



The Halifax Amateur Radio Club

REFLECTOR



2050 Hammonds Plains Road
Hammonds Plains, NS
B4B 1P3

April 2021, Volume 82 Number 4

club web site is www.halifax-arc.org



Due to Covid-19 the HARC Monthly Meetings Continue to be Virtual

HARC Club Station phone number - 902-490-6421

Executive

President - Brian Allen, VA1CC	489-4656	basailor@eastlink.ca
First V.P. - Jason Ingraham, VE1PYE	292-9924	VE1PYE@bellaliant.net
2nd V.P. - VACANT		
Secretary - Roger Stein, VA1RST	403-3738	burch.craft@gmail.com
Treasurer - Bill Simm, VA1ALW		williamrham@live.ca
Member-at-Large: -John Bignell, VE1JMB		johnmbignell@gmail.com
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Director Emeritus - Bill Elliott, VE1MR	865-8567	bowser.elliott@ns.sympatico.ca

Committees/Offices/Prime Contacts

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2021 Field Day Coordinator Vacant

Safety Officer - VACANT

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NSARA Director - Bill Elliott, VE1MR 865-8567
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Honorary Legal Counsel - Paul Radford, VE1ARH

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RAC Section Manager - Dave Hull, VE1HUL
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All phone numbers must be preceded by area code 902 when dialling, unless otherwise indicated

The **April, 2021 General Meeting** of the Halifax Amateur Radio Club will take place Wednesday, April 21. The April monthly meeting will start early - 18:30 and the business portion will run to 19:30. After that we will be joined by Al Cycles from Lunenburg where he will make a presentation on "Digital Radios". This will be our first attempt at adding another club to our meeting via Zoom. The method (**virtual**) and time will be sent in an e-mail. Check your e-mail for details as the date approaches. Also check the web site for any other updates. **Currently there is no access to Station 50.**

Guests are welcome but need to send an e-mail to the club to be able to be on the invitee list

*When wearing a bikini,
women reveal 90% of their body.
Men are so polite they only look at
the covered parts.*

GENERAL INFORMATION



Sunday evenings:
TAKE-15 NET at 8:30 PM

CLUB REPEATERS:
VE1PSR - 147.270 MHz + TX=82.5
VE1PSR/UHF - 444.350 MHz +
VE1PSR/6M - 53.550 MHz -
access and TX tone 151.4 Hz
VE1HNS - 146.940 MHz - TX=82.5
PACKET: VE1NSD 145.050 MHz
LAN NODE

Take-15 Net Controllers

This will be the rotation. We need more net controllers. If you want to join, let Bill Elliott, VE1MR, know.

April 18	Cam	VE1BIT
April 25	Gary	VA1GGM
May 2	Bill	VA1ALW
May 9	Cam	VE1BIT
May 16	Bill	VA1ALW



Losing weight doesn't seem to be working for me, so now I'm going to concentrate on getting taller.

Deadline for submissions to the May 2021 Reflector is Saturday May 8, 2021

*So if a cow doesn't produce milk,
is it a milk dud or
an udder failure?*

**RAC “Get on the Air on World
Amateur Radio Day”
Special Event**

<https://www.rac.ca/ward2021/>

On Sunday, April 18, 2021, Radio Amateurs of Canada is organizing a special on-air event to celebrate World Amateur Radio Day.

Every year on April 18, Radio Amateurs world wide take to the airwaves in celebration of Amateur Radio and to commemorate the formation of the International Amateur Radio Union (IARU) on April 18, 1925.

Radio Amateurs of Canada is once again holding a “Get on the Air on World Amateur Radio Day” special event in which we encourage as many Amateurs as possible to get on the air and contact as many RAC stations as possible.

More details are on page 2 of the March Reflector .

**RAC Canada Winter Contest 2020
logs are now available**

<https://www.rac.ca/rac-canada-winter-contest-2020-logs-now-available/>

A summary of logs received for the 2020 RAC Canada Winter Contest is now available on the RAC Contesting Rules and Results webpage.

The log categorization found within the summary is based on the contents of log files submitted in accordance with the contest rules as of March 15, 2021.

A new record for entries in the RAC Canada Winter Contest of 1,049 electronic logs were received.

Direct any inquiries to
ve5sf@sasktel.net or
Canadawinter@rac.ca

Thank you for participating in the contest!

Sam Ferris, VE5SF and
Bart Ritchie, VE5CPU
RAC Canada Winter Contest Mngrs

**Registration for Spring 2021 RAC
Basic Course is now underway**

<https://www.rac.ca/rac-online-basic-amateur-radio-course-spring-2021/>

Radio Amateurs of Canada is once again offering an online Amateur Radio course so that individuals from all across Canada can obtain their Amateur Radio Operator Certificate with Basic Qualification while continuing to practise social/physical distancing.

The course will again be conducted with the assistance of the Annapolis Valley Amateur Radio Club (AVARC) of Nova Scotia.

This course prepares students for the Innovation, Science & Economic Development Canada (ISED) Basic Qualification Level Operator Certificate exam to operate on allocated Amateur Radio frequencies.

Course material pertaining to all topics covered in the course syllabus will be provided to all registered students. Students must have a copy of the Canadian Amateur Radio Basic Qualification Study Guide provided by Coax Publications. For more information please visit the RAC Study Guides webpage.

It is essential that all students have the necessary equipment & bandwidth capable of taking the course – at least a tablet or PC and a DSL broadband connection.

Schedule and Cost:

Date: The course will start on Thursday, April 15 and will finish in late June.

Time: Classes will be held on Thursday evenings from 6 pm to 8:30 (1800 – 2030) Eastern Time (1900 – 2130 Atlantic Time) and Sunday afternoons 1 pm to 3:30 pm (1300 – 1530) Eastern Time (1400 – 1630 Atlantic Time).

Cost: The registration fee for the course is \$50 plus GST/HST. The cost of the Basic Study Guide is extra and an order link will be provided

upon completion of payment.

Instruction:

The course will use the GoToMeeting web-based service. Students will receive instructions on how to log on to the online sessions once they have registered for the course. Classes will be recorded, so occasional absences are not a problem.

The course instructor is Al Penney, VO1NO. Al was first licensed in 1977 and has been active in many areas of Amateur Radio including contesting, DXing, VHF/UHF weak signal, satellites, emergency communications & DXpeditioning. He has served as the President of six different Amateur Radio clubs in both Canada & the United States and currently chairs the International Amateur Radio Union (IARU) Region 2 Band Planning Committee. Al has taught the Basic Qualification Amateur Radio Course since 1994.

Complete information about the course and a downloadable copy of the course syllabus are available at:

<https://www.rac.ca/rac-online-basic-amateur-radio-course-spring-2021/>

Registration:

If you would like to take part in this course please register now by completing the registration form provided on the RAC website at:

<https://www.rac.ca/rac-basic-course-registration-form-spring-2021/>

Other Amateur Radio Courses:

Amateur Radio Basic & Advanced Qualification courses are also now being provided both online and in person by Canadian Amateur Radio Clubs and organizations. Please visit the Amateur Radio Courses webpage for more information at the link provided below.

<https://www.rac.ca/amateur-radio-courses/>

Glenn MacDonell, VE3XRA
RAC President and Chair

PRESIDENT'S MESSAGE for Aptil, 2021

GOOD AFTERNOON all HARC amateurs and others world wide who read this paper. Looking out the window tells me it's antenna time again - i.e. time to see how the antenna survived the winter events. Always a good idea to make sure that everything is tight (guys), all connections are intact and corrosion-free and so on.

Before we get into various points of discussion here, this is a gentle reminder that club dues for the year 2021 are due. If you have forgotten, you may not get your copy of the Reflector in your mailbox for the month.. It is also important to get your application in to the treasurer as this provides a link to the QSL Bureau in case there is a change of address or call or phone number. Currently there are over 150 folks who may not have enough funds to get their cards mailed out or their information is not complete and we get mailed items returned. Remember, this is your money that we use to get cards out to you. If we spend \$5.00 of your money to mail cards and they come back to us, after research we try to mail again, you have used up \$10.00 of your money being held in trust. We ask that you keep \$20.00 on account for mailings out to you.

The April monthly meeting will start early – 18:30 and the business portion will run to 19:30... after that we will be joined by Al Cyples from Lunenburg where he will make a presentation on “ Digital Radios”. This will be our first attempt at adding another club to our meeting via Zoom. Should this be successful, we can have regular entertainment til July and then go from there.

For those who are contesters and DXers there are 2 sites that are invaluable: a contest calender- “wa7bnm” and a site for DX is “ DXWORLD.NET”. there are several really good CW learning tools that can be put on a cell phone or laptop for an anywhere learning experience. A good follow up to this is just listening on 20 or 40 meters and learn to copy call signs and learn CW procedures on how to make a call. Dick and his merry band of CW enthusiasts are moving along at a good pace and are at about 8-10 words a minute; so good progress is being made there.

We will be making some hard decisions on “Field Day” 2021 and just how we will conduct the event. I fully expect that we will follow last years process as safety of our membership is of prime concern and the fact that vaccines will not be fully implemented at that time. This is true of our American counterparts where operations for field day will be from home and accumulated scores submitted under a club.

As for club news, Bill has successfully repaired our vhf/uhf radio at the club and Fraser has tested it during Exercise Handshake. There has been very little mail received at the club this past month or as of last meeting. I do have a basic exam to administer on April 24/21: Our satellite tower project of 30ft. is still a go for 2021 with some engineering detail to work out. Our Tower Inspection project is moving forward: our building at Cowie Hill is being looked into for project work: Bill and Jason are doing various projects related to our network and moving forward but now, with weather improving as it is, things *could* move along at a faster pace time permitting.

We have developed a monthly plan for the club: first Wednesday of the month is the Executive meeting: The second Wednesday will probably be the EMO MEETING ONCE IT RECONVENES ∴ the 3rd Wednesday is the General Monthly club Meeting: and the fourth Wednesday night can be our : OPEN SESSION night”.. Each Tuesday night is Dick's night for CW - currently there are 11 members taking advantage of his skills and teaching method. This will last until everyone is comfortable copying and sending CW and go for the exam. It is a lot of fun and everyone is enjoying Dick's approach complete with new stories to accompany his practice.

Well, that brings me to the end of this message. You are as up to date as the executive with nothing new to report. As our situation changes and we are allowed more freedom to do certain things I will keep you all up to date. In the meantime, please stay safe, get your shot when your time arrives and this way we will be able to get together sooner rather than later... but safety first.

Take care – enjoy your radio : propagation is getting better. 73' for now..

- Respectfully, Brian Allen- VA1CC,
President of the HARC

02 April 2021

QSL Bureau Update

I have just completed a review and purge of the QSL Bureau and cards on file. Any cards 2015 and earlier have been removed for destruction. If you have cards 2015 and prior but also have cards on file since that date, all have been retained.

I have attached a list of all with cards on file but either there is insufficient information or no information on file, or the card holder has insufficient or no money on deposit.

If you could please contact me, I would be pleased to advise you of your status with the Bureau. I may be reached by email at

twomacds@ns.sympatico.ca

and would appreciate hearing from you. If you do not wish to receive QSL cards, I would appreciate you letting me know.

Thank you,

Murray Mac Donald VE1BB
QSL Bureau Manager

The Atlantic Amateur

Ham Radio for the
Atlantic Provinces

www.atlanticamateur.ca

sun-gazing.com
INFINITY

**IF WE ALL STAY INSIDE
A BIT LONGER THEN
MAYBE WE CAN STARVE
MOSQUITOS TO
EXTINCTION. IF THERE
EVER WAS A CAUSE TO
UNITE ALL HUMANITY
THEN THIS IS IT!**

QSL – Outstanding

VA1AA	VE1BA	VE1GA	VE1QY
VA1AAB	VE1BAC	VE1GGH	VE1RCA
VA1CHP	VE1BAD	VE1GGM	VE1RK
VA1CWO	VE1BAN	VE1GL	VE1RM
VA1JON	VE1BAS	VE1GQ	VE1RMG
VE1MRT	VE1BDH	VE1GRC	VE1RS
VA1PYE	VE1BIR	VE1GUY	VE1RUS
VA1QLE	VE1BMD	VE1HF	VE1RV
VA1TH	VE1BTJ	VE1HUL	VE1RX
VA1UAV	VE1BWV	VE1JCS	VE1SA
VA1XH	VE1CAL	VE1JDF	VE1SEA
VA1ZZZ	VE1CAN	VE1JEH	VE1SHS
VE1AAA	VE1CE	VE1JEM	VE1SN
VE1AAB	VE1CEN	VE1JL	VE1SVP
VE1AAO	VE1CEI	VE1KEV	VE1SYN
VE1AB	VE1CHL	VE1KG	VE1TK
VE1ACB	VE1CKN	VE1KO	VE1TL
VE1ACP	VE1CMD	VE1KY	VE1UF
VE1AE	VE1CNS	VE1LAW	VE1UW
VE1AFN	VE1CRR	VE1LEB	VE1VA
VE1AFT	VE1CSM	VE1MAM	VE1VAI
VE1AHX	VE1CW	VE1MB	VE1VDM
VE1AJ	VE1DBM	VE1MC	VE1VEI
VE1AJF	VE1DC	VE1MF	VE1WRG
VE1AJK	VE1DCD	VE1MK	VE1WU
VE1AKE	VE1DDD	VE1MY	VE1XBJ
VE1AOD	VE1DPG	VE1NS	VE1XC
VE1AQB	VE1DPM	VE1NSS	VE1XQ
VE1AS	VE1DRS	VE1NT	VE1XY
VE1AUN	VE1DXA	VE1OK	VE1YC
VE1AVL	VE1EDL	VE1PHK	VE1YK
VE1AXJ	VE1ES	VE1PR	VE1YR
VE1AXO	VE1EV	VE1PSM	VE1YY
VE1AXQ	VE1FG	VE1QH	VE1ZG
VE1AYM	VE1FK	VE1QL	
VE1AYV			

The following QSL cards have been returned by Canada Post as undeliverable due to incorrect, incomplete addresses or simply the addressee has moved. If you are listed could you please contact me via email at twomacds@ns.sympatico.ca and either provide me with your current address or advise that you no longer wish to receive QSL cards.

Thank you,

Murray Mac Donald VE1BB, QSL Bureau Manager

VE1ALG	VE1OZY	VE1ARN	VE1PPR
VE1CLB	VE1RAE	VE1GA	VE1SE
VE1MEA	VE1YAR		

We all get heavier as we get older, because there's a lot more information in our heads. That's my story and I'm sticking to it.

Celebrate World Amateur Radio Day 2021 on April 18

Sunday, April 18, is World Amateur Radio Day (WARD), with this year marking the 96th anniversary of the International Amateur Radio Union (IARU), which was founded at the 1925 International Radiotelegraph Conference in Paris. ARRL cofounder and first president Hiram Percy Maxim, 1AW, was there, and today ARRL is the International Secretariat of the IARU. ARRL has resources members can use to celebrate World Amateur Radio Day, including graphics for social media posts and radio club websites, as well as a printable flyer.

IARU has chosen "Amateur Radio: Home but Never Alone" as the theme for World Amateur Radio Day 2021. The theme acknowledges

ARRL member Anne Frank, KD9LRB, of Deer Park, Wisconsin, is featured on ARRL's World Amateur Radio Day poster.

During our physical distancing to reduce the spread of COVID-19, amateur radio stands out as a welcome respite because of its variety of activities & opportunities.

Amateur radio experimenters were the first to discover that the HF spectrum was not the wasteland experts of the time considered it to be, but a resource that could support worldwide communication. In the rush to use these shorter wavelengths, amateur radio was "in grave danger of being pushed aside," IARU history has noted, prompting the founding of the IARU. At the 1927 International Radiotelegraph Conference, amateur radio gained allocations still recognized today -- 160, 80, 40, 20 & 10 meters. Over the years, the IARU has worked to defend those allocations and to give all radio amateurs new bands at 136 kHz, 472 kHz, 5 MHz, 10 MHz, 18 MHz, 24 MHz, & 50 MHz.

The 25 countries that formed the IARU in 1925 have grown to include more than 160 member-societies in three regions. The International Telecommunication Union (ITU) has recognized the IARU as representing the interests of amateur radio.

On World Amateur Radio Day, all radio amateurs are invited to take to the airwaves to share global goodwill with other amateurs. ARRL encourages members to promote the value of amateur radio to family & friends, and in their communities. Many volunteer ARRL Public Information Officers and Public Information Co-ordinators throughout the US use the run-up to WARD as an opportunity to reach out to the media to share information about amateur radio.

"The amateur radio community has a great story to tell on the occasion of World Amateur Radio Day," ARRL Product Development Manager Bob Inderbitzen, NQ1R, said. "While the pandemic has kept many of us at home, radio amateurs have still been able to get on the air."

"Over the last year, many ARRL-affiliated radio clubs and in-person ham radio events have moved their group activities online. This has helped to keep radio amateurs active and involved in the common pursuit of skill, service, and discovery in radio communication & radio technology," Inderbitzen added.

Coincidentally, the SSB running of the ARRL Rookie Roundup falls on World Amateur Radio Day (1800 - 2359 UTC). The event is aimed at hams licensed for 3 years or less. Take the opportunity to wish participants "Happy World Amateur Radio Day 2021" on the air.

Silent Key

Shirley Trites, VE1AZY, died April 6, 2021. Her home QTH was Kentville, NS.

<https://maritimeamateur.ca/maritime-silent-keys-2021>

What are World Radio Communication Conferences?

The International Telecommunications Union describes World Radio-communication Conferences as follows:

"World Radiocommunication Conferences (WRC) are held every three to four years.

It is the job of WRC to review and, if necessary, revise the Radio Regulations, the international treaty governing the use of the radio-frequency spectrum and the geostationary-satellite & non-geostationary-satellite orbits.

Revisions are made on the basis of an agenda determined by the ITU Council, which takes into account recommendations made by previous World Radiocommunication Conferences.

The general scope of the agenda of World Radiocommunication Conferences is established four to six years in advance, with the final agenda set by the ITU Council two years before the conference, with the concurrence of a majority of Member States."

When an actress saw her first strands of gray hair, she thought she'd dye.

Needed

The H.A.R.C. needs a new Safety Officer

Pat Kavanaugh, VE1PK has withdrawn from this position due to health issues.

Please contact President Brian if you are interested in taking on this position.

Pat will help you with the transition.

Halifax Amateur Radio Club Virtual General Meeting Minutes 17 March 2021

1. Welcome to the HARC virtual monthly meeting for March 17, 2021:

The virtual meeting was called to order by President Brian, VA1CC at approximately 1905.

2. Acceptance of the Agenda:

A request was made to accept the agenda as presented by Brian, VA1CC. The agenda was accepted virtually 24/24.

3. Approval of the Minutes for February 2021 as printed in the March Reflector:

A motion was made by Tom, VE1GTC to approve the minutes, seconded by Paul, VE1BEC. The motion was approved by virtual vote of 24/24.

4. Report of any Silent Keys:

The following amateurs in the Maritimes have passed since the last club meeting of 17 February 2021.

Patricia "Pat" Gillis, VE1PAT

March 6th, 2021 – Moncton NB

Richard "Rick" Sullivan, VE9RWS

February 25th, 2021 – Sackville NB

Additional information can be viewed at: maritimeamateur.ca

5. Correspondence:

Brian, VA1CC reported there was no correspondence.

6. President's Report:

Brian, VA1CC reported a note was received from Don Mosher HRM EMO coordinator, that NSHS is looking for class 2 minibus driver volunteers to drive for vaccination recipients from a fixed location to the point of vaccine administering. Contact him if you are qualified and available. Murray, VE1BB, of the QSL bureau noted that donations are welcome and that updated addresses are needed when you move.

Brian noted there are a couple of DX-peditions, A25RU in Botswana is operational until about the end of March and northern Russia, RI0Q

will soon be on the air once the snowmobile transport reaches their destination, a rare island!

7. Treasurer Report:

Bill, VA1ALW gave a detailed report of the monthly income and expenses as well as reporting the opening balance and closing balance for January. Bill, VA1ALW moved that the financial report for February be approved. It was seconded by Bill, VE1MR. The motion was approved by virtual vote 26/27.

8. Station Manager Report:

Don, VE1DTR reported that documentation was started for the RigPi access for remote operation of VE1FQ at Station 50. The Zoom CW practice meeting went very well with 10 participants. Fraser, VE1WO reported that he picked up the dual band vhf/uhf radio that has been repaired by Bill, VE1MR and that the unit will be put back in place at Station 50 at the next Exercise Handshake.

9. Education/Membership Report:

Jason, VE1PYE reported he had a couple of inquiries for the amateur radio basic license training and they were referred to the RAC Online course. Jason has been sending out membership cards as confirmation of payments are received from Bill, VA1ALW and the count is at 47 paid up members.

10. Old Business:

Grant submission preparations:

Brian, VA1CC reported no update available at this time. Deadline is Mar 31, Brian will contact the Grant submitters.

Cowie Hill tower study update:

The sample audit climb, inventory, and inspection report and structural analysis report have been received from Trylon along with a quotation for the same. Cost estimated to be \$4850 plus HST. Brian, VA1CC shared this information with Don Mosher who commented he felt this was rather expensive for the club to

take on. He indicated he will check into financial support for this activity. The club is waiting to hear back.

HARC Web site update:

John, VE1JMB, Don, VE1DTR, and Greg, VE1GFX are making tweaks to the web page. Don requested there is a need for a Webmaster.

11. New Business:

Zoom code practice report:

Dick, VE1AI reported Zoom worked very well, 10 people were on line for the first session, tones came through very well at 5 wpm. Individual characters are sent at 18 wpm, the speed Dick has his keyer set for, but the words are at 5 wpm. Fraser, VE1WO commented that Dick was having trouble sending Z and 2, much laughter! Let Jason, VE1PYE know if you want to be in on the CW practice sessions by dropping him an email. Many comments of appreciation for this code practice class process were received.

Tuesday night get togethers:

Brian, VA1CC reported on an impromptu ZOOM get together and are open to new topics. Propagation information was asked about by Ralph, VE1RAR about how to use the numbers and make sense of them for day to day operation. Scott, VE1QD noted the CQ magazine is offering their 4th edition of their Propagation Handbook on their website. The local UHF repeater VE1PSR/UHF - 444.350 MHz + is a good place to ask about DX as the locals hangout on that frequency. DX Watch is a good website application to watch for DX news.

12. Round Table:

Covid shot availability and schedule was discussed as it relates to opening up for in person club meetings in the future. Guidelines will be forthcoming as more people get

(Continued on page 7)

Ella received this Certificate of Appreciation from the Radio Amateurs of Canada (RAC).

I am very proud of her!!!

- Ken, VY2RU

*.Appropriate analogy.
"The curve is flattening so we can start lifting restrictions now" is like saying "The parachute has slowed our rate of descent, so we can take it off now."*



HELP

We are developing a team to help take care of the web page but need a dedicated web master to oversee the web site.

*March General Meeting Minutes
(Continued from page 6)*

vaccinated. Brian noted that we have approx 30 people on line tonight which was equal to turn-out at Station 50. Al Penny, VO1NO RAC Atlantic director will be a guest at a future on-line meeting.

Doug, VE1LDL reported that Field Day will operate like last year with some Class 'tweaks' being put in place to level the playing field with regard to power.

13. Motion for Adjournment:

Bill, VE1MR motioning to adjourn, the meeting was adjourned at approx 8:15 pm. Thanks to all for coming out!

Respectfully submitted by
Roger Stein, VA1RST
HARC Secretary

Amateur radio direction finding

From Wikipedia

Amateur radio direction finding (ARDF), also known as radio orienteering, radio fox hunting & radiosport is an amateur racing sport that combines radio direction finding with the map & compass skills of orienteering. It is a timed race in which individual competitors use a topographic map, a magnetic compass & radio direction finding apparatus to navigate through diverse wooded terrain while searching for radio transmitters. The rules of the sport and international competitions are organized by the International Amateur Radio Union. The sport has been most popular in Eastern Europe, Russia, & China, where it was often used in the physical education programs in schools.

ARDF events use radio frequencies on either the two-meter or eighty-meter amateur radio bands. These two bands were chosen because of their universal availability to amateur radio licensees in all countries. The radio equipment carried by competitors on a course must be capable of receiving the signal being transmitted by the five transmitters and useful for radio direction finding, including a radio receiver, attenuator, and directional antenna. Most equipment designs integrate all three components into one handheld device.

As the sport grew in the 1960s and 1970s, each nation devised its own set of rules and regulations. The need for more clearly defined and consistent rules for international competitions led to the formation of an ARDF working group by the International Amateur Radio Union (IARU) in the late 1970s. The first ARDF event to use the new standardized rules was the 1980 World Championship. These rules have been revised and updated over the years, increasing the number of gender and age categories into which competitors are classified, as well as formalizing the

start and finish line procedures. While some variations exist, these standardized rules have since been used world wide for ARDF competitions, and the IARU has become the principal international organization promoting the sport. The IARU divides the world into three regions for administrative purposes. These regions correspond with the 3 regions used by the International Telecommunications Union for its regulatory purposes, but the IARU has also used these regions for sports administration. The first IARU Region I (Europe, Africa, the Middle East, & ex-USSR) Championship was held in 1993 in Chtelnica, Slovakia, the first IARU Region III (Asia & Oceania) Championship was held in 1993 in Beijing, China, and the first IARU Region II (North & South America) Championship was held in 1999 in Portland, Oregon, USA. In addition to participation in international events, most nations with active ARDF organizations hold annual national championships using the IARU rules.

ARDF is a sport that spans much of the globe. In 2012 over 570 athletes from thirty-three countries, representing four continents, entered the 16th World Championships held in Kopaonik, Serbia. Organized ARDF competitions can be found in almost every European country and in all the nations of northern and eastern Asia. ARDF activity is also found in Thailand, Australia, New Zealand, Canada, and the United States. Although they represent a broad range of amateur radio interests in their nations today, several member societies of the International Amateur Radio Union were originally formed for the promotion and organization of the sport and continue to use the term radiosport in their society name. These include the Federation of Radiosport of the Republic of Armenia (FRRA), the Belarusian Federation of Radio-amateurs & Radiosportsmen

(BFRR), the Chinese Radio Sports Association (CRSA), and the Mongolian Radio Sport Federation (MRSF). To promote the sport, the IARU has delegated individuals as ARDF Coordinators for each IARU region to help educate & organize national radio societies & other ARDF groups, especially in nations without prior activity in the sport.

Description of competition and rules

The rules used throughout the world, with minor variations, are maintained by the IARU Region I ARDF Working Group. Although these rules were developed specifically for international competitions, they have become the de facto standard used as the basis for all international competitions worldwide.

An ARDF competition normally takes place in diverse wooded terrain, such as in a public park or natural area but competitions have also been held in suitable suburban areas. Each competitor receives a detailed topographic map of the competition area which indicates the location of the start with a triangle and the location of the finish with two concentric circles. Somewhere within the competition area designated on the map, the meet organizer will have placed 5 low power radio transmitters. The locations of the transmitters are kept a secret from the competitors and are not marked on the map. Each transmitter emits a signal in Morse code by which it is identifiable to the competitors. The transmitters automatically transmit one after another in a repeating cycle. Depending on entry classification, a competitor will attempt to locate as many as three, four, or all five of the transmitters in the woods, then travel to the finish line in the shortest possible time. Competitors start at staggered intervals, are individually timed, and are expected to perform all radio direction finding and navigation skills on

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their own. Standings are determined first by the number of transmitters found, then by shortest time on course. Competitors who take longer than the specified time limit to finish may be disqualified.

ARDF events use radio frequencies on either the 2-meter or 80-meter amateur radio bands. These two bands were chosen because of their universal availability to amateur radio licensees in all countries. Each band requires different radio equipment for transmission and reception, and requires the use of different radio direction finding skills. Radio direction finding equipment for eighty meters, an HF band, is relatively easy to design and inexpensive to build. Bearings taken on eighty meters can be very accurate. Competitors on an eighty-meter course must use bearings to determine the locations of the transmitters and choose the fastest route through the terrain to visit them. Two meters, a VHF band, requires equipment that is relatively more complicated to design and more expensive to build. Radio signals on two meters are more affected by features of the terrain. Competitors on a two-meter course must learn to differentiate between accurate, direct bearings to the source of the radio signal and false bearings resulting from reflections of the signal off hillsides, ravines, buildings, or fences. Large national or international events will have one day of competition using a 2-meter frequency and one day of competition using an 80-meter frequency.

In addition to the rules of the sport, ARDF competitions must also comply with radio regulations. Because the transmitters operate on frequencies assigned to the Amateur Radio Service, a radio amateur with a license that is valid for the country in which the competition is taking place must be present and responsible for

their operation. Individual competitors, however, are generally not required to have amateur radio licences, as the use of simple handheld radio receivers does not typically require a license. Regulatory prohibitions on the use of amateur radio frequencies for commercial use generally preclude the awarding of monetary prizes to competitors. Typical awards for ARDF events are medals, trophies, plaques, or certificates

Entry categories

Although all competitors at an ARDF event use the same competition area and listen to the same set of five transmitters, they do not all compete in the same category. Current IARU rules divide entrants into different categories based on their age and gender. Only the M21 category must locate all five transmitters, while the other categories may skip only a specified transmitter or transmitters.

M19—Men ages 19 and younger, 4 or 5 transmitters

M21—Men of any age, 5 transmitters

M40—Men ages 40 and older, 4 or 5 transmitters

M50—Men ages 50 and older, 4 or 5 transmitters

M60—Men ages 60 and older, 3 or 4 transmitters

M70—Men ages 70 and older, 3 or 4 transmitters

W19—Women ages 19 and younger, 4 or 5 transmitters

W21—Women of any age, 4 or 5 transmitters

W35—Women ages 35 and older, 4 or 5 transmitters

W45—Women ages 45 and older, 3 or 4 transmitters

W55—Women ages 55 and older, 3 or 4 transmitters

W65—Women ages 65 and older, 3 or 4 transmitters

Youth competitions

The International Amateur Radio Union rules for ARDF competitions include provisions for youth compe-

titions. These competitions are restricted to competitors aged sixteen years or younger. The course lengths are shorter (up to six kilometers), the transmitters may be located closer to the start (500 meters), and a course setter may require that fewer transmitters be located.

Since 2017, there is World Youth ARDF Championship (WYAC) every year. Participating categories in these championships are W14, W16, M14 and M16.

WYAC by year

2017 - Turcianske Teplice,
Slovakia

2018 - Doksy, Czech Republic

2019 - Vinnytsia, Ukraine

Local variations

The IARU rules go into great detail about certain procedures that are unique to international championships events. Not every ARDF competition follows all of these rules. Common variations to the generally accepted rules exist at local events. Most smaller events do not have large juries or on-course referees. Some events will use simpler start procedures, such as using only one starting corridor instead of two. ARDF events on the two meter band in North America sometimes use frequency modulation instead of amplitude modulation for the transmission of the Morse code identifications.

Map and course details

A portion of an orienteering map marked for an ARDF competition. Here, labelled circles indicate the locations of two of the five transmitters, but these do not appear on the maps given to competitors.

Ideally, the topographic maps used in ARDF competitions are created using the International Specification for Orienteering Maps 2000 (ISOM) set by the International Orienteering Federation and used for orienteering competitions. In fact, many ARDF competitions use existing orienteer-

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ing maps, in collaboration with the orienteering clubs that created those maps.

Course design is an important element of a successful competition. The international rules adopted by the IARU include both requirements & recommendations for basic course design. Important requirements are that no transmitter may be within 750 meters of the start, no transmitter may be within 400 meters of the finish or any other transmitter on course, and that there is no more than 200 meters elevation change between the start, finish, and all transmitters. The IARU rules for international competitions recommend that courses be designed for six to ten kilometers of total travel distance through the terrain. A well-designed course will present the competitors with an athletic challenge in addition to the challenges of land navigation and radio direction finding. Depending on the course design and competition, winning times at World Championship events are often less than 90 minutes for two meter courses, and can be under 60 minutes for eighty meter courses.

Equipment and clothing

ARDF equipment is a specialty market; much of what is available for purchase comes from small commercial vendors or small-batch production by individuals. Building equipment, such as handheld antennas, from published designs or kits is also a popular activity. Clothing & other equipment is sold through specialty orienteering equipment suppliers or general outdoor sports retailers.

Transmitter equipment

A transmitter, orienteering control flag, paper punch & electronic punch device at an ARDF control.

ARDF transmitters have a low power output and operate in either the two meter or 80-meter amateur radio band. The transmissions are in Morse

code. Each transmitter sends a unique identification that can be easily interpreted even by those unfamiliar with the Morse code by counting the number of dits that follow a series of dashes. The transmitters on course all transmit on the same frequency and each transmit in sequence for one minute at a time in a repeating cycle. Within a few meters of each transmitter, an orienteering control flag and punch device will be present. For many events and all major events, the punch device is an electronic system, such as SPORTident, used in orienteering competitions. This records the time competitors visit each control on a small device that they carry. An alternative is to use pin punches which the competitor uses to make a distinct pattern on a control card they carry. Competitors need to locate the control flag at the transmitter site and use the punch device to record their visit. Good course design will attempt to preclude, as much as possible, runners interfering with the transmitter equipment as they approach the control. At large international or national events, jurors might be present at transmitter controls to ensure fair play.

The IARU rules include detailed technical specifications for transmitter equipment. Transmitters for two meters are typically 0.25 to 1 watts power output, and use keyed amplitude modulation. The transmitter antennas used on two meters must be horizontally polarized and omnidirectional. Transmitters for eighty meters are typically one to five watts power output keyed CW modulation. The transmitter antennas used on eighty meters must be vertically polarized & omnidirectional. It is common for the transmitter, a battery, and any controlling hardware to be placed inside a weatherproof container such as an old ammunition case or plastic storage container for protection from the elements & wildlife.

Receiver equipment

The radio equipment carried on course must be capable of receiving the signal being transmitted by the five transmitters and useful for radio direction finding. This includes a radio receiver that can tune in the specific frequency of transmission being used for the event, an attenuator or variable gain control & a directional antenna. Directional antennas are more sensitive to radio signals arriving from some directions than others. Most equipment designs integrate all three components into one handheld device. On the two meter band, the most common directional antennas used by competitors are two or three element Yagi antennas made from flexible steel tape. This kind of antenna has a cardioid receiving pattern, which means that it has one peak direction where the received signal will be the strongest, and a null direction, 180° from the peak, in which the received signal will be the weakest. Flexible steel tape enables the antenna elements to flex and not break when encountering vegetation in the forest. On the eighty meter band, two common receiver design approaches are to use either a small loop antenna or an even smaller loop antenna wound around a ferrite rod. These antennas have a bidirectional receiving pattern, with two peak directions 180° apart and 2 null directions 180° apart from one another. The peak directions are 90° offset from the null directions. A small vertical antenna element can be combined with the loop or ferrite rod antenna to change the receiving pattern to a cardioid shape, but the resulting null in the cardioid is not as sensitive as the nulls in the bidirectional receiving pattern. A switch is often used to allow the competitor to select the bidirectional or cardioid patterns at any moment. ARDF receiver equipment is designed to be lightweight & easy to operate while the competitor is in motion as well as rugged enough to withstand use in areas of thick vegetation.