 ENG20-3.1.2.8.1

**IALA RECOMMENDATION**

R-101

MARINE RADAR BEACONS (RACONS)

**Edition 3.0**

**April 2025**



Revisions to this IALA Document are to be noted in the table prior to the issue of a revised document.

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| **Date** | **Page / Section Revised** | **Requirement for Revision** |
| January 1995 | 1st issue |  |
| December 2000 | Ed.1.1 |  |
| September 2004 | Ed.2  General Revision including updating information and clarification of terms | Discussions underway at IMO and ITU on S band radars; concern over future of Racons |
| April 2025 | Ed.3 |  |
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**THE IALA COUNCIL**

**RECALLING** the function of IALA with respect to Safety of Navigation, the efficiency of maritime transport and the protection of the environment

**NOTING** that the International Maritime Organization, in Assembly Resolution A.615(15) on "Radar Beacons and Transponders", has recommended operational standards for radar beacons;

**NOTING ALSO** that the International Maritime Organization is developing revised performance standards for Radars;

**NOTING FURTHER** that the International Telecommunication Union in ITU-R M.824-4 gives the technical characteristics of a general purpose maritime radar beacon;

**RECOGNISING** that many Aids to Navigation Authorities have installed maritime radar beacons as general purpose aids to navigation;

**HAVING CONSIDERED** the proposals made by the IALA Radionavigation Committee; **RECOMMENDS**:

~~a)~~  That radar beacons (racons) provided by Aids to Navigation Authorities should conform to the technical characteristics set out in ~~Part 1 of the Annex to~~ this recommendation.

~~b) That Aids to Navigation Authorities take into account the guidelines on the use of racons set out in Part 2 of the Annex to this Recommendation when establishing racon sites.~~

~~c) That Aids to Navigation Authorities take into account the Guidelines on Racon Range Performance set out in Part 4 of the Annex of this Recommendation.~~



**TECHNICAL PARAMETERS FOR A GENERAL PURPOSE MARITIME RADAR**

**BEACON (RACON)**

***Table 1 Technical Parameters For A General Purpose Maritime Radar Beacon (Racon) (From ITU-R M.824-2***

***Annex 1)***

|  |  |  |
| --- | --- | --- |
| **Item** | | **Specifications** |
| 1 Antenna | Polarization | In the 9 GHz band, suitable for responding to radars using horizontal polarization.  In the 3 GHz band, suitable for responding to radars using horizontal polarization and to radars using vertical polarization. |
| 2 Receiver | 1 Frequency band | 9 300 - 9 500 MHz and/ or 2 900 - 3 100 MHz. (9 300 – 9 320 from 01 January 2001). |
| 2 Blocking period | 100 µs after end of response. |
| 3 Primary radar pulse length | ≥ 0.05 µs. |
| 3 Transmitter | Frequency | Transmission should occur either:  • on the frequency of the interrogating signal with a frequency  tolerance of ± 3.5 MHz for interrogating pulses with a duration of less than 0.2 µs, or , with a frequency tolerance of ± 1.5 MHz for pulses with a duration equal to or more than 0.2 µs,  or  • by a series of sweeps covering the entire frequency band of the receiver in which the signal was received. Where the transmission consists of a series of sweeps, the form of the sweep shall be sawtooth and should  have a slew rate of between 60 s and 120 s per 200 MHz. |
| 4 Response | 1 Delay after receipt of interrogation | Normally not more than 0.7 µs. |
| 2 Form of identification | Identification coding should normally be in the form of a Morse letter. The identification coding used should be as described in appropriate navigational publications.  The identification coding should comprise the full length of the radar beacon response and, where a Morse letter is used, the response  should be divided with a ratio of one dash equal to three dots and one dot equal to one space. The coding should normally commence with a dash. |
| 3 Duration | The duration of the response should be approximately 20% of the  maximum range requirement of the particular radar beacon, or should not exceed five miles, whichever is the lower value. In certain cases,  the duration of the response may be adjusted to suit the operational requirements for the particular radar beacon (see Note 1). |
| 1. Compatibility | Should be compatible with all types of conventional magnetron radar and solid state marine radars. |

**Note 1:** Characteristics for antenna aperture and gain, receiver sensitivity, transmitter power, racon response

duration, racon ON period/ OFF period, and side-lobe suppression should be determined by Authorities.

**Note 2:** Swept frequency racons are obsolescent and are not recommended for new installations.

**Note 3:** Power output is not specified. ~~Please see section PART 2for information on racon signal strength.~~