CEPT ECC
Electronic Communications Committee

ECC Decision (16)01

The harmonised frequency band 76-77 GHz, technical characteristics, exemption from individual licensing and free carriage and use of obstacle detection radars for rotorcraft use

approved 04 March 2016

latest updated 30 October 2026

EXPLANATORY MEMORANDUM

1 INTRODUCTION

The free circulation of radio communication products and the provision of equipment in Europe for radio communications are only achievable if there are common regulations throughout Europe regarding the availability of frequency bands, harmonised technical conditions and border crossing procedures. The main requirements for fulfilling these objectives for obstacle detection radars for rotorcraft use are the Europe-wide availability of a suitable frequency band, harmonised technical conditions and the implementation of national regulations.

The mature and readily available radar technology in the band 76 GHz to 77 GHz provides appropriate sensor performance combined with values of low sensor size, weight, power consumption and cost that make it ideally suited for this airborne application.

Radar characteristics are derived from the required detection capability to also detect those obstacles that are most difficult to be visually identified by the flight crew (e.g. power lines, poles, masts etc.).The effective detection range of the sensors is prescribed by the velocity at which the rotorcraft approaches the environment as well as the minimum warning time needed for the pilot to assess the situation and initiate evasive manoeuvres.

Note: The use of the system is limited to manned rotorcraft for which certification specifications CS-27 for small rotorcraft or CS-29 for large rotorcraft apply (since pilots need to verify visually the information directly by themselves). The system is also connected to the GNSS positioning information available at the rotorcraft, so that automatic deactivation is ensured when approaching and flying into a defined exclusion zone around a radio astronomy site.

The intended function of the obstacle detection system is to detect and inform the flight crew of obstacles in a protective volume around the rotorcraft. The operational benefit of this system is in the initial or final phases of flight, as well as during hovering phases, in which the rotorcraft manoeuvers in ground vicinity at low airspeeds. It is in those flight phases in which there is an increased risk of collision with all kinds of obstacles. To cover all degrees of freedom of the rotorcraft in approach, landing, hovering and take-off, the envelope to be covered is ideally the lower hemisphere around the rotorcraft.

This decision only covers the radio regulatory aspects of operation of such systems, not the aviation safety aspects (both technical and human factors related) that are in the responsibility of the relevant aviation authorities.

2 BACKGROUND

ECC received the ETSI Technical Report ETSI TR 103 137 V1.1.1 (2014-01) on “Surveillance radar equipment for helicopter application operating in the 76 GHz to 79 GHz frequency range” [1]. In the ETSI Technical Report two different radar modes are presented: a short range mode operating in the 76 to 77 GHz band and a long range mode operating in the 76 to 79 GHz band. The request has been modified later on in the process towards this ECC Decision to limit the regulatory approach to one obstacle detection system only which operates in the 76 GHz to 77 GHz frequency range. The values of the technical requirements for the obstacle detection radar system to be regulated in this Decision do not exceed the values used in ETSI TR 103 137, the ECC Report 222 [2] and the corresponding separation distance calculations.

An agreed regulatory approach is required to ensure that the spectrum utilised by obstacle detection radars on-board rotorcrafts can be used in any national airspace that the aircraft is crossing, provided that the system conforms to agreed radio specification limits in order to prevent harmful interference.

The designation of a harmonised band forms the basis for the free circulation and use of obstacle detection radars on-board rotorcrafts within Europe. ECC included this application within the update process under the permanent mandate for revision of the technical annex of the EC Decision for short range devices (Commission Decision 2006/771/EC and its amendments).

3 REQUIREMENT FOR AN ECC DECISION

The allocation or designation of frequency bands for use by a service or system under specified conditions in CEPT administrations is laid down by law, regulation or administrative action. ECC Decisions are required to deal with the radio spectrum related matters and for free circulation and use of equipment throughout Europe. The free circulation and use of radio equipment will be greatly assisted when all CEPT administrations exempt the same categories of radio equipment from licensing and accordingly apply the same criteria.

The harmonisation on a European basis supports the Directive 2014/53/EU of the European Parliament and of the Council of 16 April 2014 on the harmonisation of the laws of the Member States relating to the making available on the market of radio equipment and repealing Directive 1999/5/EC [3]. A commitment by CEPT administrations to implement this ECC Decision will provide a clear indication that the required frequency bands are available on a European-wide basis, for obstacle detection radars for rotorcraft use.

ECC DECISION OF 04 MARCH 2016 ON THE HARMONISED FREQUENCY BAND 76-77 GHz, TECHNICAL CHARACTERISTICS, EXEMPTION FROM INDIVIDUAL LICENSING AND FREE CARRIAGE AND USE OF OBSTACLE DETECTION RADARS FOR ROTORCRAFT USE (ECC DECISION (16)01) CORRECTED 18 NOVEMBER 2016 AND UPDATED 30 OCTOBER 2026

"The European Conference of Postal and Telecommunications Administrations,

considering

a) that every state has sovereignty over the airspace, including the radio spectrum, above its territory;

b) that use of obstacle detection radars for rotorcrafts requires authorisation by the relevant national administration and/or civil aviation authority of the country where the rotorcraft is registered;

c) that the installation of obstacle detection radars for rotorcraft use is subject to aviation regulation, including airworthiness certification, by the relevant aviation authorities and the equipment cannot be put into operation until it complies with these regulations;

d) that obstacle detection radars may be used in rotorcrafts and will aid the crew in the obstacle detection task while manoeuvring at low airspeeds typically close to the ground;

e) that the system reduces the risk of collision with objects by an early detection of obstacles and will therefore improve safety for aircrew, passengers and persons on the ground;

f) that harmonised conditions across CEPT/EU help to establish an effective single market for these applications, with consequent economies of scale and benefits to the flying rotorcraft fleet above Europe, and avoid difficulties in enforcing divergent national regulations;

g) that devices using obstacle detection radars for rotorcrafts are not considered as a safety of life application in accordance with the ITU Radio Regulations [4]. They must operate on a non-interference, non-protected basis;

h) that the issue of compatibility of obstacle detection radars for rotorcraft use with other radio equipment including aeronautical communication and navigation equipment operated on board a rotorcraft is the responsibility of the relevant aviation authorities;

i) that a co-existence study considering obstacle detection radars for rotorcraft use and existing radio services and applications (Radio Astronomy Service (RAS), Radio Amateur and Amateur-Satellite Services (AS), automotive radar applications and fixed transport infrastructure radar applications (as in Commission Decision 2006/771/EC and its amendments)) in the frequency band from 76 GHz to 77 GHz has been conducted by the ECC and that the results of these studies are contained in ECC Report 222 [2];

j) that administrations can define exclusion zones to protect the Radio Astronomy Service (RAS) on a national level;

k) that there is an industry and user requirement for harmonised usage conditions for the use of radio equipment throughout Europe for obstacle detection radars for rotorcraft use;

l) that it would be desirable for administrations to have common regulations at their disposal in order to control free carriage and use of obstacle detection radars for rotorcraft use throughout Europe;

m) that ETSI developed the Harmonised European Standard EN 303 360 "Short Range Devices; Transport and Traffic Telematics (TTT); Radar equipment operating in the 76 GHz to 77 GHz range; Harmonised Standard covering the essential requirements of article 3.2 of Directive 2014/53/EU; Obstacle Detection Radars for Use on Manned Rotorcraft" [5] for heliborne obstacle detection radar equipment;

n) that changes of the protection of radio astronomy sites (RAS) in Annex 2 will be visible by means of this Decision as well as the ETSI EN 303 360 and subsequently be implemented under the responsibility of the rotorcraft manufacturers;

DECIDES

1. that the **purpose of this ECC Decision** is to harmonise the usage conditions for obstacle detection radars operating in 76 GHz to 77 GHz for rotorcraft use;

2. that CEPT administrations shall designate the band 76 GHz to 77 GHz for obstacle detection radars for rotorcraft use;

3. that subject to decides 6 (technical requirements) and 12 (RAS exclusion zone implementation) below, CEPT **administrations shall** permit free carriage and use of obstacle detection radars on-board rotorcrafts;

4. that CEPT **administrations shall** exempt from individual licensing the obstacle detection radar devices permitted under this ECC Decision;

5. that the obstacle detection radar devices permitted under this ECC Decision operate on a non-interference and non-protected basis;

6. that the technical requirements in Annex 1 apply to obstacle detection radar devices permitted under this ECC Decision;

7. that the obstacle detection radar devices permitted under this ECC Decision shall inhibit sensor transmission during cruise flight phase or when flying inside a RAS exclusion zone included in Annex 2;

8. that any request for update of the information on radio astronomy sites (RAS) in Annex 2 (new RAS sites or withdrawal of RAS sites, exclusion zones) shall be notified by administrations to the European Communications Office specifying the date on entry into force or when this exclusion zone is no longer required;

9. that changes of protection of radio astronomy sites (RAS) in Annex 2 shall be effective in the obstacle detection radar devices within a timeframe of not more than 12 months after the notification of the specified exclusion zones. Changes should be recorded by adding a new exclusion zone and indicating the end date on the previous version of that zone;

10. that this Decision **enters into force** on 04 March 2016;

11. that the preferred **date for implementation** of this Decision shall be 05 September 2016;

12. that national administrations having (a) radio astronomy site(s) included in Annex 2 shall inform the European Communications Office about the national exclusion zone implementation by the preferred date for implementation of this ECC Decision;

13. that CEPT administrations should inform the European Communications Office about the national implementation of this Decision by updating their national implementation information in relation to the entry for obstacle detection radars for rotorcraft use in ERC Recommendation 70-03, annex 5."

Note:

Please check the ECO Documentation Database https://docdb.cept.org/ for the up to date position on the implementation of this and other ECC Decisions.

ANNEX 1: TECHNICAL REQUIREMENTS FOR THE OBSTACLE DETECTION RADAR DEVICES FOR ROTORCRAFT USE PERMITTED UNDER THIS ECC DECISION

Table 1: Technical requirements

Frequency Band	Power / Magnetic Field	Spectrum access and mitigation requirements	Notes
76-77 GHz	30 dBm peak e.i.r.p.	≤ 56 %/s duty cycle	3 dBm/MHz average power spectral density. For obstacle detection radars for rotorcraft use.

ANNEX 2: PROTECTION OF RADIO ASTRONOMY SERVICE (RAS) SITES

Administrations can define on a national level the size of the exclusion zone to protect the RAS as appropriate. One example of an assessment method that might be used on a national level is a procedure provided in ECC Report 222, annex 10 [2].

In case of life-saving missions, the obstacle detection radar devices may be used without protecting the radio astronomy sites (RAS), only on decision by the pilot on case by case basis and by activation from the pilot pursuant Article 4.9 of the ITU Radio Regulations.

Table 2 lists the RAS stations in the CEPT operating in the range 76 to 77 GHz.

Table 2: Use or potentially use of RAS in the 76 to 77 GHz frequency band within CEPT

<table>
<tr><th>Observatory Name</th><th>Administration</th><th>Latitude (N) Longitude (E)</th><th>Altitude (Above Mean Sea Level) (in metres)</th><th>Geographical Characteristics</th><th>Date of entry into force of this exclusion zones</th><th>Date at which the exclusion zone was no longer required</th><th>Exclusion Zone Implementation[1]</th></tr>
<tr><td>Metsahovi 14 m</td><td>Finland</td><td>60°13'04"
24°23'37"</td><td>61</td><td></td><td>4 March 2016</td><td>--</td><td>An exclusion zone is not defined because there is no research activity at the moment in the 76 - 77 GHz frequency range.</td></tr>
<tr><td>Plateau de Bure, 12 x 15 m Array, IRAM,</td><td>France</td><td>44°38’02”
05°54’28.5”</td><td>2250</td><td>Isolated high mountaintop in line-of-sight to various public facilities</td><td>4 March 2016</td><td>--</td><td>
<table>
<tr><th>Height above ground (metres)</th><th>Latitude (N), Longitude (E) Central point</th><th>Radius (kilometres)</th></tr>
<tr><td>< 3</td><td colspan="2">No protection (*)</td></tr>
<tr><td rowspan="2">3 to < 100</td><td>44.638499°N, 6.020521°E</td><td>43</td></tr>
<tr><td>44.112578°N, 6.076490°E</td><td>39</td></tr>
<tr><td>100 to < 300</td><td>44.666733°N, 6.021409°E</td><td>46</td></tr>
</table>
</td></tr>
</table>

[1] According to WGS84 (World Geodetic System 1984)

<table>
<tr><th>Observatory Name</th><th>Administration</th><th>Latitude (N) Longitude (E)</th><th>Altitude (Above Mean Sea Level) (in metres)</th><th>Geographical Characteristics</th><th>Date of entry into force of this exclusion zones</th><th>Date at which the exclusion zone was no longer required</th><th>Exclusion Zone Implementation[1]</th></tr>
<tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td>
<table>
<tr><td></td><td>44.121552°N, 6.069830°E</td><td>49</td></tr>
<tr><td rowspan="3">300 to 1000</td><td>44.150002°N, 6.01667°E</td><td>57</td></tr>
<tr><td>44.661033°N, 5.974051°E</td><td>74</td></tr>
<tr><td colspan="3">(*)The rotorcraft radar has to be turned off during take-off and landing from the station of Bure
The protection zones were derived from the respective maximum height above ground level</td></tr>
</table>
</td></tr>
<tr><td>Maido (la Réunion)
Horns 0.25 x 0.36 m, 0.70 x 0.48 m</td><td>France</td><td>-21°04’46”
55°23’01”</td><td>2200</td><td>Mountain top</td><td>4 March 2016</td><td>--</td><td>
<table>
<tr><th>Height above Ground (metres)</th><th>Latitude (N), Longitude (E) Central point</th><th>Radius (kilometres)</th></tr>
<tr><td>< 3</td><td colspan="2">No protection zone (*)</td></tr>
<tr><td rowspan="2">3 to 1000</td><td>-20.771199°N, 54.972865°E</td><td>69</td></tr>
<tr><td>-21.539077°N, 54.778243°E</td><td>66</td></tr>
<tr><td colspan="3">(*)The rotorcraft radar has to be turned off during take-off and landing from the station of Maido
The protection zones were derived from the respective maximum height above ground level</td></tr>
</table>
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<table>
<tr>
<td>Effelsberg,
100 m</td>
<td>Germany</td>
<td>50°31’32”
06°53’00”</td>
<td>369</td>
<td>Broad flat plain exposed to nearby roads</td>
<td>4 March 2016</td>
<td>--</td>
<td>
<table>
<tr><th>Height above ground (metres)</th><th>Latitude (N), Longitude (E)</th><th>Radius (kilometres)</th></tr>
<tr><td>< 3</td><td colspan="2">No protection zone</td></tr>
<tr><td>3 to < 100</td><td>50.52898°N, 6.906735°E</td><td>8.5</td></tr>
<tr><td rowspan="2">100 to < 300</td><td>50.527057°N, 6.959232°E</td><td>21</td></tr>
<tr><td>50.785613°N, 7.185484°E</td><td>20</td></tr>
<tr><td>300 to 1000</td><td>50.569565°N, 7.110509°E</td><td>53</td></tr>
<tr><td colspan="3">The protection zones were derived from the respective maximum height above ground</td></tr>
<tr><td colspan="3">
Schutzzonen.jpg</td></tr>
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<tr>
<td>Sardinia Radio Telescope 64 m</td>
<td>Italy</td>
<td>39°29’34”
09°14’42”</td>
<td>600</td>
<td>On a valley partially surrounded by hills, no natural shields in North and West directions. Exposed to nearby roads.</td>
<td>29 November 2016</td>
<td>--</td>
<td>
<table>
<tr><th>Height above ground (metres)</th><th>Latitude (N), Longitude (E)</th><th>Radius (kilometres)</th></tr>
<tr><td rowspan="2">0 to < 100</td><td>39.677757°N, 8.656262°E</td><td>23</td></tr>
<tr><td>39.653577°N, 9.135560°E</td><td>25</td></tr>
<tr><td rowspan="2">100 to < 300</td><td>39.748209°N, 8.887414°E</td><td>38</td></tr>
<tr><td>39.449300°N, 9.268361°E</td><td>13</td></tr>
<tr><td rowspan="2">300 to 1000</td><td>39.800684°N, 8.895254°E</td><td>51</td></tr>
<tr><td>39.353442°N, 8.978644°E</td><td>47</td></tr>
</table>

Protection zones Sardinia.jpg
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<td>On a valley partially surrounded by hills, no natural shields in North and West directions. Exposed to nearby roads.</td>
<td>4 March 2016</td>
<td>28 November 2016</td>
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<table>
<tr><th>Height above ground (metres)</th><th>Latitude (N), Longitude (E)</th><th>Radius (kilometres)</th></tr>
<tr><td>< 3</td><td colspan="2">No protection zone</td></tr>
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</table>

Protection zones Sardinia.jpg
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<tr>
<td>Noto 32 m</td>
<td>Italy</td>
<td>36°52′33″
14°59′20″</td>
<td>90</td>
<td>Relatively isolated. More exposed in South and West directions.</td>
<td>29 November 2016</td>
<td>--</td>
<td>
<table>
<tr><th>Height above ground (metres)</th><th>Latitude (N), Longitude (E)</th><th>Radius (kilometres)</th></tr>
<tr><td rowspan="2">0 to < 100</td><td>36.843323°N, 14.948270°E</td><td>10</td></tr>
<tr><td>36.927102°N, 14.831307°E</td><td>7</td></tr>
<tr><td rowspan="2">100 to < 300</td><td>36.907848°N, 14.837616°E</td><td>20</td></tr>
<tr><td>36.648057°N, 14.949379°E</td><td>18</td></tr>
<tr><td rowspan="2">300 to 1000</td><td>36.839554°N, 14.854403°E</td><td>35</td></tr>
<tr><td>36.369523°N, 14.870684°E</td><td>35</td></tr>
</table>

Protection zones Noto.jpg
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</table>

Protection zones Noto.jpg
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<tr>
<td rowspan="2">Pico de Veleta, 30 m IRAM</td>
<td rowspan="2">Spain</td>
<td rowspan="2">37º03’58”
-03º23’34”</td>
<td rowspan="2">2850</td>
<td rowspan="2">Mountainside overlooking nearby ski resort, line of sight to city of Granada</td>
<td>4 March 2016</td>
<td>31 July 2016</td>
<td>
<table>
<tr><th>Height above ground (metres)</th><th>Latitude (N), Longitude (E)</th><th>Radius (kilometres)</th></tr>
<tr><td rowspan="2">0 to < 1000</td><td>37°03’58”N, -3°23’34”E</td><td>15 (*)</td></tr>
<tr><td>37°03’58”N, -3°23’34”E</td><td>101 (**)</td></tr>
<tr><td colspan="3">(*) Circle of 15 km radius around Pico Veleta
(**) Circle sector around Pico Veleta of 101 km radius from azimuth of 224° up to azimuth of 52°.</td></tr>
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<tr>
<td>1 August 2016</td>
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<table>
<tr><th>Height above ground (metres)</th><th>Latitude (N), Longitude (E)</th><th>Radius (kilometres)</th></tr>
<tr><td rowspan="2">0 to < 1000</td><td>37.066111ºN, -3.392778ºE</td><td>20 (*)</td></tr>
<tr><td>37.066111ºN, -3.392778ºE</td><td>70 (**)</td></tr>
<tr><td colspan="3">(*) Circle of 20 Km radius around Pico Veleta
(**) Circle sector around Pico Veleta of 70 Km radius from azimuth of 226° up to azimuth of 57°.</td></tr>
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<tr>
<td rowspan="2">Yebes 40 m
Yebes 14 m</td>
<td rowspan="2">Spain</td>
<td rowspan="2">40º31’27”
-03º05’22”</td>
<td rowspan="2">981</td>
<td rowspan="2">Broad flat plain exposed to roads</td>
<td>4 March 2016</td>
<td>31 July 2016</td>
<td>
<table>
<tr><th>Height above ground (metres)</th><th>Latitude (N), Longitude (E)</th><th>Radius (kilometres)</th></tr>
<tr><td>0 to < 1000</td><td>40°31’27”N, -3°05’22”E</td><td>101</td></tr>
</table>
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<td>
<table>
<tr><th>Height above ground (metres)</th><th>Latitude (N), Longitude (E)</th><th>Radius (kilometres)</th></tr>
<tr><td rowspan="5">0 to < 50</td><td>40.959250ºN, -3.304583ºE</td><td>38</td></tr>
<tr><td>40.727639ºN, -3.788250ºE</td><td>18</td></tr>
<tr><td>40.668000ºN, -2.642056ºE</td><td>44</td></tr>
<tr><td>40.387778ºN, -2.908889ºE</td><td>44</td></tr>
<tr><td>40.150111ºN, -3.000111ºE</td><td>44</td></tr>
<tr><td>50 to < 1000</td><td>40.524167ºN, -3.089444ºE</td><td>68</td></tr>
</table>
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</tr>
<tr>
<td>Onsala 20 m</td>
<td>Sweden</td>
<td>57º23’45”
11º55’35”</td>
<td>23</td>
<td>Waterside, forested, relatively isolated</td>
<td>4 March 2016</td>
<td>--</td>
<td colspan="3">
<table>
<tr><th>Distance from Onsala</th><th>Rotorcraft height above ground (metres)</th><th>Comments</th></tr>
<tr><td>0-10 km</td><td>-</td><td>Radar should not be used in this area</td></tr>
<tr><td>10-25 km</td><td>< 50</td><td></td></tr>
<tr><td>25-35 km</td><td>< 100</td><td></td></tr>
<tr><td>35-55 km</td><td>< 300</td><td></td></tr>
<tr><td>> 55 km</td><td>No limit</td><td></td></tr>
</table>
</td>
</tr>
</table>

ANNEX 3: LIST OF REFERENCES

[1] ETSI TR 103 137 V1.1.1 (2014-01): “Electromagnetic compatibility and Radio spectrum Matters (ERM); System Reference document (SRdoc); Surveillance Radar equipment for helicopter application operating in the 76 GHz to 79 GHz frequency range”
[2] ECC Report 222: “The impact of Surveillance Radar equipment operating in the 76 to 79 GHz range for helicopter application on radio systems”, approved September 2014
[3] Directive 2014/53/EU of the European Parliament and of the Council of 16 April 2014 on the harmonisation of the laws of the Member States relating to the making available on the market of radio equipment and repealing Directive 1999/5/EC
[4] ITU Radio Regulations, Edition of 2024
[5] ETSI EN 303 360: “Short Range Devices; Transport and Traffic Telematics (TTT); Radar equipment operating in the 76 GHz to 77 GHz range; Harmonised Standard covering the essential requirements of article 3.2 of Directive 2014/53/EU; Obstacle Detection Radars for Use on Manned Rotorcraft”