



Division VHF/UHF/SHF

Report on the HAM RADIO Friedrichshafen 2022

HAM RADIO
45. Internationale Amateurfunk-Ausstellung
24. – 26. Juni 2022
Messe Friedrichshafen

OFFIZIELLER PARTNER



Die Nr.1 in Europa!

The poster features a green background with white and black text. It includes a stylized illustration of a blimp and a radio tower. The DARC logo is prominently displayed as an official partner.

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IARU Conference

The IARU Interim Meeting, traditionally held in Vienna, was moved to the summer along with HAM RADIO due to the pandemic. Jann Traschewski, DG8NGN (VHF/UHF/SHF Manager), was therefore busy in the committee C5.

23 cm amateur radio band and Galileo E6

A large portion was taken up by the issue of Galileo E6 vs. 23-cm Amateur. Barry Lewis, G4SJH, represents the IARU in the matter. The "SRLC" (Spectrum and Regulatory Liaison Committee) has published the current status at HAM RADIO:

<https://www.iaru-r1.org/2022/iaru-r1-srlc-at-hamradio2022>

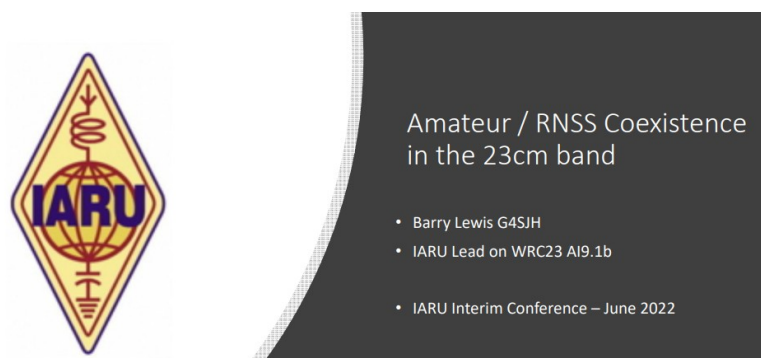
SRLC Presentation:

<https://www.iaru-r1.org/wp-content/uploads/2022/06/SRLC-slides.pdf>



Presentation on coexistence studies:

<https://www.iaru-r1.org/wp-content/uploads/2022/06/23cm-Band-and-RNSS- June2022.pdf>



Presentation on the coexistence studies

The "Working Group Spectrum Engineering" of the ECC (Electronic Communications Committee) of CEPT is working in its subdivision "SE 40 - Space Service compatibility issues" (<https://www.cept.org/ecc/groups/ecc/wg-se/se-40>) on an ECC Report on „Coexistence between the radionavigation-satellite and the amateur services in the frequency range 1 240 - 1 300 MHz“.

The latest draft can be found in the "Meeting documents" of the SE40 from the 74th meeting (Minutes → ANNEX 9_WD_draft ECC report RNSS Amateurs_Final):

<https://www.cept.org/ecc/groups/ecc/wg-se/se-40/client/meeting-documents/?flid=29394>

This includes the study by the University of the Federal Armed Forces in Munich, which shows that narrowband interference can be well suppressed by using "interference suppression units" (ISUs) (ANNEX 6: MEASUREMENTS MADE IN GERMANY).

Such study results will probably have no effect on the limits for the protection of RNSS receivers, which are defined in ITU Recommendation M.1902 (<https://www.itu.int/rec/R-REC-M.1902/en>), but our amateur radio community should work to ensure that the state of the technology is considered when evaluating coexistence possibilities.

How difficult such an undertaking can be can be seen in the "Editor's Note 12" in chapter "A6.5.3 RFI mitigation on GALILEO E6-B receiver" of the above mentioned minutes.

The next SE40 meeting is scheduled for 7/25 - 7/28 in Biel, Switzerland:

<https://www.cept.org/ecc/groups/ecc/wg-se/se-40/client/meeting-calendar>

At the IARU level, discussions are underway on what a new band plan might look like to achieve better compatibility with the Galileo E6 signal.

Individual regulators are starting to talk about ideas for restricting amateur radio operations.

Radio Frequency Information System

Furthermore, Jann gave a preview of the Radio Frequency Information System (RFIS), which is gradually being developed in cooperation with Björn, DL1PZ, and Jan, DL9JBE. The goal is to bring together free machine-readable information about the frequency bands used by our radio amateur community and to make it available to the general public in a web-based way.

Currently, the data of the Radio Regulations Frequency Allocation Table (ITU), the European Table of Frequency Allocations and Applications (ECR Report 25, ECC/CEPT), the frequency plan of the Federal Network Agency and the Amateur Radio Ordinance (Annex 1) are entered into the system.

The interested radio amateur can quickly get an overview of other frequency users and their status (primary, secondary) in the used frequency band. Ideally, national data of other countries can be read into the system, so that a cross-border overview is also possible.

Currently under evaluation is whether the Radio Frequency Information System can also incorporate the IARU or national band plans. The preview is available at <http://bandplan.hc-i.r1.ampr.org>:

rfis		ITU / Region 1	CEPT / EU	BNetzA Teilplan / DL	BNetzA Zuweisung / DL			AFuV / DL
430 MHz	- 432 MHz	ALLOCATION <i>RRS.271 RRS.274 RRS.275 RRS.276 RRS.277</i> AMATEUR RADIOLOCATION	Amateur Radiolocation (Military) ULP-WMCE	Teilplan 247 <i>D150 D282 3 5 10 19 31</i>	Eintrag: 247001 Funkdienst: In diesem Frequenzbereich sind Einzelfrequenzen für militärische Radar- Anwendungen mit der Bundesnetzagentur zu koordinieren.	Eintrag: 247002 Funkdienst: Einzelfrequenzen für militärische Nutzungen sind mit der Bundesnetzagentur zu koordinieren. Militärische Funkanwendungen	Eintrag: 247003 Funkdienst: AMATEURFUNKDIENST Technische und betriebliche Rahmenbedingungen werden durch die nach § 6 Satz 1 des Gesetzes über den Amateurfunk vom 23. Juni 1997 (BGBl. I 1997 S. 1494) erlassene Rechtsverordnung festgelegt.	Primary A 750 W PEP 7 73 E 75 W PEP 7 73
432 MHz	- 433.05 MHz	ALLOCATION <i>RRS.138 RRS.271 RRS.276 RRS.277 RRS.280 RRS.281 RRS.282</i> AMATEUR EARTH	Active Sensors (Satellite) 5.279 Amateur 5.279 Radiolocation (Military) 5.279 ULP-WMCE 5.279		Militärische Funkanwendungen 19		Amateurfunk	
433.05 MHz	- 433.0875 MHz	EXPLORATION- SATELLITE (Active) <i>RRS.279A</i>	Active Sensors (Satellite) 5.279				Eintrag: 247004 Funkdienst: Übertragung von Daten und Tonsignalen über kurze Entfernung Maximal zulässige äquivalente Strahlungsleistung: 10 mW ERP Relative Frequenzbelegungsdauer („duty cycle“): 100% bei einem Kanalabstand von 25 kHz Funkanwendungen Geringer Reichweite (SRD) 10	
433.0875 MHz	- 434.7625 MHz	RADIOLOCATION	Non-Specific SRDs 5.279 Radiolocation (Military) 5.279 ULP-WMCE 5.279				Eintrag: 247005 Funkdienst: Übertragung von Datensignalen (Fernwinkfunk) Maximal zulässige äquivalente Strahlungsleistung: 0,5 W ERP Kanalbandbreite: 25 kHz / 50 kHz / 150 kHz Kanalrastrer: 25 kHz Betriebsfunk	
434.7625 MHz	- 434.79 MHz							
434.79 MHz	- 435 MHz		Active Sensors (Satellite) 5.279					
435 MHz	- 438 MHz	ADDITIONAL INTERPRETED (RRS.283) <i>RRS.282</i> AMATEUR- SATELLITE	Amateur 5.279 Amateur- Satellite 5.279 Radiolocation (Military) 5.279 ULP-WMCE 5.279				Eintrag: 247006 Funkdienst: Amateurfunkdienst über Satelliten Technische und betriebliche Rahmenbedingungen werden durch die nach § 6 Satz 1 des Gesetzes über den Amateurfunk vom 23. Juni 1997 (BGBl. I 1997 S. 1494) erlassene Rechtsverordnung festgelegt. <i>D.282</i> Amateurfunk	
438 MHz	- 440 MHz	ALLOCATION <i>RRS.271 RRS.274 RRS.275 RRS.276 RRS.277 RRS.283</i> AMATEUR RADIOLOCATION	Amateur Radiolocation (Military) ULP-WMCE					

Data sources: Radio Regulations Frequency Allocation Table (ITU), The European Table of Frequency Allocations and Applications (ECR Report 25, ECC/CEPT), Frequenzplan (BNetzA), Amateurfunkverordnung Anlage 1 (BNetzA)

Radio Frequency Information System: <http://bandplan.hc-i.r1.ampr.org>

HAMNET

HAMNET/HamCloud Coverage

The VHF/UHF/SHF division used its hamfest equipment to offer connectivity to HAMNET and HamCloud via WiFi to hamfest visitors in Hall A1.

The HAMNET connectivity was established by a Mikrotik DynaDish 5, which was aimed at the user access of HB9SG (Hohe Buche) in Switzerland with a distance of 32km. The signal level of -65dBm across Lake Constance was always stable, apart from the heavy thunderstorm in the night from Thursday to Friday.



HAMNET connection of hall A1 via 5 GHz dish (center of picture on the air conditioning system)

Inside the hall, a sliding mast was set up in the DARC warehouse on the side of the hall. At the top of the mast was a MikroTik OmniTIK 5 PoE ac (supplied with 24V via LAN cable), which served as HAMNET BGP router, HamCloud VPN bridge, 5 GHz access point, switch with Power-over-Ethernet and DHCP/DNS server.

The 5 GHz dish was connected to it via a 50m LAN cable (supplied via PoE passthrough). Below there is a MikroTik cAP ac as a 2.4 GHz and 5 GHz access point (also supplied via PoE passthrough). A MikroTik wAP 60Gx3 AP was connected to this via PoE passthrough. This covered the exhibition hall via its 180° antenna array on 60 GHz and ensured the supply of the DARC VHF/UHF/SHF division, the OEVSV and the Swiss-ARTG with HAMNET and HamCloud independently of the 2.4 and 5 GHz spectrum.

At each of the three booths, a MikroTik hAP ac was used to distribute HAMNET and HamCloud on 2.4 and 5 GHz. At the DARC VHF/UHF/SHF booth, a MikroTik CRS326-24G-2S+ switch was also used for local connections.

At the very bottom of the mast was a TP-Link CPE510, which managed the access to the Internet via the 5 GHz trade fair WiFi (also supplied via PoE passthrough from the OmnitTIK 5 PoE ac). A MikroTik hAP ac³ was used as backup Internet access. However, since the trade fair WiFi ran stable this year, there was no need to change the access. The HamCloud connection therefore always ran via the trade fair WiFi.



HAMNET-/HamCloud Coverage Hall A1

The exhibition equipment supplied more than 400 end devices over the 3 days of the exhibition. The choice between HAMNET and HamCloud showed the difference between a HAMNET and a HamCloud connection to the end users. If the end user selected the "HAMNET" Wifi network, destinations on the HAMNET were routed via the radio link. If the "HamCloud" Wifi network was selected, then destinations in the HAMNET were routed via the VPN access to the HamCloud. In this case, traffic is routed via the shortest path from HamCloud to HAMNET via VPN tunnel (VPN border gateways to HAMNET are shown with blue dots on the HamnetDB map: <https://hamnetdb.net/map.cgi>). The end user could compare the different routes via the "Traceroute" tool. The HamCloud ensures that data traffic "into" or "out of" the Internet takes the shortest possible path on the HAMNET, so that the HAMNET backbone is relieved and sufficient capacity is available for pure radio applications.



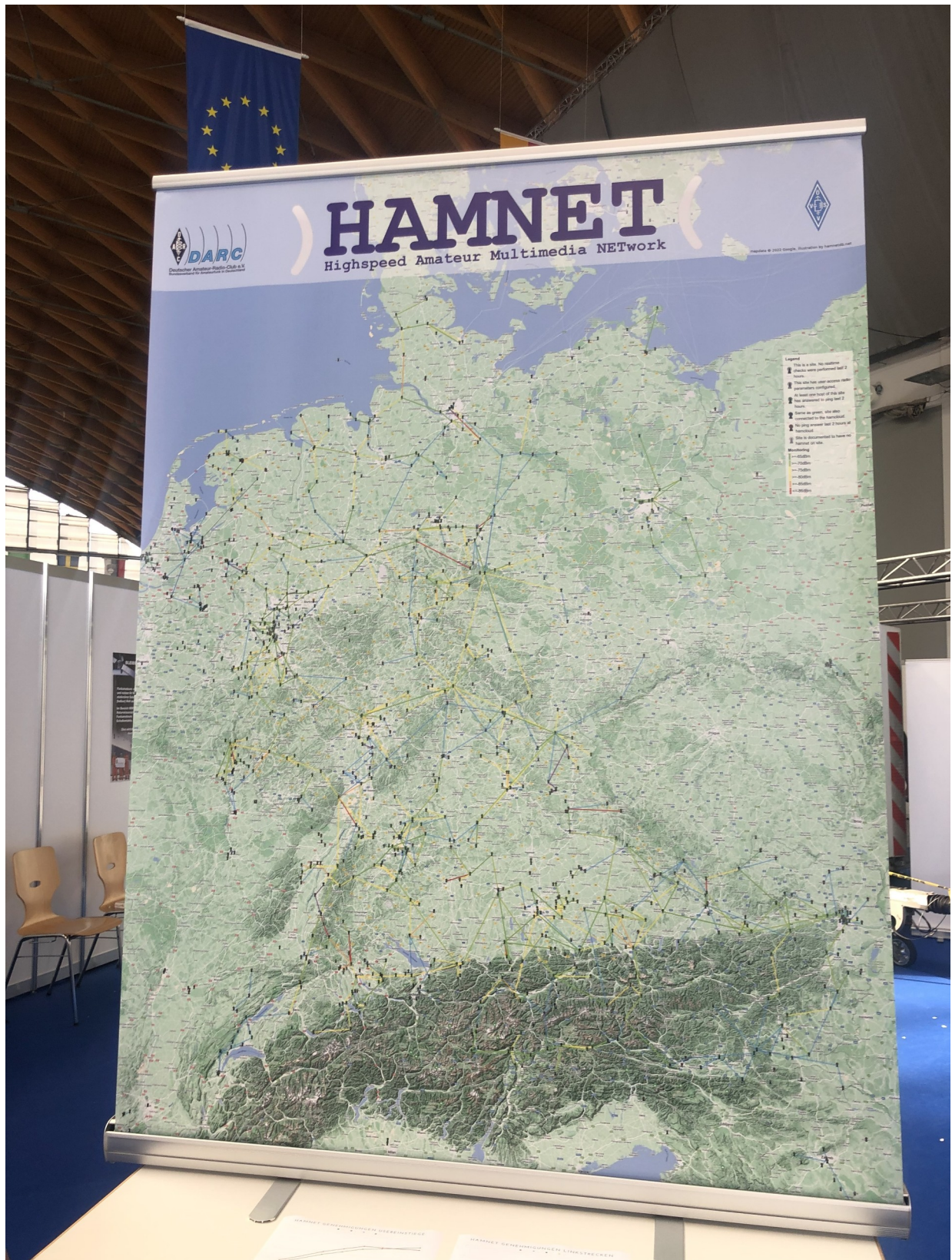
Joint booth of the DARC VHF/UHF/SHF unit and ARDC - Top right of the tripod shows the 60 GHz link.

HAMNET Map

The HAMNET map (<https://hamnetdb.net/map.cgi>) with the current expansion status of the HAMNET backbone got our brand. On the floor version (3x4 m) as well as on the roll-up (2x1,5 m) intensive discussions about further expansion and strengthening of the backbone were held. For interested end users, the possibilities to access the HAMNET were examined with the help of the "RF tools".



The VHF Manager, Jann, DG8NGN (left in the picture), during the discussion on the HAMNET map



The roll-up version of the HAMNET map

RF-Tools

Our RF-Tools roll-up was also present at the booth again. It draws attention to tools such as the flexible link profile calculation or also the calculation of radio coverage. These can be used online at <https://hamnetdb.net/map.cgi>.

RF-Tools

hamnetdb.net

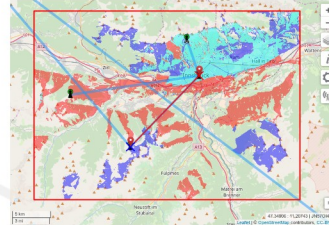
Point-to-Point-Profile



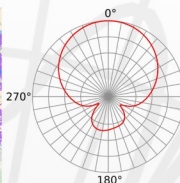
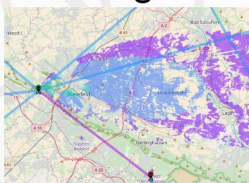
Calculate the topographic profile between two points for a good link estimation. Results include Fresnel zone, potential trees, atmospheric refraction and free space path loss.

Simulate visibility from one or two points for potential contact. Use optical or RF line of sight. It is easy to find possible interconnection points between existing sites. Share your results using a permalink.

RF-Visibility



Coverage



Pre-calculate coverage to get an overview where access is possible. Antenna pattern and power are used to calculate the link budget.

Hamnet links can be monitored. Most common manufacturers are supported. Just activate the monitor flag of your two link devices from your transfer network. Find and improve weak links for a better stability.

RSSI



Statistics of the Federal Network Agency on HAMNET

We annually request the approval status of HAMNET link- and user access licenses from the Federal Network Agency. The current figures as of 7.6.2022 are as follows:

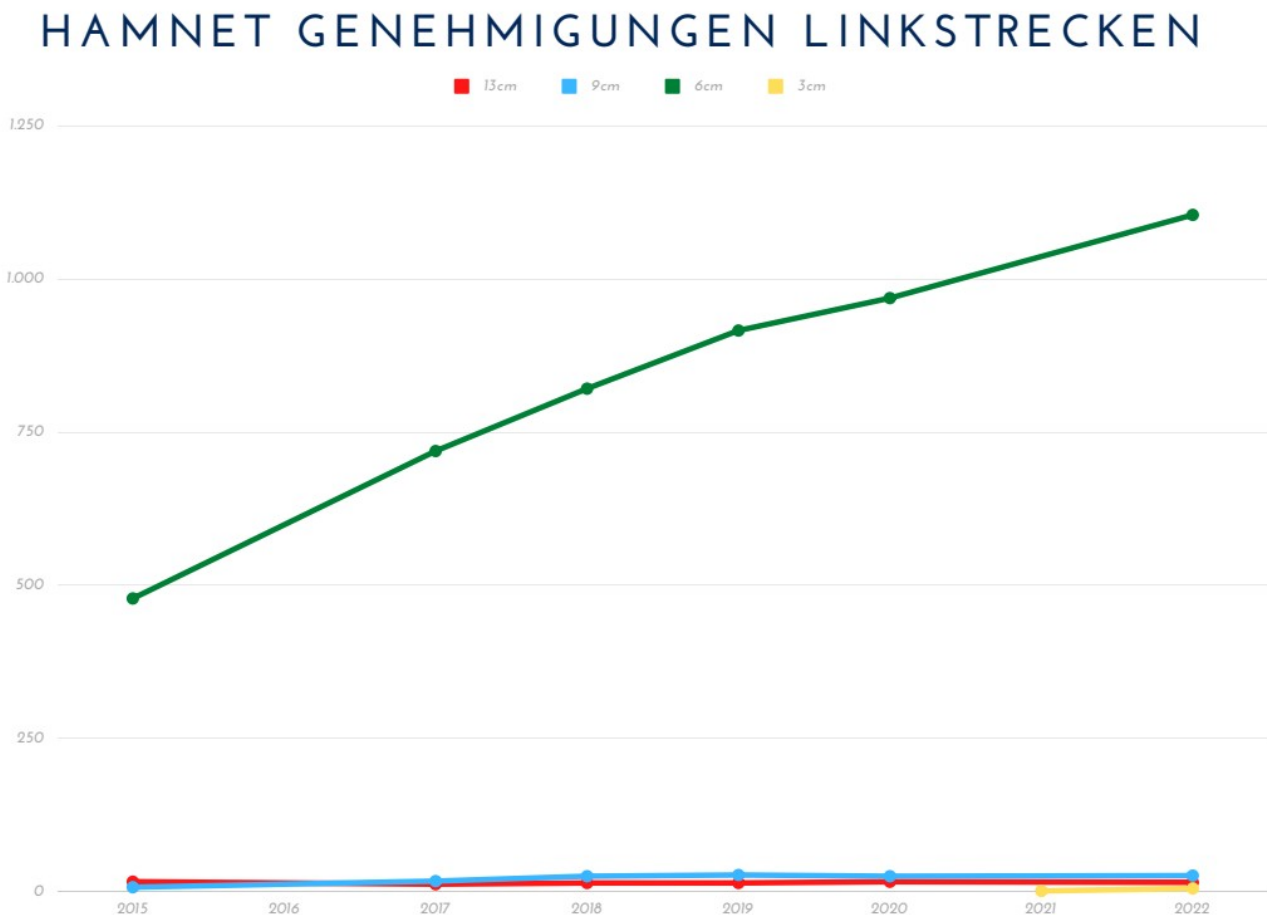
Permits for HAMNET links in the respective amateur radio band:

13cm:	14
9cm:	25
6cm:	1105
3cm:	4

Permits for HAMNET user access in the respective amateur radio band:

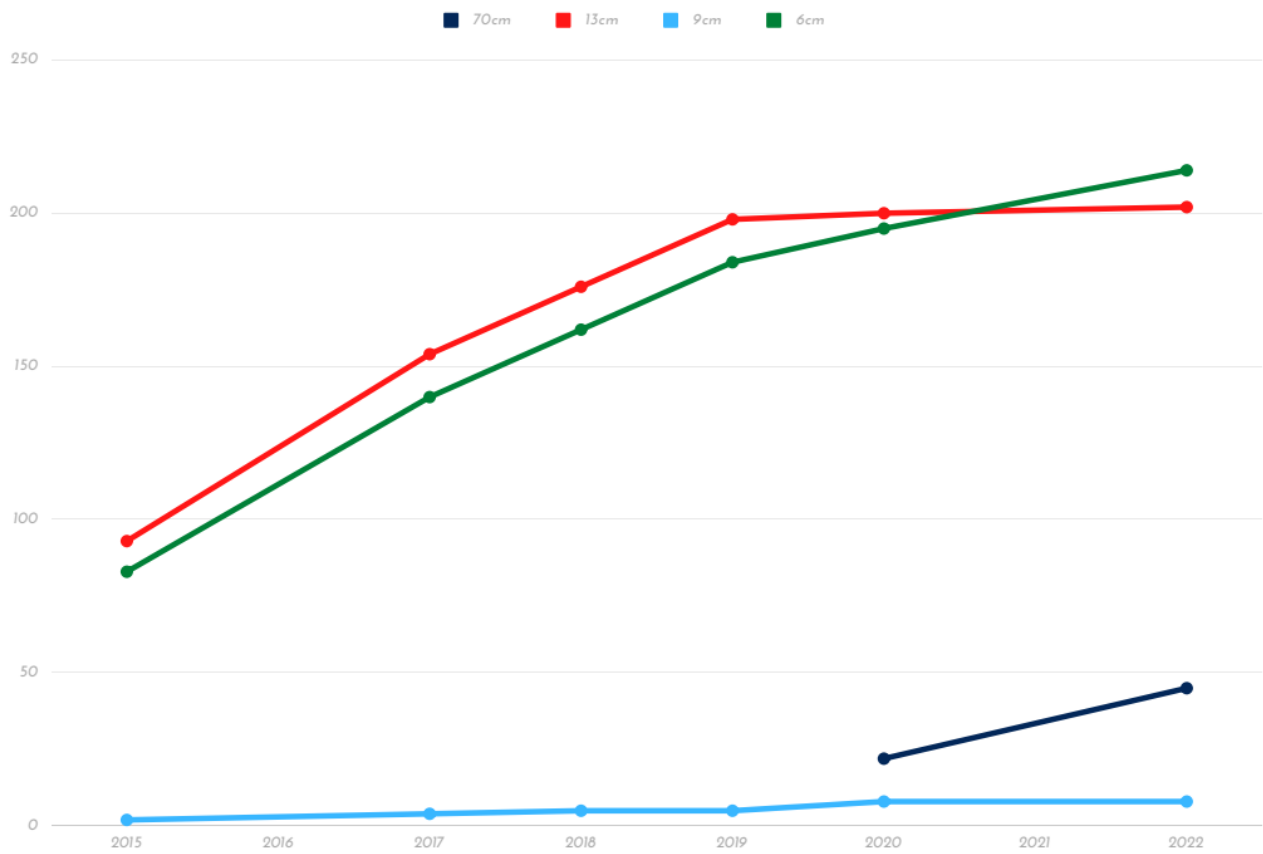
70cm:	45
13cm:	202
9cm:	8
6cm:	214
3cm:	0

We have compiled the development from 2015 in graphic form.



Development of the number of permits for HAMNET links

HAMNET GENEHMIGUNGEN USEREINSTIEGE



Development of the number of permits for HAMNET user access

Financing of hardware for HAMNET expansion

Since last year, the DARC has been promoting the targeted expansion of the HAMNET backbone in Europe. Jann DG8NGN, Tobias DG3TD, and Daniel DL6FZ, have positioned themselves within the division on the topic and are available as contact persons. Besides the financing of new links, weak links are identified and existing links are improved by hardware exchange (e.g. upgrade to MIMO technology or larger antenna dishes).



Our colleagues from OE7 (Tyrol) during the discussion

At HAM RADIO, the links in Switzerland and Austria in particular were examined in detail and hardware upgrades agreed. Although in principle each link is considered individually and a suitable solution is sought for it, we have drawn up a standard portfolio to simplify the discussion. Attention was paid to the highest possible isolation between link units, good EMC shielding and compliance with quality requirements of commercial sites. The following standard solutions are therefore only intended for orientation:

HAMNET Grant - Portfolio - 2022-06-12

The German Amateur Radio Club (DARC e.V.) has received a large grant from ARDC to strengthen the European HAMNET backbone network. The DARC is now able to give away radios free of charge to interested parties (prices are shown below only for comparison of products).

We have decided to stay in close contact with interested parties and discuss the available options. There is the possibility of live feedback by telegram (<https://t.me/hamnetcoord>) or by email to <grants@darc.de>.

The purpose of this paper is to provide some information about our "standard" solutions, which may change over time as new products are introduced or products are discontinued. The selection is based on our experience and requirements:

- Radios should have high isolation (avoiding co-channel problems when using a large number of radios at one site).
- Radios should not cause EMC problems (enclosed metal cabinets for the radios to prevent the radio board from interfering with the input frequency of the 2 m repeater, for example).
- Radios should be accepted on professional commercial sites, thus need to ensure the requested minimum quality.

The current shortage on the chip market is challenging the whole project, however we do our best to find solutions.

Our "standard" portfolio consists of four "Ubiquiti" and four "MikroTik" solutions:

Solution	Manufacturer	Pole mount diameter (mm)	Gain (dBi)	Equipment	Price
1	Ubiquiti	<80	24	PBE-5AC-ISO-Gen2	~130 €
2	Ubiquiti/Jirous	<120	24	JRC-24DD MIMO PriS Precision IS-5AC	~310 €
3	Ubiquiti	<101	29	PBE-5AC-620 ISO-BEAM-620	~265 €
4	Ubiquiti/Jirous	<120	29	JRC-29DD MIMO PriS Precision IS-5AC	~405 €
5	MikroTik/Jirous	<74	24	JRC-24DD SX MIMO JR-250 S1 Pigtail R-SMA/MMCX RB912UAG-5HPnD	~220 €
6	MikroTik/Jirous	<120	24	JRC-24DD MIMO Precision JR-250 S1 Pigtail R-SMA/MMCX RB912UAG-5HPnD	~345 €
7	MikroTik/Jirous	<74	29	JRC-29DD SX MIMO JR-250 S1 Pigtail R-SMA/MMCX RB912UAG-5HPnD	~295 €
8	MikroTik/Jirous	<120	29	JRC-29DD MIMO Precision JR-250 S1 Pigtail R-SMA/MMCX RB912UAG-5HPnD	~415 €

24dBi gain ~ 40cm dish

29dBi gain ~ 65cm dish

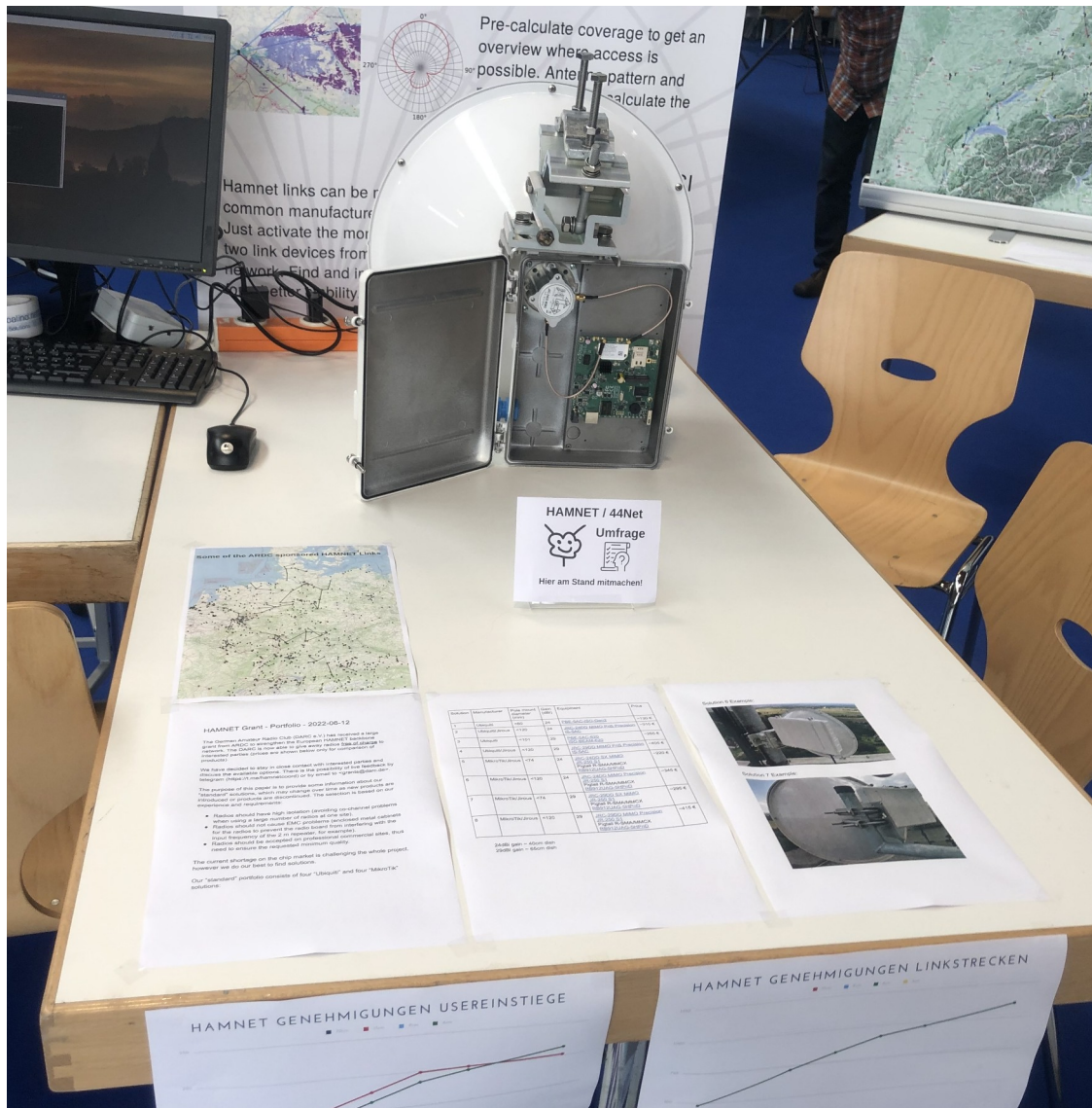
Solution 6 Example:



Solution 7 Example:



Solution #6 was also available to touch at our trade fair booth.

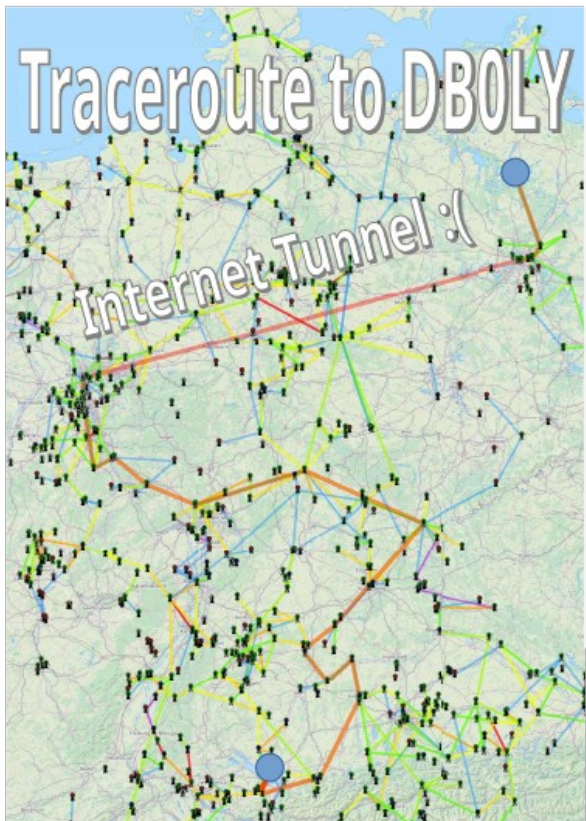
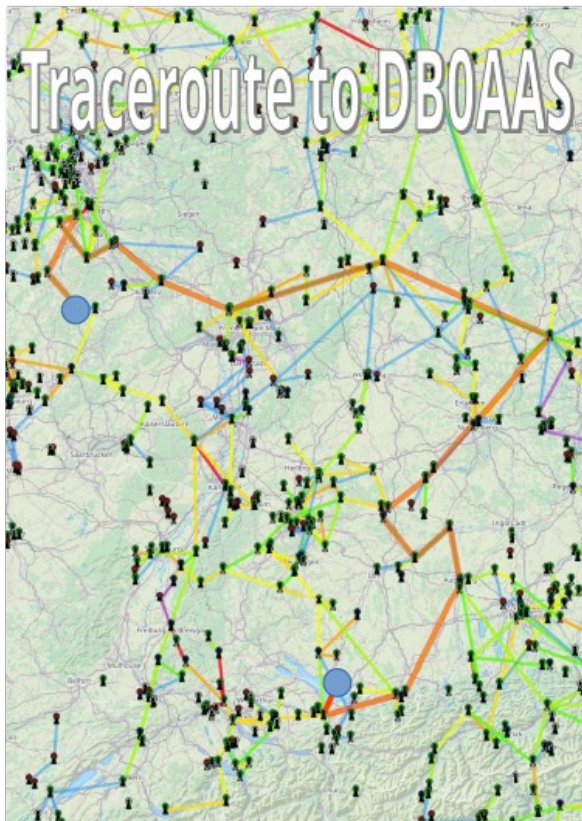
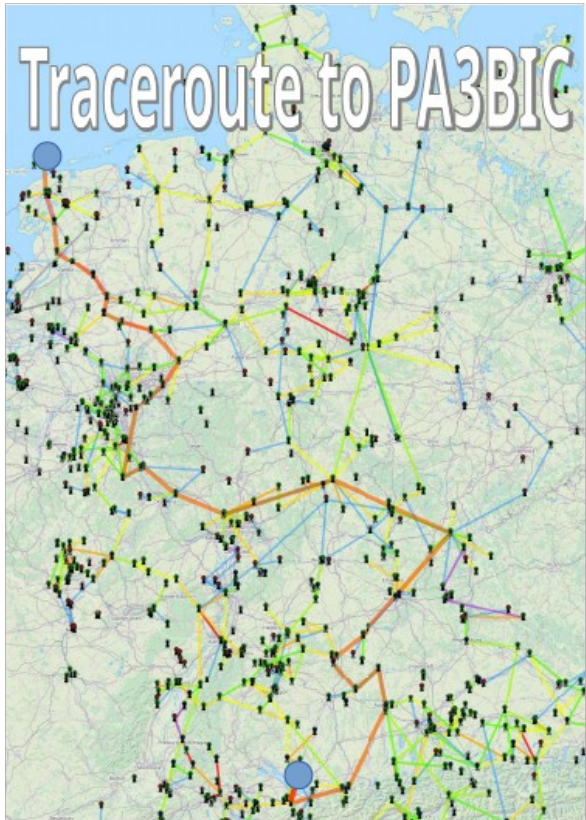
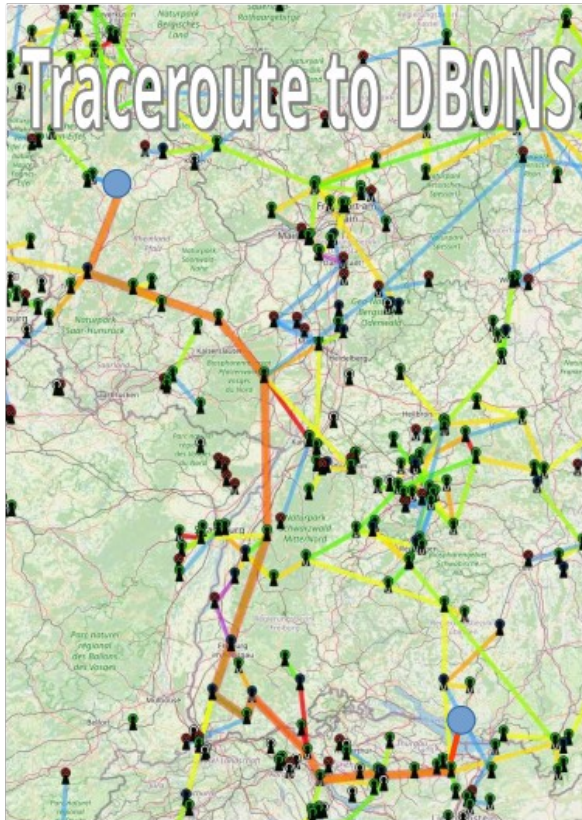


Solution 6: Jirous JRC-24DD MIMO Precision with Mikrotik RB912UAG-5HPnD Board

Demonstrations

Traceroutes

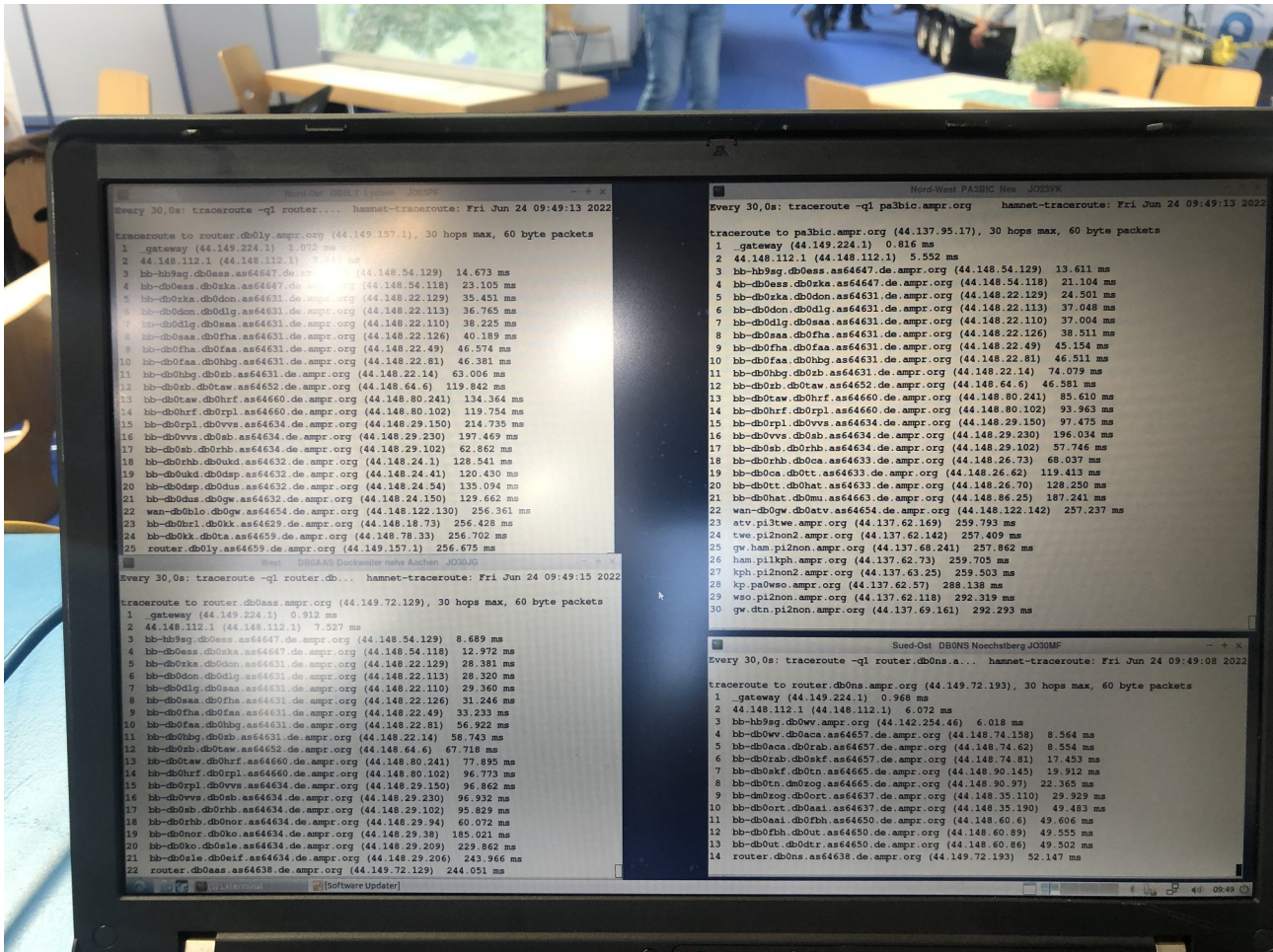
The routing of the data packets from our booth through the HAMNET to DB0NS, DB0AAS, PA3BIC and DB0LY was displayed graphically using the traceroute functionality of HamnetDB.



Data paths from the booth across the HAMNET

Unfortunately, the path to Berlin still runs through an Internet tunnel. Closing the gap remains an important goal.

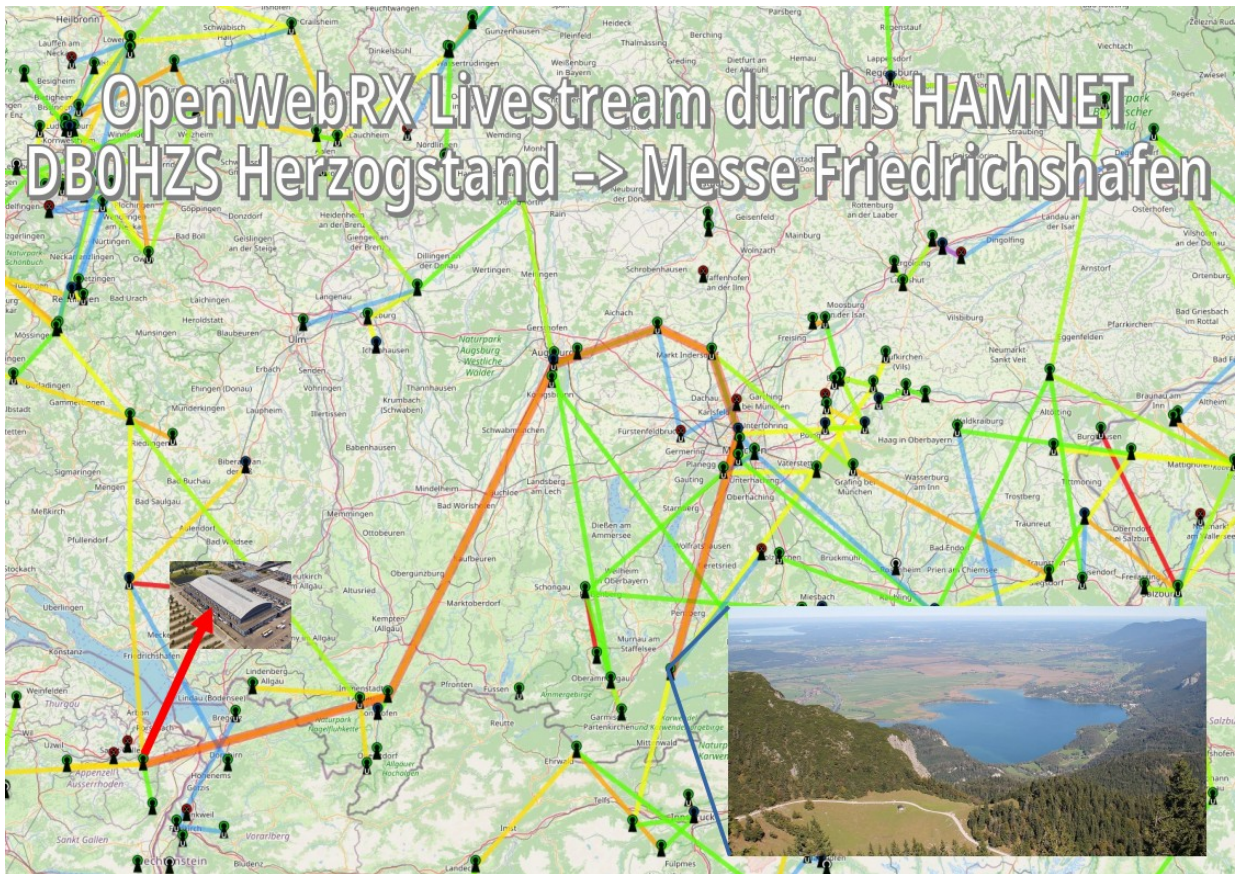
The route tracking was displayed live on a notebook using the "Traceroute" tool over all days of the trade fair. Changes in the topology or failures would have been noticed here immediately.



Visualization of the path with the "Traceroute" tool in HAMNET

Audio streaming using the example of OpenWebRX

Our focus is still on the expansion of the HAMNET backbone, but there are more and more applications running on top of the HAMNET. One example we showed at the fair was a WebSDR at Herzogstand (DB0HZS on 1600m). Visitors of the booth could look around in the 2m and 70cm spectrum and demodulate and listen to single signals. The data flowed completely over our own amateur radio infrastructure.



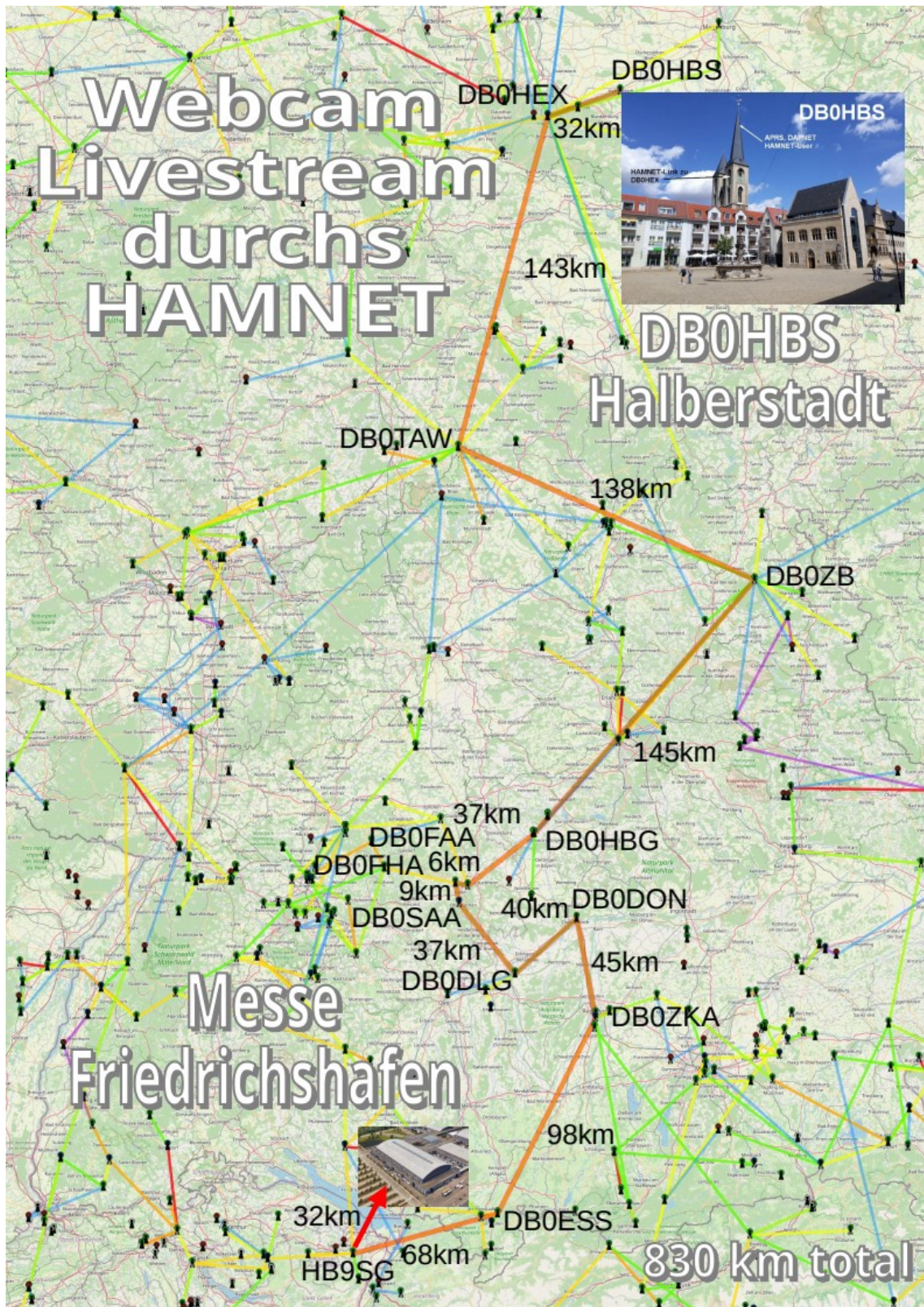
WebSDR DB0HZS Panorama and route to HAM RADIO through HAMNET



OpenWebRX on Linux notebook opened with Firefox

Video-Streaming

The performance of the HAMNET backbone can be demonstrated by the example of video streaming. From Halberstadt, a video stream came into the exhibition halls via 830km HAMNET links. The partial routes and their distances can be seen here:



Webcam livestream over 830km links through HAMNET



Livestream on the TV at the booth incl. HAMNET setup over it

On Sunday, the activities on the amateur radio TV repeater on the Brocken (DB0HEX) over 800km link distance with 2.5 megabits / second (video & audio) were brought into the exhibition halls and displayed on the TV. The video stream (RTSP) arrived absolutely smoothly which was proven by the summit webcam with its active wood wasps in the video.



*Wood wasp activity at the summit webcam of DB0HEX
(The quality of the image is limited by the camera used)*

Operation on 70-cm

Steffen, DO5DSH, showed his hardware version for "New Packet Radio" (NPR) at the booth. With NPR an access to the HAMNET on 70-cm can be realized. The hardware of NPR-H 2.0 also uses, like its predecessor NPR-H 1.0 (presented in CQ DL 03-2021), the firmware of F4HDK and is therefore fully compatible. With NPR-H, a radio link was established at the booth over 70-cm and the connection to the HAMNET was established. OMs and YLs who do not have a line of sight to a HAMNET user access can thus also fall back on the proven 70cm band to establish a connection.



WHAT'S NPR?

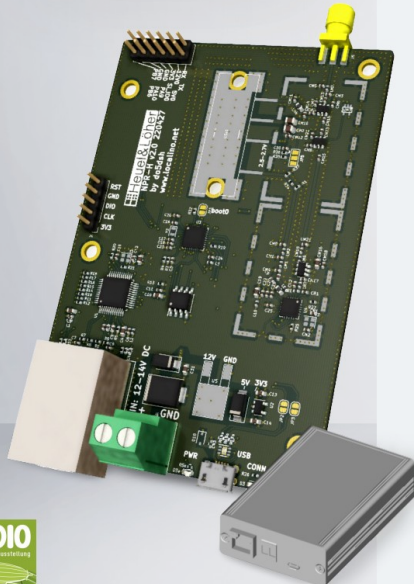
NEW PACKET RADIO

NPR (New Packet Radio) is a radio protocol for bi-directional transport of IP data in 70 cm ham radio band.

- Bi-directional IP over radio link (no AX.25 despite the name "packet radio")
- 70cm frequency band - much easier to use | reaches longer distances than 2.4 GHz or 5.6 GHz (Hamnet)
- Transparent TCP bridge over 70 cm
- 100 % Open-Source Firmware
- Special modulation and codes to operate in Germany with 100 kbps
- Already many NPR master nodes in operation

7 WATTS TX POWER


IN 70 CM BAND



ALL-IN-ONE

HARDWARE

- 7 Watts output power @ 70 cm
- Low noise amplifier and TRX
- Raw datarate: 110 kbps to 1 Mbps
- Compatible to NPR firmware from F4HDK
- Successor of NPR-H (see CQ DL 3-2021)
- 12V DC input, <150mA standby, up to 1A TX current
- SMA RF Connector
- Aluminium Enclosure
- Dimensions 72x28x100 mm
- Design by DO5DSH, Ortsverein O28



HAM RADIO
45. Jahrgang
24. - 26. Juni 2022
Dienstag

HEUEL & LÖHER GMBH & CO KG
Kölner Str. 103 | 57368 Lennestadt | info@localino.net | www.localino.net

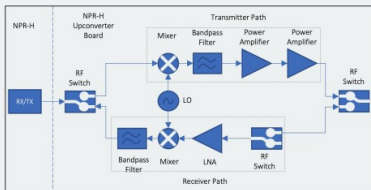
NPR on 70 cm

Operation on 23-cm

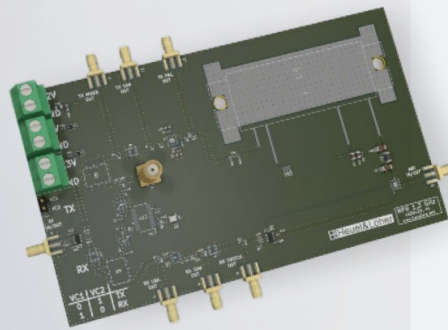
Steffen, DO5DSH, also showed a prototype of the 23 cm upconverter for NPR at the booth. In contrast to the 70 cm band, larger bandwidths are available on 23 cm, so that up to 1 megabit / second becomes possible for a HAMNET user access.

23 CM UPCONVERTER FOR NPR-H

NPR (New Packet Radio) is a radio protocol for bi-directional transport of IP data in 70 cm ham radio band... and you can use 1Mbps in 23 cm band (1.24 - 1.3 GHz)



15 WATTS TX POWER IN 23 CM BAND



1.3 dB NOISE FIGURE

Current prototype design
by D05DSH and HS, Version 04/2022

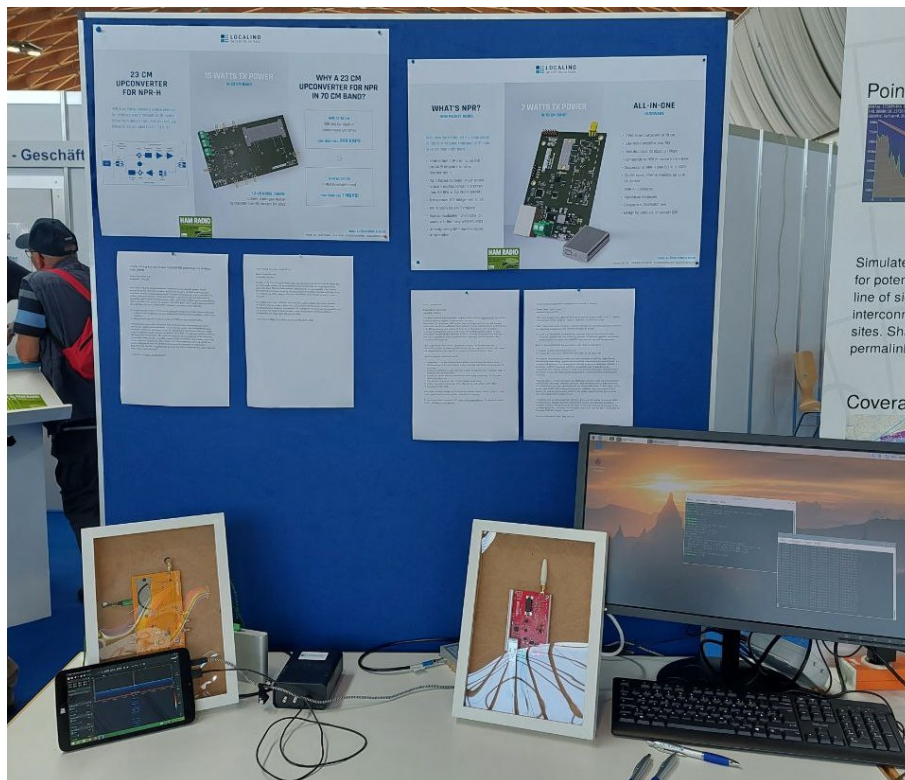
WHY A 23 CM UPCONVERTER FOR NPR IN 70 CM BAND?

NPR AT 70 CM
200 kHz bandwidth
(automated stations)
raw datarate 200 KBPS

NPR AT 23 CM
1 MHz bandwidth and
raw datarate 1 MBPS!



NPR on 23 cm



NPR-H setup at the booth

Backup-Server

The HAM RADIO is also always a good opportunity to move hardware from A to B. In our case we have taken delivery of a new backup server with 32x 1.2 TB SAS disks for the HamCloud. Egbert, DD9QP, will take care of the integration so that our virtual machines can be backed up there.



New backup server for HamCloud

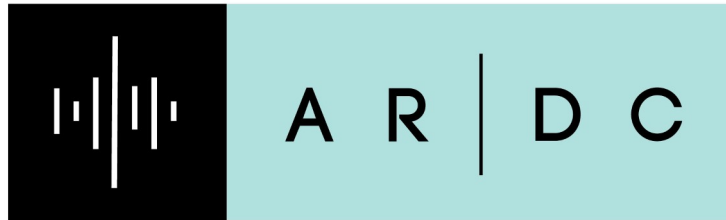
The team at the booth



f.l.t.r.: Jann DG8NGN, Egbert DD9QP, Iwo DG0CBP, Thomas DG5MPQ, Bernhardt DM2DXG und Thomas DL9SAU

ARDC

The speaker, Jann, DG8NGN, has had close ties with ARDC for many years. This year the ARDC was represented at our booth.



AMATEUR RADIO DIGITAL COMMUNICATIONS

Das Logo der ARDC

Talk

John Hays, K7VE, and Jann Traschewski, DG8NGN, gave the presentation "ARDC Grant Funding and Update" in the Switzerland room on Saturday at 10 am. John went over ARDC and the opportunities for funding Amateur Radio projects. Jann reported on past and current DARC funded projects.

To accomplish the first project, DARC had to go through what is called an "equivalency determination" process, which demonstrates that DARC is equivalent to a U.S. 501(c)(3) organization. This allows DARC to apply for grants from ARDC itself or to serve as a "fiscal sponsor" for other organizations.

25. Juni 2022, 10:00

ARDC Grant Funding and Update

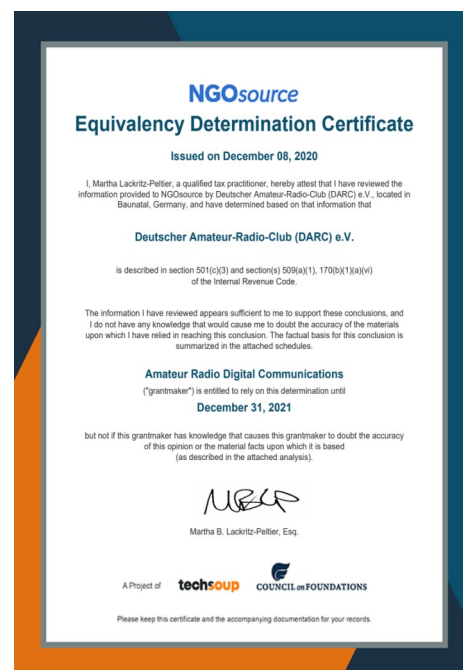
Referent: John Hays, K7VE / Jann Traschewski, DG8NGN

🕒 10:00

📍 Konferenz-Zentrum West, Raum Schweiz

🌐 englisch

Talk announcement



Equivalency Determination Certificate from 2020

DARC Projects

DARC has now received funding from ARDC for four projects.

OpenWebRX

<https://www.ampr.org/grants/2021-grants/grant-openwebrx>

Grant: OpenWebRX

Grant Date: April 2021

Amount: €95.000

This grant proposal aims to enhance the open source software "[OpenWebRX](#)" by funding a dedicated software engineer for the period of one year.

OpenWebRX is a multi-user SDR receiver that can be operated from any web browser without the need for any additional client software. It is the ideal solution to provide access to the HF spectrum at your location of choice to a wide audience. All you need is a computer, an SDR device and network access. OpenWebRX aims to support as many modulations and encodings as possible, while still focusing on an easy-to-use interface, so that even inexperienced users can explore the HF spectrum without the need to buy expensive radio equipment.

ARDC grant funds will be used to significantly progress the development of the OpenWebRX project by assigning dedicated development capacity in the form of a named and assigned software developer to the project for the initial period of 1 year.

Significant project milestones include:

- Completion of the web configuration interface to further simplify receiver setup
- Modularization of the user interface to allow multiple waterfalls to be displayed at the same time
- Implement extraction of band segments to allow the efficient use of wideband SDRs by multiple users simultaneously
- Research of a more efficient demodulation chain using overlapping FFTs for more efficient hardware use
- User interaction features: Chat, activity display, band voting
- Further decoding modules (e.g. Tetra, PI4 beacons, LoRaAPRS, D-ATV, M17)
- Support of further SDRs

This project is being managed by the Deutscher Amateur Radio Club e.V. (DARC), a non-profit organization for amateur radio enthusiasts in Germany.

To learn more about the project, visit <https://www.openwebrx.de>.

To learn more about DARC, visit <https://www.darc.de/>.

HAMNET

<https://www.ampr.org/grants/2021-grants/grant-grantmaking-effort-to-support-radio-network-in-europe>

Grant: Grantmaking Effort to Support Radio Network in Europe

Grant Date: April 1, 2021

Amount: 163.400 EUR

With grant support from ARDC, the German Deutscher Amateur Radio Club e.V. (DARC), will boost and secure European HAMNET expansion in a two-part project.

Part I: Boost and secure European HAMNET expansion by providing sponsored hardware for radio links making use of the AMPRNet IP space in Europe.

- DARC e.V. will provide a Europe-based hardware granting team who will review proposals, identify weak links within the network and propose upgrades, and identify opportunities to strengthen the HAMNET and make new site and link proposals.

Part II: Enable HAMNET Europe (which is part of the AMPRNet) to:

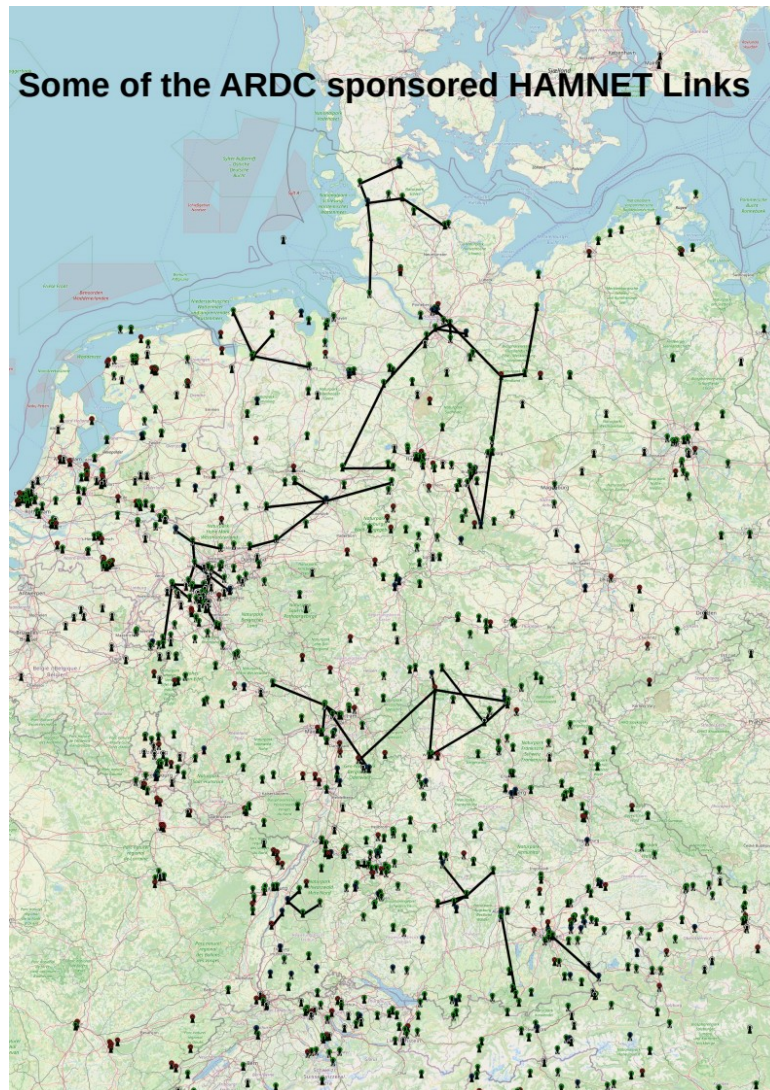
- upgrade its back-end infrastructure, and
- evaluate RF hardware to activate new bands (70-cm, 23-cm, 3-cm)

The amateur radio community (especially those interested in VHF and higher bands) benefits from those setting up permanent accessible infrastructure for amateur radio. E.g. repeaters or beacons are very common and will help amateurs in their daily radio life. A significant HAMNET expansion will bring the usability of an IP-based network, independent from internet, close(r) to many radio amateur enthusiasts, allowing for new generations to learn about the underlying principles of all their modern communication platforms.

“Amateur radio is a worldwide hobby, and ARDC has wanted to make international grants since day one” says ARDC President Phil Karn. “One way we can do that is by partnering with international 501(c)(3) equivalents who are able to make grants in their region. That’s exactly what DARC will be doing with this grant – and their region encompasses all of Europe. We look forward to seeing what they do, and to engage in similar partnerships with other organizations outside the US.”

“Partnering with an organisation like ARDC is a great way of pursuing the goals of DARC; the promotion of Amateur Radio in Germany and Europe” says Christian Entsfellner, President of DARC. “Being able to do this based on the great work and in the spirit of the late Brian Kantor is a true honor. We are highly excited that with this grant we can give the European HAMNET project a huge boost.”

For more information, visit: www.darc.de



*Einige der bis zur HAM RADIO 2022 geförderten
Linkstrecken*

Linux-AX.25

<https://www.ampr.org/grants/2021-grants/grant-fixing-the-linux-kernel-ax-25>

Grant: Fixing the Linux kernel AX.25

Date: December 2021

Amount: €179,690

Changes to the Linux kernel over the years have improved and modernized the kernel, but have also made existing AX.25 implementations incompatible and turned preexisting issues into bugs. This can make systems unpredictable or even unusable. Linux kernel development is complex, requiring deep specialized knowledge, and bugs are hard to trace.

This may be one of the reasons, why the Linux kernel AX.25 stack is currently in such a bad state.

This ARDC grant funds will allow the Deutscher Amateur Radio Club to hire software developers who can create a stable Linux AX.25 implementation and prevent Linux distributions from dropping pre-compiled AX.25 support. The fixed and functional Kernel-AX.25 stack will improve global amateur radio infrastructure. Professional kernel development can bring Linux AX.25 back to life.

Learn more at https://www.linux-ax25.org/wiki/Main_Page.

GSM/GPRS

<https://www.ampr.org/grants/2021-grants/grant-paving-the-way-to-use-gsm-gprs-technology-on-amateur-radio-bands>

Grant: Paving the way to use GSM/GPRS technology on amateur radio bands

Date: November 2021

Amount: €249,424

Open Source Mobile Communications (Osmocom) is an umbrella project, fiscally sponsored by the Deutscher Amateur Radio Club (DARC), that hosts, develops, and maintains mobile communications and SDR open source projects, with a main focus on cellular telephony systems. Osmocom identified a gap between the last decade of very promising open source developments in cellular technology and the requirements of being able to use this in the context of amateur radio. This grant will be used to develop software that will allow the use of GSM/GPRS technology on amateur radio bands by:

1. Implementing a SDR PHY that can be plugged beneath the existing OsmocomBB code to allow its use on general-purpose SDR hardware such as the LimeSDR or USRP series of radios.
2. Adding basic support for packet-switched GPRS services to OsmocomBB.

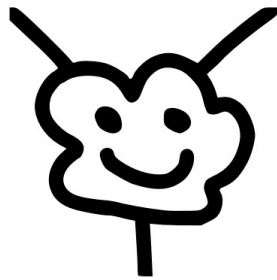
Osmocom developers will utilize their long-term experience developing open source software for mobile communications to carry out the project. Any developments made within this project are developed as part of existing Free/Open Source Software (FOSS) projects, published under licenses recognized by the FSF Free Software Definition and the OSI Open Source Definition. The entire development process happens in the Osmocom community, using publicly accessible resources such as redmine issue tracker, gerrit code review platform, mailing lists, IRC channel, etc. Once completed, the work within this project will pave the way to a potential subsequent development of 8PSK based EGRPS/EDGE in order to significantly increase the achievable packet data rates within the same narrow-band channel.

Learn more at <https://osmocom.org/>.

Survey

The ARDC had launched a (meanwhile closed) survey about HAMNET and 44Net at <http://survey.ardc.net>. We had created the possibility to participate directly via a dedicated computer at the booth.

HAMNET / 44Net



Umfrage



Hier am Stand mitmachen!

Flyer for the ARDC survey

Thank you for participating in the survey. We are looking forward to the consolidated results.

ARDC presentation



HAM RADIO 2022

25 June 2022 - Friedrichschafen, DE

ARDC Giving

Giving	Amount
Total giving in 2021	\$9 Million
Planned giving in 2022	\$6 Million



Photo Credit: TAPR



ARDC Giving: Grantee Requirements

ARDC makes grants to non-profit organizations which fall into the following categories:

1. US IRS 501(c)(3) Non-Profit Public Charities or their International Equivalents
2. Non-Profit Educational Institutions (US and International)
3. Government projects that align with our mission
4. Groups and Individuals sponsored by an entity meeting the above requirements. This is known as fiscal sponsorship.
 - a. Hope to have news on a European Fiscal Sponsor soon.



Photo Credit: K7UAZ University of Arizona Amateur Radio Club, who received a grant to renovate their HF station and satellite station

Grant Category: Support and Growth of Amateur Radio

Grants in this category are core to our mission. We make grants to clubs for all types of projects, including licensing classes, continuing education, community outreach, club station update or enhancement, repeater and network infrastructure, and certain emergency communications projects.

We are particularly interested in projects which include underrepresented individuals and groups.



Grant Category: Education

Grants in this category include scholarship funds for university and technical schools, as well as projects that aim to educate or mentor individuals, such as primary and secondary school programs and programs aimed at underserved groups.



Students try their hand at fox hunting at Woodridge Middle School.



Grant Category: Research and Development

Projects in this category advance the state of the art in amateur radio and communication science & technology.

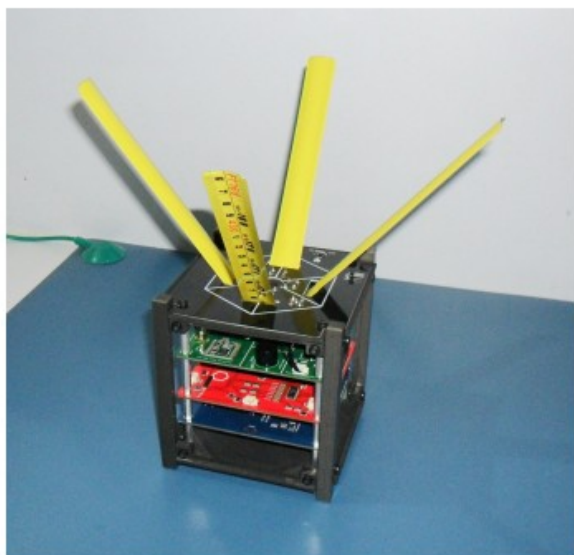


Photo Credit: Paradox Sonic Space Research Agency, who is developing India's first open-source satellite



Applying for a Grant

You can apply for a grant at anytime.

Grants are collected, reviewed, and compared like-for-like four (4) times a year. The two remaining deadlines for 2022 are July 15th and October 1st.

Apply online at <https://www.ampr.org/apply/>



Photo Credit: Norwich Free Academy, an ARDC grantee who built a satellite and ARISS ground station



Applying for a Grant - Key Points

- Be sure to review all of the information under ‘Apply’ (and sub pages) on the [ampr.org](https://www.ampr.org) website.
- Most of our projects are “shovel ready” and take about one year to complete.
 - If a large project, consider a multi-phase approach and apply for follow-on grants as you go.
 - Have any external resources already lined up (e.g. facilities, personnel, partners, etc.)
- Include all expenses such as equipment, taxes, fees, shipping, professional services, indirect costs, etc.
- Select modern, quality, items that will have an appropriate service life, don’t “gold plate” and don’t under specify.
- Have a good project plan including who, when, where and why.



Applying for a Grant - The Process

- Prepare your proposal
 - Description
 - Goals
 - Project Outline
 - Budget
- Submit your application online at <https://www.ampr.org/apply/>
- Reviewed by Grants Advisory Committee (GAC)
- Funding determined by the Board of Directors



The Grants Advisory Committee

Staff Lead: John Hays – K7VE

Dewayne Hendricks – WA8DZP

Hank Magnuski – KA6M

Brian Mileschosky – N5ZGT

Randy Neals – W3RWN

Dave Pasco – KM3T

Chair: Bob Witte – K0NR

Douglas Kingston – KD7DK

Steve Stroh – N8GNJ

Leandro Indrusiak – G5LSI

Don Prosnitz – N9PRZ



The Grants Advisory Committee

We would welcome more international representation. Watch for call for applicants in our newsletter and on our website.

- We reconstitute the committee membership each year.
- Effort is about 3-8 hours per week
- Applications are solicited at the end of the year
- Meetings are over Zoom:
 - Every other Friday
 - Evening in Europe
 - Activities are in English



Applying for a Grant - GAC Review

- A preliminary eligibility check will be made by ARDC staff
 - Include your EIN and non-profit status
 - If you are not a qualified non-profit, find a fiscal sponsor
- Determination if the proposal fits ARDC's grantmaking categories
 - Support and Growth of Amateur Radio and/or Select Digital Communications
 - Education
 - Research and Development



Applying for a Grant - GAC Review

We look for grants that further the following goals

- Broad Reach
- Social over commercial benefit
- Inclusion of underrepresented groups
- Empowerment of individuals, and distributed rather than centralization
- Preservation of the right to innovate

Open Access Requirement

- ARDC funded work should be open sourced/access and shared



Applying for a Grant - GAC Review

The GAC will strive to compare similar proposals to similar proposals

- Applications are scored by each reviewer
- Together the GAC will rank proposals to lift up the best proposals
- The GAC then lists recommended proposals by ranking
- The GAC recommends a portfolio of proposals to our Board of Directors
 - The list includes all recommended proposals
 - A 'cut' line is applied to fit the budget for the grant window (approximately \$1.5 million each window)



Applying for a Grant - Board Approval

The ARDC Board of Directors meets and reviews the portfolio and votes to fund or not fund the proposals.

- The Board may reach into the list to increase giving for a given window.
- The Board may want more information from the applicant before a final determination.
- Approved proposals are sent to the Grants Manager, who prepares the grant contract and upon execution of the contract arranges for payment to the grantee or their fiscal sponsor



Applying for a Grant - Key Points

- Make your project really stand out
 - Include previous accomplishments
 - Show how you are doing outreach and building community around your project
 - State how you will adhere to ARDCs open access/open source requirement
 - If your project is truly innovative, explain how it innovates
 - Include inclusiveness and equity initiatives your group is engaged in
 - Include how you will engage youth to fight the greying of the hobby
 - We don't need a book but be complete in your description
 - Include any other fundraising and support you are receiving for this project
- How will your project make the world a better place?



Applying for a Grant - Talk to Us

- Visit our table here at Ham Radio 2022 - A1-564
- Members of our staff and volunteers are here to hear from you and answer your questions
 - John Hays, K7VE - Outreach Manager
 - Merideth Stroh, KK7BKI - Operations Manager
 - Leandro Soares Indrusiak, G5LSI - Volunteer, Member of Grants Advisory Committee
- Email questions about grants to giving@ardc.net



44-Net / AMPRnet Survey

ARDC also runs the 44-Net which has 12 million routable IPv4 Internet addresses for use by Amateur Radio. We are currently running a survey until June 30th to help us better understand your needs as we work to make it a more usable resource. Please take the survey.

Available in English, German, French, and Japanese



<https://survey.ardc.net>

