IALA

RACON RBM4 model, manufactured by MSM.

RADAR

RADAR, whose name comes from the acronym of its name in English (**Radio Detecting and Ranging**), is a **system based on a microwave transmitter / receiver** that, with a rotating antenna, emits powerful pulses concentrated in a narrow beam in all directions and **receives the echoes of its own pulses on surrounding obstacles**: landmasses, ships, buoys, etc.

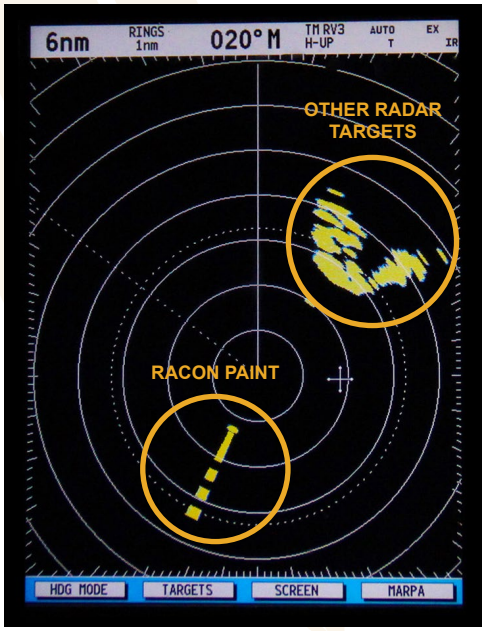
The **reflected signals appear on a screen** that allows the navigator to see the profile of the coast with its most unique points and the objects that surround it, thus avoiding possible collisions.

RADAR BEACON OR RACON

The radar equipment carried by ships on board does not constitute an aid to navigation in the sense used here, but the **RACON** (RAdar beaCON) is, which **works in the frequency bands of marine radar**.

A radar beacon, also known as racon or transponder beacon, is **designed to give an indication on the radar screen of both bearing and distance**, its characteristic paint usually beginning at and extending outward from a point a few hundred yards beyond the echo of the object on which it is mounted.

When the racon receives a pulse from the ship's radar, it emits a signal that on the ship's screen indicates its Morse identification code, the distance between them and the bearing it is on.



Radar Target Enhancer or RTE (Radar Target Enhancer)

Within this same type of aid there is another, recently implemented, called radar target intensifier or RTE (Radar Target Enhancer) whose **operation is similar to that of the racon**, but with fewer features since **it only reinforces its image on the radar screen**, and whose effectiveness is halfway between the RACON and the passive radar reflector.

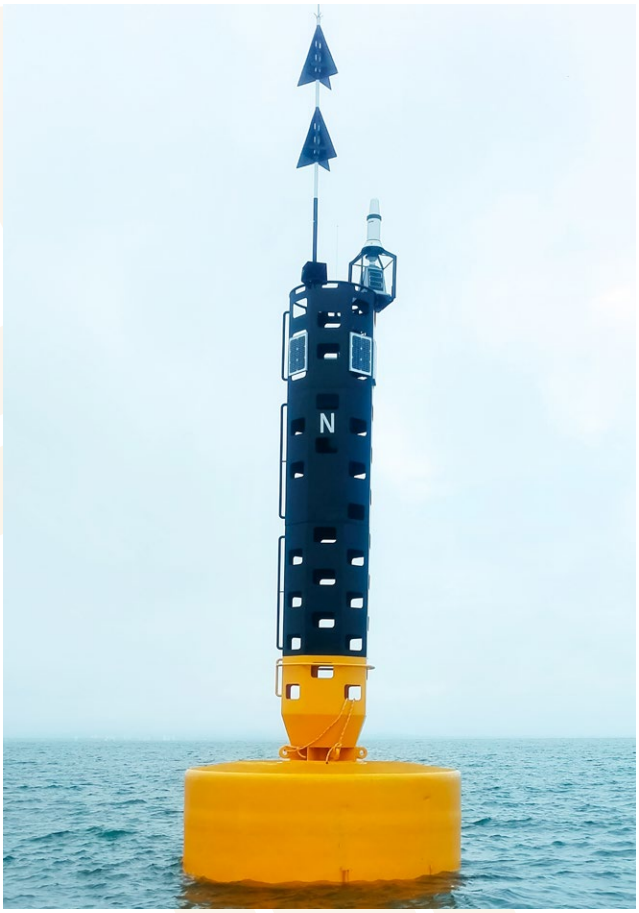
The latter consists of an element formed by dihedrals or trihedrons to increase its section for radar purposes and facilitate its identification on the radar screen.

MSM

TECHNICAL PARAMETERS FOR A GENERAL PURPOSE MARITIME RADAR BEACON

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.



Receiver frequency band

- **9 300 - 9 500 MHz and/ or 2 900 - 3 100 MHz**

  (9 300 – 9 320 from 01 January 2001).

Receiver blocking period

- **100 µs** after end of response

Receiver primary radar pulse length

- **0.05 µs**

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.

Response delay after receipt of interrogation

- Normally **not more than 0.7 µs**.

Response 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.

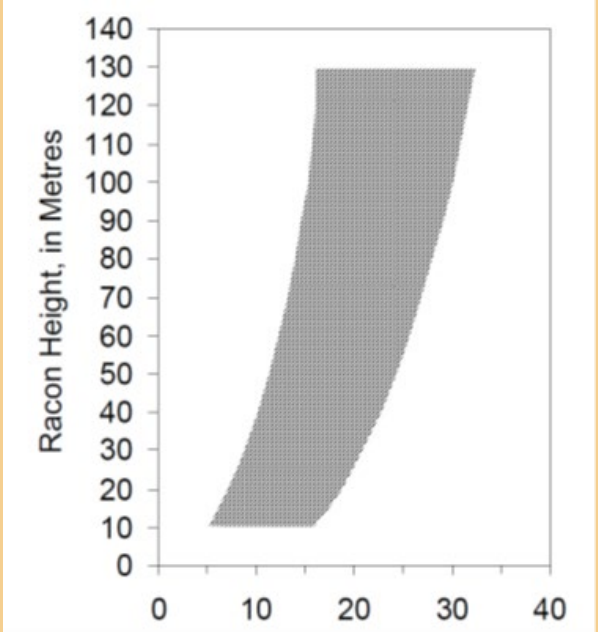
  The coding should normally commence with a dash.

Response 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.

EXPECTED RACON RANGE

Expected Racon range is showed on the following image:



The **left edge of the shaded area** represents the **expected distance for a small vessel** using a **4 kW** radar with its **antenna mounted at 3 m** above sea level.

The **right edge of the shaded area** represents the **expected distance for a large vessel** using a **25 kW** radar with its **antenna mounted at 35 m** above sea level.