



AMATEUR RADIO DIGITAL COMMUNICATIONS

ARDC Community Meeting

21 January 2023


Agenda

- Welcome & Housekeeping
- Grants Update
- New GAC and TAC Members
- 44Net Assessment
- Q&A

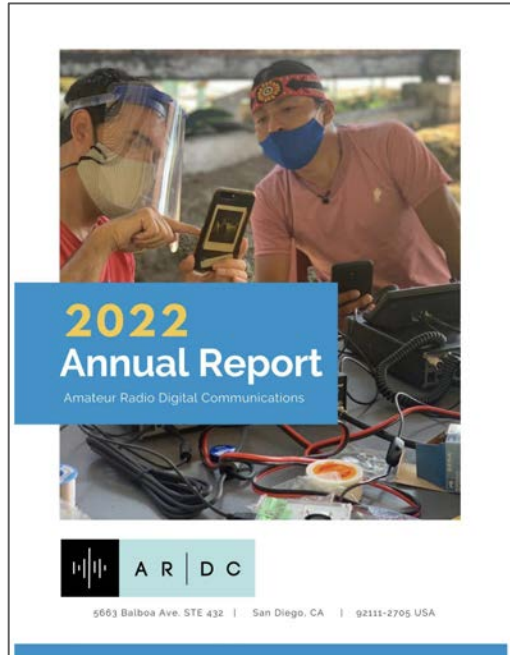


Youth on the Air (YOTA) Camp, July 2022

Housekeeping

- This session is being  recorded
- Questions in the chat window please!
- Mute yourself if not presenting
- All materials will be posted after the call

2022 Annual Report



bit.ly/ARDC-2022

- Grants
- Tech & 44Net
- Operations
- Staff arrivals; Board departures
- Communications
- Events

New GAC Members



Katie Allen, WY7YL



Judi Clark, KK6CZU



**Dennis Dickerson,
AC0P**



Jim Idelson, K1IR

New GAC Members



Kristin Paget, KJ6GCG



Bill Thomas, WT0DX



**Randy Wilkinson,
W4LKS**

New TAC Members



**Dave Gingrich,
K9DC**



Rich Gopstein, KD2CQ



**Randy Neals,
W3RWN/VE3RWN**

New TAC Members

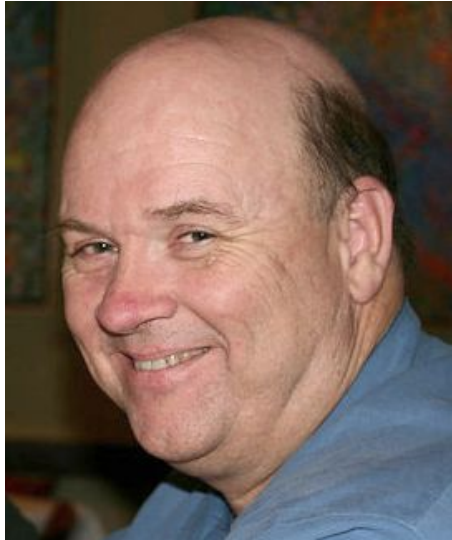


Alvaro Prieto, KC2VVE



Ian Redden, VE3IAN

2022 Departures



Board

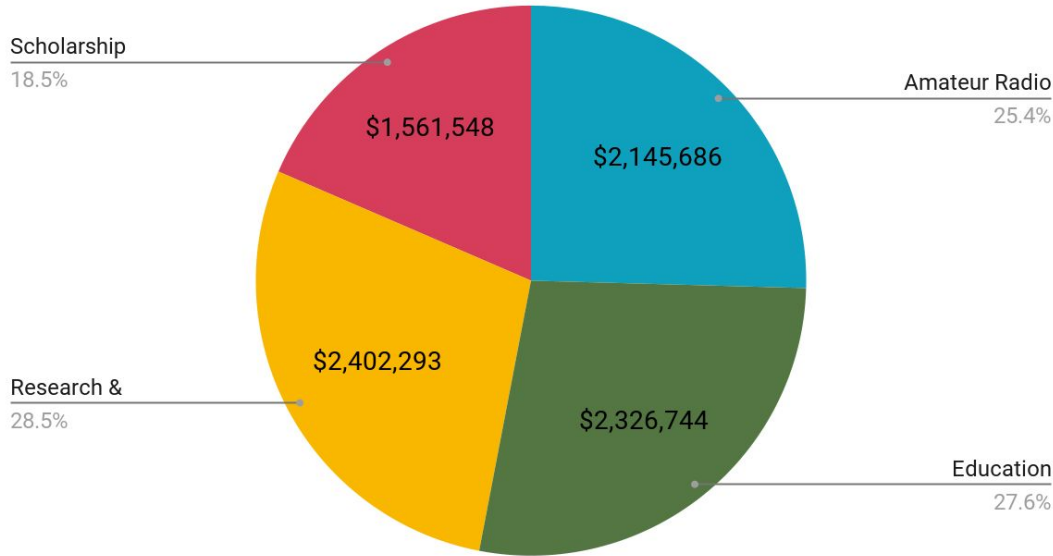
- Robert McGwier,
N4HY (2021-2022)

GAC

- Hank Magnuski – KA6M
(2020-2022)
- Steve Stroh – N8GNJ
(2021-2022)
- Randy Neals – W3RWN
(2022)
- Dave Pascoe – KM3T
(2022)

Grants Update

2022 ARDC Grants By Category - Dollars



Number of grants made in 2022:

101 Grants

Dollars distributed in 2022:

\$8,000,000*

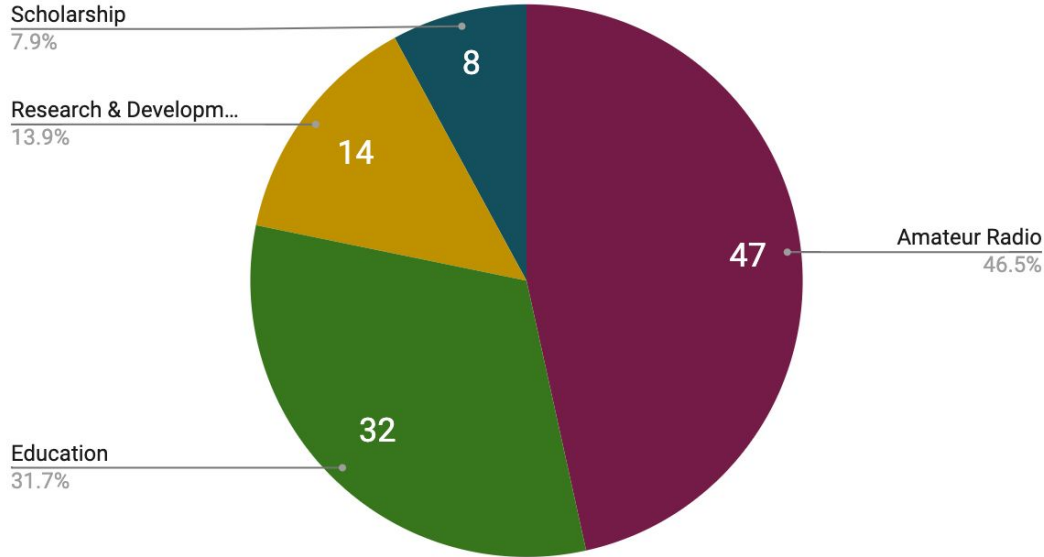
Number of people directly impacted:

14,737 People

* More exact totals will be provided in 2022 audited financials

Grants Update

2022 ARDC Grants By Category - Number of Projects



Compared to 2021, R&D grew as a category from 14% to 28% (in dollars)

We had:

- 8 scholarship grants
- 14 R&D grants
- 32 education grants
- 47 amateur radio grants

Grants Update - Scholarships

- In 2023, ARDC is funding 95 scholarships (*313 all time*)
- Who are these scholars?

For example: Washington Women In Need is managing 13 ARDC scholarships for women pursuing degrees in STEM. These women are often first-generation students and mothers. The average annual household income of a selected applicant is \$35,305 for an average family size of three.



Taylor, a past WWIN Scholar

Grants Update - Education



A grant from ARDC is anticipated to directly impact over 300 students over the next several years at Fernwood Elementary School in Canada.

- Program strategies include publishing children's books, equipping makerspaces, radio astronomy tours, building museum displays, mentoring, curriculum development, & camps.
- What are these education programs?

Andrew VA7ASI, a teacher at Fernwood Elementary used amateur radio as a classroom tool. As a classroom they celebrated YOTA month and made over 100 contacts using FT8 and mapped contact locations. Students enjoyed it so much they plan to return for the event next year. They built an RF connection for AREDN, and are getting other schools and youth groups involved so they all can talk on the air.

Grants Update - R&D

Four projects **improve on existing amateur radio** tools:

- Fixing and IDing bugs for Linux AX.25 (DARC)
- Enhancing usability for GNU radio (SETI Institute)
- Extending GMS/GPRS mobile communications (DARC)
- Mesh wide management and diagnostic features for LibreRouterOS (Altermundi)

Five projects **develop new, open source, amateur radio** technology:

- M17
- TangerineSDR (TAPR)
- A universal radio test instrument (Great Scott Gadgets)
- A new 915 MHz digital transceiver (Bradley University)
- A new digital transmission procedure allowing high speed data communication in Sub-GHz Frequency bands (Austrian Amateur Radio Society)

Two academic projects **innovate in the communications field** more generally:

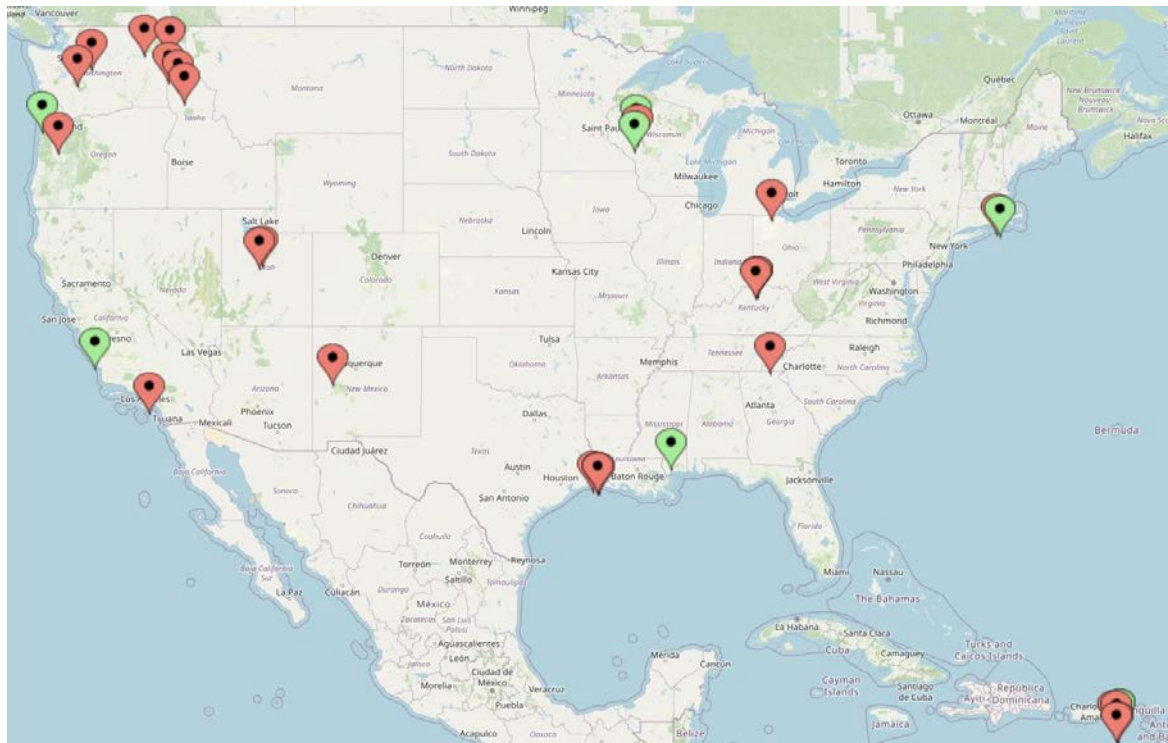
- Developing an electromagnetic visualization tool (Colorado School of Mines)
- Conducting research that characterizes the needs of under-connected communities, and the ability of the local mesh network to meet those needs (UCSB)

Three projects support **CubeSat development** (Paradox, Kyushu, AMSAT)

ALL of ARDC's supported R&D projects are open source

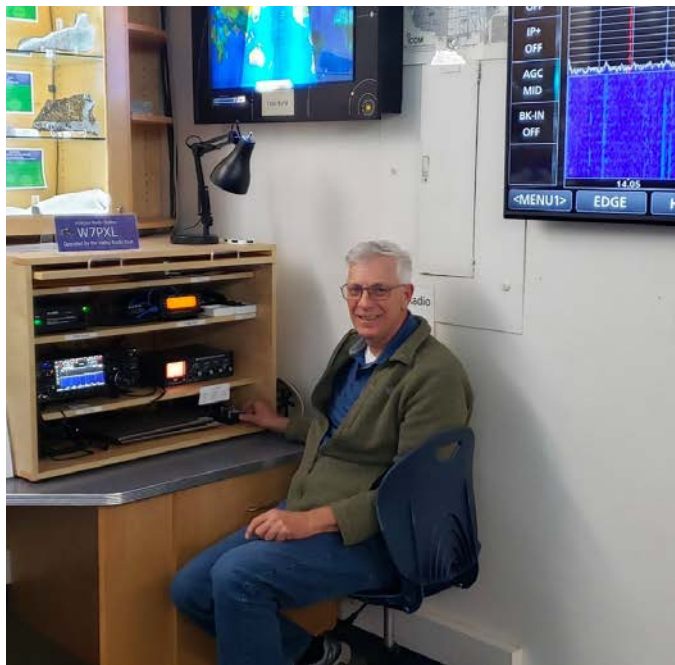
Grants Update - Amateur Radio

- Almost all of these grants are medium-sized equipment requests
- We made grants to nine college projects and 33 amateur radio club projects
- We supported eight projects that built or equipped communications vehicles



Newly built repeaters are mapped in green, while repairs and upgrades are mapped in red. Repeater projects pictured are from 2020-2022.

Grants Update - Quality Control



A volunteer staffs the station at the Eugene Science Center in Oregon



On average applicants spend **32 hours** on an application. However, there is a huge range. Some spend 2 hours, some spend over 100.

We currently fund **about half** of the proposals sent to us.

Anonymous feedback survey applicants indicated they want:

- Clearer communication around how long it takes to get funds. (**It can be a few months!**)
- Resolution to some technical issues with the application form
- Faster responses from staff to questions & status update requests

It's a priority for us to better meet these needs in 2023.

39% of our applicants say our grant application is easier to complete than other applications. Seven percent say it's harder.

Grants Update on 2019-21 Results

Things we learned:

- Plan for delays
- Plan for a way to track impacts and outcomes in advance
- Stuff happens, so include contingency funds as a part of your budget
- When working with a school or government agency, get them on board in advance
- If your goal is to reach a new audience, have a clear plan

Things we love:

- 80% Outreachy alums continue to contribute to free and open-source software.
- The Eugene Science Center had 133 visitors interact with their new demonstration station in its first month.
- The Chippewa Valley Amateur Radio Club has ensured that the North West part of Wisconsin can now be 98% accessed with a handheld radio.
- Paradox Sonic Space Research Agency in India was able to forge a partnership to take their open source CubeSat into orbit

Grants Update

All-Time Number of grants made:

187 Grants

All-Time Dollars distributed:

~\$20,900,000

Number of people directly impacted:

71,193 People

Pictured: Left are students at Norwich Free Academy, Right are Hampton University Scholarship recipients



Looking to apply in 2023?

Check out the application deadlines

- February 1
- April 1
- July 1
- October 1 (general & scholarship programs)



More information and applications at: <https://grants.ardc.net>

Come See Us at...

- [HamCation 2023](#)
February 10 - 13, 2023, Orlando, FL
- [HamSCI Workshop 2023](#)
March 17 - 18, 2023, Scranton, PA
- [QSO Today Virtual Ham Expo](#)
March 25-26, 2023, Virtual
- [Hamvention](#)
May 19 - 21, 2023, Dayton, OH

Q & A – Grants



AMATEUR RADIO DIGITAL COMMUNICATIONS

44Net Assessment Report

ARDC 44Net Assessment Results

Prepared for



Prepared by




| | |
|---------------------|--|
| Version | 0.8 |
| Document ID | TwoQ-ARDC44NetResults-0.8 |
| Last Modified | January 20th, 2023 |
| TwoQ Representative | Matt Peterson matt@twoq.com +1 (510) 422-3528 |

bit.ly/44Net-Assessment

- Methodology
- Survey Results
- Notes from Focus Groups

44Net Assessment

- Purpose is to detail the **current state** of 44Net
- Contract with **TWO**  for objective, professional research
- Completed:
 - Quantitative data collection (survey)
 - Focus groups
 - 51 page report (survey + focus group results)
- Last steps (within a month):
 - BGP + tunnel routing separate report (draft already done for tunnel portion)
 - Recommendations from Two P to the board

Amateur Radio and You

- 99% respondents licensed operators (1524)
 - Just under half (762) no prior ARDC relationship
- Analog modes just slightly above digital modes
 - Engaged operators, over half with weekly activities

44Net Apps & Services

- Traditional IP protocols dominate (HTTP, FTP, SMTP, etc)
- Services are experimental or “somewhat critical”
 - Important due to ARDC terms of service
- Networks such as HAMNET (*heavy 44Net*) & AREDN (*no 44Net*) are popular & growing
- 48.6% use amateur RF as part of their 44Net usage

Routing & BGP

- Private IP dominates slightly above BGP, followed by tunnels.
- BGP announced primarily @ co-lo's, followed by res/biz ISP's and virtual VPS/container providers.
 - LOA papertrail validation most popular, followed by IRR
- Encourage ARDC to adopt routing standards (RPKI, IRR) - just under half (47.3%), followed by neutral (31.4%)

ARDC facilitation of 44Net

- Only 8.5% success in an allocation - remember over half of respondents have never heard of ARDC prior to survey
 - Those that have scored favorable for ease of allocation, 31.4% “Very easy”, 29.3% “Easy”, 23.1% “Neutral”
- Allocations generally processed within days, hours, or some weeks - rarely months.. *Impressive for an volunteer RIR*
- Documentation is “Helpful”, but assumes prior Linux, routing, firewall, etc knowledge

ARDC Facilitation of 44Net

- Majority of allocations regionally, followed by global, and then regional/existing subnets
- Improvements (*closely weighted*):
 - Easier/modern connectivity (*NAT44 compatible*)
 - Easier/turn-key software (*embedded SBC image*)
 - Documentation / training events (*AREDN as a baseline, ARDC wiki + listserv essentially only resources*)

Q & A – 44Net



AMATEUR RADIO DIGITAL COMMUNICATIONS



AMATEUR RADIO DIGITAL COMMUNICATIONS

Thank you!

Reach out any time: contact@ardc.net