

# INTERNATIONAL AMATEUR RADIO UNION - Region 1



## RULES FOR CHAMPIONSHIPS IN AMATEUR RADIO DIRECTION FINDING PART B - COMPETITION

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**14. Categories**

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14.1. Competitors are divided into the categories according to their sex and age.

14.2. Categories:

Women (W)	Men (M)	Age
W19	M19	19 and younger
W21	M21	regardless of age
W35	M40	35/40 and older
W50	M50	50 and older
W60	M60	60 and older
	M70	70 and older

14.3 Competitors belong to the M19 or W19 category up to the end of the calendar year in which they reach the age of 19.

14.4 Men competitors aged 40 or older or women competitors aged 35 or older belong to each category from the beginning of the calendar year in which they reach the given age.

14.5 To qualify as an IARU World Championship, a minimum of six societies must have applied to participate.

14.6 To establish any official category, a minimum of three societies must have entered.

14.7 Each society may enter a team of up to three competitors in each category for classic competitions combined (3,5 and 144 MHz) and possibly up to another three competitors in each category for Sprint and Foxoring competitions combined.

**15. Training event**

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15.1 For training purposes the organising society shall offer a model event on both bands on the day prior to the first competition to demonstrate the transmitter features, the set-up of transmitters and antennas, the registering devices etc., which will be used in the competitions. If possible, the terrain type and map quality shall also be similar to the competitions.

15.2 Competitors, Jury members, team officials, IARU officials and media representatives shall be invited to participate in the training event.

15.3 Equal opportunities for training shall be offered to all societies.

15.4 Transmitters, antennas, flags and registering devices used in the training event, their installation and setting shall be identical to those used in the competitions.

**16. Starting order**

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16.1 The start draw shall be supervised by an ARDF International Class Referee who is a member of the Jury. The start draw may be public or private. It may be made by hand or by computer. The start draw shall be done separately for each competition.

16.2 The start list shall be published on or before the day prior to the competition and before the team officials' meeting.

16.3 All competitors and teams correctly entered shall be drawn, even including competitors who might not have arrived at that time.

16.4 The starting order shall be drawn at random. The draw shall be made in three starting groups (early, middle, late).

16.5 Competitors from the same society and category may not start at the same time or consecutively. If they are drawn to start consecutively, the next competitor shall be inserted between them.

16.6 The competitors within one category start at equal start intervals. The normal start interval is 5 minutes.

16.7 All competitors of a particular category shall start in the same start corridor and at the beginning of the same minute of the 5-minute cycle.

16.8 Competitors participating unofficially shall not start until 15 minutes after the last official competitor has started.

**17. Team officials' meeting**

- 17.1 A team officials' meeting shall be organised on the day prior to each competition. This meeting shall start not later than 19.00 hours. The Chairman of the International Jury shall lead or supervise the meeting.
- 17.2 All competition material (start number bibs, start lists, transport schedules, latest information, etc) shall be handed out well before the meeting starts.
- 17.3 Team officials shall have the opportunity to ask questions during the meeting.

**18. Terrain**

- 18.1 The terrain shall be suitable for setting competitive ARDF courses without any serious hazards to competitors and avoiding man-made objects which could interfere with direction finding activities.
- 18.2 The competition area shall not have been used for ARDF for as long as possible prior to the championship – certainly not for the previous two years - to guarantee fair play.
- 18.3 The competition area shall be placed out-of-bounds to ARDF competitors as soon as it has been selected. All relevant information published in the country of the championship should be handed over to the ARDF-WG Chairman for further dissemination.
- 18.4 Any rights of nature conservation, forestry, hunting, etc in the area shall be respected.

**19. Courses**

- 19.1 The Principles for ARDF Course Planning (see Appendix 2) shall be followed.
- 19.2 The standard of the courses shall be worthy of international ARDF events. The technical and navigational skill, concentration and running ability of the competitors shall be tested. All courses shall call upon a range of different ARDF techniques.
- 19.3 Transmitters including the finish beacon shall be located not less than 400 meters apart. The transmitter nearest to the start shall be located not less than 750 meters from the start. Transmitters on different bands shall be located not less than 200 m apart. Both finish beacons are at the same location.
- 19.4 Course lengths shall be given as the length of the shortest viable route from the start line via the transmitters in optimum order to the finish line.
- 19.5 Total climb along the shortest viable route shall not exceed 6% of the course length.
- 19.6 The effective course length is defined as the course length (see 19.4) + 10 times the total climb along it.
- 19.7 Number of transmitters and course lengths assigned to particular categories:

Category	number of transmitters	effective course length
W19	4...5 + finish beacon	6...8 km
W21	4...5 + finish beacon	7...9 km
W35	4...5 + finish beacon	6...8 km
W50	3...4 + finish beacon	5...7 km
W60	3...4 + finish beacon	4...6 km
M19	4...5 + finish beacon	8...10 km
M21	5 + finish beacon	9...12 km
M40	4...5 + finish beacon	8...10 km
M50	4...5 + finish beacon	6...8 km
M60	3...4 + finish beacon	5...7 km
M70	3...4 + finish beacon	4...6 km

- 19.8 The composition of the courses (transmitter numbers assigned to particular categories) shall be defined by the siting referee and published on or before the day prior to the competition and before the team officials' meeting.

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**20. Restricted areas and routes**

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- 20.1 Rules set by the organising society to protect the environment and any related instructions from the organiser shall be strictly observed by all persons connected with the event.
- 20.2 Out-of-bounds or dangerous areas, forbidden routes, line features that shall not be crossed etc. shall be described in the information and marked on the map. If necessary, they shall also be marked on the ground. Competitors may not enter, follow or cross such areas, routes or features.
- 20.3 Compulsory routes and crossing points shall be marked clearly on the map and on the ground. Competitors shall follow the entire length of any marked section of their course.
- 20.4 The use of official transport during the Championship may be declared mandatory by the organiser.

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**21. Maps**

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- 21.1 Maps and additional overprinting shall be drawn and printed according to the IOF International Specification for IOF Maps. The map scale shall be 1:15000 or 1:10000. Deviations need approval by the ARDF WG.
- 21.2 Errors on the map and changes which have occurred in the terrain since the map was printed shall be overprinted on the map if they have a bearing on the event.
- 21.3 The competition map shall cover the whole competition area including start, finish beacon and all transmitters. The start, finish beacon, finish corridor and finish line shall be clearly marked on the map. The start is marked by a triangle (symbol 701), the finish beacon by a circle (symbol 702), the finish corridor by a dashed line (symbol 705) and the finish by two concentric circles (symbol 706).
- 21.4 Unless otherwise noted, the area covered by the map issued by the organiser shall be considered as the competition area.
- 21.5 The IARU and its member societies shall have the right of free reproduction of the event maps with courses in their official magazines.

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**22. Equipment used by competitors**

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- 22.1 Every competitor shall have a direction finding receiver for the relevant band. The receivers shall meet the Technical Specifications for ARDF Equipment (see Appendix 1, section 1).
- 22.2 Start number bibs shall be clearly visible and be worn on the upper part of the body and on the back and front of the competitors. The bibs shall not be larger than 25\*25 cm with figures at least 14 cm high. The number bibs may not be folded or cut.
- 22.3 As long as the rules of the organiser do not specify otherwise, the choice of clothing and footwear shall be free.
- 22.4 On the day of the competition, the use of any telecommunication device by competitors or team officials is prohibited until permitted by the organiser. The penalty for this shall be disqualification. If the team official breaks this rule, the whole team shall be disqualified.

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**23. Control cards and registering devices**

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- 23.1 Only ARDF WG approved control cards and registering devices may be used - see Appendix 3.
- 23.2 The control card shall be supplied to the competitor 10 minutes prior to his/her start at the latest.
- 23.3 When non-electronic or combined systems are used, competitors are allowed to prepare the control card, eg. by writing on it, by reinforcing it or by putting it into a bag, but not by cutting-off parts of the control card.
- 23.4 When electronic systems are used, competitors must have the opportunity to practise them at the model event.
- 23.5 Competitors shall be responsible for registering at each transmitter using the registering device provided. They are responsible for correct markings which must be clearly identifiable.
- 23.6 Missing or unidentifiable control marks shall not be considered, unless it can be established with certainty that the competitor visited the transmitter and that the mark missing or unidentifiable is not the competitor's fault.
- 23.7 When systems with visible punch marks are used, at least a part of the marking must be in the appropriate box for this transmitter or in an empty reserve box. One mistake per competitor is acceptable, eg. marking outside the

correct box or jumping one box, provided all markings can be identified clearly. A competitor who attempts to gain advantage by inaccurate marking may be disqualified.

23.8 Competitors who lose their control cards shall be disqualified.

## **24. Start**

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24.1 On arrival at the competition area, competitors shall place their receivers at the point indicated to them by the referee. Spare receivers and components, clearly marked as property of a particular team or competitor, shall be placed at an indicated point just beyond the starting line beside the starting corridor. All transmitters shall remain silent until collection of the receivers is completed.

24.2 All competitors shall have at least 45 minutes for undisturbed preparation and warm-up at the start area. Only competitors who have not started and team officials shall be allowed to enter the warm-up area.

24.3 The following information shall be shown on a special board at the start area:

- time limit
- transmitter frequencies
- list of transmitter and band assignments for each category.
- start list
- first start time (in local time)
- sample of the flag and registering device
- clock showing the official time of the competition

24.4 The start shall be organised with a pre-start before the time start, situated at one edge of the warm-up area. The competitors' names shall be called or displayed. Beyond the pre-start, only competitors who are starting and media representatives guided by the organiser are allowed.

24.5 Competitors shall enter the pre-start area TEN MINUTES before their own start. At the same time, they shall be given their receivers and maps.

24.6 The start shall be organised so that later competitors and other persons cannot see the maps and the route choices of the starters.

24.7 When the starting signal is given, competitors may switch on their receivers and shall run along the starting corridor. Reaching the end, they shall start searching for the hidden transmitters. Competitors shall not stop in the starting corridor except for a receiver malfunction.

24.8 Competitors, whose receivers fail, may return within their own running time to the start line and take their spare receiver or parts from the referee. It is strictly forbidden to give or take any assistance to or from any person except referees.

24.9 At least two start corridors shall be provided by the organiser. They shall not be longer than 250 meters. The end of each corridor shall not be visible either from the start area or from any part of the other corridor(s). The terrain at the end of the starting corridors should offer normal runnability. The end of the start corridor shall be clearly marked.

24.10 Competitors who are late for their start time through their own fault shall be permitted to start. The starting referee shall determine at which time they may start which shall be as soon as possible but taking into consideration possible influence on other competitors. These late competitors shall be timed, however, as if they had started at their original start time.

24.11 Competitors who are late for their start time because of a fault of the organiser shall be given a new start time.

## **25. Transmitters**

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25.1 Transmitters used at IARU ARDF Championships shall meet the Technical Specifications for ARDF Equipment (see Appendix 1, section 2).

25.2 The antenna installation shall not be changed during the competition.

25.3 All transmitters including the beacon(s) shall be clearly audible during the whole competition from the start point, using a receiver of average sensitivity. All transmissions shall be monitored and recorded by the organiser.

25.4 Transmitters begin to operate after all receivers have been collected at the start. Transmitters shall remain operating until the end of the time limit of the last competitor. The beacon transmitter(s) shall remain operating until all competitors have finished.

25.5 In the event of a thunderstorm, the Chairman of the International Jury is entitled to recall the competition immediately. In this case, all transmitters except for finish beacon(s) will be switched off. Finish beacon(s) remain in operation until all competitors reach the finish.

- 25.6 If the authorities of the organising society make any transmitter identification compulsory, such identification can only be transmitted during the active minute.
- 25.7 The order in which competitors search for and discover the transmitters is entirely at their discretion except for the finish beacon, which shall be registered as the last one of the transmitters.
- 25.8 The finish beacons shall be placed at the entrance of the finish corridor. They shall be registered in the same way as other transmitters. Beacons for both bands share one flag and one registering device.
- 25.9 All transmitters shall be marked by a flag consisting of three squares 30 x 30 cm arranged in a triangular form. Each square shall be divided diagonally, one half being white and the other orange.
- 25.10 The flag shall be close to the transmitter antenna and not more than 4 meters away. The flag shall be visible to competitors when they reach the transmitter antenna.
- 25.11 To prove that competitors have visited each transmitter, there shall be at least two or more registering devices in the immediate vicinity of each flag.
- 25.12 Each transmitter must be easily recognizable by its code number, which shall be fixed to the flag or to the registering device for easy identification by the competitors. In addition, there must be another clear sign indicating the frequency band of the transmitter.
- 25.13 All transmitters shall be guarded.
- 25.14 The time at which each competitor finds a transmitter shall be recorded.

## 26. Transmitters arrangement

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- 26.1 Competitions are organized on both the 3.5 MHz and 144 MHz bands simultaneously. Categories are divided into two groups at the discretion of the siting referee. On the first competition day, the first group run on the 3.5 MHz band and the second group on the 144 MHz band. On the second competition day, the bands are swapped.
- 26.2 There are 12 transmitters in the competition area, 6 on each band. Transmitters shall operate on each band in the following sequence:

transmitter	code sent	frequency	operating period
finish beacon	MO	A	continuously
transmitter No.1	MOE	B	in the first minute
transmitter No.2	MOI	B	in the second minute
transmitter No.3	MOS	B	in the third minute
transmitter No.4	MOH	B	in the fourth minute
transmitter No.5	MO5	B	in the fifth minute

- of the 5-minute cycle, starting at 0:00.

## 27. Finish and time-keeping

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- 27.1 The competition ends for a competitor when the finish line is crossed. When using an electronic registration system, the competition ends for a competitor by the registration at the finish line.
- 27.2 The finish corridor begins at the finish beacon and ends at the finish line. Its entrance shall not be wider than 10 m. It shall be clearly marked on both sides by uninterrupted tape. The last 20 m shall be straight. The corridor should normally be no longer than 250 m and its length shall be indicated by the siting referee at the team officials meeting a day prior to the competition.
- 27.3 The finish line shall be at least 3 m wide and shall be at right angle to the direction of the run-in. The exact position of the finish line shall be obvious to approaching competitors. Competitors in the finish corridor may run only in the direction from the beacon towards the finish line.
- 27.4 The finish time shall be measured when the competitor's chest crosses the finish line. When using an electronic registration system, the finish time is given by the registration at the finish line. Times shall be rounded down to whole seconds. Times shall be given in either hours, minutes and seconds or in minutes and seconds only.
- 27.5 After a competitor has crossed the finish line, the control card and, if so required, the competition map have to be handed over to the organiser.
- 27.6 Having completed the competition, a competitor may not re-enter the competition terrain without the permission of the organiser. A competitor who retires shall announce this at the finish immediately and hand in the map and control card. That competitor shall in no way influence the competition nor help other competitors.
- 27.7 There shall be medical facilities and personnel at the finish, who are also equipped to work in the forest.

27.8 The time-keeping system shall meet the Technical Specifications for ARDF Equipment (see Appendix 1, section 3).

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**28. Results**

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28.1 The place of an individual competitor depends on (first) the number of transmitters found and (second) his or her running time. Only transmitters which are scored for the particular category are considered. Competitors who have failed either to find any transmitter other than the finish beacon or who have exceeded the time limit, shall not be classified.

28.2 The place of a team depends on (first) the sum of transmitters found and (second) the sum of times reached by the two classified team members possessing the best results.

28.3 Two or more competitors or teams having the same result shall be given the same placing in the results list. The position(s) following the tie shall remain vacant.

28.4 Provisional results shall be announced and displayed in the finish area during the competition. The official results shall be published not more than 2 hours after final approval of the provisional results by the Jury. They shall be handed out on the day of the competition to each team manager and to accredited media representatives and presented openly at three different places for general information at least.

28.5 The official results shall include all participating competitors and teams.

28.6 At the end of the championship every Jury member, team leader and accredited media representative shall receive an official results list and the competition maps. Official results lists, competition maps and further reports shall be published on the event website and sent in electronic form to every participating society. Further result lists and maps may be sold at a small charge to all interested.

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**29. Prizes**

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29.1 The title of World Champion or Regional/Continental Champion shall be awarded for the 3.5 and 144 MHz competitions and for each official category separately.

29.2 The following prizes shall be awarded in all competitions:

- 1st place Gold medal and certificate
- 2nd place Silver medal and certificate
- 3rd place Bronze medal and certificate
- 4th–6th place Certificate

29.3 If two or more competitors or teams have the same placing, they shall each receive the appropriate medal and/or certificate.

29.4 In the team classification, each classified member of the team shall receive the appropriate medal and/or certificate.

29.5 The organiser shall arrange a dignified prize-giving ceremony.

29.6 The prize-giving ceremonies shall be performed by the representatives of the organising society and the IARU Regional Organisation.

29.7 During the prize-giving ceremony, the national flags of the first three competitors/teams should be flown and the national anthem of the winner may be played.

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**30. Fair play**

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30.1 All persons taking part in an ARDF event shall behave with fairness and honesty. They shall have a sporting attitude and a spirit of friendship. Competitors shall show respect for each other, for officials, journalists, spectators and the inhabitants of the competition area. The competitors shall be as quiet as possible in the terrain.

- 30.2 It is absolutely forbidden to give or take any assistance to or from any person, including competitors, or to utilize any means of transport, except:
- assistance provided by referees within the scope of their defined duties, as long as that assistance is equally available to all competitors;
  - it is the duty of all competitors to help injured runners. No competitor will be disqualified for giving or receiving such an assistance, as long as he or she does not gain competitive advantage by doing so.
- 30.3 Doping is forbidden. The ARDF WG or during a championship the Jury may require doping control procedures to be conducted.
- 30.4 The organiser, with the consent of the ARDF WG, may decide to publish the venue of the competition in advance. If the venue is not made public, all officials shall maintain strict secrecy about the competition area and terrain. In any case, strict secrecy shall be maintained regarding the courses.
- 30.5 Surveying or training in the area declared out-of-bounds by the organiser is not allowed. Attempts to gain any information related to the courses, beyond that provided by the organiser, are not permitted before and during the competition.
- 30.6 Team officials, competitors, media representatives and spectators shall remain in the areas assigned to them.
- 30.7 Members of the international Jury and transmitter operators shall neither disturb or detain any competitor nor supply any information whatsoever. They shall remain quiet, wear inconspicuous clothing and shall not help competitors approaching transmitters. This also applies to all other persons in the competition area.
- 30.8 A competitor who breaks any rule, or who benefits from the breaking of any rule, shall be disqualified.



## Appendix 1: Technical Specifications for Amateur Radio Direction Finding Equipment

### T1. Receivers

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- T1.1 Receivers and antennas of any type may be used by the competitors.
- T1.2 Any receiver producing audible interference in the 3.5 MHz or 144 MHz band at a distance of 10 meters or more shall not be used in the competitions.
- T1.3 The International Jury may require tests on any competitor's receiver prior to its use in the competitions.

### T2. Transmitters

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- T2.1 It is the responsibility of the organising society to ensure that all transmitters in use comply with the relevant radio regulations in force in the country of operation with regard to their electric parameters, identification and to their being operated only by duly authorised operators.
- T2.2 All transmitters within one competition shall have the same parameters and the same antenna installation.
- T2.3 The frequency of the beacon transmitter shall be significantly different from the frequency of the other five transmitters.
- T2.4 When not scheduled to be transmitting, neither the transmitter nor its antenna may radiate any RF energy.
- T2.5 Antennas shall provide omnidirectional horizontal radiation patterns.
- T2.6 Specifications for the 3.5 MHz transmitters:
- |   |  |
|---|--|
| • Carrier frequency *   | 3510 ... 3600 kHz                      |
| • Frequency stability   | better than 50 ppm                     |
| • Channel spacing between simultaneously working transmitters | more than 30 kHz                       |
| • Undesired products level                                    | conforming to the national regulations |
| • Output RF power   | 1 ... 5 W                              |
| • Mode  | A1A (keyed unmodulated carrier)        |
| • Keying speed  | 8 ... 15 WPM                           |
| • Antenna   | vertical                               |
- T2.7 Specifications for the 144 MHz transmitters:
- |   |   |
|---|---|
| • Carrier frequency *   | 144.50 ... 144.90 MHz   |
| • Frequency stability   | better than 50 ppm  |
| • Channel spacing between simultaneously working transmitters | more than 200 kHz   |
| • Undesired products level                                    | conforming to the national regulations  |
| • Effective Radiated Power (ERP)                              | 0.25 ... 1 W  |
| • Mode  | A2A (keyed carrier modulated by AF tone or continuous carrier modulated by keyed AF tone) |
| • Modulation depth  | 70 ... 80 %   |
| • Keying speed  | 8 ... 15 WPM  |
| • Antenna polarisation  | horizontal  |
| • Antenna height  | 2 ... 3 meters above ground level   |

*Note: ( \* ) Carrier frequency ranges indicated in these Rules are those normally used by IARU Region I societies. Organizers in other Regions may employ different ranges to meet their band plan regulations. According to Part A 7.4 of these Rules transmitter frequencies are to be stated in bulletin 2, which is to be dispatched 5 months before the event.*

### T3. Time-keeping system

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- T3.1 The official competition time shall correspond to the official local time.
- T3.2 Two independent time-keeping systems, a primary and a secondary, shall be used.
- T3.3 The maximum deviation of the clocks at the start and finish line is ONE SECOND against the official time during the whole competition.
- T3.4 The maximum deviation of the transmitting periods is FIVE SECONDS against the official time during the whole competition. The maximum transmitting overlap of two transmitters is FIVE SECONDS.

### T4. Other equipment

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- T4.1 Any other equipment used by the organiser (service radio net, time-keeping system, computers, electronic marking devices etc.) shall not cause audible interference to competitors' receivers.
- T4.2 The use of satellite positioning devices is allowed provided they do not contain digital map of the terrain ("non-mapping" devices).

## Appendix 2: Principles for course planning

### P1. Introduction

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#### P1.1 Purpose

These principles aim at establishing common standards for the planning of ARDF courses in order to ensure fair competitions and to safeguard the unique character of ARDF.

#### P1.2 Application of these principles

Courses in all international ARDF events shall be planned in accordance with these principles. They should also serve as general guidelines for the planning of other competitive ARDF events.

### P2. Basic principles

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#### P2.1 Aim of good course planning

The aim of course planning is to offer competitors courses correctly designed for their expected abilities. Results shall reflect the competitors' technical and physical ability.

#### P2.2 Siting referee's golden rules

The siting referee shall keep the following principles in mind:

- the unique character of ARDF: the combination of direction finding under time stress and the physical ability
- the fairness of the competition
- competitors enjoyment
- the protection of wildlife and the environment
- the needs of the media and spectators

##### P2.2.1 Unique character

Every sport has its own character. The unique character of ARDF is to find a number of transmitters hidden in unknown terrain against the clock. This demands special skills: handling of the direction finding receiver and interpreting measurements, accurate map reading, route choice evaluation, concentration under stress, quick decision making, running in natural terrain, etc.

##### P2.2.2 Fairness

Fairness is a basic requirement in competitive sport. Unless the greatest care is taken at each step of course planning and transmitter placing, luck can easily become significant in ARDF competitions. The siting referee shall consider all such factors to ensure that the contest is fair and that all competitors face the same conditions during every part of the course.

##### P2.2.3 Competitors enjoyment

The popularity of ARDF can only be enhanced if competitors are satisfied with the courses they are given. Careful course planning is therefore necessary to ensure that courses are appropriate in terms of length, physical and technical difficulty, transmitters siting, etc. In this respect it is particularly important that each course is suitable for the competitors doing that course.

##### P2.2.4 Wildlife and the environment

The environment is sensitive: wildlife may be disturbed and the ground as well as the vegetation may suffer from overuse. The environment also includes people living in the competition area, walls, fences, cultivated land, buildings and other constructions, etc. It is usually possible to find ways to avoid interference with the most sensitive areas without damage. Experience and research have shown that even large events can be organised in sensitive areas without permanent damage if the correct precautions are taken and the courses are well planned.

It is very important that the siting referee ensures that there is access to the chosen terrain and that any sensitive areas in the terrain are discovered in advance.

### P3. ARDF course

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#### P3.1 Terrain

The terrain shall be chosen so that a fair competition is offered to all competitors. To safeguard the character of the sport, the terrain should be runnable and suitable for testing the ARDF skills of the competitors. On a good ARDF course, competitors are forced to concentrate on navigation throughout the race. Sections requiring no attention to navigation should be avoided (if possible).

Alternative routes force competitors to use the map to assess the terrain and to draw conclusions from it. Route choices make competitors think independently and will split up the field, thus minimising "following". A good course shall disperse the competitors throughout the competition area and not bring them together. The transmitters should be intentionally placed and numbered so that competitors of different categories have different "optimum first" transmitters. The direction of the start corridor carries a certain weight in these considerations.

Courses should not contain routes or transmitter order choices resulting in any advantage or disadvantage which cannot be foreseen from the receiver or the map by a competitor under competitive conditions.

Course sections which encourage competitors to cross the start or finish area or forbidden or dangerous areas must be avoided.

### **P3.2 Start**

The start area should be so situated and organised that:

- there is a warm up area and shelter sufficient for all competitors
- waiting competitors cannot see the bearings taken or route choices made by those who have already started.

The start point should not be located in the best part of the competition area – an area of 1.5 km in diameter around the start cannot be used for transmitters.

The start corridors shall be easy-to-run and clearly marked, especially at their ends and the following terrain should be runnable.

All transport from the start to the finish (competitors clothing, people) shall be well organized in order to prevent information transfer in the reverse direction.

### **P3.3 Transmitters**

Transmitter sites are the most important element of an ARDF course and will largely determine its quality.

It is particularly important that the map portrays the ground accurately in the vicinity of the transmitters. There shall be no objects disturbing the electro-magnetic field which might upset the bearings taken in the vicinity of the transmitters.

It is necessary to choose transmitter sites with the greatest care. Especially the 'acute angle' effect must be avoided meaning that incoming competitors will be led into the transmitter site by outgoing runners.

The mechanical performance of the transmitter, antenna and registering device with a flag shall be rugged. The transmitter and its accessories shall continue to operate for about eight hours under ANY circumstances. The antenna of the transmitter shall be properly installed and the transmitter final stage shall be properly tuned into the antenna. The counterpoises shall be installed in a way that they do not obstruct or trip competitors running over them.

Flags should be positioned such that competitors may see them when they are within ten meters of the transmitter. For fairness, the visibility of the flag should be the same whether or not there is a competitor near it.

### **P3.4 Finish**

The arrangement of the finish beacon, finish corridor and the whole finish area shall be distinct, clear and not confusing.

The finish corridor shall be easy-to-run, as straight as possible and at least 3 m wide. Two protective zones along both sides of the finishing corridor are recommended for better visibility and to prevent spectators from getting in the competitors' way.

## **P4. Siting referee**

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The siting referee should be fully acquainted with the terrain before he or she starts to plan the course. The siting referee should also be aware that on the day of the competition the conditions regarding map and terrain could be different from those which exist at the time the courses are planned.

The person responsible for course planning shall have an understanding and appreciation of the qualities of a good course gained from personal experience. He or she shall also be familiar with the theory of course planning and appreciate the special requirements of different categories.

The siting referee shall be able to assess, on site, the various factors which can affect the competition, such as the terrain, radio wave propagation, the quality of the map, the presence of participants and spectators, etc.

The siting referee is responsible for the courses and the running of the competition between the start and the finish line. It is strongly recommended that the siting referee's work shall be checked by another qualified referee to avoid errors which might have serious consequences.

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**Appendix 3: Approved control cards and registering devices**

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- C1. The only automatically approved control registering system is the traditional pin punch and control card system.
- C2. The control card shall satisfy the following specifications:
- it shall be made of resistant material and not exceed 7 x 16 cm in size,
  - each punch box shall have a minimum side length of 18 mm,
  - one box shall be clearly marked as reserve box,
  - the size of figures in punch boxes shall be at least 12 x 8 mm.
- C3. With respect to the electronic system, a backup unit must be present at each transmitter - either a second electronic unit or a pin punch. It is the competitor's responsibility to ensure that the electronic chip is held in the electronic registering device until the feedback signal has been received. If, and only if, no feedback signal is received, is the competitor to use the backup unit.
- C4. When using the pin punch backup, the competitor can punch either his/her map or start number bib. He/she is still responsible for the correct mark which must be clearly identifiable at the finish.
- C5. The use of any other registering system requires prior approval of the ARDF WG.

#### **Appendix 4: IARU ARDF International Class Referees**

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- R1. An IARU ARDF International Class Referee is an experienced ARDF official supervising the strict observation of the Rules at ARDF events.
- R2. There are two classes of IARU ARDF International Class Referees:
- Active Referees
  - Honorary Referees
- Unless otherwise noted, only Active Referees are considered in the ARDF Rules.
- R3. Candidates for nomination as an IARU ARDF International Class Referees shall fulfill the following conditions:
- to be a holder of a valid amateur radio transmitting licence
  - to be a member of an IARU member society
  - to be presented by the ARDF manager of his society
  - to be familiar with ARDF Rules, guidelines and all ARDF WG documents concerned
  - to be able to communicate in English
  - to be physically able to serve in the competition terrain
- R4. Candidates for nomination as an IARU ARDF International Class Referee shall be submitted by his or her national society to the relevant regional ARDF WG confirming that the candidate fulfills the conditions listed in paragraph 3. The Chairman of the ARDF WG shall send the request for nomination (with his comment) to the relevant regional Executive Committee for final approval. After the approval of the Executive Committee, a written certificate is issued to the newly appointed referee.
- R5. The number of IARU ARDF International Class Active Referees shall not exceed FIVE for each member society.
- R6. Any referee who has not served once as a Jury member at national or international ARDF events organized by the IARU or one of its societies for five consecutive years, shall be moved automatically to be an Honorary Referee. At the start of every year the ARDF WG shall update the list of IARU ARDF International Class Referees, moving – if appropriate – inactive referees from the list of Active Referees to the Honorary Roster. Honorary Referees may be returned to the Active list by request of his or her society.
- R7. Societies having IARU ARDF International Class Referees shall send, as at December 31<sup>st</sup>, a list to the chairman of the ARDF WG showing the activities of their referees in the year ended.

## Appendix 5 : Start list preparation

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On the evening of day one (arrival day) of a championship the nominations of all competitors shall be in the hands of the organiser.

To prepare the start list all nominations are to be split up into their corresponding categories and these into one of the following two groups:

- categories with up to 40 competitors - in which competitors shall start singly ;
- categories with more than 40 competitors - in which two competitors shall start together ;

Note: When presenting the list of competitors to the organising society (see part A – Organisation, para.8.3.) team leaders are also requested to indicate the starting sequence of the competitors in each category.

To guarantee fairness and to avoid any chances of manipulation it is clear that the preparation of the start list becomes of great importance for any championship. The following balloting procedure has been designed to fulfill these requirements and organisers shall make themselves acquainted with the balloting method well in advance of the event. Although appearing rather complex - especially in written form - organisers will soon gain experience of how to handle the system. Furthermore it is to be expected that suitable computer software shall be made available shortly by the ARDF WG.

At larger competitions with many societies having nominated the maximum number of competitors in all or nearly all categories, the manual procedure to draw up the start list cannot maintain all the essential requirements. The manual procedure then has to be replaced by a computer program that fulfills all the requirements.

### Balloting procedure to prepare the start list for categories with up to 40 competitors:

Note: Categories may be merged during the balloting process if this does not increase the number of start groups.

Single competitors and those belonging to teams of two or three have to be spread equally over the whole of the start period. This is easy for teams of three: every competitor shall be placed into a different third of the starting period. Competitors of teams of two and single runners, however, are to be spread by the following balloting procedure:

Balloting shall start by drawing lots for the two person teams (alphabetical order of the societies involved). For this procedure a ballot box has to be filled with three lots each marked with the number of the corresponding starting third. Two of these lots shall be drawn for the first two person team and the two runners shall start in the corresponding starting thirds. The lot which is still in the box shall be drawn for the next two person team. As there are no more lots in the box the three lots shall be replaced into the box and another lot shall be drawn for the second runner of the second two person team. The remaining two lots shall be drawn for the third team. The box shall then be refilled again and balloting continues until all two person teams have been distributed equally over the three starting thirds. The same procedure shall be applied to distribute the single runners.

Now follows the determination of the starting sequence for this category. Lots carrying the numbers of their starting thirds (as used before) also have to be marked with the name of the society they stand for (except all blanks, of course, which are to be employed in this process as well - see below). Three ballot boxes are required - one for each start third. Into each of these boxes one lot for each runner of a three person team is to be placed. Also the lots of the balloting procedure of the teams of two and the single runners must be added to the corresponding boxes. Eventually blanks must be used to compensate for unequal numbers of lots in any of the three boxes. Further blanks are to be added to every box until the total number of lots in each box corresponds to a third of the starting groups of the category having the highest number of starting groups in the championship. There must be a minimum of 33 lots spread over the three boxes, however, because a society can send up to 33 competitors (3 runners in 11 categories).

For the final preparation of the starting list please see below.

### Balloting procedure to prepare the start list for categories with more than 40 competitors:

Competitors in these categories have to be split up into "top-runners" and "other-runners". To be selected as a top-runner the organiser shall consider the results lists of the last two ARDF Championships and in doing so it will be irrelevant if the same or another sportsman has been nominated by his or her national society for the category concerned. Only the society to whom she or he belongs is relevant. It will be taken for granted that a new sportsman from a particular society will be as good as his previous colleague.

For ARDF World Championships, top-runners shall be selected on basis of the last two ARDF World Championships. For Regional Championships the results of the last two Regional Championships shall be considered.

Considering the results of the two 3,5 MHz and the two 144MHz competitions of the last two championships and starting with position no. 1 and working down from the top, the organiser shall note separately for every category all those societies which have had runners in top positions. All competitors (of a certain category) nominated by these societies

shall then be listed as "top runners" until at least 50% of the total number of competitors in this category is reached. For this procedure it shall be irrelevant if these societies have nominated teams of three or two or single runners. The other competitors in this category shall be listed as "other runners".

If the results lists of the last two championships do not yield 50% "top-runners", competitors from the remaining societies should be considered. The sequence of the societies shall be in alphabetical order.

For categories with less than 40 participants there now follows the procedure for the preparation of the two independent ballots for "top-runners" and "other-runners". First teams of two and single runners shall be distributed equally over the three start thirds. Then to each box of the three thirds an equal number of runners of the three person teams has to be added (not forgetting eventual blanks) and finally the lots shall be drawn - as described below - to determine the starting sequence of the "top-runners" of this category. Nearly the same procedure shall be applied to establish the starting sequence of the "other-runners". However, before drawing, the blanks have to be placed into those start groups which are already filled with blanks of the top runners of the same category. Then the lots of the "other runners" are being drawn and distributed over the various start groups.

**Final preparation of the start list:** lots resulting from the previous balloting procedures for each category and each starting third have been placed into boxes - one for each starting third and category. Drawing one lot after the other and starting with box number 1 (and starting e.g. with the M21 category) the organiser sets up the start list for this category. If the first third has been finished, start thirds two and three shall follow. If by changing from one box to the next the last drawn society and the one drawn out of the new box are the same, the lot drawn last shall be placed one start group later and the empty space be filled by the following lot. A similar procedure applies if two runners of the same society have been drawn for the same start group (within different categories, of course). If placing of such a lot into the next later start group is impossible (because the following group(s) is/are already filled with this same society for other categories) that lot shall be placed at the first possible location in exchange for a lot that might be in this position. If a replaced lot should also not fit, the exchange process has to continue and in cases where this occurs at the end of a starting third, the exchange process has to return to the start of this third only.

After all lots of the first category have been drawn and their starting positions been marked, balloting must continue for the other categories in the same way as described above until the start list is completed.

If organised in a suitable way the drawing procedure offers an excellent opportunity for media and public attention. The best time for drawing would be the morning of the day after arrival. Studying the results lists of the last two earlier championships well before this day, the organiser has ample time to prepare everything that is required to finish this spectacular procedure within a reasonable time. Supervised by one or several Jury members, the lots being drawn - carrying so far only the names of the societies - could be fixed on a large board (or any other suitable display) visible to all present. The organiser should have at his/her disposal a list of the names of all competitors and the sequence in which the team leader wishes them to start. So each lot on the board shall be marked with the name of the corresponding competitor. The organiser can enter all the details into the computer system to print the start list for immediate distribution.

Although spectacular, it is obvious that a manual balloting procedure will consume a certain time span (two to three hours typically). So if the organiser prefers to employ an electronic balloting system he/she must obtain the permission of the chairman of the ARDF Working Group as early as possible but not later than three months before the start of the championship indicating at the same time which software is to be employed.

Any computer program must perform the same functions as the manual balloting procedure. Improvements in the balloting procedure as such are permitted.

The permission by the chairman shall be granted only if a) the organiser intends to use an approved software for the balloting process, or b) the organiser obtains approval for his own software.

To obtain approval of any balloting software, this software together with description and documentation of the algorithms used has to be sent to the chairman of the ARDF WG at least six months before the championship. The software shall be tested and having been passed the software becomes "approved software for balloting in ARDF Championships". Such software shall be added to a software pool and becomes public domain for use at International Championships.

An electronic balloting procedure shall be carried out on a computer designated by the ARDF WG Chairman. The organising society shall present the list of all participants. The result lists of the last two championships shall be supplied by the chairman.

## Appendix 6: Rules for Youth Regional ARDF Championships

These Rules are based on the Rules for Championships in Amateur Radio Direction Finding. The points as stated below replace identically numbered points of part A and B of the Rules.

- Y1.6 A Youth Regional ARDF Championship is the event to award the title of Youth Regional Champion in ARDF. A Youth Regional ARDF Championship is organised by an amateur radio society authorised by its corresponding IARU Organisation.
- Y3.1 A Youth Regional ARDF Championship is an annual event.
- Y4.3 Applications are to be received by the Chairman of the ARDF WG not later than January 31st two years prior to the year of the Championship.
- Y5.5 Not valid at Youth Regional ARDF Championships.
- Y6.4 Not valid at Youth Regional ARDF Championships.
- Y9.1 The International Jury for Youth Regional ARDF Championships shall consist of the following members:
- Chairman of the Jury
  - Secretary of the Jury
  - Siting referee
  - representative of each participating society
- Y9.2 The Chairman of the Jury at a Youth Regional ARDF Championship shall be an ARDF International Class Referee authorised by the relevant regional ARDF WG.
- Y9.3 The referees in the competition area, at start and finish and the siting referee shall be experienced referees provided by the organising society.
- Y9.4 The names of the members of the International Jury shall be recorded and announced at the first Jury meeting at the Championship at the latest.

Y14.2. Categories:

Women (W)	Men (M)	Age
W14	M14	14 and younger
W16	M16	16 and younger

- Y14.3 Competitors belong to the particular category up to the end of the calendar year in which they reach the given age.
- Y14.7 Each society may enter a team of up to five competitors in each category for the whole Championship (i.e., the same competitors must be entered for all races).
- Y19.3 Transmitters including the finish beacon shall be located not less than 400 meters apart. The transmitter nearest to the start shall be located not less than 500 meters from the start.
- Y19.7 Number of transmitters and course lengths assigned to particular categories:

Category	number of transmitters	effective course length
W14	3..4 + finish beacon	3..4 km
W16	3..4 + finish beacon	3..5 km
M14	3..4 + finish beacon	3..5 km
M16	3..5 + finish beacon	4..6 km



## Appendix 7: Rules for ARDF Sprint Event

### S1. General provisions

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S1.1 It is strongly recommended that the sprint event is a regular part of the IARU ARDF World or Regional Championships. Its aim is to bring ARDF nearer to the public and to attract potential sponsors and new athletes to ARDF.

**NOTE: The organizer shall declare in the Bulletin 1 at the latest whether the ARDF World/Regional Sprint Championship will be organized or not.**

S1.2 The sprint event shall be organized on Day 1 or on the free day between the main competitions.

S1.3 The sprint event shall be organized on the 3.5 MHz band.

S1.4 The sprint event shall be organized in a forest or city park easily accessible by the public.

### S2. Categories

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S2.1 Each society may enter a team with up to three competitors in each category.

### S3. Starting order

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S3.1 Competitors start at 2 minute-intervals in all categories.

S3.2 Competitors from the same society and category may not start consecutively.

### S4. Race system

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S4.1 The competition shall be run as two loops with a spectator run through the finish area between them.

S4.2 Each competitor runs through the start corridor, which leads to the area with transmitters No.1 to No.5 (slow keying). After finding all the required transmitters from this loop, he/she runs to the spectator control and through the spectator corridor to the area with transmitters No.1F to No.5F (fast keying). After finding all the required transmitters from this loop, the competitor runs to the finish beacon and through the finishing corridor to the finish line.

S4.3 The transmitters hunted on each of the loops are defined in advance but may be visited in any order. All transmitters hunted on each loop shall be on the same frequency.

S4.4 The finish beacon and the spectator control may be at the same place. In this case, there is no spectator control transmitter.

### S5. Courses

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S5.1 The transmitters shall be located not less than 100 metres apart and not less than 100 metres from the start.

S5.2 The beacon (B) and the spectator control (S), if this differs from the beacon, could be located less than 100 metres from the start.

S5.3 The course shall be planned for an expected winning time of 15 minutes in all categories.

### S6. Maps

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S6.1 The map for the sprint event shall be made at the scale 1:5000 or 1:4000, and shall not be more than 2 years old.

S6.2 The competitor receives the map along with the receiver in the pre-start area 2 minutes before the start. The start, finish beacon, spectator control, if this differs from the beacon, finish corridor and finish line shall be clearly marked on the map. The start is marked by a triangle (symbol 701), the finish beacon and spectator control by a circle (symbol 702), the finish corridor by a dashed line (symbol 705) and the finish by two concentric circles (symbol 706).

S6.3 The organization of the finish area shall be explained to the competitors in advance along with the symbols on the map.

**S7. Transmitters**

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- S7.1 Transmitters with a lower output power (0.3...1W) shall be used in the sprint competitions.
- S7.2 The beacon (B) and the spectator control (S), if this differs from the beacon, shall operate continuously on the frequencies different from the other transmitters and from each other.
- S7.3 Two sets of five transmitters shall be used in the sprint event. Transmitters groups 1 to 5 and 1F to 5F shall operate on different frequencies and with different keying speeds.

Example of frequency and keying speed assignment:

frequency	function	code	speed
3510kHz	TX 1...5	MOE...MO5	50 PARIS
3540kHz	spectator control	S	70 PARIS
3570 kHz	TX 1F (fast)...5F	MOE...MO5	70 PARIS
3600 kHz	finish beacon	MO	50 PARIS

- S7.4 Transmitters operate in the following sequence:

No. 1 and 1F sending code MOE in seconds 0 to 12  
 No. 2 and 2F sending code MOI in seconds 12 to 24  
 No. 3 and 3F sending code MOS in seconds 24 to 36  
 No. 4 and 4F sending code MOH in seconds 36 to 48  
 No. 5 and 5F sending code MO5 in seconds 48 to 60

- of a 1-minute cycle starting at 0:00

- S7.5 Transmitters are equipped with registering devices without flags. The finish beacon is equipped with at least two registering devices, especially if acting as the spectators control as well.
- S7.6 The beacon (B) and the spectator control (S), if this differs from the beacon, are registered as any other transmitter.
- S7.7 The number of transmitters assigned to each age category will normally be twice the number given in 19.7. There shall be an equal number of transmitters assigned on the fast and slow keyed frequencies.

**S8. Corridors**

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- S8.1 The start corridor is the corridor that runs away from the start. The end shall be clearly marked and only after this point can the competitor start searching for the transmitters. The start corridor shall not be longer than 400 metres.
- S8.2 When leaving the spectator control, competitors shall run along the spectator corridor. The spectator corridor shall not be longer than 300 metres. The spectator control shall be placed at the entrance to the spectator corridor.
- S8.3 The finish corridor is the corridor that shall be run from the beacon to the finish line. The finish beacon shall be placed at the entrance to the finish corridor. The finish corridor shall not be longer than 400 metres.

**S9. General arrangements**

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- S9.1 Competitors waiting for the start shall be well separated from any other people (spectators and competitors who already finished their races) once the first competitor has started.

## Appendix 8: Rules for the ARDF Foxoring Event

### F1. Basic explanation

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Foxoring is a special format of the ARDF competition. Its main features are as follows:

- At the start, competitors get competition map with marked start, finish beacon and nominal positions of the transmitters.
- Transmitters except for the finish beacon are placed close to their nominal positions marked on the maps.
- All transmitters except for the finish beacon are very weak and therefore audible only at the close vicinity of the antenna. All transmitters operate continuously.
- The RF field strength of each transmitter is adjusted so that :
  - the transmitter is clearly audible at its nominal position marked on the map AND at the distance of 30m from its real position
  - the transmitter is NOT audible at the distance of 250m from its real position.
- Competitors shall run to the close vicinity of the transmitters by means of the map and then complete the final approach by means of the direction finding receiver.

The Foxoring Rules are based on the Rules for Championships in Amateur Radio Direction Finding. The points as stated below replace identically numbered points of part A and B of the Rules.

### 15. Training event

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F15.1 For training purposes the organising society shall offer a model event on the day prior to the competition to demonstrate the transmitter features, the set-up of transmitters and antennas, the registering devices etc., which will be used in the competitions. One transmitter of each frequency which will be used in the competition shall be installed.

### 16. Starting order

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F16.6 The competitors within one category start at equal start intervals. Minimum start interval is 2 minutes.

F16.7 All competitors of a particular category shall start in the same start corridor

### 19. Courses

---

F19.3 Transmitters including the finish beacon shall be located not less than 250 meters apart. The transmitter nearest to the start shall be located not less than 250 meters from the start.

F19.7 Number of transmitters and course lengths assigned to particular categories:

Category	number of transmitters	effective course length
W19	5...8 + finish beacon	4...6 km
W21	6...10 + finish beacon	5...7 km
W35	5...8 + finish beacon	4...6 km
W50	4...7 + finish beacon	3...5 km
W60	4...7 + finish beacon	3...5 km
M19	6...8 + finish beacon	6...8 km
M21	8...10+ finish beacon	7...9 km
M40	6...8 + finish beacon	6...8 km
M50	5...8 + finish beacon	5...7 km
M60	5...8 + finish beacon	4...6 km
M70	4...7 + finish beacon	3...5 km

F19.8 The composition of the courses (transmitter numbers assigned to particular categories) shall be defined by the siting referee and published on or before the day prior to the competition and before the training.

## 21. Maps

---

F21.3 The competition map shall cover the whole competition area including start, finish beacon and all transmitters. The map start (the point where competitors obtain the maps), nominal positions of all transmitters assigned to the particular category, finish beacon and the finish corridor shall be clearly marked on the map. The start is marked by a triangle (symbol 701), all transmitters by a circle (symbol 702), the finish corridor by a dashed line (symbol 705) and the finish by two concentric circles (symbol 706).

F21.6 Maps shall be protected against moisture.

## 24. Start

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F24.1 Spare receivers and components, clearly marked as property of a particular team or competitor, shall be placed at an indicated point just beyond the starting line beside the starting corridor.

F24.5 Competitors shall enter the pre-start area not earlier than FIVE MINUTES before their own start. At the same time, they shall be given their receivers. Competitors receive maps after their start, at the starting line or at the indicated point within the starting corridor.

## 25. Transmitters

---

F25.3 Each transmitter shall be clearly audible during the whole competition at its nominal position marked on the map AND at the distance of 30m from its real position. Transmitters shall NOT be audible at the distance of 250 m from their real positions. The finish beacon operates at normal power and therefore shall be clearly audible during the whole competition from the start point. Audibility of all transmitters shall be considered as using a receiver of average sensitivity.

F25.9 All transmitters except for finish beacon have no flags. Registering devices shall be placed at the immediate vicinity of each transmitter.

F25.10 not valid

## 26. Transmitters arrangement

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F26.1 Competitions in Foxoring are organized on the 3.5 MHz band.

F26.2 There are number of transmitters in the competition area plus the finish beacon. Transmitters shall operate continuously.

## Technical Specifications for ARDF Foxoring

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FT2.6 Specifications for the 3.5 MHz transmitters:

- |   |  |
|---|--|
| • Carrier frequency *                                       | 3510 ... 3600 kHz                      |
| • Frequency stability                                       | better than 50 ppm                     |
| • Channel spacing between the beacon and other transmitters | more than 30 kHz                       |
| • Undesired products level                                  | conforming to the national regulations |
| • Output RF power (finish beacon)                           | 1 ... 5 W                              |
| • Output RF power (other transmitters)                      | 10 mW                                  |
| • Mode  | A1A (keyed unmodulated carrier)        |
| • Keying speed  | 8 ... 15 WPM                           |
| • Antenna (finish beacon)                                   | vertical                               |
| • Antenna (other transmitters)                              | vertical (approx. 30 cm long)          |