Fulton ARL					
AK4O	46	2	1	242	WCF
Hays/Caldwell ARC					
KG5UNK	53	2	1	242	STX
Wisconsin ARC					
W9MXQ	96	2	1	242	WI
West Essex ARC					
K2NNN	96	2	1	242	NNJ
N8LES	48	2	1	242	OH
Lewis and Clark RC					
KD9DD	30	2	1	240	IL
KB3WFQ	49	2	2	240	EPA
VE6FAR Cycle 25					
VA6IAB	95	2	1	240	AB
Santa Clara Co. ARA					
WB6AAJ	47	2	1	238	SCV
Monkey Lover's Radio Consortium					
KN6MLM	22	2	1	238	SCV
Fauquier ARA					
KN4FTT	94	2	1	238	VA
Mid-MO ARC					
N0SS	47	2	1	238	MO
Bellbrook ARC					
KD8JOE	44	2	1	238	OH
WD6FIE	67	2	1	238	ORG
WCARC-TX					
KD8PNG	94	2	1	238	STX
VE7DFJ	47	2	1	238	BC
KN6EVH	50	2	1	238	SJV
W1REP	47	2	1	238	NC
Mike & Key ARC					
KJ7CBO	43	2	1	236	WWA
South Wake ARC					
WA4TCJ	93	2	1	236	NC
VE3SSB	50	2	1	236	GTA
AC8WC	93	2	1	236	MI
AC7CJ	43	2	1	236	EWA
Redondo Beach DCS					
WA6OWM	46	2	1	234	LAX
North Shore (ON) ARC					
VE3IRB	42	2	2	234	GTA
OH-KY-IN ARS					
N8ADK	46	2	1	234	OH
Union Co. Indiana Bicentennial					
K9U	46	2	1	234	IN
Putnam Emergency Amateur Repeater League					
WV1V	58	2	1	232	CT
Boeing Employees ARS — St. Louis					
NO0L	46	2	1	232	MO
Highlands Co. ARC					
KW4G	52	2	1	232	WCF
Columbia (MD) ARA					
K3TBD	41	2	2	232	MDC
Richfield RC					
KC0TJ	91	2	1	232	MN
Lodi ARC					
K6AAN	91	2	1	232	SJV
Franklin Co. (NC) ARC					
WA4PMG	54	2	1	232	NC
WZ9O	25	2	1	232	WI
K5PAR	91	2	1	232	NTX
K2HJ	91	2	1	232	WNY
North Fulton ARL					
NJ8J	51	2	1	230	GA
Broughton Memorial Field Day Group					
K2NMT	40	2	1	230	ENY
Comox Valley ARC					
VE7XFA	22	2	1	230	BC
W1DEY	115	2	1	230	ME
AI9IN	20	2	1	230	IN
KJ7YTS	58	2	3	230	AZ
K7WJV	45	2	1	230	WWA
W0PL	49	2	2	230	MN
KN4PHS	45	2	1	230	AL
K3IDE	90	2	2	230	NC
Boeing Employees ARS — St. Louis					
K2DP	53	2	1	228	MO
Palos Verdes ARC					
K9BGC	67	2	1	228	LAX
Cleveland Co. AR Service					
KG4IUQ	45	2	1	228	NC
WF7T	54	2	1	228	TN
KE8XH	89	2	1	228	MI
Edmond ARS					
N5ILQ	44	2	1	226	OK
Sierra ARC of the High Mojave					
KM6DLI	44	2	1	226	SJV
Port Lavaca ARC					
K5KXF	44	2	1	226	STX
PODXS 070					
KA5VZG	44	2	1	226	TN
Haldimand Norfolk ARC					
VE3NYP	88	2	1	226	ONS
Victor Valley ARC					
WY6R	44	2	1	226	ORG
Warminster ARC					
N3UO	48	2	1	226	EPA
Utica Shelby Emergency Comms Assn.					
K8RDJ	44	2	1	226	MI
WA7SHP	87	2	1	224	OR
WVARC-AZ					
W7CJH	87	2	1	224	WI
Falmouth ARA					
W1OH	76	2	2	222	EMA
Irving ARC					
WA5CKF	51	2	3	222	NTX
PODXS 070					
K5SP	43	2	1	222	NTX
Lancaster RC					
KB2ADN	43	2	1	222	WNY
North Georgia QRP Club					
W4QBA	43	2	1	222	GA
Cambridge ARA					
K8SLJ	86	2	1	222	OH
Western Placer ARC					
K1FMB	36	2	1	222	SV
W3MY	61	2	1	222	NFL
Suburban Technical ARS					
KD9GHO	43	2	1	222	IL
N8FKF	43	2	1	222	MT
Bullitt ARS					
N4CCJ	85	2	1	220	KY
Mississauga ARC					
VE3YV	85	2	1	220	GTA
KCARC					
W4OLC	85	2	1	220	SC
Peak RA					
WA7YXY	80	2	1	220	OR
KF5YET	75	2	2	220	OK
VA3ZNQ	56	2	1	220	ONE
SLSRC					
KC0BYE	17	2	1	218	MO
Panama City ARC					
KK4YPA	84	2	11	218	NFL
Reading RC					
W3SMP	17	2	1	218	EPA
North Shore RA					
W1PAC	17	2	1	218	EMA
Bristol ARC					
K4BGV	84	2	1	218	TN
Sunnyvale ARES					
KG6HI	42	2	1	218	SCV
Watauga ARC					
N4DE	42	2	1	218	NC
York Region ARC					
VE3EB	42	2	1	218	GTA
AC4UK	42	2	1	218	VA
Desoto ARC					
KN4JND	33	2	1	216	WCF
VA6RCN	50	2	1	216	AB
Sherlock ARA					
K6ESS	82	2	1	214	SV
Arkansas River Valley ARF					
NK5K	82	2	1	214	AR
Davis Co. ARC					
KJ7NO	41	2	1	214	UT
Fort Wayne RC					
KB9OZI	82	2	1	214	IN
Old Barney ARC					
W2NRS	41	2	1	214	SNJ
Redstone Rockets					
KY4G	41	2	1	214	AL
Brandon ARC					
VE4MR	41	2	1	214	MB

Palos Verdes ARC
KM6LGX 32 2 1 214 LAX
Broughton Memorial Field Day Group
W2YJL 28 2 1 214 ENY
KA1YQC 41 2 1 214 RI
K1DRH 41 2 1 214 EMA
Brunswick Shores ARC
K5EK 41 2 1 212 NC
Broughton Memorial Field Day Group
W2QAC 81 2 1 212 ENY
AD7OY 42 2 1 212 NV
Tennessee Contest Group
W4BCG 45 2 1 212 TN
AG7KO 81 2 1 212 WWA
KØYQX 42 2 1 212 MN
USS Wisconsin RC
W4ZPR 53 2 1 212 VA
Ottawa Valley Mobile RC
VE3OKD 40 2 1 210 ONE
Long Island CW Club
W7PEZ 40 2 1 210 WWA
ARC of Columbia Co.
WK4F 50 2 1 210 GA
Estes Valley ARC
W9INE 80 2 1 210 CO
Healing Springs Mtn. VHF Soc.
KI4QCN 40 2 1 210 NC
Bear Bait RC
N9ZSY 40 2 1 210 IN
WA4YL 80 2 1 210 WCF
KN4EDG 70 2 1 210 NFL
West Island ARC
VE2RFI 80 2 1 210 QC
K4TEP 80 2 2 210 AL
Northville ARA
KB2DX 60 2 1 208 ENY
AB4DP 52 2 1 208 TN
W8DBC 27 2 1 208 MI
AG6JA 57 2 1 208 EB
Morongo Basin ARC
KB6DAN 39 2 1 206 ORG
Eastern Shore ARC
WAØWHT 39 2 1 206 VA
Lake Co. (OH) ARA
N8FRJ 68 2 1 206 OH
Radio Club of Tacoma
KF7GPO 28 2 1 206 WWA
Mahoning Valley ARA
KB8GAE 39 2 1 206 OH
South Jersey Radio Assn.
KD2SSE 22 2 1 206 SNJ
WA1FKP 41 2 1 206 AL
Stillwater ARA
AGØH 39 2 1 206 MN
WCARC-TX
KI5ETN 78 2 1 206 STX
WA3TD 78 2 1 206 WPA
Mountaineer ARA
N8TJD 77 2 1 204 WV
Half Moon Bay ARC
AJ6BN 77 2 1 204 SCV
San Gorgonio Pass Amateur Club
K6WM 27 2 1 204 ORG
Lakeland ARC
W4XDS 45 2 1 204 WCF
ARC of Butts Co.
AK4EM 27 2 1 204 GA
Sumner Co. ARA
WK4K 77 2 1 204 TN
Tri-State ARS (IN)
N9QVQ 77 2 1 204 IN
WO2N 40 2 1 204 NLI
W7FD 77 2 1 204 NV
KI5FUY 75 2 1 204 STX
Prescott-Russell ARC
VA3LP 26 2 1 202 ONE
KO4HRD-NS2X Team
NS2X 66 2 2 202 TN
Eastern New Mexico RC
WS5D 38 2 1 202 NM
Broughton Memorial Field Day Group
KC2ZVK 26 2 1 202 ENY
Hudson Valley Contesters and DXers
KD2NE 76 2 1 202 ENY
DFW Contest Group
K1DW 38 2 1 202 LA
Smoky Mountain ARC
W6UB 44 2 1 202 TN
KJ7EP 44 2 1 202 MT
AC4JG 38 2 1 202 NC
AJ6CE 76 2 1 202 SF
AE1TG 38 2 1 202 ME
K8OIP 38 2 1 202 NM
US West Wireless Club
KØUW 13 2 1 202 MN
AC5O 76 2 1 202 LA
KY4HV 76 2 1 202 AL
Columbia-Montour ARC
KC3LIR 75 2 1 200 EPA
Splitrock ARA
K1SRE 75 2 1 200 ME
Midland (MI) ARC
N8ERF 25 2 1 200 MI
Hinesville ARR Emergency Soc.
W4LLS 45 2 1 200 GA
Ottawa Valley Mobile RC
VA3KXA 42 2 2 200 ONE
East Greenbush ARA
KB2CDX 75 2 1 200 ENY
Straight Key Century Club
WB8WUA 44 2 1 200 OH
W8AZB 75 2 1 200 OH
Coyote ARC
KN5S 38 2 1 198 STX
Ellis Co. ARC
K5EIS 23 2 1 198 NTX
North Ottawa ARC
N8GMY 37 2 1 198 MI
Jefferson Co. (WA) ARC
N7ZW 38 2 1 198 WWA
Eastern Shore ARC
WA4RX 12 2 1 198 VA
KM4PDI 37 2 1 198 KY
Swan Ham RC
KG8RRY 12 2 1 198 OH
K5WW 37 2 1 198 STX
KD2UUC 37 2 1 198 NNJ
WB2KXC 74 2 1 198 LAX
Tri-State ARA
AB8WW 37 2 1 198 WV
N2FBV 37 2 1 198 NLI
Bergen ARA
WA2CLP 13 2 1 196 NNJ
Grand Rapids ARA
N8DGD 38 2 1 196 MI
Splinter Group ARC
N8WUA 42 2 7 196 OH
Comox Valley ARC
VA7CTG 23 2 1 196 BC
W2VDZ 73 2 1 196 NNJ
Woodbridge Wireless
KM4KWZ 73 2 1 196 VA
K4DTR 73 2 1 196 NFL
South Bay ARA
KJ6DBE 36 2 1 194 EB
Pahrump AR Repeater Assn.
N7HYV 59 2 1 194 NV
Montrose Co. ARC
N7SE 42 2 1 194 CO
Holland ARC
KE8JAS 36 2 1 194 MI
New Providence ARC
W2IOC 72 2 1 194 NNJ
Old Barney ARC
N2RPQ 36 2 1 194 SNJ
Adams Co. ARS
KC3GBU 22 2 1 194 EPA
Desert Radio Amateur Transmitting Soc.
KE6VHQ 22 2 1 194 ORG
Boone and Hamilton Co. ARES
KBØMPL 11 2 1 194 IA
WCARES-TN
WC4DA 22 2 1 194 TN
N9JAF 36 2 1 194 IL
W8UHW 72 2 1 194 MI
WA7RV 36 2 1 194 AZ
Wisconsin ARC
KB9PRF 72 2 1 194 WI
WA7L 66 2 1 194 WWA
KJ7LAN 41 2 1 194 WWA
W4KP 72 2 1 194 KY
Tortolita RC
N7LRK 31 2 1 194 AZ
KØJV 36 2 1 194 SD
Soc. of Midwest Contesters
KE9UA 71 2 1 192 IL
New Providence ARC
KC2OSR 71 2 3 192 NNJ
South Jersey Radio Assn.
K2WJL 71 2 1 192 SNJ
W4TWR 71 2 1 192 SC
KN9P 42 2 1 192 WI
AA5UY 20 2 1 192 LA
WA6HOO 65 2 1 192 LAX
KR9E 71 2 1 192 IN
KM6KFW 71 2 1 192 SV
N4ES 37 2 1 192 NC
Squaw Island ARC
AB2WZ 70 2 1 190 AL
North Shore (ON) ARC
VA3GDZ 20 2 1 190 GTA
Chesapeake Amateur Radio Service
KM4ALL 70 2 1 190 VA
Anderson RC
K4TG 70 2 1 190 KY
Quinte & Prince Edward RCs
VA3ACE 70 2 1 190 ONE
Delaware Repeater Assn.
W3FME 70 2 1 190 EPA
Meriden ARC
W1DQ 35 2 1 190 CT
Kingston Amateurs
VE3FMK 10 2 1 190 ONE
Shreveport ARA
K5JAD 70 2 1 190 LA
Portland ARC
K7ENN 35 2 1 190 OR
Hays/Caldwell ARC
W5ERX 45 2 1 190 STX
North Fulton ARL
KK4E 35 2 1 190 GA
Snohomish Co. Hams Club
KE7FQJ 70 2 2 190 WWA
Albemarle ARC
KA4JJD 35 2 1 190 VA
AD4IE 35 2 1 190 NC
K2TJK 35 2 1 190 NNJ
WB5LAI 70 2 1 190 MS
KD5CFA 70 2 1 190 LA
KØGOB 70 2 1 190 MO
Huron ARA
KMØF 69 2 1 188 SD
Eastern Ohio Contesters
KE8E 64 2 1 188 OH
Brightleaf ARC
WA4SLC 69 2 1 188 NC
Yuba-Sutter ARC
K6JFP 69 2 1 188 SV
WA4AH 69 2 1 188 NFL
KCØJQO 45 2 1 188 MN
Texas Emergency Amateur Communicators
KK5DO 19 2 1 188 STX
Columbia-Montour ARC
AB3BL 54 2 1 186 EPA
McMinnville ARC
AG7OG 68 2 1 186 OR
Hampstead Hams
KN4WGC 34 2 1 186 NC
Brunswick Shores ARC
KI4KK 45 2 1 186 NC
Tellico Lake ARC
K4MJF 18 2 1 186 TN
KA7RRA 68 2 1 186 WWA
WB2COY 34 2 1 186 ENY
N6YMK 34 2 1 186 ORG
Broughton Memorial Field Day Group
W2SID 17 2 1 184 ENY
Penn Wireless Assn.
WE3F 67 2 1 184 EPA
Mid-MO ARC
NNØJS 36 2 1 184 MO
KG2NI 67 2 1 184 WNY
N2CEC 35 2 1 184 NNJ
North Okaloosa ARC
KI5FR 16 2 1 182 NFL
Foothills ARS (CA)
AA6PZ 50 2 1 182 SCV
Delaware ARA
W8JJB 16 2 1 182 OH
Mid-MO ARC
ADØKH 33 2 1 182 AR
Paducah ARA
KG4SRK 66 2 1 182 KY
K8UHL 45 2 3 182 KY
KC4RSL 46 2 3 182 GA
NX3P 66 2 1 182 AL
Watauga ARC
WS4JH 66 2 1 182 NC
NH7TV 66 2 1 182 WPA
WØPP 59 2 1 182 MO
Nelson Co. Post 42 American Legion ARC
KD4NSU 65 2 1 180 KY
South Lyon Area ARC
N8CWX 65 2 1 180 MI
South Jersey Radio Assn.
W2MC 65 2 1 180 EPA
Anderson RC
KA8D 65 2 1 180 KY
North East Tarrant ARC
N5DWV 65 2 1 180 NTX
Santa Clara Co. ARA
WA6OYS 65 2 1 180 SCV
Monkey Lover's Radio Consortium
W6LPW 65 2 1 180 SCV
WCARC-TX
W6RKK 15 2 1 180 STX
York Region ARC
VA3EJF 65 2 1 180 GTA
K5JM 33 2 1 180 STX
SC4ARC
KN6LGM 14 2 13 178 SCV
OCAPA
W5SRO 32 2 1 178 OK
QSY Soc.
WA2NYY 32 2 1 178 ENY
SARC-SEPAR
VA7FMR 32 2 1 178 BC
Alamance ARC
W1LZ 64 2 1 178 NC
VA2KD 64 2 1 178 QC
N1AAM 14 2 1 178 NH
KW2A 32 2 1 178 MDC
Tennessee Contest Group
KEØL 32 2 1 178 TN
Northern Lakes ARC
KDØZYL 63 2 1 176 MN
Ascension ARC
K5AJL 44 2 1 176 LA
Ellsworth Amateur Wireless Assn.
KB1H 63 2 1 176 ME
North Richland Hills ARC
W5GT 13 2 1 176 NTX
HP Alumni RC
W1DYJ 39 2 1 176 EMA
Crescenta Valley RC
KM6ERG 63 2 1 176 LAX
ND4DX 59 2 1 176 NFL
N1ADX 63 2 1 176 WMA
AG2TH 42 2 1 176 AZ
Tortolita RC
K7ADX 13 2 1 176 AZ
KJ5SO 55 2 1 176 LA
South Mountain Radio Amateurs
W3HMS 37 2 1 174 EPA
Rochester (NY) DX Assn.
N2DD 62 2 1 174 WNY
Radio Club of Tacoma
W7MKE 6 2 1 174 WWA
Oro Valley ARC
N6ITY 31 2 1 174 AZ
Austin ARC
KM5MQ 62 2 1 174 STX
Potomac Valley RC
N3AO 31 2 1 174 VA
Mecklenburg ARS
W4WNT 6 2 1 174 NC
Ski Country ARC
KØALT 31 2 1 174 CO
FVFD21
KS4GD 31 2 1 174 GA
Southern Arizona DX Assn.
W7MD 31 2 1 174 AZ
Twin City FM Club
KØCV 31 2 1 174 MN
K4LVW 31 2 1 174 GA
Desert Radio Amateur Transmitting Soc.
WA6QGH 38 2 1 172 ORG
Fair Lawn ARC
K3KKH 61 2 1 172 NNJ
Patoka Valley ARC
WB9LIB 61 2 1 172 IN
Gainesville ARS
K4TMG 61 2 1 172 NFL
Old Barney ARC
KE2NN 30 2 1 170 SNJ
Azalea Coast ARC
NKØS 6 2 11 170 NC
Old Barney ARC
WA2ACV 60 2 1 170 SNJ
Putnam Emergency Amateur Repeater League
W2BRA 60 2 1 170 ENY
CARA/OBARC
KF5TPT 30 2 1 170 MS
Orange Co. Radio Amateurs & Durham FM Assn.
N4JQR 60 2 1 170 NC
North Shore (ON) ARC
VE3VGJ 60 2 1 170 ONE
Elmira ARC
VA3WPJ 50 2 1 170 ONS
Panama City ARC
KK4PJ 60 2 1 170 NFL
St. Louis ARC
WAØIYY 30 2 1 170 MO
Inverhuron Ham RC
VA3KGZ 10 2 1 170 ONS
Sun Parlour ARC
VE3FME 30 2 1 170 ONS
Tortolita RC
W7RMM 30 2 1 170 AZ
KA1QYP 30 2 1 170 WMA
K6WI 60 2 1 170 SV

Panoramaland ARC
KM7H 45 2 1 168 EWA
Goshen ARC
K9WPV 48 2 1 168 IN
CenTor ARC
VE3WGK 9 2 1 168 GTA
Lakeland ARC
KI4CDY 59 2 1 168 WCF
Scenic City ARS
AG4HG 59 2 1 168 TN
WA2ILY 59 2 1 168 CT
AD6AD 59 2 1 168 SV
N9AUP 34 2 1 168 IL
East Greenbush ARA
KC2HRO 47 2 1 166 ENY
Club Station Répétitrice de Laval
VE2TSX 30 2 1 166 QC
Northeast Maryland AR Contest Soc.
KC3RGK 58 2 1 166 MDC
Raytown ARC
WØJWT 34 2 1 166 MO
Central Michigan ARC
KD8RSH 8 2 1 166 MI
Chicago Suburban Radio Assn.
K9SSN 58 2 1 166 IL
Egyptian RC
WAØLIS 29 2 1 166 IL
ARTS of Louisville
KY1RK 58 2 2 166 KY
Club Station Répétitrice de Laval
VE2KEZ 58 2 1 166 QC
PART of Westford
KB1SEQ 29 2 1 166 EMA
WC6L 29 2 1 166 ORG
AL1G 29 2 1 166 AK
K6OWS 58 2 1 166 EB
KE8HZV 58 2 1 166 OH
KK6ZIZ 29 2 1 166 EB
WK2P 29 2 1 166 EPA
Columbia ARC (SC)
K4LLE 57 2 1 164 SC
St. Croix ARA
K9CTS 57 2 1 164 WI
Tortolita RC
KG7DYX 29 2 1 164 AZ
W6MSN 7 2 1 164 LAX
KBØOLA 57 2 1 164 UT
Columbia (MD) ARA
KC3JPP 56 2 1 162 MDC
Colorado QRP Club
WA6MOK 28 2 1 162 CO
Cumberland ARC
W3JJB 3 2 1 162 EPA
Brainerd Area ARC
NØGEW 56 2 1 162 MN
Northwest Indiana DX Club
N9ID 28 2 1 162 IN
Heritage Hunt Hams
KM4IAJ 56 2 1 162 VA
Everglades ARC
K4UTL 28 2 1 162 SFL
Pasadena RC/JPLARC/CITARC
W6FTR 6 2 1 162 LAX
N1OIG 40 2 1 162 ME
NØYH 28 2 1 162 MO
Wheaton Community Radio Amateurs
N9HQ 56 2 1 162 IL
WCARES-TN
KC1DWP 56 2 1 162 TN
KD8MRL 28 2 1 162 IL
AAØIZ 56 1 1 162 OR
Brookings Radio Research Club
WBØQDO 45 2 1 160 SD
Ottawa Valley Mobile RC
VE3GIQ 55 2 1 160 ONE
WG4MC 55 2 1 160 SC
WB7DUO 55 2 1 160 ID
Kemptville AR Group
VE3KAE 35 2 1 158 ONE
Columbia-Montour ARC
WC3A 54 2 1 158 NFL
Southern Counties ARA
KD2QED 2 2 1 158 SNJ
Richardson Wireless Klub
WX7V 51 2 1 158 NTX
Barnstable ARC
W1LEM 27 2 1 158 EMA
Orange Co. (NY) ARC
N2ETA 54 2 1 158 ENY
Algoma ARC
VE3WMZ 44 2 1 158 ONN
N4KHZ 27 2 1 158 WNY
WO2Y 54 2 1 158 SNJ
W3GUY 4 2 1 158 EPA
Barry ARA
KD8LNO 53 2 1 156 MI
London ARC
VA3CBN 53 2 1 156 ONS
DuPage ARC
K9FEH 53 2 1 156 IL
Chicago Suburban Radio Assn.
W9TTY 3 2 1 156 IL
Bellbrook ARC
AD8HN 53 2 1 156 OH
N9GH 53 2 1 156 WI
WH6LE 53 1 1 156 NC
Wheaton Community Radio Amateurs
KA3HSW 3 2 1 156 IL
GVARC/SBCARA
KG6YUN 52 2 1 154 SCV
Cumberland ARC
AF3I 1 2 1 154 EPA
Sierra Foothills ARC
AA6RS 51 2 1 154 SV
Humboldt ARC
KN6CEH 52 2 1 154 SF
KX1W 26 2 1 154 SNJ
VE9WH 52 2 1 154 MAR
NG2G 26 2 1 154 WWA
Truro ARC
VA1JG 52 2 1 154 MAR
WB9LUR 26 2 1 154 NFL
London ARC
VE3FTM 51 2 1 152 ONS
Arkansas River Valley ARF
AE5SS 1 2 1 152 AR
Sioux Empire ARC
KEØRJ 51 2 1 152 SD
Central Massachusetts ARA
AI1G 51 2 1 152 WMA
Schaumburg ARC
KC9NZP 51 2 1 152 IL
Eastern Fulmont ARC
N2KAE 51 2 1 152 NNY
Broughton Memorial FD Group
KD2QKU 51 2 1 152 ENY
Kicked Back Contesters Club
KD5YPH 35 2 1 152 CO
WB3GBL 51 2 1 152 VA
AC4DP 34 2 1 152 GA
KE6FQC 51 2 1 152 ORG
NV1Y 51 2 1 152 VT
Lewisville ARA
KG5ZNJ 25 2 1 150 NTX
Mahoning Valley ARA
KD8NZF 25 2 1 150 OH
MicroHAMS ARC
KB7WSD 28 2 2 150 WWA
Eastern Shore ARC
W4ACM 50 2 1 150 VA
Hoodview ARC
K7NWT 25 2 5 150 OR
South East Metro ARC
WAØKRL 50 2 1 150 MN
Orange Co. (CA) ARC
W6HHC 30 2 1 150 ORG
South Mountain Radio Amateurs
N3ACP 50 2 1 150 EPA
Peconic ARC
WB2EUJ 25 2 1 150 NLI
Columbus ARC
KM4TLR 30 2 1 150 GA
DFW Contest Group
N5GI 50 2 1 150 NTX
Black Diamond ARC
W8HY 50 2 1 150 WV
Hilltop Transmitting Assn.
WS3C 50 2 1 150 EPA
Framingham ARA
KB1VXY 50 2 1 150 EMA
Livermore AR Klub
KF6JS 50 2 1 150 EB
KØRVB 50 2 1 150 STX
WBØWIV 50 2 1 150 IA
W8FUN 50 2 1 150 MI
West Valley ARA
N5YJZ 25 2 1 150 SCV
N6AVI 25 2 1 150 LAX
N3UYI 27 2 1 150 WI
W6GF 50 2 1 150 EB
WVARC-AZ
KA7NPQ 50 2 1 150 AZ
Stillwater ARA
NØDRX 50 2 1 150 MN
North Augusta Belvedere RC
K4NAB 49 2 1 148 SC
Desert Radio Amateur Transmitting Soc.
KJ8O 49 2 1 148 ORG
Reelfoot ARC
WD4LAR 49 2 1 148 TN
North Shore (ON) ARC
VE3KZT 49 2 1 148 GTA
AA5AH 35 2 1 148 NTX
KD4QMY 49 2 1 148 GA
NL7V 35 2 1 148 AK
KDØB 49 2 1 148 MN
WC9D 49 2 1 148 VA
KI5JJJ 49 2 1 148 OK
South Bay ARA
WB9YVM 41 2 1 146 EB
Palos Verdes ARC
AC6RM 48 2 1 146 LAX
St. Louis & Suburban RC
W9LRM 24 2 1 146 IL
Anoka Co. RC
KEØVKO 24 2 1 146 MN
Sierra Nevada ARS
W4FLL 24 2 1 146 NV
Mississippi Coast ARA
AD5HS 24 2 1 146 MS
Barry ARA
AC8AZ 24 2 1 146 MI
Comox Valley ARC
VE7JO 48 2 1 146 BC
London ARC
VA3ATB 48 2 1 146 ONS
Mid-MO ARC
WAØZOG 48 2 1 146 MO
REDXA/MARS
AAØBV 24 2 1 146 SF
W5JJJP 48 2 1 146 STX
AA5OY 24 2 1 146 LA
KI5NUG 19 2 2 146 NTX
KY4TG 48 2 1 146 KY
W4HXH 24 2 1 146 SFL
WB9SWI 24 2 1 146 EMA
Haldimand Norfolk ARC
VE3HSR 47 2 1 144 ONS
Columbia (MD) ARA
N3KNN 47 2 1 144 MDC
GOTAHAMS
K6BCB 27 2 2 144 ORG
Minnetonka Minnesota RC
AJØO 38 2 1 144 MN
K1AUS 47 2 1 144 MT
KBØROA 47 2 1 144 MN
N6DPL 47 2 1 144 AZ
Valley RC of Oregon
AD7Z 47 2 1 144 OR
Oakland Radio Communication Assn.
KA6NZB 23 2 1 142 EB
Palos Verdes ARC
W6OQ 46 2 1 142 LAX
Elgin ARS
VE3GAM 46 2 1 142 ONS
Club KC5NX
KEØNCP 46 2 1 142 MN
Lafayette DX Assn.
K9ELF 26 2 1 142 IN
K1USN RC
AB1KT 23 2 1 142 EMA
Pasadena RC/JPLARC/CITARC
K6FOD 23 2 1 142 LAX
KM4WYO 24 2 1 142 AL
AI4LL 23 2 1 142 VA
K9SIU 26 2 1 142 IL
Williamson Co. ARC
KI5QHR 26 2 1 142 STX
W5OT 46 2 1 142 AZ
Cupertino ARES
AG6GX 45 2 1 140 SCV
Assoc. Radio Amateurs of Long Beach
K6MUG 45 2 1 140 SCV
Disney EARS
KT4JF 45 2 1 140 EPA
Orange Co. Radio Amateurs & Durham FM Assn.
KO4DHJ 45 2 1 140 NC
Redding Veterans ARC
K6WK 45 2 1 140 SV
Kendall ARS
KI5KUI 45 2 1 140 STX
North Fulton ARL
K4DQM 45 2 1 140 GA
W4RJA 45 2 1 140 NFL
WM4X 45 2 1 140 VA
Aeronautical Center ARC
KF5GTX 89 1 1 139 OK
Quinte & Prince Edward RCs
VE3UGT 44 2 1 138 ONE
Mid-MO ARC
NØJBF 22 2 1 138 MO
PODXS 070
WB4JJJ 22 2 1 138 VA
Montvale OEM
K2GFM 22 2 1 138 NNJ
KE8CSW 44 2 1 138 OH
K8III 44 2 1 138 OH
Tallahassee ARS
KN4FCC 22 2 1 138 NFL
N5KAE 35 2 1 138 STX
VECTOR
VE7NCD 36 2 1 138 BC
NY9P 22 2 1 138 IL
Peterborough ARC
VE3KBI 43 2 1 136 ONE
HDXCC
AE9LL 33 2 1 136 IN
Columbia-Montour ARC
N3OMA 42 2 1 136 EPA
Burlington ARC
VE3AYR 23 2 1 136 GTA
Healing Springs Mtn. VHF Soc.
KA4SEY 28 2 1 136 NC
WRAET
N2RBJ 43 2 1 136 NNJ
K1MAZ 43 2 1 136 VT
Tri-County Radio Assn.
AC2ZZ 43 2 1 136 NNJ
South Bay ARA
AB6BR 21 2 1 134 EB
Oakland Radio Communication Assn.
WB6NER 42 2 1 134 EB
Dalton ARC
WI4L 42 2 1 134 GA
Kitchener-Waterloo ARC
VA3IDD 42 2 1 134 ONS
Mid-MO ARC
KDØCCI 42 2 1 134 MO
Falmouth ARA
WM1N 21 2 1 134 EMA
Estes Valley ARC
WD1W 42 2 1 134 CO
Haldimand Norfolk ARC
VE3HTF 42 2 1 134 ONS
Central Illinois RC
KD8PYY 42 2 1 134 IL
KA1VMG 42 2 1 134 CT
AC8HZ 42 2 1 134 MI
KO4MAO 16 2 1 134 TN
W3RLO 23 2 1 134 DE
KFØCQN 21 2 1 134 MO
N9TNT 21 2 1 134 IN
W7DBA 84 1 1 134 UT
Hampden Co. RA
KB1VSX 41 2 1 132 WMA
Black Diamond ARC
WB8CNN 41 2 1 132 WV
Reading RC
N3YQG 41 2 1 132 EPA
Culver City ARES
KM6RNJ 41 2 1 132 LAX
Liverpool Amateur Repeater Club
N2BSN 41 2 1 132 WNY
K7DFL 41 2 1 132 EWA
KC9QEW 41 2 1 132 IN
Richardson Wireless Klub
KIØR 40 2 1 130 NTX
Cuyahoga ARS
KD8SCV 40 2 1 130 OH
Metrocrest ARS
AC5DL 40 2 1 130 NTX
FMARC
KA9FAJ 40 2 1 130 IL
OH-KY-IN ARS
K8NW 40 2 1 130 OH
Albemarle ARC
AD6JV 20 2 1 130 VA
Mid-MO ARC
NØEAX 20 2 1 130 MO
Black River ARC
KD8JBG 20 2 1 130 MI
Peterborough ARC
VA3MYC 40 2 1 130 ONE
Federación de Radio Aficionados de PR
WP3KW 20 2 1 130 PR
OCAPA
W5TJS 40 2 1 130 OK
Columbia-Montour ARC
N3KCR 40 2 1 130 EPA
Old Barney ARC
K2YQ 40 2 1 130 SNJ
Overlook Mountain ARC
AC2UQ 40 2 1 130 ENY
SARC-SEPAR
VE7SXM 40 2 1 130 BC
Halifax ARC
VA1ALW 20 2 1 130 MAR
WVARC-AZ
K9RZ 40 2 1 130 AZ
VE6FAR Cycle 25
W5WTH 20 2 1 130 STX
VE6JF 20 2 1 130 AB

VE2PGI	20	2	1	130	QC
N5BRG	40	2	1	130	NTX
WCARES-TN					
W4RG	40	2	1	130	TN
KC7KPG	40	2	1	130	NM
KV8Z	32	2	1	130	OH
Tri-State ARA					
KD8UWF	40	2	1	130	WV
Panhandle ARC					
KI5MPX	39	2	1	128	WTX
Jersey Shore ARS					
AC2ZU	39	2	1	128	SNJ
Santa Clara Co. ARA					
KA6YMD	39	2	1	128	SCV
Tri-State ARS (IN)					
K9PNP	31	2	1	128	IN
KF6AHX	39	2	1	128	SDG
KK4CS	39	2	1	128	GA
North Fulton ARL					
KO4QJF	38	2	1	126	GA
San Diego ARES					
K6IET	19	2	1	126	SDG
Ohio Valley Experimenters Club					
N8NMV	19	2	1	126	OH
Mahoning Valley ARA					
N8NB	19	2	1	126	OH
Jefferson (LA) ARC					
WA5CFT	19	2	1	126	LA
Hamilton (OH) ARC					
W8WCQ	38	2	1	126	OH
South Bay ARA					
WY6P	38	2	2	126	EB
Richardson Wireless Klub					
KI5IIL	19	2	1	126	NTX
4SQRP					
KD9MDL	38	2	1	126	IL
KG5UMH	38	2	1	126	WTX
WC5D	19	2	1	126	NTX
K1NA	23	2	1	126	AL
N3TDE	76	1	1	126	EPA
United Radio Amateur Club					
K6IGY	19	2	1	126	LAX
WW3MM	38	2	1	126	MDC
Silver Comet ARS					
W4AEX	37	2	1	124	GA
Middlesex ARS					
K1CMM	37	2	1	124	CT
K6MDG	20	2	1	124	SDG
Stamford ARA					
KB1IRB	37	2	1	124	CT
N6CST	37	2	1	124	EB
Peterborough ARC					
VE3AND	33	2	1	122	ONE
CARA/OBARC					
KM4AEM	36	2	1	122	MS
ARA of the Southern Tier					
N2PEZ	18	2	1	122	WNY
Elgin ARS					
VE3BTC	36	2	1	122	ONS
Oakland Radio Communication Assn.					
W6VQ	36	2	1	122	EB
Henry Co. ARC					
KD9ILY	18	2	1	122	IN
Boston Valley Simplex Club					
KB2JDB	36	2	2	122	WNY
Toronto ARC					
VA3JCL	36	2	1	122	ONS
KC7YE	18	2	1	122	WWA
Stubblefield Repeater Club					
KY4TPR	36	2	1	122	KY
KO8S	18	2	1	122	MI
KE6UWJ	18	2	1	122	UT
KC2RXS	18	2	1	122	VA
Crescenta Valley RC					
NO1H	32	2	1	120	LAX
Champaign ARA					
KC9UL	35	2	1	120	IL
Haldimand Norfolk ARC					
VE3KGE	35	2	1	120	ONS
San Jose ARES/RACES					
K6CES	29	2	1	120	SCV
DuPage ARC					
N8NIX	35	2	1	120	IL
Peconic ARC					
NY2NY	37	1	1	120	NLI
KB1YO	35	2	1	120	CT
Sturdy Memorial Hospital ARC					
KA1EWN	35	2	1	120	EMA
WCARES-TN					
K4IRS	35	2	1	120	TN
KB0KFH	35	2	1	120	KS
K5MPD	35	2	1	120	NTX
Soc. of Midwest Contesters					
N9GUN	17	2	1	118	IL

Laura Robertson, KO4DFJ, operated CW during the David M. Fiedler Memorial Amateur Radio Club, K4WAR, event for the 2021 ARRL Field Day. Their event was held at the VFW Post 6445 in Harlem, Georgia. [Matthew Sherburne, KF4WZB, photo]

Central Illinois RC					
N9TO	28	2	1	118	IL
Cupertino ARES					
AG6GR	17	2	1	118	SCV
Peterborough ARC					
VE3AXT	26	2	1	118	ONE
North Augusta Belvedere RC					
W3WR	34	2	1	118	SC
Granite State ARA					
N1KWG	34	2	1	118	NH
Overlook Mountain ARC					
KD2EYH	34	2	1	118	ENY
Cumberland ARC					
N3FWE	17	2	1	118	EPA
Jefferson (LA) ARC					
WF9M	17	2	1	118	LA
PODXS 070					
W4BZM	17	2	1	118	NFL
VA3ROC	34	2	1	118	ONS
N4NP	17	2	1	118	KY
Warminster ARC					
KC3HXF	34	2	2	118	EPA
KK9D	20	2	1	118	WI
KK4RFL	34	2	1	118	GA
VA3EY	34	2	1	118	ONS
KG4WNA	17	2	1	118	KY
WA9MQP	17	2	1	118	IL
VE2SCA	17	2	1	118	QC
Tri-State ARS (IN)					
WB4ZUT	34	2	1	118	IN
KA5ULE	34	2	1	118	WTX
N1CGP	17	2	1	118	ME
Long Island CW Club					
N3IOE	30	2	1	116	EPA
Kachina ARC					
AG7AB	27	2	1	116	AZ
WN8Y	33	2	1	116	TN
W9VTD	33	2	1	116	IL
K3BTE	33	2	1	116	MDC
KK4QYR	33	2	1	116	VA
Yankee Clipper Contest Club					
VA2PHK	33	2	1	116	QC
Carbon ARC					
KB3BYT	16	2	1	114	EPA
Santa Clarita ARC					
AD6CY	16	2	1	114	LAX
FD Philips NEO					
K8FCM	32	2	1	114	OH
Scarborough ARC					
VE3NR	16	2	1	114	GTA
AC1FS	16	2	1	114	EMA
VA7DXC	16	2	1	114	BC
WA2VIU	18	2	1	114	NLI
N7AKG	16	2	1	114	WWA
WD8BXP	32	2	1	114	MI
N7XLD	32	2	1	114	WWA
Wellington RC					
KN4ZLM	16	2	1	114	SFL
KI7N	16	2	1	114	OR

Irvine Disaster EmComms					
N6YH	31	2	1	112	ORG
Bellbrook ARC					
KD8YNG	31	2	1	112	OH
Grand Strand ARC					
KN4UUR	31	2	1	112	SC
Orange Park ARC					
N4RVD	31	2	1	112	NFL
Shenandoah Valley ARC					
W4MER	31	2	1	112	VA
WVARC-AZ					
W7TUE	31	2	1	112	AZ
KF4RAL	62	1	1	112	VA
VE9WRS	31	2	1	112	MAR
AJ6DI	23	2	1	112	SDG
Oro Valley ARC					
K7VTT	30	2	1	110	AZ
Elmira ARC					
VA3BLW	30	2	1	110	ONS
Lakes Area ARC					
W5JAS	30	2	1	110	STX
Azalea Coast ARC					
N2COP	29	2	1	110	NC
OCAPA					
AD5BU	30	2	1	110	OK
GVARC/SBCARA					
W6SC	15	2	1	110	SCV
North Shore (IL) RC					
K9OR	15	2	1	110	CO
Spokane DX Assn.					
K7STO	30	2	3	110	EWA
Cleveland Co. AR Service					
KI4RBI	30	2	1	110	NC
CARA/OBARC					
KF8PD	15	2	1	110	MS
Bedford ARC					
W5BTY	15	2	2	110	NTX
Providence Radio Assn.					
WA1WEE	15	2	1	110	RI
Cumberland ARC					
KB3PQT	30	2	1	110	EPA
N4MM	53	2	1	110	VA
Toledo Mobile RA					
KD8KXD	30	2	1	110	OH
The Villages ARC					
KM4PIH	15	2	1	110	NFL
KO4NIK	18	2	1	110	NC
KC1ETY	15	2	1	110	CT
W3HDG	30	2	1	110	WPA
K4MZE	15	2	1	110	GA
KC9KGK	16	2	1	110	IL
VE3HED	60	1	1	110	ONE
N5AF	15	2	1	110	STX
K3QC	15	2	1	110	SFL
N9AJD	26	2	1	110	IN
WCARES-TN					
N4BAX	30	2	1	110	TN
W5JPT	15	2	1	110	NTX
VE3AWS	30	2	1	110	ONS
Fort Myers ARC					
KB9LXM	29	2	1	108	WCF

Milwaukee Radio Amateurs' Club					
N9UX	16	2	1	108	WI
Barrie ARC					
VA3EDB	29	2	1	108	ONS
Azalea Coast ARC					
W4BIX	29	2	1	108	SC
Columbia (MD) ARA					
K3YMI	29	2	1	108	MDC
W3AO PVRC					
AJ3M	29	2	1	108	MDC
KU4V	29	2	1	108	NC
N5QNS	29	2	1	108	WTX
W5KV	29	2	1	108	STX
WVARC-AZ					
K6UGS	29	2	1	108	OR
K0FNS	29	2	1	108	CO
W4QDV	29	2	1	108	GA
K6KS	29	2	1	108	SV
Radio Club of Tacoma					
KA7NWF	28	2	1	106	WWA
Ottawa Valley Mobile RC					
VE3LBG	14	2	1	106	ONE
South Lyon Area ARC					
KE9CZC	14	2	1	106	MI
Green Mountain Wireless Soc.					
W1AD	18	2	1	106	NV
South Lyon Area ARC					
KE8CZC	14	2	1	106	MI
Halifax ARC					
VE1DTR	28	2	1	106	MAR
Healing Springs Mtn. VHF Soc.					
KO4JHG	14	2	1	106	NC
San Gorgonio Pass Amateur Club					
KD6ZJZ	28	2	1	106	ORG
Albemarle ARS					
KG4FSE	28	2	1	106	NC
Philmont Mobile RC					
WD8RYV	24	2	1	106	EPA
North Richland Hills ARC					
W5JJR	14	2	1	106	NTX
Anne Arundel RC					
N3ADF	14	2	1	106	MDC
Sunnyvale ARES					
WB6PVU	14	2	1	106	SCV
KC1AJT	17	2	1	106	EMA
Ruckerville Amateur Transmitting Soc.					
WA4WCD	27	2	1	104	KY
PART of Westford					
K1PAK	27	2	1	104	EMA
Cuyahoga ARS					
K8KR	27	2	1	104	OH
Long Island Mobile ARC					
W2MIT	26	2	1	104	NLI
North Okanagan RAC					
VE7KWA	27	2	1	104	BC
CRCRST					
WB0NPR	27	2	1	104	IN
AE5ZX	27	2	1	104	NM
AB5XM	14	2	1	104	STX
WO2C	27	2	1	104	WPA
N8OSF	27	2	1	104	OH
KG6JDR	21	2	1	104	EB
N9HSJ	22	2	1	104	IL
Blue Ridge ARC					
KN4KWA	13	2	1	102	NC
Mabcom					
VE6CA	26	2	1	102	AB
West Valley ARC					
KA7RGW	26	2	1	102	AZ
NP4VM	26	2	1	102	PR
VE6TWP	26	2	1	102	AB
AE6NN	15	2	1	102	ORG
Vienna Wireless Soc.					
W7SUA	24	2	1	102	AZ
Charleston ARS					
KW4XO	25	2	1	100	SC
Radio Club of Tacoma					
K7DKP	19	2	1	100	WWA
St. Croix Valley ARC					
K1ALA	25	2	1	100	ME
Boca Raton ARA					
N1QFH	25	2	1	100	SFL
North Shore (ON) ARC					
VE3NMD	25	2	1	100	GTA
Deep South ARC					
WA4GNL	25	2	1	100	AL
Somerset Co. ARC					
KD3RVR	14	2	1	100	WPA
South Bay ARC					
WB6MYD	25	2	1	100	LAX
Barrie ARC					
VA3NED	25	2	1	100	ONS
K6TQM	25	2	1	100	ORG
York RC					
KD9RCL	25	2	1	100	IL
N0UB	15	2	1	100	MO

K8AXZ	25	2	1	100	OH
W1FOY	25	2	1	100	EMA
Sterling Park ARC					
W4KLS	25	2	1	100	VA
AI7EQ	25	2	1	100	OR
K4EVT	14	2	11	100	NC
Wisconsin ARC					
W0AH	25	2	1	100	WI
KN3B	25	2	1	100	EPA
KC9MDY	25	2	1	100	WI
Sun City ARC					
WB5LJO	25	2	1	100	WTX
Central West Virginia Wireless Assn.					
KE8FRB	24	2	1	98	WV
Central West Virginia Wireless Assn.					
KE8RFB	24	2	1	98	WV
San Gorgonio Pass Amateur Club					
WA6UIJ	16	2	1	98	ORG
Jefferson Co. (WA) ARC					
N7TPR	24	2	1	98	WWA
Lynchburg ARC					
N4NQY	12	2	1	98	VA
Alabama Contest Group					
W4NBS	12	2	1	98	AL
Bergen ARA					
WA2ALY	12	2	1	98	NNJ
K0ZX	12	2	1	98	CO
N9BT	24	2	1	98	IL
W6ZL	12	2	1	98	ORG
KN6BAZ	12	2	1	98	SCV
KI7PBR	22	2	1	98	AZ
W7SKW	24	2	1	98	OR
West Valley ARA					
K6WV	24	2	1	98	SCV
N3CZ	12	2	1	98	NC
Lynchburg ARC					
WA2OMT	23	2	1	96	VA
Oakland Radio Communication Assn.					
KE6IUE	23	2	1	96	EB
South Bay ARC					
N6LEM	23	2	1	96	LAX
Boca Raton ARA					
N2ELG	23	2	1	96	SFL
Cleveland Co. AR Service					
KB0PD	23	2	1	96	NC
WA0VPJ	23	2	1	96	MN
KK4QKP	23	2	1	96	WCF
York Region ARC					
VE3PUH	23	2	1	96	GTA
Dallas ARC					
KI5NON	6	2	2	94	NTX
Radio Club of Tacoma					
K7EG	11	2	1	94	WWA
Emergency Communications Assn.					
N0AQI	11	2	1	94	MO
North Richland Hills ARC					
KD5DID	22	2	1	94	NTX
Azalea Coast ARC					
WA9FCH	11	2	1	94	NC
Sierra Foothills ARC					
W6EMR	22	2	1	94	SV
Cherokee ARS					
N4BBG	11	2	1	94	GA
Columbus ARC					
K4EOR	13	2	1	94	NC
Palos Verdes ARC					
W6KCV	22	2	1	94	LAX
Portage Co. AR Service					
N8QE	11	2	1	94	OH
AJ6HT	11	2	1	94	SCV
AE7EE	11	2	1	94	WWA
KE3KD	11	2	1	94	WPA
W6AOY	22	2	1	94	SF
K3ZE	22	2	1	94	MDC
KF3AA	11	2	1	94	DE
Tri-County ARC (WI)					
KD9PM	22	2	1	94	WI
South Bay ARA					
W6TYD	21	2	1	92	EB
Explorer Post 599					
KF7TUP	21	2	2	92	AZ
Longmont ARC					
KE0VT	21	2	2	92	CO
Saratoga Co. ARA					
KC2YLM	11	2	1	92	ENY
Pasadena RC/JPLARC/CITARC					
N1BN	21	2	1	92	LAX
Peconic ARC					
K2KKH	21	2	2	92	NLI
NV6W	11	2	1	92	SCV
K9IXS	23	2	1	92	LAX
Sterling Park ARC					
AJ4LN	21	2	1	92	VA
N7PS	21	2	1	92	EWA
KE4TH	21	1	1	92	UT
KC9LFG	21	2	1	92	WI
Tellico Lake ARC					
K4ZRP	21	2	1	92	TN
KF4IRC	14	2	1	92	AL
N0TYE	21	2	1	92	MN
MARCA					
AA7OO	10	2	1	90	AZ
Lucas ARC					
K5MGB	10	2	1	90	NTX
Eastern Shore ARC					
KB4MCP	20	2	1	90	VA
Loudoun Amateur Radio Group					
KO4NMN	10	2	1	90	VA
Ak-Sar-Ben ARC					
KE0U	10	2	1	90	NE
South Bay ARC					
KA6ZTO	19	2	1	90	ORG
Lynchburg ARC					
N2QT	10	2	1	90	VA
Barrie ARC					
VA3EEB	20	2	1	90	ONS
San Diego ARES					
N1TEN	20	2	1	90	SDG
Mid-MO ARC					
N0LBY	10	2	1	90	MO
REDXA/MARS					
K6CTA	10	2	1	90	SF
Cherryville Repeater Assn. II					
K2TZ	10	2	1	90	NNJ
Cupertino ARES					
AG6CL	20	2	1	90	SCV
KB1SL	20	2	1	90	CT
AE4FQ	10	2	1	90	AL
KN4WQP	10	2	1	90	TN
KI5GHO	20	2	1	90	STX
NA5M	10	2	1	90	NTX
WB2DHY	10	2	1	90	VA
AC3EW	18	2	1	90	MDC
VE7BLW	14	2	1	90	BC
AA2AD	19	2	3	90	WPA
Whitman Co. ARES/RACES					
WI7EOC	20	2	2	90	EWA
W5IOH	20	2	3	90	STX
N1AOK	10	2	1	90	CO
Half Wave Soc.					
W4BXC	19	2	1	88	SC
Club Station Répétitrice de Laval					
VE2CPY	19	2	1	88	QC
South San Francisco Communications					
KA6IND	19	2	1	88	SCV
Crescenta Valley RC					
AD6IZ	18	2	1	88	LAX
Middlesex ARS					
W1RJL	19	2	1	88	CT
Plano AR Klub					
W5ZBT	19	2	1	88	NTX
AF7JM	19	2	1	88	WWA
N4DAR	9	2	2	88	KY
K8WZY	10	2	1	88	OH
W7YTF	19	2	1	88	ID
N6OIL	19	2	1	88	ORG
W5SLG	19	2	1	88	WTX
Boeing Employees ARS					
KA7TTY	9	2	1	86	WWA
Egyptian RC					
KC9ZCA	18	2	1	86	IL
Batesville Area RC					
AG5CC	18	2	1	86	AR
Comstock ARA					
KL2P	18	2	1	86	NV
Lambton Co. RC					
VA3KSF	9	2	1	86	ONS
EUPAR Club					
KE8FJW	18	2	1	86	MI
Clallam Co. ARC					
N1SB	9	2	1	86	WWA
Falmouth ARA					
WB1CWI	18	2	1	86	EMA
Framingham ARA					
KC1HBG	18	2	1	86	EMA
Arizona Outlaws Contest Club					
KR2E	18	2	1	86	AZ
W3ZF	9	2	1	86	CO
KC3RDV	18	2	1	86	EPA
WU6K	9	2	1	86	SCV
K2SAB	9	2	1	86	NNJ
W1CWO	18	2	1	86	EMA
AE0EE	9	2	1	86	MN
AI4IC	12	2	1	86	TN
AJ0A	18	2	1	86	NE
KI5FQJ	18	2	1	86	NTX
Midland (TX) ARC					
KG5YUO	17	2	1	84	WTX
Falmouth ARA					
K1WDY	15	2	1	84	EMA
Coconino ARC					
KI7WNS	21	2	1	84	NM
Cape Fear ARS					
K3IRV	17	2	1	84	NC
Snohomish Co. Hams Club					
N7OBI	17	2	1	84	WWA
Denver RC					
K0KPS	17	2	1	84	CO
Central Oregon Coast ARC					
K7TMV	17	2	1	84	OR
WCARC-TX					
K0LVS	17	2	1	84	STX
Toronto ARC					
VA3LDM	16	2	1	84	ONS
Victoria-Haliburton ARA					
VE3KZJ	17	2	1	84	ONE
KI4AQT	17	2	4	84	GA
Camden Co. ARS					
KA7SQD	16	2	1	82	GA
North Shore (IL) RC					
KB9LM	14	2	1	82	IL
Columbia (OR) ARA					
W7CO	8	2	1	82	OR
NOARS-LCARA					
K2WJS	16	2	1	82	OH
Murgas ARC					
AB3ZI	14	2	1	82	EPA
ARESLAXNW					
W6ETF	16	2	1	82	LAX
Bolingbrook ARS					
W9GPB	16	2	1	82	IL
Riverland ARC					
KC9HDS	16	2	1	82	WI
Shelby Co. ARC					
KY4IK	16	2	1	82	AL
Cherryland ARC					
NS8K	16	2	1	82	MI
South Bay ARA					
KF6ZYD	16	2	1	82	EB
Kent Co. ARC					
N2IMB	16	2	1	82	DE
Ottawa ARC					
VE3OU	8	2	1	82	ONE
Northeastern Indiana ARA					
KA9NVZ	16	2	1	82	IN
Lynchburg ARC					
K4WWP	16	2	1	82	VA
Jefferson Co. (WA) ARC					
KI7AUH	16	2	1	82	WWA
South Pasadena ARC					
KM6OUK	13	2	1	82	LAX
WCARES-TN					
KA4OTB	16	2	1	82	TN
WA3GOS	8	2	1	82	MDC
N5CLS	8	2	1	82	NTX
VE6FAR Cycle 25					
W0TV	8	2	1	82	MN
AF7LZ	8	2	1	82	ID
K6BP	16	2	1	82	EB
Pamlico ARS					
KI4NSP	15	2	1	80	NC
Six Meter Club of Chicago					
WD9GJK	15	2	1	80	IL
Hancock-Hawkins AR Team					
KO4DWE	15	2	1	80	TN
Central Indiana ARA					
KI4L	15	2	1	80	IN
Pasadena RC/JPLARC/CITARC					
KG6DNY	15	2	1	80	LAX
Coconino ARC					
KI7WTS	15	2	1	80	AZ
Adams Co. ARS					
W3HN	15	2	1	80	EPA
Batesville Area RC					
N5TUM	15	2	1	80	AR
Brunswick Shores ARC					
KO4ZL	15	2	1	80	NC
Big Island ARC					
KH7LM	10	2	1	80	PAC
WVARC-AZ					
W0IVB	15	2	1	80	AZ
KD2RPX	15	2	1	80	SNJ
N1OSN	15	2	1	80	ORG
K8GVK	15	2	1	80	MI
Vienna Wireless Soc.					
KB1NG	15	2	1	80	VA
KI7MFB	15	2	1	80	MI
Riverside Co. ARA					
AD6JF	7	2	1	78	ORG
Lancaster RC					
WA2QYA	7	2	1	78	WNY
Elmira ARC					
VE3DCC	14	2	1	78	ONS
North Fulton ARL					
W1CY	14	2	1	78	GA
St. Louis & Suburban RC					
KE0LD	12	2	1	78	SCV
Orange Co. Radio Amateurs & Durham FM Assn.					
K1ZW	14	2	1	78	NC
McMinnville ARC					
KK1NP	4	2	2	78	OR
AD6GE	7	2	1	78	ORG
Wellesley ARS					
WA3ITR	14	2	1	78	EMA
Watauga ARC					
KE4AAP	14	2	1	78	NC
KM5GT	7	2	1	78	TN
K4JSK	14	2	1	78	NC
Western IL ARC					
W9DP	14	2	1	78	IL
KU4RC	14	2	1	78	NTX
WB8CZH	7	2	1	78	WCF
Eastern Ozarks ARC					
W1TBM	13	2	1	76	MO
Douglas Co. ARC					
AC0KN	12	2	1	76	KS
Half Moon Bay ARC					
N6BHS	13	2	1	76	SCV
North Shore (IL) RC					
WA9LKZ	8	2	2	76	IL
Old Barney ARC					
K2DCM	13	2	1	76	SNJ
Sawnee ARA					
KG8TRS	13	2	1	76	GA
N4CZ	8	2	1	76	AL
N8CZH	13	2	1	76	OH
AC0TG	13	2	2	76	NTX
VE2HAY	13	2	1	76	QC
VE2POU	13	2	1	76	QC
K7YJ	13	2	1	76	AZ
AE0GT	13	2	1	76	MN
K4ZMF	13	2	1	76	NFL
WB7CLF	13	2	1	76	WWA
KJ7GCM	13	2	1	76	AZ
VE3ETE	13	2	1	76	ONN
N6REK	13	2	1	76	SB
Lakeland ARC					
N4RTD	6	2	1	74	WCF
Six Meter Club of Chicago					
N9TUQ	12	2	1	74	IL
Findlay RC					
KD8AVT	12	2	1	74	OH
Hop River RC					
K1MTD	12	2	1	74	CT
Hamilton (ON) ARC					
VE3QYV	12	2	1	74	GTA
Arkansas River Valley ARF					
KC5VRI	12	2	1	74	AR
Metrocrest ARS					
KG5GXU	6	2	1	74	NTX
Oak Forest ARC					
WB5ANN	6	2	1	74	STX
Cross Roads Ham RC					
KI5OMW	12	2	1	74	STX
A3OB	12	2	1	74	EPA
W5AAJ	6	2	1	74	AR
AA0K	6	2	1	74	CO
West Allis Radio Amateur Club					
WI9EV	12	2	1	74	WI
K6WRF	6	2	1	74	WWA
AI6LY	12	2	1	74	SCV
KE5IRK	6	2	1	74	OK
KD0QG	12	2	1	74	CO
KD9RXU	6	2	1	74	IL
Orange Park ARC					
N4QLC	11	2	1	72	NFL
Parker RA					
KC0LUH	11	2	1	72	CO
Hi-Line ARC					
K7HEH	11	2	1	72	MT
Irvine Disaster EmComms					
KW6B	11	2	1	72	ORG
Raytown ARC					
KC0MO	11	2	1	72	MO
Anne Arundel RC					
KB3ZGL	11	2	1	72	MDC
Jackson Co. (MS) ARA					
KE5ZDW	11	2	1	72	MS
KK6VZE	11	2	1	72	SF
KC5CMX	11	2	1	72	AR
K2FSO	11	2	1	72	ENY
XWARN/DARA					
KD8GCN	11	2	1	72	OH
WZ6ZZ	11	2	1	72	EB
KM4ICE	11	2	1	72	VA
Thunderbird ARC					
K7RQN	36	2	1	72	AZ
KB1FFV	11	2	1	72	CT
Old Post ARS					
KC9HTC	21	1	1	71	IN
Edmond ARS					
WD5DFK	10	2	1	70	OK

Cuyahoga ARS
NC8J 10 2 1 70 OH
Desert Radio Amateur Transmitting Soc.
KN6KTU 10 2 1 70 ORG
Eastern Shore ARC
W4RLC 5 2 1 70 VA
Coastal Plains ARC
KM4SI 10 2 1 70 NFL
Northern Lakes ARC
KEØYPZ 10 2 1 70 MN
South Canadian ARS
N5UWY 5 2 1 70 OK
East Greenbush ARA
W2RBS 6 2 1 70 ENY
CRES ARC
WB8ZTP 10 2 1 70 OH
REDXA/MARS
N6VAW 10 2 1 70 SF
KN6NLZ 10 2 1 70 SV
KC3OJV 5 2 1 70 EPA
W2TAD 10 2 1 70 NFL
KD6YPS 5 2 1 70 SCV
Vienna Wireless Soc.
AE4R 5 2 1 70 VA
Barrie ARC
VE3WPK 9 2 1 68 ONS
Palos Verdes ARC
K6DMO 9 2 1 68 LAX
Old Barney ARC
N2OB 9 2 4 68 SNJ
Somerset Co. ARC
WB3FBI 9 2 1 68 WPA
Hazel Park ARC
N8REL 9 2 1 68 MI
San Gorgonio Pass Amateur Club
W6GRH 9 2 1 68 ORG
Columbia (MD) ARA
N3AWP 9 2 1 68 MDC
Radio Operadores Del Este
WP4MQQ 5 2 1 68 PR
WQ1Q 9 2 1 68 RI
KE8QFP 9 2 1 68 OH
KD2QLH 9 2 1 68 NNY
KK6TRC 9 2 1 68 ORG
Fort Myers ARC
AD4AS 8 2 1 66 SFL
Skyview Radio Soc.
K3RMB 8 2 1 66 WPA
ARC of Butts Co.
W4DED 4 2 1 66 GA
Shreveport ARA
KI5KOI 8 2 1 66 LA
Deep South ARC
NØJMC 8 2 1 66 AL
Keuka Lake ARA
NB2L 8 2 1 66 WNY
Radio Amateurs of Skagit Co.
W7ABF 8 2 1 66 WWA
Orange Co. (NY) ARC
W2JMU 4 2 1 66 ENY
South Towns ARS
N2QZR 8 2 1 66 WNY
K7TXL 4 2 1 66 WWA
Cherryville Repeater Assn. II
KD2DB 7 2 1 64 NNJ
Greenwood ARC
VE1DIY 7 2 1 64 MAR
Saskatoon ARC
VE5WD 7 2 1 64 SK
Framingham ARA
N1MH 7 2 1 64 EMA
Richmond ARC
K4GNE 6 2 1 64 VA
Ottawa Valley Mobile RC
VA3BGO 7 2 1 64 ONE
Pottstown Area ARC
W3DCT 7 2 1 64 EPA
Barrie ARC
VA3XFE 7 2 1 64 ONS
Cuyahoga ARS
KC8MRC 7 2 1 64 OH
BCI Communications ARC
W4BCI 7 2 1 64 WCF
Mike & Key ARC
KG7DAB 7 2 1 64 WWA
K4TSO 7 2 1 64 SC
W4YPW 7 2 1 64 OH
Shiawassee ARA
W8TEK 6 2 1 62 MI
Patoka Valley ARC
KD9PLX 4 2 1 62 IN
Carolina DX Assn.
K8YC 6 2 1 62 NC
Parker RA
WB3EVZ 3 2 1 62 CO
High Desert Amateur Radio Group
AH8K 6 2 1 62 OR
Pasadena RC/JPLARC/CITARC
KN6DVC 3 2 1 62 LAX
North Shore (IL) RC
W9TOC 6 2 1 62 IL
PODXS 070
N7RI 3 2 1 62 WY
Club Station Répétitrice de Laval
VE2LKR 6 2 1 62 QC
Queen Anne's ARC
KE3AO 6 2 1 62 MDC
Niagara Frontier Radiosport
KD2KEH 6 2 1 62 WNY
VE2ZYD 6 2 1 62 QC
K7NZE 3 2 1 62 WWA
WCARES-TN
K9LDB 6 2 1 62 TN
VE7DOG 6 2 1 62 BC
N3XPD 6 2 1 62 EPA
KE7NKR 3 2 1 62 OR
Truro ARC
VE1NEL 3 2 1 62 MAR
N4YHC 3 2 1 62 KY
K3MGQ 6 2 1 62 EPA
WB9PRG 22 2 1 62 WI
Seattle ACS
AC7MX 5 2 1 60 WWA
Santa Cruz Co. ARC
W6OJE 5 2 1 60 SCV
Smoky Mountain ARC
AA0JE 5 2 1 60 TN
Mining ARC/St. Paul RC
WØCOE 5 2 1 60 MN
South San Francisco Communications
KD6ZXC 5 2 1 60 SCV
Granite State ARA
KB1SXE 5 2 1 60 NH
N8HQY 5 2 1 60 OH
West Allis Radio Amateur Club
W9NAW 30 2 1 60 WI
WØJOP 3 2 1 60 MO
KFØFFH 5 2 1 60 MN
KE5WMA 5 2 1 60 LA
Kingston Amateurs
VA3BAH 4 2 1 58 ONE
Adams Co. ARS
KC3GBV 4 2 1 58 EPA
Riverside Co. ARA
W6SOW 3 2 1 58 ORG
Leisure World of Maryland ARC
W3LWM 4 2 1 58 MDC
Conejo Valley ARC
KD6IJF 4 2 1 58 SB
North Okanagan RAC
VA7RLX 4 2 1 58 BC
Boca Raton ARA
KO4AEP 4 2 1 58 SFL
Orleans Co. ARC
KD2RWC 2 2 1 58 WNY
Southwest Dallas Co. ARC
KC5MQC 4 2 1 58 NTX
Black Diamond ARC
N5ZPK 4 2 3 58 WV
Leisure World of Maryland ARC
W3LMW 4 2 1 58 MDC
Niagara Frontier Radiosport
WB2AIV 2 2 1 58 WNY
Brandon ARC
VE4WJM 4 2 1 58 MB
KW9F 4 2 1 58 IL
K6EXT 4 2 1 58 SCV
WB4KSL 4 2 1 58 AL
KG6TGI 4 2 1 58 OR
KN6HIP 2 2 1 58 SCV
North Shore (BC) ARC
VE7JYH 3 2 1 56 BC
Niagara Peninsula ARC
VA3KWG 3 2 1 56 GTA
Austin ARC
N5MHI 3 2 1 56 STX
Desert Radio Amateur Transmitting Soc.
KM6RRS 3 2 1 56 ORG
Huntsville ARC
AE4M 3 2 1 56 AL
Coconino ARC
AE7OH 3 2 1 56 AZ
Richmond Amateur Telecommunications Soc.
K1YOR 3 2 1 56 VA
West Valley ARC
KI7FQT 3 2 1 56 AZ
K2OFC 3 2 1 56 NNJ
KEØHLC 3 2 1 56 MO
KD8JCY 3 2 1 56 OH
AA4JM 3 2 1 56 SFL
NN4JM 3 2 1 56 AL
WXØG 3 2 1 56 WCF
Mid-MO ARC
KDØMRJ 2 2 1 54 MO
South Bay ARC
WB6HLS 2 2 1 54 LAX
Bluegrass ARS
KI4ENS 2 2 1 54 KY
Pamlico ARS
KG4ISY 2 2 1 54 NC
Greenwood ARC
VE1WLU 2 2 1 54 MAR
Hamfesters RC
KCØAHK 1 2 1 54 IL
Florida Contest Group
K4FB 1 2 1 54 WCF
Chandler Ham RC
WB8ZXU 2 2 1 54 AZ
Cape Fear ARS
KI4EZL 1 2 1 54 NC
El Dorado Co. ARC
K6MLE 2 2 1 54 SV
San Fernando Valley ARC
KM6JS 2 2 1 54 LAX
Nanaimo ARA
VE7VYZ 2 2 1 54 BC
NM8U 1 2 1 54 OH
K6AEA 2 2 1 54 KS
W2STM 2 2 1 54 WNY
N2RRA 1 2 1 54 ENY
Twin City ARC
KD9SSX 2 2 1 54 IL
VE5ZC 2 2 1 54 SK
Tri-County ARA (CA)
KB6IQ 2 2 1 54 ORG
VA3ZNW 1 2 1 54 ONS
KN4OET 2 2 1 54 VA
KI6EMD 2 2 2 54 EB
Garden City ARC
KC8VCX 1 2 1 52 MI
Orange Co. (NY) ARC
KC2HGP 1 2 1 52 ENY
Club Radio Amateur Sorel —Tracy
VE2GT 1 2 1 52 QC
New Providence ARC
N6JIV 1 2 1 52 NNJ
N6UA 1 2 1 52 WY
NP2N/WØ 1 2 3 52 IA
W3KAC 1 2 1 52 EPA
KD8COO 1 2 1 52 OH
KØBJR 1 2 1 52 CO
WH6FZH 1 2 1 52 PAC
KB9VUJ 1 2 1 52 WI
Tri-County ARC (TX)
AI5CX 1 2 1 52 NTX
Reading RC
W3FCT 23 2 1 46 EPA
Kershaw Co. ARC
KB1ND 22 2 1 44 SC
Spirit Valley Amateurs
NØNKL 21 2 1 42 MN
WØKRT 20 2 1 40 KS
KF6FIX 14 2 1 28 ORG
KA1LHJ 9 2 1 26 CT
KG4FAB 8 2 1 16 NC
DuPage ARC
WB9RCE 5 2 1 10 IL
N6TCZ 5 2 1 10 LAX

2D

Tampa ARC
N4TP 2,204 2 12 7,358 WCF
West Valley ARA
NW6P 1,793 2 6 6,372 SCV
Collins Aerospace Radio Group
W7CXX 1,403 2 7 5,914 UT
Big Stefa Memorial FD Group
KC3WX 1,818 2 3 5,716 EPA
N2LBR Contest Team
N2LBR 1,298 2 2 5,342 ENY
K9NO 1,739 2 4 5,052 IL
Club de Radio Amateur Outaouais
VE2CRO 1,133 2 2 4,534 QC
DFW Contest Group
N5YA 1,812 2 4 4,418 STX
Tucker Family RC
KA6BIM 1,058 2 2 4,116 OR
Huntsville ARC
N7KDT 867 2 1 3,718 AL
Mound ARA
W8DYY 802 2 14 3,104 OH
Yankee Clipper Contest Club
W1FM 762 2 2 3,044 EMA
Great Southern DX Assn.
K5GDX 699 2 1 2,946 MS
Radio Farm
NØMA 860 2 5 2,940 IA
N4N Field Day Group
W4MC 601 2 1 2,854 SC
W3AO PVRC
W3AO 797 2 2 2,750 MDC
Orange Co. Radio Amateurs & Durham FM Assn.
W4BOH 660 2 3 2,616 NC
WB9TFF 747 2 2 2,550 WI
Kingston Amateurs
VA3WW 1,029 2 1 2,520 ONE
Team Cramp/MXG Designs Radio Geeks
W5NN 602 2 2 2,430 STX
Broughton Memorial Field Day Group
K2ARE 939 2 12 2,428 ENY
Spokane DX Assn.
N7UVH 542 2 2 2,218 ID
K4K 489 2 22 2,210 TN
North Shore (IL) RC
AB9PR 696 2 2 2,190 IL
Sierra Nevada ARS
WB2AWQ 502 2 2 2,058 NV
Federación de Radio Aficionados de PR
KP4VZ 487 2 1 1,998 OH
Western IL ARC
NR9Q 635 2 1 1,988 IL
Big Bend ARC
W5TRL 469 2 1 1,924 STX
Case ARC of Case Western Reserve University
W8EDU 612 2 14 1,880 OH
Pathfinders ARC
VA4PAR 791 2 2 1,632 MB
KP4JRS 377 2 2 1,558 PR
GEARS
KF6NCX 348 2 2 1,530 SV
Orange Co. Radio Amateurs & Durham FM Assn.
KU4GC 349 2 3 1,466 NC
Cabarrus ARS
W4GHV 313 2 2 1,458 NC
Valley and Massanutten ARA
N5SMQ 313 2 1 1,432 VA
WBØN 345 2 1 1,430 MN
Moncton Area ARC
VE9EMM 536 2 9 1,390 MAR
KG4WZZ 336 2 2 1,324 GA
AZ DARC
KT7AZ 298 2 2 1,262 AZ
Nittany ARC
W3YA 304 2 18 1,214 WPA
N9ZWY 282 2 2 1,200 WI
Portage Co. AR Service
N8BI 354 2 2 1,130 OH
Radio Club of Tacoma
W7DK 330 2 8 1,080 WWA
Potomac Valley RC
KA4RRU 339 2 3 1,064 VA
Fair Lawn ARC
KM2C 328 2 2 1,056 NNJ
N2OEF 384 2 4 884 DE
HAMsters
N3COB 378 2 6 852 MDC
Rochester (NY) DX Assn.
W2CCC 204 2 1 810 WNY
Columbia River DX Club
WW7E 376 2 5 802 OR
Radio Club of Tacoma
W7XH 202 2 2 784 WWA
Fox Mike Hotel Portable Ops Team
K4FMH 286 2 3 718 MS
Soc. Of Midwest Contesters
K9QJ 156 2 1 674 IL
WB2BTJ 257 2 6 660 NFL
Richmond ARC
VE7GOG 76 2 4 654 BC
K3RWN 301 2 1 652 WPA
VE5XAM 138 2 2 640 SK
KK5PL 282 2 2 614 NM
AF5D 136 2 1 534 NTX
Dutchess Demons
AE2AN 134 2 5 518 ENY
Orange Co. Radio Amateurs & Durham FM Assn.
NA4VY 222 2 4 494 NC
Macon Co. ARC
AD0B 142 2 2 478 MO
Soc. of Midwest Contesters
KD9V 134 2 2 478 IN
NA7L 100 2 1 450 NFL
Lake Whitney ARS
NZ5T 163 2 4 440 NTX
N1DOU 96 2 1 432 NH
Cambridge ARC
VE3SWA 169 2 2 388 ONS

South Bay ARA
AG6TT 100 2 1 360 SV
W9CH 116 2 2 320 NC
Vintage Radio & Communication Museum of CT ARC
W1VCM 54 2 6 312 CT
Plymouth Historical Museum/Univ. Michigan
KC8SWR 103 2 4 306 MI
Snohomish Co. Hams Club
NR3O 121 2 2 292 WWA
Macon Co. ARC
N0BEX 60 2 2 290 MO
KD7GE 85 2 2 282 OR
W6LU 102 2 2 254 ORG
694 Group
W2FW 22 2 6 194 ENY
Mt. Shasta ARC
W6BML 43 2 3 184 SV
N9QID 42 2 2 178 MI
NC9P 31 2 2 174 STX
Katy ARS
KG5IGO 30 2 1 170 STX
Club KC5NX
KC5BOO 38 2 1 158 NTX
Pride Radio Group
AB1KM 33 2 7 148 NH
McMinnville ARC
WA0OGN 36 2 3 122 OR
Loudoun Amateur Radio Group
KG4TIH 17 2 4 116 VA
Niagara Peninsula ARC
VE3KPA 23 2 1 96 GTA
Hughes ARC
N6VZF 22 2 2 94 LAX
Fallbrook ARC
N6OUI 7 2 1 64 SDG
KC1MJZ 5 2 1 60 CT
KB9JVY 2 2 2 54 IL
Mt. Vernon (VA) ARC
KN4YZY 1 2 1 52 VA

3D

Providence Radio Assn.
W1QP 2,145 2 30 6,942 RI
Great Salt Lake Contest Club
K7KC 1,307 2 4 3,862 UT
McDowell ARA
W4HOG 986 2 8 3,770 NC
W7TBC 878 2 14 3,630 AZ
South Georgia ARC
W4TFM 935 2 5 3,566 GA
Brandon ARS
K4TN 859 2 14 3,536 WCF
MicroHAMS ARC
W7YED 956 2 3 3,318 WWA
Boston ARC
N1QD 807 2 3 3,266 NH
Green River Valley ARS
K9WM 429 2 4 1,766 IL
Superstition ARC
K7K 362 2 12 1,652 AZ
Edmond ARS
N0LD 420 2 7 1,638 OK
Blount Co. ARC
W4BLT 422 2 30 1,162 AL
W1DGL 330 2 5 918 AZ
George Co. ARES
KC5CWW 187 2 19 906 MS
Arizona Outlaws Contest Club
AG7GB 184 2 3 786 AZ
NX3W 176 2 1 768 IN
Tri-County ARC (PA)
N3VYZ 275 2 3 700 WPA
Copper Country Radio Amateur Assn.
W8PSP 243 2 3 610 MI
NU0Y 122 2 1 538 KS
North Georgia VHF Soc.
K4NGA 145 2 11 522 GA
Naturist ARC
NU5DE 218 2 2 508 STX
Floyd ARS
W4FCV 92 2 6 472 VA
Heritage Village Radio and Electronics Club
WA1UKD 93 2 3 298 CT
Tri-County ARC (PA)
KE3WN 61 2 3 294 WPA
Tri-County ARC (PA)
W3TCA 54 2 3 158 WPA
Tri-County ARC (PA)
K3VED 54 2 3 158 WPA
KD9PEV 15 2 1 110 WI
Peel ARC
VE3HSE 3 2 6 56 GTA

4D

Rochester (NY) DX Assn.
K2TER 961 2 1 3,894 WNY
Scioto Valley ARC
W8BAP 540 2 12 2,360 OH
Western KS ARC
K0WPM 449 2 14 1,940 KS
Richardson Wireless Klub
K5WFR 182 2 2 1,178 NTX
Hassayampa Amateur Radio Klub
N7C 233 2 4 1,036 AZ
Haldimand Norfolk ARC
VE3SU 424 2 4 898 ONS
Cleveland ARC
KA4J 241 2 50 868 TN
ARA of the Tonawandas
W2VCI 289 2 45 730 WNY

5D

Port Lavaca ARC
KF5DDV 80 2 5 470 STX

6D

W3AO PVRC
WX3B 3,080 2 6 7,748 MDC
Corona PD CSV Group
NC6V 141 2 1 714 ORG

8D

South Jersey Radio Assn.
K2AA 2,254 2 33 8,512 SNJ

Home Stations Emergency Power

1E

W3AO PVRC
W4KFC 1,112 5 2 11,470 MDC
AA3B 2,682 2 1 10,978 EPA
N4BP 2,100 2 1 8,650 SFL
Tilson Contest Club
K5TU 2,006 2 6 8,174 STX
VE3MGY 1,700 2 1 7,450 ONS
Albuquerque DX Assn.
K8TE 1,707 2 1 7,078 NM
Rochester (NY) DX Assn.
NN2L 661 5 1 6,760 WNY
NV9L 1,798 2 2 6,668 IL
Southern California Contest Club
K6LA 1,610 2 1 5,986 LAX
McHenry Co. Wireless Assn.
KY0Q 542 5 2 5,770 IL
W9TS 532 5 1 5,570 IL
Hattiesburg ARC
N5CW 1,290 2 1 5,310 MS
W8HW 513 5 1 5,280 SFL
Colorado QRP Club
KF7MD 508 5 1 5,230 CO
KH7X 1,242 2 1 5,118 AZ
Reading RC
K3ATO 481 5 1 4,960 EPA
KE0UI 1,140 2 1 4,810 CO
Woodbridge Wireless
K5OF 2,233 2 1 4,616 NC
Gateway ARC
KR4AE 438 5 1 4,530 GA
Waterton ARS
W0ZA 1,095 2 1 4,430 CO
WX8J 404 5 1 4,390 OH
Southern California Contest Club
W6AFA 2,014 2 1 4,278 LAX
Yankee Clipper Contest Club
NC1CC 1,250 2 2 4,256 RI
Kentucky Contest Group
K4WW 1,000 2 1 4,050 KY
New Providence ARC
K2YG 360 5 1 3,950 NNJ
Deep Dixie Contest Club
K4OAQ 972 2 1 3,938 VA
Ottawa Valley Mobile RC
VE3LC 358 5 1 3,900 ONE
St. Charles ARC
W0ECC 986 2 1 3,794 MO
Baldwin Co. ARC
N4RT 363 5 1 3,780 AL
New Providence ARC
K2AL 331 5 1 3,655 NNJ
Tri-Town Radio Amateur Club
WD9HSY 814 2 1 3,606 IL
Florida Contest Group
N1TO 829 2 1 3,466 SFL
WA8KAN 327 5 1 3,420 WV
QRP ARC International
WZ2T 288 5 1 3,330 NNY
Oregon Tualatin Valley ARC
WS7L 310 5 1 3,250 OR
W3AO PVRC
NY3A 772 2 1 3,212 EPA
Morris RC/Hanover TWP OEM
WR2G 604 2 1 3,166 NNJ
York RC
K9KE 379 5 1 3,155 IL
K4RCA 1,018 2 1 3,146 VA
K5UV 306 5 1 3,110 OK
Barnstable ARC
K1DCA 244 5 1 3,090 EMA
Garrett Co. ARES
K3LNZ 730 2 1 3,070 MDC
Baldwin Co. ARC
W2BJN 264 5 1 2,990 AL
Frankford RC
NW3Y 708 2 1 2,982 DE
W9XU 681 2 1 2,974 WI
N9EP 707 2 1 2,956 IL
Albemarle ARC
WR4I 279 5 1 2,940 VA
Puerto Rico Amateur Radio League
KP4ES 671 2 4 2,934 PR
Piedmont ARC
NZ2X 586 2 1 2,894 GA
Ottawa Valley Mobile RC
VE3BOE 237 5 1 2,820 ONE
W4IT 661 2 1 2,794 NFL
W4UW 683 2 1 2,782 TN
Kanawha ARC
KM8G 1,187 2 1 2,724 WV
NEMO ARC
KC0FGX 616 2 1 2,614 MO
NA4A 640 2 1 2,610 AL
Burlington ARC
VE3SMA 243 5 1 2,605 GTA
PART of Westford
W1IS 243 5 1 2,580 EMA
K4FHI 233 5 1 2,575 NC
Anderson RC
KM4CH 577 2 1 2,558 KY
Plano AR Klub
W8OV 217 5 1 2,520 NTX
DFW Contest Group
AA5TB 224 5 1 2,490 NTX
York RC
W9YK 557 2 1 2,452 IL
KE0FOE 510 2 2 2,410 MO
Florida Contest Group
WO4O 1,460 1 1 2,393 NFL
KC2DUX 200 5 3 2,370 SNJ
AB9CA 222 5 1 2,370 IN
Old Barney ARC
WS2C 210 5 1 2,350 SNJ
Sawnee ARA
WW8RR 551 2 1 2,310 GA
York Co. SC ARS
K4VSV 206 5 1 2,310 SC
OH-KY-IN ARS
N8BV 777 2 1 2,308 OH
REDXA/MARS
N6ZFO 205 5 1 2,300 SF
AE0DC 917 2 6 2,284 MO
WCARC-TX
AD5L 177 5 1 2,220 STX
Carroll Co. ARC
WB8YYY 218 5 1 2,200 MDC
K8ET 768 2 2 2,200 MI
Vienna Wireless Soc.
AK4AO 436 2 1 2,194 VA
Smoky Mountain ARC
K1GU 502 2 1 2,158 TN
W7GB 450 2 1 2,150 EWA
MARC/DECT
AK3Y 497 2 1 2,138 MDC
Peterborough ARC
VA3NW 979 2 1 2,108 ONE
Hudson Valley Contesters and DXers
N2MTG 979 2 1 2,108 ENY
Palos Verdes ARC
K6JW 160 5 1 2,055 LAX
AC3D 508 2 2 2,050 TN
Tennessee Contest Group
W4UT 463 2 1 2,002 TN
WB9AYW 185 5 1 2,000 IL
MARC/DECT
W2LNX 408 2 1 1,982 MDC
Ottawa Valley Mobile RC
VE3KTN 163 5 1 1,980 ONE
Central West Virginia Wireless Assn.
WV8DL 457 2 1 1,978 WV
York Region ARC
VE3IBW 172 5 1 1,970 GTA
Ski Country ARC
WA1ENO 857 2 2 1,964 EMA
Shreveport ARA
KA5M 451 2 1 1,954 LA
KB8PGW 351 2 1 1,954 MI
Four Lakes ARC
AC9BJ 428 2 1 1,946 WI
Greer ARC
K0FE 456 2 2 1,940 SC
Federación de Radio Aficionados de PR
WP4SD 490 2 1 1,930 PR
Lynchburg ARC
W4PK 444 2 1 1,926 VA
Piedmont ARC
KM4LFT 268 2 1 1,922 GA
K3KEK 419 2 1 1,916 STX
AE4WX 152 5 3 1,910 NC
The 415 ARC
W9XB 877 2 1 1,904 IL
Uniontown ARC
NR5N 174 5 1 1,890 WV
Tortolita RC
N7GHZ 401 2 1 1,854 AZ
Albemarle ARC
KO8V 375 2 1 1,850 VA
Carbon Co. DXCC
W0MB 170 5 1 1,840 MO
W4HWD 493 2 1 1,832 NC
W9BS 158 5 1 1,830 SFL
N5JB 419 2 1 1,818 NTX
Cuyahoga Falls ARC
KE8OWX 443 2 1 1,816 OH
Intercity ARC
N8A 316 2 2 1,814 OH
Potomac Valley RC
NY4A 431 2 1 1,774 NC
WCARES-TN
WD4CFN 142 5 1 1,770 TN
N5JND 151 5 1 1,760 STX
Salkehatchie ARS
K4HR 402 2 1 1,758 SC
DuPage ARC
K9EW 130 5 1 1,750 IL
Pacific Northwest VHF Soc.
N7EPD 381 2 1 1,738 WWA
Carolina DX Assn.
N4IJ 437 2 1 1,688 NC
Cupertino ARES
KI6LDM 340 2 1 1,680 SCV
Northeast Maryland AR Contest Soc.
N3WD 421 2 1 1,678 MDC
Peel ARC
VA3YT 132 5 1 1,670 GTA
Vienna Wireless Soc.
W2QL 142 5 1 1,670 VA
Wayne Co. ARC
KZ3MW 140 5 1 1,650 EPA
Niagara Peninsula ARC
VA3FLF 108 5 1 1,645 GTA
KY7M 578 2 2 1,638 AZ
Southern Counties ARA
KB2MN 391 2 2 1,632 SNJ
Sawnee ARA
NR4N 325 2 1 1,628 GA
WO8L 152 5 1 1,620 NC
Benicia ARC
K2GMY 126 5 1 1,605 EB
New Mexico Big River Contesters
N5HC 724 2 1 1,598 NM
Splinter Group ARC
K8ARY 360 2 1 1,586 SC
Fort Madison ARC
WB0B 357 2 1 1,578 IA
Inverhuron Ham RC
VE7NI 112 5 1 1,570 BC
Orange Co. Radio Amateurs & Durham FM Assn.
W4SAR 337 2 2 1,550 NC
Heritage Hunt Hams
W5VS 337 2 1 1,498 VA
W0PE 336 2 1 1,494 ORG
Deep South ARC
N9GQA 134 5 1 1,490 AL
Fort Wayne RC
N8KR 358 2 1 1,484 IN
Zuni Loop MEF
W6SIY 122 5 1 1,470 SJV
WI8J 112 5 1 1,470 MI
W0RCZ Memorial Station
N0AWE 535 2 5 1,458 MO
Bloomington ARA
NR0T 425 2 4 1,454 MN
Benton ARS
W4KRN 302 2 1 1,446 VA
KA7T 343 2 1 1,422 ID
CenTor ARC
VE3SB 128 5 1 1,420 GTA
KO4EOD 267 2 1 1,418 WCF
Albemarle ARC
KK4JP 224 2 1 1,414 VA

W3KIT	313	2	1	1,402	MDC
AI3KS	238	2	1	1,402	EPA
Mohegan ARC					
W1HAD	263	2	2	1,392	CT
Palos Verdes ARC					
K6MU	264	2	3	1,386	LAX
K3XT	309	2	1	1,386	NNY
Smith Chart ARS					
AB4V	397	2	2	1,378	NC
Northeast Iowa Radio Amateur Assn.					
KØINR	308	2	1	1,378	IA
Austin ARC					
WB5AOH	100	5	1	1,350	STX
KS4X	129	5	1	1,340	TN
South Lyon Area ARC					
W8MSC	269	2	1	1,320	MI
Fallbrook ARC					
KJ6UMY	294	2	1	1,318	SDG
New Providence ARC					
K2GLS	265	2	1	1,310	NNJ
NOARS-LCARA					
W8NNC	115	5	1	1,300	OH
K8RXB	110	5	2	1,300	MI
Eastern Shore ARC					
WA4LM	105	5	1	1,270	VA
N4NA	280	2	1	1,270	TN
KL1JP	181	2	1	1,270	AK
K7CA	111	5	1	1,260	UT
AI9K	121	5	1	1,260	IL
Sonoma Co. Radio Amateurs					
W6GEE	252	2	1	1,258	SF
Gold Coast ARA					
NX4T	248	2	1	1,252	SFL
Red Mule DX					
NC6R	550	2	1	1,250	SV
Allegheny Valley RA					
W3RA	285	2	1	1,250	WPA
Bishop ARC					
AD6NR	550	2	1	1,250	ORG
Anderson RC					
W4IOD	300	2	1	1,250	KY
Estes Valley ARC					
AEØJM	273	2	1	1,242	CO
W6MZ	91	5	1	1,240	SDG
North Shore (IL) RC					
WQ9F	224	2	1	1,238	IL
Anne Arundel RC					
AB3XJ	194	2	1	1,238	MDC
Orange Co. Radio Amateurs & Durham FM Assn.					
K4SAR	491	2	2	1,232	NC
N6TV	330	2	1	1,230	SCV
K4GSX	98	5	1	1,230	GA
Hamilton (ON) ARC					
VA3SPN	269	2	1	1,226	GTA
Ellsworth Amateur Wireless Assn.					
W3AKD	268	2	1	1,222	ME
Austin ARC					
KJ5T	117	5	1	1,220	STX
N6HCN	97	5	1	1,220	ORG
NZ5A	107	5	1	1,220	STX
London ARC					
VE3YOB	301	2	1	1,216	ONS
Sierra Foothills ARC					
KM7S	265	2	1	1,210	SV
Algoma ARC					
W8SSM	262	2	1	1,198	MI
Alamance ARC					
W1ES	236	2	1	1,194	NC
West Valley ARA					
W6ESL	199	2	1	1,186	SCV
K4DZR	104	5	1	1,185	TN
MGRA/CGARC					
AB4RT	233	2	1	1,182	GA
AFØZ	275	2	1	1,180	MN
Palos Verdes ARC					
N6HE	164	2	1	1,172	LAX
Six Meter Club of Chicago					
AB9BZ	102	5	1	1,170	IL
Sun City Hilton Head ARC					
AD5EN	205	2	1	1,170	SC
KC7CS	280	2	1	1,170	AZ
Not Quite Workable Contest Club					
WB8JUI	254	2	1	1,166	OH
Indy United ARC					
KJ9C	259	2	1	1,162	MT
W7LG	252	2	1	1,162	WPA
PODXS 070					
KC3FL	250	2	1	1,150	WCF
SC4ARC					
KJ6VCP	150	2	13	1,146	SCV
Nanaimo ARA					
VA7DXX	251	2	1	1,140	BC
K5KJ	102	5	1	1,140	NTX
Rochester (NY) DX Assn.					
AC2RL	253	2	1	1,130	WNY
W3AO PVRC					
N1EK	245	2	1	1,130	MDC
SC4ARC					
KM6DKE	125	2	16	1,124	SCV
Billerica ARS					
K1TW	114	5	1	1,110	EMA
Comox Valley ARC					
VA7EWG	185	2	1	1,106	BC
Framingham ARA					
NV1N	164	2	1	1,106	EMA
Kitchener-Waterloo ARC					
VA3TMV	237	2	1	1,098	ONS
Boulder ARC					
K6DJ	248	2	1	1,088	CO
Chehalis Valley ARS					
AC7SR	187	2	1	1,088	WWA
Brunswick Shores ARC					
WA6SUZ	139	2	1	1,086	NC
Framingham ARA					
AC1KY	103	5	1	1,080	EMA
Nashua Area Radio Soc.					
AK1K	205	2	1	1,070	NH
HP Alumni RC					
KB1NO	204	2	1	1,062	EMA
Alford Memorial RC					
N4UJ	229	2	2	1,062	GA
Mid-MO ARC					
W4RK	81	5	1	1,060	MO
Highline ARC					
W7POE	176	2	1	1,054	WWA
Clark Co. (WA) ARC					
KB7AK	151	2	1	1,054	WWA
Quinte & Prince Edward RCs					
VA3EP	226	2	1	1,054	ONE
Pasadena RC/JPLARC/CITARC					
WB6CIA	221	2	1	1,052	LAX
Boone and Hamilton Co. ARES					
WØFS	95	5	1	1,050	IA
Colorado QRP Club					
KRØU	90	5	1	1,050	CO
Hannibal (MO) ARC					
WØCCR	223	2	1	1,042	MO
Orange Co. Radio Amateurs & Durham FM Assn.					
WB4OSU	79	5	1	1,040	NC
Dial RC of Middletown					
N8QF	221	2	1	1,034	OH
Juneau ARC					
WL7CSJ	442	2	1	1,034	AK
Skyview Radio Soc.					
W3ANX	222	2	1	1,034	WPA
AG5JW	194	2	1	1,026	LA
West Allis Radio Amateur Club					
AA9RK	185	2	3	1,022	WI
Sawnee ARA					
WG4I	86	5	1	1,010	GA
Warminster ARC					
AA3K	305	2	1	1,010	EPA
Sturdy Memorial Hospital ARC					
K1AV	218	2	1	1,008	RI
Sonoma Co. Radio Amateurs					
WB6FRZ	226	2	1	1,006	SF
Tri-Lakes ARC					
KCØM	214	2	1	1,006	MO
W1GKT	427	2	1	1,004	AL
KC5SM	426	2	1	1,002	AR
York Region ARC					
VE3MUU	214	2	1	1,002	GTA
Northwest ARS					
WA5LEE	212	2	1	998	STX
Piedmont ARC					
K4EGA	212	2	1	998	GA
OCAPA					
NQ5M	163	2	3	996	OK
Morris RC/Hanover TWP OEM					
KC2RDX	209	2	1	986	NNJ
Southwest Mississippi ARC					
N5ZNT	128	2	1	978	MS
Northeast Maryland AR Contest Soc.					
K3TEF	212	2	1	974	EPA
Ottawa Valley Mobile RC					
VE3KJQ	72	5	1	970	ONE
Rochester (NY) DX Assn.					
N2BJW	197	2	1	970	WNY
Orange Co. Radio Amateurs & Durham FM Assn.					
WA2JLW	82	5	1	970	NC
Niagara Peninsula ARC					
VE3NDW	129	2	2	964	GTA
SC4ARC					
W6VG	74	2	13	962	SCV
K2MTS	73	5	1	960	ENY
WD Contest Group					
KØWD	154	2	1	958	NE
Twin Cities Repeater Club					
KBØNES	248	2	1	958	MN
Huntsville ARC					
K4FTY	141	5	1	955	AL
WB4UBK	208	2	1	954	NFL
K9CPO	201	2	1	954	WI
Edmond ARS					
K5JCN	85	5	1	950	OK
Gwinnett ARS					
W4KLY	225	2	1	950	SC
Katy ARS					
W5AQY	200	2	1	950	STX
Clay Co. (NC) AuxComm					
N4ZAX	171	2	1	934	NC
N6PAZ	130	2	1	934	SJV
Moreno Valley ARA					
N6BOX	341	2	2	932	ORG
Orange Park ARC					
KC4VZT	68	5	1	930	NFL
Barnstable ARC					
WA3SWJ	119	2	1	926	EMA
David Sarnoff ARC					
WB2YGF	77	5	1	920	NNJ
RF Hill ARC					
NE3I	50	5	1	920	EPA
K9AXT	77	5	1	920	NC
Redneck Radio Rangers					
NS8O	213	2	1	918	OH
McMinnville ARC					
W7OWO	142	2	1	918	OR
KC7STU	192	2	1	918	EWA
K7ER	270	2	1	908	NV
KF8O	189	2	1	906	OH
Pasadena RC/JPLARC/CITARC					
W6KA	244	2	1	902	LAX
KC8SQC	162	2	1	898	MI
WCARC-TX					
KI5DDO	183	2	1	894	STX
Pamlico ARS					
K4HPS	210	2	1	890	NC
W4SKB	183	2	1	882	GA
Broughton Memorial Field Day Group					
W2UI	201	2	1	880	ENY
Barrie ARC					
VE3MKX	73	5	1	880	ONE
Barstow ARC					
WA6MTZ	182	2	1	878	ORG
Westcoast ARA					
VE7JKZ	156	2	1	874	BC
Eastern Shore ARC					
WA2AIC	145	2	1	870	VA
Alamance ARC					
KN4AXJ	180	2	1	870	NC
K2KI	72	5	1	870	VT
K4AKS	180	2	1	866	WCF
W6RKC	181	2	1	864	SV
Desert Radio Amateur Transmitting Soc.					
KJ6DQR	178	2	1	862	ORG
Wahkiakum Co. ARC					
K7SH	154	2	1	862	WWA
KA2CNN	177	2	1	858	RI
W7DDE	153	2	1	858	OR
Sierra Foothills ARC					
K6GPB	70	5	1	850	SV
K5TWJ	150	2	1	850	IL
N4TPT	225	2	1	850	KY
Cape Ann ARA					
WØZEN	134	2	1	848	EMA
Desert Radio Amateur Transmitting Soc.					
WB6DIK	75	2	1	844	ORG
Tennessee Contest Group					
W4CMG	173	2	1	842	TN
Wahkiakum Co. ARC					
KC4ONA	86	2	1	842	WWA
Wisconsin ARC					
AC9QR	59	5	1	840	WI
Barnstable ARC					
N1ILZ	100	2	1	838	EMA
WO9Z	341	2	1	834	IN
SC4ARC					
AF6IE	44	2	13	826	SCV
Montgomery ARC					
KV4AC	145	2	1	826	AL
Northeastern Indiana ARA					
KD9GDY	153	2	1	824	IN
NO8C	170	2	1	814	OH
Socorro ARA					
KC7QY	156	2	1	798	NM
W7GF	162	2	1	798	OR
WCARES-TN					
KA4BKA	89	5	1	795	TN
Cupertino ARES					
K6TD	160	2	1	790	SCV
Northeast Maryland AR Contest Soc.					
AK3B	198	2	1	790	MDC
Sangamon Valley RC					
W9EBK	160	2	1	790	IL
Valley RC of Oregon					
N7JI	166	2	1	786	OR
W3ADP	77	5	1	785	MDC
OCAPA					
WDØGTY	134	2	1	782	OK
K8SAS	166	2	1	782	OH
WCARC-TX					
WB5GVY	139	2	1	780	STX
Culver City ARES					
AJ7C	116	2	1	778	LAX
AJ4BB	87	2	1	776	NV
Desert Radio Amateur Transmitting Soc.					
KA6UGS	59	5	1	775	ORG
Ozaukee RC					
W9KHH	106	2	1	774	WI
Mesilla Valley RC					
W6VJT	156	2	1	774	NM
W3KS	262	2	1	774	DE
Niagara Peninsula ARC					
VE3TOB	260	2	1	770	GTA
Franklin Co. (NC) ARC					
K4BRU	130	2	1	770	NC
N4SOI	160	2	1	768	NC
Ogden ARC					
KE7DOA	154	2	1	766	UT
WØIS	65	5	1	765	MN
Lodi ARC					
N6NFB	132	2	1	764	SJV
KW7WP	163	2	1	764	OR
KF6JXM	127	2	1	758	SDG
NT7C	151	2	1	754	KS
Mesilla Valley RC					
KM5ZE	125	2	1	750	NM
Dallas ARC					
NT5TM	25	2	1	750	NTX
Valley and Massanutten ARA					
N4RLI	30	5	1	750	VA
WB4BIN	60	5	1	750	NTX
W4ZTH	173	2	1	748	NFL
N8URE	52	5	1	740	MDC
N7NB	59	5	1	740	WWA
KC7FMM	46	5	1	730	EWA
K4PH	143	2	1	722	NC
KA3HFS	47	5	1	720	SCV
AC1DD	284	2	1	718	IL
SC4ARC					
K6TPS	78	2	2	714	SCV
Sky Valley ARC					
K8TOM	40	2	1	710	WWA
Baldwin Co. ARC					
N4DM	56	5	1	710	AL
KØGEO	145	2	1	704	STX
Eastern Shore ARC					
K4LSK	144	2	1	700	VA
Orange Co. (CA) ARC					
K6JEY	55	5	1	700	LAX
Foothills ARS (CA)					
AJØSE	61	2	1	694	SCV
K6AJA	175	2	1	694	SDG
Chandler Ham RC					
N6HI	65	5	1	690	AZ
Fayette Amateur Radio Transmitting Soc.					
W5GCX	62	5	1	690	STX
Atchison Co. ARS					
KØHK	110	2	1	690	KS
Pasadena RC/JPLARC/CITARC					
KK6KOI	44	5	1	690	LAX
Brazos Valley ARC					
K5LJ	132	2	1	678	STX
Lambton Co. RC					
VA3AUZ	128	2	1	678	ONS
Columbia-Montour ARC					
KC3JNW	205	2	3	674	EPA
South Bay ARA					
AE6YN	130	2	1	670	EB
Arizona Outlaws Contest Club					
WO7T	52	5	1	670	AZ
K9KJ	130	2	1	670	IN
KE4UKX	102	2	4	670	VA
Rochester (NY) DX Assn.					
WA2CHV	108	2	1	666	WNY
Pamlico ARS					
AI4WL	137	2	1	666	NC
Nashua Area Radio Soc.					
N1CEO	79	2	1	666	EMA
Castle Shannon VFD ARC					
K3CSF	152	2	5	664	WPA
MARC/DECT					
WB2U	128	2	1	662	MDC
Boston ARC					
NV1W	52	5	1	660	EMA
South Pasadena ARC					
W2JCL	42	5	1	660	LAX
Billerica ARS					
N1ALO	127	2	1	658	EMA
ADØRW	127	2	1	658	IA

The antenna setup for the Whatcom Emergency Communications Group, W7ECG, at their location in Everson, Washington, during the 2021 ARRL Field Day. [Jim McCabe, AE7UQ, photo]

Niagara Peninsula ARC					
VA3WM	21	5	1	655	GTA
Pasadena RC/JPLARC/CITARC					
KC7O	250	2	1	650	LAX
Garden City ARC					
WQ8T	125	2	1	650	MI
KDØJHW	150	2	1	650	IA
N9XAU	50	5	1	650	IN
CRCRST					
WØPZD	51	5	1	645	AZ
Ruckerville Amateur Transmitting Soc.					
N4LSJ	158	2	1	634	OH
Parma RC					
KA8VTV	241	2	2	632	OH
Parker RA					
AB4BA	48	5	1	630	CO
Tyler ARC					
N1EW	190	2	1	630	NTX
Lake Co. RACES/ARES					
KD9GY	228	2	1	626	IL
W4DWS	86	5	1	625	GA
Lebanon Valley Soc. of Radio Amateurs					
KM3D	131	2	1	624	EPA
Wellesley ARS					
N1WEN	135	2	1	624	EMA
KB2DSQ	83	2	1	622	WNY
KB3KOC	116	2	1	614	MDC
K5MKS	91	2	1	614	NTX
Morris RC/Hanover TWP OEM					
K2SCH	115	2	1	610	NNJ
Zuni Loop MEF					
N6VCW	26	5	1	610	ORG
Littleton Area RC					
WG1X	114	2	1	606	NH
Central Ohio Operators Klub					
N8CJ	178	2	1	606	OH
Barrie ARC					
VE3YTN	91	5	1	605	ONS
Ozaukee RC					
KD9FM	113	2	1	602	WI
Hughes ARC					
K6PNJ	75	2	1	600	LAX
Ozone ARC					
KD5GFG	175	2	1	600	LA
KM4OQO	128	2	2	600	VA
Arrow Comm. Assn					
WS8U	24	2	1	598	MI
Arrow Comm. Assn					
AC8TO	113	2	1	596	MI
NØNS	136	2	1	594	IA
N1JEZ	220	2	1	594	VT
NEMO ARC					
KDØYTE	110	2	1	590	MO
KØWRY	110	2	1	590	KS
K7SVX	124	2	2	590	ID
Warminster ARC					
N3RMC	60	2	1	590	EPA
Metrocrest ARS					
W5MDB	47	2	2	588	NTX
Queen Anne's ARC					
KD3CR	119	2	1	588	MDC
Great South Bay ARC					
W2TE	119	2	1	586	NLI
Club Radio Amateur de Québec					
VE2NGK	18	2	1	586	QC
Paulding ARC					
KV4TE	83	2	1	582	GA
Pueblo West ARC					
WØOJW	129	2	1	582	CO
NP2WJ	33	2	1	582	VI
Cleveland ARC					
W4LSV	53	5	1	580	TN
AF9J	43	5	1	580	WI
KCØCCR	28	5	1	580	KS
North Richland Hills ARC					
K5GD	9	2	1	578	NTX
Ottawa Valley Mobile RC					
VE3LBU	94	2	1	574	ONE
Sierra Nevada ARS					
W6DSG	106	2	1	574	NV
Ham Radio Adventures					
NØYEP	83	2	1	572	MN
SC4ARC					
KJ6GMG	10	2	13	570	SCV
Holmesburg ARC					
KA3TTT	32	5	1	570	EPA
KT0A	52	5	1	570	SD
Arrow Comm. Assn					
WK8A	83	5	1	565	MI
N2AXX	156	2	1	564	NNJ
El Dorado Co. ARC					
W6MPD	206	2	1	562	WWA
Hughes ARC					
N6MDV	21	5	2	560	LAX
Manotick AR Group					
VE3AIR	84	2	1	560	ONE
K4KGM	35	5	1	560	NC
Baldwin Co. ARC					
W4JOV	102	2	1	558	AL
Comox Valley ARC					
VE7YAH	55	2	1	556	BC
Kalamazoo ARC					
KE8ICM	101	2	1	554	MI
NB8F	114	2	1	554	MI
Warminster ARC					
N3EXA	197	2	1	554	EPA
Wellesley ARS					
AF1R	101	2	1	552	EMA
Motor City RC					
K8SB	125	2	1	550	MI
Jonathan Sennetti					
K5VX	200	2	1	550	NTX
Old Barney ARC					
W2TT	100	2	1	550	CT
K7EA	100	2	1	550	UT
W7WJ	30	5	1	550	LAX
WB9LWO	40	5	1	550	IL
Sturdy Memorial Hospital ARC					
W1TW	94	2	2	546	EMA
NØEVH	30	5	1	545	MO
Jefferson Washington ARC					
KX7JM	29	5	1	540	WWA
Nashua Area Radio Soc.					
NU1T	39	5	1	540	NH
Fort Smith Area ARC					
WX5DR	195	2	1	540	AR
Montgomery ARC					
K4PO	122	2	1	538	AL
PODXS 070					
KK6KMU	133	2	1	536	SDG
Hughes ARC					
WB6MMQ	92	2	1	534	LAX
Irvine Disaster EmComms					
WB6CJH	75	2	1	530	ORG
Ottawa Valley Mobile RC					
VA2EEK	15	5	1	530	QC
Glynn ARA					
AK4YW	45	2	1	530	GA
Mt. Vernon (VA) ARC					
WJØT	70	2	1	530	VA
KØVU	45	2	1	530	MN
N8OQ	28	5	1	530	VA
KD8ZM	38	5	1	530	OH
WØMAR	189	2	1	528	CO
Hampden Co. RA					
W1CAD	138	2	2	526	WMA
KEØGSZ	94	2	1	526	IA
SPARGE					
K3ALE	55	5	3	525	WPA
Arkansas River Valley ARF					
K5CS	68	2	1	522	AR
VE6XL	136	2	1	522	AB
Tortolita RC					
KM6JSR	93	2	1	522	AZ
Ak-Sar-Ben ARC					
WØOJU	126	2	1	520	NE
Franklin Co. (MA) ARC					
N1AW	27	5	1	520	WMA
Niagara Peninsula ARC					
VE3FNY	88	2	1	516	GTA
Splitrock ARA					
K2PHD	18	5	1	515	NNJ
Broken Arrow Emerg. Mgmt. ARC					
AE5MM	66	2	1	514	OK
K4TLS	91	2	1	514	TN
Montachusett ARA					
W1QED	32	5	1	510	WMA
W3AO PVRC					
K3TN	90	2	1	510	MDC
KB7GK	72	5	1	510	ID
AL2F	180	2	1	510	AK
K2FZZ	36	5	1	510	NNJ
Nashoba Valley ARC					
W1MTI	71	2	1	508	WMA
Vienna Wireless Soc.					
W4AWM	129	2	1	508	VA
Valley of the Moon ARC					
N7PIB	100	2	1	500	SF
Utah ARC					
AB1IP	29	5	1	495	UT
W7RTA	108	2	1	492	OR
KF4VXJ	46	2	1	492	NC
Dial RC of Middletown					
W8RES	42	5	1	490	OH
Florida Contest Group					
WB4MM	101	2	1	490	NFL
Broughton Memorial FD Group					
WK2Q	81	2	1	488	ENY
York Region ARC					
VA3ASE	102	2	1	488	GTA
Big Sandy ARC					
AD5MQ	84	2	1	486	CO
Pottstown Area ARC					
W3REZ	59	2	1	486	EPA
Baldwin Co. ARC					
N4DQ	109	2	1	486	AL
W1FYG	217	2	1	484	CT
Palos Verdes ARC					
KG6RH	53	2	1	482	LAX
Dallas ARC					
N5SQA	16	2	1	482	NTX
Boone and Hamilton Co. ARES					
KEØH	83	2	1	482	IA
KE5DG	58	2	1	482	STX
AC9VM	23	5	1	480	IN
San Jose ARES/RACES					
N6DVS	57	2	1	478	SCV
Sierra Foothills ARC					
W2VX	107	2	1	478	SV
VE3LMS	112	2	1	478	GTA
Warren Co. NY RC					
AJ2A	113	2	1	476	ENY
Boca Raton ARA					
KE4JQ	92	2	1	474	SFL
KCØNOX	162	2	1	474	MO
New Providence ARC					
W2EMC	111	2	1	472	NNJ
San Jose ARES/RACES					
W6GYQ	11	2	1	472	SCV
North Shore (IL) RC					
KD9EBS	42	5	1	470	IL
Verde Valley ARA					
AB7FB	32	5	1	470	NV
Bedford ARC					
W5DLW	108	2	1	466	NTX
McGregor Memorial EMS ARC					
W1HMM	78	2	1	462	NH
Stillwater ARA					
WØOXB	156	2	1	462	MN
Saratoga Co. ARA					
W2MRD	48	2	1	460	ENY
KF3EB	82	2	1	460	WPA
K2SAQ	41	5	1	460	NTX
bcars.org					
N3EYF	77	2	1	458	WPA
AJ4EY	76	2	1	458	VA
K9NUD	31	5	1	455	IL
Chesapeake AR Service					
K5VIP	101	2	1	454	VA
San Diego ARES					
W6F	80	2	1	454	SDG
Cherokee ARS					
K9APD	101	2	1	454	GA
Saginaw Valley ARA					
W8DW	76	2	1	454	MI
Vienna Wireless Soc.					
W2WCM	102	2	1	454	VA
N2USM	151	2	1	452	ENY
Copper Country Radio Amateur Assn.					
KB8W	30	5	1	450	MI
Manatee ARC					
KX4FZ	50	2	1	450	WCF
Cuyahoga Falls ARC					
WO3X	100	2	1	450	OH
Central Washington ARC					
KJ7V	75	2	1	450	EWA
Kitchener-Waterloo ARC					
VE3KTZ	50	2	1	450	ONS
W6JPG	40	5	1	450	SB
WA4FHY	10	5	1	450	TN
NEMO ARC					
KD0PGM	145	2	1	448	MO
Kentwater ARC					
W6DMS	49	2	1	448	ORG
AA2BG	105	2	1	446	WNY
N3BAS	134	2	1	446	WPA

Cupertino ARES
KI6DRN 97 2 1 444 SCV
WQ7F 87 2 1 440 MDC
WB3CJU 194 2 1 438 EPA
Sonoma Co. Radio Amateurs
N1CKA 68 2 3 436 SF
N1DFD 193 2 1 436 ME
Presque Isle Co. ARC
WB8TQZ 115 2 1 434 MI
Sonoma Co. Radio Amateurs
AE6SF 69 2 1 434 SF
Humboldt ARC
KE6SLS 78 2 1 434 SF
N3BAL 29 2 1 434 MDC
N3MTB 84 2 1 432 ENY
Honeywell-Glendale ARC
N7TWB 89 2 1 428 AZ
Lambton Co. RC
VE3FR 79 2 1 426 ONS
Peel ARC
VA3RMU 38 2 1 426 GTA
KJ7WPN 69 2 1 426 AZ
N8XKZ 137 2 1 424 MI
Lake Area Amateur Radio Klub
K5VOP 68 2 1 422 NTX
Chesapeake Amateur Radio Service
KI5FJ 36 2 2 422 VA
Minnesota Wireless Assn.
N0UK 67 2 1 418 MN
Haldimand Norfolk ARC
VE3DVC 67 2 1 418 ONS
WCARES-TN
K4ARC 134 2 1 418 TN
K6YLG 67 2 1 418 STX
Sun City ARC
KD5MFS 17 2 1 418 WTX
KB9FU 83 2 1 416 STX
Kitchener-Waterloo ARC
VE3EOS 132 2 1 414 ONS
Tallahassee ARS
K4ICY 126 2 1 414 NFL
Columbia-Montour ARC
KC3OLH 70 2 2 410 EPA
Fallbrook ARC
KM6UFF 68 2 3 404 SDG
Lynchburg ARC
WB2CYJ 77 2 1 404 VA
South Bay ARA
W6SFI 82 2 1 402 EB
Southwest Mississippi ARC
W2NNU 125 2 1 400 MS
Sun City Hilton Head ARC
AI4HH 15 5 1 400 SC
South Bay ARC
KM6VME 62 2 1 398 LAX
Hilltop Transmitting Assn.
W3RMS 124 2 1 398 EPA
Hellgate Contest Club
W7FS 122 2 1 394 OR
Ottawa Valley Mobile RC
VE3YDK 72 2 1 394 ONE
Palms West ARC
N2JB 4 5 1 390 SFL
KK4ZDZ 35 2 1 390 KY
KO5HX 24 5 1 390 STX
N4MUH 85 2 1 390 NFL
Kilocycle Club of Fort Worth, TX
K5JFB 59 2 1 386 NTX
Panoramaland ARC
WB7WUQ 59 2 1 386 EWA
Bitterroot ARC
AB9OS 67 2 2 386 MT
Southern Counties ARA
KD2JJF 66 2 1 382 SNJ
NEMO ARC
KE0FOM 58 2 1 382 MO
Sierra Blanca ARC
KS5KIP 66 2 1 382 NM
Northeastern Indiana ARA
KD9KMK 115 2 1 380 IN
Fallbrook ARC
KK6BYR 85 2 1 380 SDG
WA7BNM 26 5 1 380 LAX
Gold Coast ARA
AF4FA 57 2 1 378 SFL
K7AEZ 57 2 1 378 AZ
VA7JC 64 2 1 378 BC
Oakland Radio Communication Assn.
KG6RYV 70 2 1 376 EB
Sonoma Co. Radio Amateurs
AA6BD 13 2 1 376 SF
KD9ONG 13 5 1 375 WI
GVARC/SBCARA
W6TST 6 2 1 374 SCV
Island Co. ARC
N7AXJ 26 2 3 374 WWA
Clark Co. (IN) ARC
W9MCP 12 2 1 374 IN
KC5PRK 8 2 1 374 STX
Benton ARS
KB5QR 92 2 1 372 AR
PODXS 070
KG5SSB 83 2 1 372 MS
Dallas ARC
W7KYG 1 2 1 372 NTX
Waterton Contest Club
N6YEL 61 2 1 372 CO
Ottawa Valley Mobile RC
VE3NA 24 5 1 370 ONE
Mid-MO ARC
N0ZH 55 2 1 370 MO
South Pasadena ARC
KK6ZVQ 9 2 1 368 LAX
Albemarle ARS
K4SDL 54 2 1 366 NC
K9VQA 108 2 1 366 IL
Downey ARC
KD6KHJ 55 2 1 364 LAX
Turkey Heaven Mtn. Repeater Assn.
N4GPW 107 2 1 364 GA
North Shore (ON) ARC
VA3TPS 53 2 1 362 ONE
North Shore (ON) ARC
VE3TPS 53 2 1 362 ONE
Hamilton (ON) ARC
VE3XBF 106 2 1 362 GTA
Orca DX and Contest Club
VA7GI 53 2 1 362 BC
West Island ARC
VE2DDZ 53 2 1 362 QC
Truro ARC
VE1HUL 73 2 1 362 MAR
WB2TVB 21 5 1 360 LAX
Peel ARC
VA3RIE 3 2 1 356 GTA
Mound ARA
K8HEF 69 2 1 356 OH
N8NBA 98 2 1 356 OK
Stanwood-Camano ARC
N7LRG 103 2 1 356 WWA
Mohawk ARC
K1QED 41 5 1 355 WMA
Cascade RC
WA7AXT 52 2 1 354 WWA
KI8DP 102 2 1 354 MI
AE6PL 54 2 1 354 SB
South Bay ARA
W2AFE 1 2 1 352 EB
AC3MB 101 2 1 352 EPA
KC3NNO 101 2 1 352 EPA
Cumberland Plateau ARC
KM4IYQ 100 2 1 350 TN
W0DHZ 58 2 1 348 MN
Niagara Peninsula ARC
VA3ONO 96 2 1 342 GTA
K4IDT 96 2 1 342 KY
Rochester (MN) ARC
K4IU 19 5 1 340 MN
Maple Ridge ARC
VE7XZW 44 2 1 338 BC
Huntsville ARC
W4EVV 47 2 1 338 AL
K9WBS 44 2 1 338 AZ
W1AM 94 2 1 338 GA
Raritan Bay Radio Amateurs
N2UUS 43 2 1 336 NNJ
Pasadena RC/JPLARC/CITARC
N3BKV 47 2 1 336 ORG
W8YT 20 5 1 335 WV
Piedmont ARC
K4IO 42 2 1 334 GA
Franklin Co. (NC) ARC
K4GMV 21 2 1 334 NC
Trident ARC
KO4EKZ 41 2 1 334 SC
Florida Contest Group
K4SBZ 91 2 1 332 NFL
KT7WW 131 2 2 332 ID
Loudoun Amateur Radio Group
K3WD 90 2 1 330 VA
Orange Co. (NY) ARC
KD2JJY 16 5 1 330 DE
Cochise ARA
KK6NOH 8 5 1 330 AZ
Mid-MO ARC
K0EMT 10 5 1 330 IN
AA3SP 45 2 1 330 EPA
K5SMH 89 2 1 328 WTX
Jacksonville ARS
KB9RUG 69 2 1 326 IL
KF0MJB 38 2 1 326 CO
K7HOW 44 2 1 326 ID
Team RU
W8RU 71 2 1 326 MI
Irving ARC
N5HYP 34 2 4 324 NTX
WB3IJZ 37 2 1 324 MO
K7DBN 59 2 1 324 UT
South Bay ARC
K6CSH 36 2 1 322 LAX
KL4VA 43 2 1 322 AK
Ottawa Valley Mobile RC
VE3XEM 85 2 1 320 ONE
PODXS 070
VA2SIB 42 2 1 318 QC
Albuquerque DX Assn.
N5EPA 84 2 1 318 NM
K3ORS 84 2 1 318 TN
Huntsville ARC
KO4ALY 33 2 1 316 AL
K1DJB 51 2 1 316 MI
KF6RQZ 33 2 1 316 ORG
K4YYL 41 2 1 314 SC
ARC EmComm Srvc.
WA2WZT 31 2 1 312 NLI
NB3O 81 2 2 312 VA
Reno Co. ARA
K0YBV 32 5 1 310 KS
South Lyon Area ARC
KE8JBF 80 2 1 310 MI
Georgian Bay ARC
VA3TS 80 2 1 310 ONS
Aeronautical Center ARC
AF5BG 65 2 1 310 OK
WG0D 40 2 1 310 MN
SundayNightNet.org
KN9W 65 2 1 308 TN
KC1CNO 79 2 1 308 CT
KC2NHT 66 2 1 306 WNY
United Radio Amateur Club
KK6TXN 28 2 1 306 LAX
Granite State ARA
NI1E 21 5 1 305 NH
SARC-SEPAR
VE7TI 26 2 1 302 BC
VE3PYJ 76 2 1 302 GTA
AD8EC 76 2 1 302 OH
Michigan QRP Club
AB8DF 15 5 1 300 MI
AG4ZP 15 5 1 300 CO
Sangamon Valley RC
N9PUZ 37 2 1 298 IL
City of Cypress RACES
K6KTS 24 2 1 298 ORG
London ARC
VE3HOR 123 2 1 296 ONS
Terrace ARC
VE7ECK 21 2 1 296 BC
MARCA
N0RMZ 9 5 1 295 AZ
Nanaimo ARA
VE7ODG 22 2 1 294 BC
Grundy Co. ARC
KD9FGR 36 2 1 294 IL
Hilltop Transmitting Assn.
KD3HN 121 2 1 292 EPA
Culver City ARES
KI6RJN 21 2 1 292 LAX
Elmira ARC
VA3KXS 70 2 1 290 ONS
Tri-State ARS (IN)
KZ9C 70 2 1 290 IN
N7SHG 8 5 1 290 OR
Wireless Soc. of Southern Maine
KB1YTR 19 2 1 288 MN
N6HDN 69 2 1 288 SCV
North Okanagan RAC
VA7AEJ 18 2 1 286 BC
McMinnville ARC
W7ICS 17 2 1 284 OR
Morris RC/Hanover TWP OEM
K2EMJ 17 2 1 284 NNJ
N8IJY 42 2 1 284 OH
KF8MZ 49 2 1 284 OH
Sierra Foothills ARC
AI3A 8 2 1 282 SV
N1DCH 38 2 1 282 EMA
AD0IU 13 5 1 280 CO
Splinter Group ARC
K0BIE 32 2 7 278 OH
WCARC-TX
KG5RXE 13 2 1 276 STX
N4FA 56 2 1 274 SFL
W1JAB 12 2 1 274 NH
KN6FKQ 12 2 1 274 SDG
North Fulton ARL
KO4DFC 11 2 1 272 GA
NU3Q 61 2 1 272 WPA
Pasadena RC/JPLARC/CITARC
AC6VV 60 2 1 270 LAX
EVQRP
W9JRF 60 2 1 270 AZ
South Canadian ARS
W5MQC 60 2 1 270 OK
London ARC
VA3ZZA 20 5 1 270 ONS
Albuquerque DX Assn.
K8OZ 57 2 1 270 NM
W8WSE 60 2 1 270 OH
Dayton ARA
WB8SCT 54 2 1 266 OH
Sacksafone Acres RA
W8PIX 57 2 2 264 MI
KK1J 57 2 1 264 AZ
Palos Verdes ARC
KB9ENS 28 2 1 262 LAX
El Paso ARC
W5ES 6 2 6 262 WTX
Lake Area Amateur Radio Klub
K5MAY 56 2 1 262 NTX
Irvine Disaster EmComms
KI6QJD 6 2 1 262 ORG
KK6JON 30 2 1 262 SV
KJ5MA 56 2 1 262 NTX
Mansfield-Johnson ARS
KI5HGT 55 2 2 260 NTX
KR4GT 22 5 1 260 KY
KN6OHW 22 5 1 260 ORG
KC9AEC 54 2 1 258 MO
KD6LDA 54 2 1 258 SV
Culver City ARES
K6CLE 1 5 1 255 LAX
East Greenbush ARA
WB2LXC 1 2 1 254 ENY
N7FNA 42 2 1 254 OR
VE7MHW 2 2 1 254 BC
McMinnville ARC
W7LAW 51 2 1 252 OR
W4BTH 51 2 1 252 OH
McMinnville ARC
W7ISE 100 2 1 250 OR
London ARC
VE3ACW 50 2 2 250 ONS
Sonoma Co. Radio Amateurs
W6IBC 50 2 1 250 SF
Somerset Co. ARC
K3VL 35 2 1 248 WPA
LOHSEP ARC
KI5FXD 49 2 1 248 LA
Highlands Co. ARC
N4RWH 48 2 1 246 WCF
KE4MIQ 48 2 1 246 WCF
Oakland Radio Communication Assn.
KO6R 23 2 1 242 EB
Kingman Amateur Radio CW Operators Club
WE7G 23 2 1 242 AZ
Sonoma Co. Radio Amateurs
K6TJP 27 2 1 242 SF
Middlesex ARS
KC1BQP 45 2 1 240 CT
Superstition ARC
AG7KU 45 2 1 240 AZ
VE7EMI 18 5 1 240 BC
Mile Highlanders Group
WA4GLH 22 2 1 238 TN
North Hills RC
KB6ODH 44 2 1 238 SV
Sonoma Co. Radio Amateurs
N6IIY 44 2 1 238 SF
South Bay ARA
AC6MM 44 2 1 238 EB
Montgomery ARC
N4FLB 43 2 1 236 AL
KN4OXN 43 2 1 236 TN
Big Sandy ARC
KE0GVX 21 2 1 234 CO
Sierra Foothills ARC
W2MWK 35 2 1 234 SV
K5YVY 42 2 1 234 MS
KA5FDX 63 2 1 234 AR
KE6BGN 42 2 1 234 ORG
Northeast Maryland AR Contest Soc.
K3NO 20 2 1 230 MDC
K7GZP 8 5 1 230 OR
VA3KRT 40 2 1 230 ONE
New Providence ARC
W2UDT 26 2 1 228 NNJ
Irvine Disaster EmComms
N6EKC 39 2 1 228 ORG
Elmira ARC
VE3IXX 22 2 1 228 ONS

Great Southern DX Assn.
W5THT 89 2 1 228 MS
KO4DDO 31 2 1 228 AL
Austin ARC
WA5YZD 19 2 1 226 STX
WCARES-TN
NM4N 37 2 1 226 TN
Raritan Bay Radio Amateurs
K3GNZ 34 2 1 224 NNJ
Palo Alto ARA
KG6LWE 37 2 1 224 SCV
Seattle ACS
KI6KTE 14 5 1 220 WWA
K4WSW 35 2 1 220 GA
AC2N 35 2 1 220 NFL
AC1BB 7 5 1 220 IL
Silver Comet ARS
K4LDC 17 2 1 218 GA
KØDVT 33 2 1 216 MN
Clark Co. (WA) ARC
K7NOJ 21 2 2 214 WWA
Orange Co. Radio Amateurs & Durham FM Assn.
N2XZF 32 2 1 214 NC
AI7FF 16 2 1 214 MT
Sun Coast ARC Soc.
VA7UI 16 2 1 214 BC
N1ATB 16 2 1 214 CT
Everglades ARC
N6DME 30 2 1 210 SFL
PAPA System
KW6REX 15 2 1 210 ORG
Niagara Peninsula ARC
VE3RNF 30 2 1 210 GTA
NJ7W 16 5 1 210 WWA
VE6GRT 15 2 1 210 AB
AA3KM 40 2 1 210 STX
Ak-Sar-Ben ARC
ADØLS 29 2 1 208 NE
Orange Co. (NY) ARC
KC2YYF 29 2 1 208 ENY
KD7ZSE 29 2 1 208 SCV
Wisconsin ARC
WA9WYI 16 2 1 208 WI
Sangamon Valley RC
KA9KQH 28 2 1 206 IL
Grand Strand ARC
N4QI 28 2 1 206 SC
KF5ADE 28 2 1 206 STX
Lake Area Amateur Radio Klub
KC5LL 21 2 1 202 NTX
Emergency Communications Assn.
ADØMO 26 2 1 202 MO
KD8YYP 26 2 1 202 OH
KD6EFO 26 2 1 202 SDG
4SQRP
KE3FL 5 5 1 200 MDC
San Juan Co. ARS
N7TZW 25 2 1 200 WWA
N2JPR 5 5 1 200 NLI
North Texas Homeschoolers ARC
NT5HS 12 2 1 198 NTX
David Sarnoff ARC
KA2BXH 14 2 1 198 SNJ
Bonner Co. ARES
K7HUM 24 2 1 198 ID
Boulder ARC
WE7A 24 2 1 198 CO
Portland ARC
KJ7GVL 37 2 1 198 OR
Mike & Key ARC
WA7NIW 24 2 1 198 WWA
Stanislaus ARA
W6UHF 74 2 1 198 SJV
Irvine Disaster EmComms
KN6BMO 23 2 1 196 ORG
Socorro ARA
NFØJ 23 2 1 196 NM
Pottstown Area ARC
N3ZRW 23 2 1 196 EPA
South Bay ARA
KM6VHD 9 5 1 195 EB
KI7BCL 9 5 1 195 ID
KF4OLO 22 2 1 194 GA
AR Caravan Club
W5FHA 21 2 1 192 NM
Sun Coast ARC Soc.
VA7FI 17 2 1 192 BC
Clark Co. (WA) ARES/RACES
KJ7FTX 8 5 1 190 WWA
Katy ARS
W5WMC 20 2 1 190 STX
Oregon Tualatin Valley ARC
KE7WNB 20 2 1 190 OR
Granite State ARA
WA1N 20 2 1 190 NH
Trident ARC
K4OPZ 35 2 1 190 SC
Hampden Co. RA
W1IRL 19 2 1 188 WMA
KJ6KCG 19 2 1 188 ORG
Mahoning Valley ARA
WA8ZLK 9 2 1 186 OH
Monroe Co. Radio Communications Assn.
KJ8H 68 2 1 186 OH
Sonoma Co. Radio Amateurs
KI6UGB 18 2 1 186 SF
KM4RK 18 2 1 186 SC
KB9LNR 7 5 1 185 IL
Superstition ARC
K7AV 17 2 1 184 AZ
KC1MC 16 2 1 182 OR
KJ7ALP 16 2 1 182 WWA
N7CVW 16 2 1 182 WWA
Tallahassee ARS
N4JEL 16 2 1 182 NFL
W6KYF 8 2 1 182 SCV
South Bay ARA
KK6IPR 6 5 1 180 EB
St. Louis ARC
KØDY 3 5 1 180 MO
Crescenta Valley RC
KF6KXG 15 2 1 180 LAX
KC9WIB 15 2 1 180 IL
KC1WD 3 5 1 180 EMA
Sun Parlour ARC
VE3NNI 15 2 1 180 ONS
N5OFW 15 2 1 180 NTX
North Fulton ARL
AD4V 7 2 1 178 GA
Superstition ARC
K2JNL 14 2 1 178 AZ
Clark Co. (WA) ARC
K7BSO 13 2 1 176 WWA
Foothills ARS (CA)
K3ADM 13 2 1 176 SCV
Huntsville ARC
W4NFK 7 2 1 176 AL
AF5LA 13 2 1 176 STX
KI7AAY 13 2 1 176 EWA
Tri-Town Radio Amateur Club
WD9GHK 5 5 1 175 IL
Six Meter Club of Chicago
KD9MHJ 12 2 1 174 IL
WØLGZ 12 2 1 174 MN
North Hills RC
W6PAP 11 2 1 172 SV
Potomac Valley RC
WA8AHZ 32 2 1 172 VA
Kings Co. RC
W2ZF 11 2 1 172 NLI
Big Island ARC
KH6EKD 1 2 1 172 PAC
Irvine Disaster EmComms
KE6GYD 11 2 1 172 ORG
Cochise ARA
KI7TKR 10 2 1 170 AZ
Nanaimo ARA
VA7WPM 10 2 1 170 BC
South Lyon Area ARC
N8AB 2 5 1 170 MI
VE6FAR Cycle 25
VA3JHQ 4 5 1 170 GTA
KG7GMR 9 2 1 168 WWA
Hoodview ARC
W7HDF 8 2 1 166 OR
Cupertino ARES
N6IM 8 2 1 166 SCV
Brazos Valley ARC
KG5SXG 4 2 1 166 STX
London ARC
VE3PNK 58 2 1 166 ONS
San Jose ARES/RACES
K6SW 8 2 1 166 SCV
AA6DX 8 2 1 166 SF
AG7OO 4 2 1 166 WWA
W9NZB 4 2 1 166 IL
W8NAT 30 2 1 166 MI
Montgomery ARC
KN4SBC 6 2 1 162 AL
WØRV 6 2 1 162 MO
K4IJK 6 2 1 162 RI
Dallas ARC
K5SLO 5 2 1 160 NTX
Lancaster RC
KD2LLM 3 2 1 160 WNY
KM6HBH 5 2 1 160 SCV
Arkansas River Valley ARF
KW5STW 2 2 1 158 AR
Irvine Disaster EmComms
KM6FPE 2 2 1 158 ORG
Iredell Co. ARS
W1HO 2 2 1 158 NC
AC7CA 4 2 1 158 AZ
San Diego ARES
KN6KTN 3 2 1 156 SDG
Orange Park ARC
KT4NN 3 2 1 156 NFL
Eastern Shore ARC
KD2CWU 3 2 1 156 VA
KM4AF 3 2 1 156 SC
Irvine Disaster EmComms
KE7RXD 1 5 1 155 WWA
W3CF 1 5 1 155 NFL
Irvine Disaster EmComms
KM6KUQ 2 2 1 154 ORG
Club de Radio Amateur Outaouais
VA2ZIO 2 2 1 154 QC
Big Island ARC
AH6AE 1 2 1 154 PAC
Riverside Co. ARA
AJ6MF 1 2 1 152 ORG
Big Island ARC
WH6GLD 1 2 1 152 PAC
Big Sandy ARC
KE0GVY 1 2 1 152 CO
York Region ARC
VA3MCT 1 2 1 152 GTA
Matagorda Co. Arc
WA5YPD 22 2 1 144 STX
Chicago Suburban Radio Assn.
KC9YJP 21 2 1 134 IL
Pueblo West ARC
NEØDA 20 2 1 130 CO
Raytown ARC
NØGRP 38 2 1 128 MO
Fort Madison ARC
KCØTSL 22 2 2 126 IA
Sangamon Valley RC
KD9BNQ 37 2 1 124 IL
NØWLX 37 2 1 124 NE
KJ7DJR 17 2 1 118 AZ
Shreveport ARA
AI5DQ 32 2 1 114 LA
Ottawa Valley Mobile RC
VA2OJD 12 5 1 110 QC
Ocean Co. ARES
WB2ALJ 16 2 1 110 SNJ
W2ECK 15 2 1 110 GA
RF Hill ARC
WB3ABH 20 2 1 106 EPA
Denver RC
W6HAB 1 2 1 102 CO
REDXA/MARS
N3RC 10 2 1 90 SF
K9TWW 16 2 1 82 MN
Hughes ARC
AC6RW 14 2 1 78 LAX
KØMIS 9 2 1 68 CO
KA7FOO 6 2 1 62 NV
Mt. Vernon (VA) ARC
K3XEC 1 5 1 60 MDC
North Shore (ON) ARC
VE3LWJ 3 2 1 56 GTA
Rains ARA
KG5NUX 3 2 1 56 NTX
Stanislaus ARA
KF6FIR 1 2 1 52 SJV

2E

Central Texas DX and Contest Club
W5CT 2,757 2 5 10,944 STX
WAØMN 908 5 1 9,430 MN
Franklin Co. (VA) ARC
W4CB 2,046 2 3 8,534 VA
K9OM 1,983 2 2 8,182 WI
Berwick Contest Team
WQ3N 2,199 2 5 7,480 EPA
Tortolita RC
W8TK 1,630 2 4 6,570 AZ
Mike & Key ARC
K7LED 1,531 2 3 6,374 WWA
Metro DX Club
W9TY 1,488 2 11 6,300 IL
Mike & Key ARC
N7XS 1,721 2 10 4,856 WWA
North Port ARC
KE4Q 1,295 2 2 4,516 WCF
K6NO 1,236 2 10 3,934 SV
Club Radio Amateur de Québec
VE2CSP 815 2 5 3,776 QC
VE6FI 1,236 2 2 2,722 AB
Orca DX and Contest Club
VA7MM 556 2 4 2,668 BC
Radio Central ARC and Order of Boiled Owls of NY
KQ2F 697 2 2 2,436 NLI
Sun City ARC
K5WPH 507 2 20 2,278 WTX
N9CHA 550 2 3 2,106 WI
AK7AT 434 2 2 2,086 ID
Boeing Employees ARS — St. Louis
ABØRX 484 2 1 2,008 MO
Guadalupe Valley ARC
WB5LVI 519 2 16 1,822 STX
Southborough Rod & Gun ARC
W1SRG 417 2 3 1,796 EMA
Central Massachusetts ARA
N1ZTB 353 2 2 1,732 WMA
N3DGE 404 2 1 1,666 EPA
Marietta ARC
W8HH 390 2 6 1,278 OH
Woodchuck ARC
WA8Q 113 2 10 1,214 OH
Mansfield-Johnson ARS
K3JAR 183 2 2 1,088 NTX
FVFD21
WA1RWO 182 2 3 1,078 NFL
South Bay ARA
AF6TF 216 2 1 1,076 EB
WN3N 257 2 20 1,064 EPA
KE5GL 241 2 5 1,056 STX
Walla Walla Valley ARC
W7DP 183 2 7 1,048 EWA
FVFD21
N9LHS 120 2 3 1,030 NFL
W5VUI 190 2 4 1,016 STX
WØDYD 204 2 2 1,004 MN
KA5DJS 153 2 1 962 GA
Tippecanoe ARA
WO9G 130 2 2 940 IN
Milwaukee Radio Amateurs' Club
KA9WXN 153 2 1 912 WI
Williamson Co. ARES
WA4JA 288 2 1 826 TN
South Jersey Radio Assn.
AI2D 134 2 1 786 SNJ
North Okaloosa ARC
KO4AFZ 140 2 3 750 NFL
PODXS 070
KC2ASA 39 2 6 720 ENY
Bourbon Fueled Nerds
WW4KB 207 2 3 664 KY
Gloucester Co. ARC
KC2IEB 67 2 1 662 SNJ
N9AGC 99 2 1 648 OH
Grassroots ARC
VO1GRC 60 2 5 636 NL
Clark Co. (WA) ARES/RACES
WA7PTM 43 2 2 636 WWA
FVFD21
N9HF 31 2 2 566 NFL
Lake Cumberland ARA
KK4KTV 77 2 1 558 KY
W6DVO 30 5 2 550 SF
Putnam Emergency Amateur Repeater League
AC2GC 97 2 2 544 ENY
KA4HOT 143 2 2 536 IN
Dayton ARA
WS8B 126 2 8 528 OH
VE6FAR Cycle 25
VE3HB 38 5 4 470 GTA
KA2JAI 72 2 2 468 MDC
Goddard ARC
AC3CJ 7 2 4 466 MDC
Big Signal ARC
KE8PUB 51 2 3 452 MI
NP2Q 100 2 2 438 VI
AJ6RX 58 2 1 422 ORG
KD6LM 17 5 2 420 SF
Conejo Valley ARC
KM6TXE 31 2 2 412 SB
WI7J 78 2 2 406 UT
Stratford ARC
W1ORS 33 2 9 382 CT
Pontotoc Co. ARA
KC5DDS 44 2 2 338 OK
VA7IM 17 2 1 316 BC
CenTor ARC
VE3NIS 9 2 2 286 ONS
CenTor ARC
VE3KEI 4 2 2 258 ONS
Parker RA
W5VV 2 2 1 254 CO
KA2VCW 20 2 1 90 WNY

3E

Potomac Valley RC
W4YY 2,064 2 6 8,306 VA
W3AO PVRC
WA3EKL 2,153 2 8 8,016 MDC

South Towns ARS
W2E 2,076 2 15 6,658 WNY
Frankford RC
NF3R 1,278 2 1 5,454 EPA
Skyview Radio Soc.
K3MJW 1,579 2 29 5,276 WPA
Midland (TX) ARC
KD5C 1,050 2 12 5,142 WTX
Jefferson (LA) ARC
W5GAD 815 2 15 3,890 LA
Southwick RACES
WC1SW 786 2 10 3,798 WMA
W3AO PVRC
K3CCR 873 2 3 3,436 MDC
WD Contest Group
KG0RD 567 2 3 3,214 NE
Jefferson Co. (TX) ARC
W5SSV 725 2 42 2,854 STX
Low Country Contest Club
NU4SC 639 2 6 2,502 SC
Lithopolis Field Day Group
WJ8B 452 2 12 2,168 OH
Las Moras ARC
AA5KC 282 2 7 1,858 STX
K6P 424 2 8 1,798 SDG
Pasadena RC/JPLARC/CITARC
AA6QI 299 2 2 1,706 LAX
St. Cloud ARC
W0SV 248 2 28 1,146 MN
Niagara Frontier Radiosport
KB2URI 80 2 1 1,070 WNY
Twin State RC
W1UC 149 2 2 1,036 NH
California Dept. Of Justice ARC
W6DOJ 434 2 3 974 SV
Cumberland ARC
K3IEC 31 2 12 972 EPA
Ohio Army National Guard Veterans RC
KE8MVL 24 2 1 520 OH

4E

Contoocook Valley RC
K1B 3,330 2 12 10,228 NH
Steel City ARC
W3KWH 1,026 2 21 4,250 WPA
Radio Assn. of Erie
W3GV 884 2 6 3,382 WPA
VE6FAR Cycle 25
VE6FAR 266 2 4 2,084 AB
Masonic Village ARC
K3WEB 216 2 11 2,082 EPA
Jackson Co. AR Service
KF4DTL 27 2 4 504 NC

6E

FM38 Repeater Group
N9GMT 1,345 2 9 4,544 WI

8E

North Bay ARA
K6LI 287 2 50 2,214 EB

EOC Stations

1F

Cottonwood Heights ARC
W7RCH 443 2 12 3,210 UT
Mansfield-Johnson ARS
KN5TX 442 2 3 2,718 NTX
Northeast Mississippi Radio Amateurs
W5NEM 399 2 8 2,514 MS
Amargosa ARC
N7A 340 2 8 2,470 NV
Mansfield-Johnson ARS
WA5JRS 216 2 46 1,482 NTX
Green Mountain Wireless Soc.
N1VT 83 2 20 1,362 VT
AZ DARC
KF0X 302 2 1 1,358 AZ
Parsippany-Troy Hills RACES
KD2CJM 218 2 8 1,286 NNJ
Charlotte ARC
W4CQ (+WB4ETF)
235 2 9 1,180 NC
Franklin Co. ARES
W1FCA 93 2 6 1,062 ME
Grupong Magellan Org. Search and Rescue Team
VA3GMO 451 2 1 1,052 GTA
Montvale OEM
K2TO 162 2 3 1,002 NNJ
Mohawk ARC
W1SEX 102 2 1 954 WMA
Wayne ARC
W8WOO 173 2 7 944 OH
Franklin Co. (OH) Auxiliary Comms Club
W8THV 31 2 8 912 OH
Culver City ARES
K6CCR 206 2 6 842 LAX
Sarasota Emergency RC
W2DEN 112 2 1 686 WCF
LaSalle Co. IL RACES
KC9VIF 4 5 1 540 IL
Radio Operadores Del Este
KP3LH 43 2 4 506 PR
Henry Co. EOC
WA9LT 47 2 2 480 IL
Tri-State AR Group
W5AOK 56 2 8 462 OK
El Segunda AR Group
WB6VMV 93 2 8 436 LAX
Northville ARA
NA1RA 68 2 14 286 CT
Halifax ARC
VE1FO 27 2 1 104 MAR
Pacific Co. EOC
W7RDR 24 2 1 98 WWA
Albemarle ARS
NX4PC 12 2 1 74 NC
Mississippi Coast ARA
WX5RJ 6 2 2 62 MS
Northeast Maryland AR Contest Soc.
KB3JQQ 1 2 1 52 MDC

2F

West Jersey DX Group
K2NJ 3,850 1 5 8,150 NNJ
Platinum Coast ARS
W4MLB (+AF4Z)
1,618 2 35 7,062 SFL
Bullitt ARS
KY4KY (+W4KBR)
1,142 2 30 5,498 KY
Rappahannock Valley ARC
W4NNK 1,291 2 19 5,296 VA
Point Loma Radio Ops Group
W6A 1,055 2 14 5,216 SDG
WCARES-TN
N4FR 1,434 2 21 5,026 TN
Augusta University ARC
WA4AUG 1,202 2 12 4,542 GA
Coventry EMA
KC1CUE 1,273 2 6 4,180 RI
Lake Co. RACES/ARES
K9IQP (+W9QL)
1,573 2 24 4,076 IL
Frankford RC
WA2CP 1,671 2 2 4,032 NLI
Calhoun Co. EOC
AB8I 879 2 10 3,558 MI
RICOMU/RIEMA
WA1USA 828 2 8 3,556 RI
Alachua EOC RC
NF4AC 513 2 23 3,290 NFL
Deep South ARC
K4DSR 768 2 22 3,242 AL
Harford Co. ARES/RACES
KC3FHC (+KC3GTO)
577 2 10 3,018 MDC
Orleans Co. ARC
W2ORC (+WA2DQL)
737 2 12 2,904 WNY
Dixie ARC
W7DRC (+NA7UT)
627 2 48 2,754 UT
Virginia Mountain ARC
W4COV 610 2 7 2,646 VA
Preble ARA
K8YR (+KI0CT)
672 2 16 2,458 OH
Boonville ARC
WA0E (+W0BRC)
515 2 7 2,370 MO
Bankhead ARC
N4IDX 547 2 12 2,306 AL
Shelby Co. ARES
K8EMA 628 2 8 2,140 OH
McHenry Co. RACES/ARES
K9ESV 368 2 10 2,136 IL
Kaw Valley ARC
W0CET 425 2 29 2,082 KS
Tri-County ARC (TX)
WC5C (+KA5ZLE)
314 2 6 2,012 NTX
Bayouland Emergency ARES
W5BMC 473 2 7 1,996 LA
Dickson Co. ARC
WC4DC 340 2 14 1,950 TN
Rains ARA
W5ENT 269 2 10 1,910 NTX
Carteret Emerg. Mgmt. Vol. ARC
K2ZV 341 2 5 1,904 NNJ
Bernalillo Co. ARES
NM5BC 422 2 4 1,876 NM
Baytown Area ARC
K5BAY 203 2 7 1,544 STX
Lehigh Valley ARC
W3OI 303 2 19 1,502 EPA
Charlevoix/Cheboygan/Emmet Co. Pub Srvc Comms Org.
W8CCE 492 1 8 1,476 MI
N2FLO 185 2 4 1,394 NNJ
Royal Gorge ARC
NC0A 175 2 20 1,216 CO
Portola Valley ARC
KM6DLG 259 2 8 1,210 SCV
Providence EMA RACES Club
KK1PMA 74 2 6 1,208 RI
Ak-Sar-Ben ARC
K0USA 262 2 5 1,174 NE
Rusk Co. ARC
N5RCA 179 2 16 1,152 NTX
ARL of Lawrence Co.
K3ACS 130 2 10 1,110 WPA
Boeing Employees ARS
K7NWS 144 2 10 1,090 WWA
Nacogdoches ARC
W5NAC 145 2 27 1,068 NTX
Lincoln Co. Volunteer Communications
NC4LC 137 2 6 1,028 NC
Meriden ARC
W1NRG 228 2 15 1,020 CT
FARCE
KF6NNM 116 2 18 964 SV
Bergen Co. Emerg. Mgmnt. RC
NJ2BC 169 2 2 926 NNJ
Washington Co. ARC
W5AUM 163 2 26 790 STX
Marshall (TX) ARC
KB5MAR 33 2 13 734 NTX
Radio Operadores Del Este
KP4WA 48 2 2 662 PR
Preston Co. ARC
W8PCA 88 2 15 644 WV
Saline Co. ARES
AD5EO 42 2 3 616 AR
Putnam Co. ARES/RACES
WB9EOC 11 2 7 492 IN
Woodford Co. ARC
KY4WC 46 2 22 442 KY
LaGrange ARC
AB4KE 33 2 10 434 GA
Chester Co. Amateur Radio
W3EOC 74 2 6 398 EPA
Carson City Ares
W7DEM 10 2 2 370 NV
Union Co. ARC
KE8ANU 90 2 6 346 OH
NFLARC
W5NFL 43 2 14 336 NTX
South San Francisco Comms
N6SSF 48 2 6 246 SCV
Shannon ARC
KE5RHN 2 2 2 154 WTX

3F

Jackson Co. ARC
KS0JA 1,753 2 20 6,776 KS
Passaic Co. ARES Team
K2P 885 2 11 4,022 NNJ
XWARN/DARA
W8XRN (+W8BI)
692 2 74 3,796 OH
South Canadian ARS
W5NOR 777 2 102 3,760 OK
Sioux Empire ARC
W0ZWY 662 2 29 3,316 SD
Cochise ARA
K7RDG (+W7SVD)
502 2 14 3,160 AZ
Northwest ARS
W5NC (+N5XJB)
540 2 24 2,820 STX
River Bend Wireless Operators Club
W9XG 697 2 23 2,782 IL
Central Mississippi ARA
WM5A 469 2 16 2,738 MS
Lucas ARC
W5AWL 692 2 16 2,728 NTX
Tri-State ARA
W8VA 626 2 10 2,656 WV
Heart of America RC
W0RR 433 2 11 2,650 MO
Citrus Co. ARC and ARES
N4F 438 2 25 2,644 NFL
Silver Cornet ARS
W4RSC 705 2 34 2,576 GA
Platte Co. ARG
NR0AD 405 2 28 2,232 MO
Burlington Co. RC
K2TD 265 2 25 1,944 SNJ
Burlington Co. RC
K2D 265 2 25 1,944 SNJ
Richardson Wireless Klub
K5RWK 359 2 30 1,632 NTX
FVFD21
W4F 301 2 12 1,574 NFL
Area 51 Radio Group
WA5RGM 124 2 22 1,102 MS
Schoharie Co. ARA
WA2ZWM 263 2 16 1,076 NNY
Kings Point ARC
W4KPR 212 2 9 982 WCF
Mid-State ARC
W9MID 213 2 7 978 IN
Top of Michigan ARC
NM8RC 51 2 15 852 MI
Ozone ARC
W5SLA 178 2 10 828 LA
Capital Area ARES Unit
W1CPL 104 2 9 758 NH

4F

Stanford ARC
W6YX (+K6SU)
5,419 2 32 19,766 SCV
Delaware ARA
K8ES (+W8JK)
2,843 2 15 10,774 OH
Van Wert ARC
W8FY 1,744 2 19 5,386 OH
Ohio Valley ARC
KT9K 579 2 6 2,300 IN
Aroostook ARA
K1FS 282 2 15 1,986 ME
Four Co. ARES
NC4CA 463 2 4 1,716 NC
San Angelo ARC
W5SJT 305 2 30 1,692 WTX
Broken Arrow Emerg. Mgmt. ARC
WX5BA 143 2 19 1,626 OK
Bootheel ARC
W5ENL 364 2 6 1,542 AR
Old Post ARS
W9EOC 560 2 40 1,482 IN
Texas Emerg. Amateur Communicators
W5SI 291 2 28 1,348 STX
Centralia ARES
K7CEM 109 2 20 872 WWA
Metro Detroit SATERN
N8SE 174 2 6 620 MI
Carter Co. ARA
WR4CC 148 2 13 560 TN

5F

Hiram Percy Maxim Memorial Station
W1AW 1,702 1 12 2,983 CT
Great South Bay ARC
W2GSB 378 2 12 2,702 NLI
Prince William Co. ARES
W4PWC 121 2 4 1,412 VA
WARA/GBARC
W1WDT 344 2 10 1,372 CT
Endless Mountains ARC
N3EP 259 2 10 1,310 EPA
Corona PD CSV Group
W6CPD 81 2 7 1,038 ORG
Orange ARC
W5ND 289 2 7 928 STX

6F

Morehead ARS
KY4HS 409 2 40 2,562 KY
BEARS of Manchester ARC
W1BRS 360 2 25 2,214 CT

7F

Mercer Co. ARC
W3LIF 1,325 2 45 4,648 WPA
ARA of the Southern Tier
W2ZJ 390 2 38 1,980 WNY

9F

Johnson Space Center ARC/Clear Lake ARC
W5RRR (+K5HOU)
1,201 2 20 5,266 STX