RECOMMENDATION ITU-R M.1176*

# TECHNICAL PARAMETERS OF RADAR TARGET ENHANCERS

(Question ITU-R 28/8)

(1995)


## Summary

Trials of radar target enhancers have indicated that the radar returns from navigation buoys and small craft can be significantly improved by the use of such devices.

This Recommendation provides the technical parameters for radar target enhancers operating in the frequency bands 2 900-3 100 MHz and/or 9 320 (9 300 from 1 January, 2001)-9 500 MHz.


The ITU Radiocommunication Assembly,

*considering*

a) that shipborne radars in the maritime radionavigation service operate in the bands 2 900-3 100 MHz and 9 320 (9 300 from 1 January, 2001)-9 500 MHz;

b) that a transponder is a device that can provide for echo enhancement with the provision that such enhancement should not significantly exceed that which could be achieved by passive means (IMO Resolution A.615(15));

c) that the radar returns from targets such as navigation buoys and small craft can be significantly improved by the use of an active target enhancer consisting of a broadband radio-frequency amplifier, receive and transmit antennas,

*recommends*

**1** that the technical parameters of radar target enhancers for use on navigation buoys and small craft should be in accordance with Annex 1.

* This Recommendation should be brought to the attention of the International Maritime Organization (IMO) and the International Association of Lighthouse Authorities (IALA).

ANNEX 1

# Technical parameters of a radar target enhancer for use on navigation buoys and small craft

| Item | Parameters | Specifications |
|---|---|---|
| 1. Antennas (for receiving and transmitting) | Polarization | In the 3 GHz band, suitable for responding to radars using horizontal polarization and to radars using vertical polarization<br><br>and/or<br><br>in the 9 GHz band, suitable for responding to radars using horizontal polarization |
| | Beamwidth | 360° horizontal within ± 3 dB<br>± 15° vertical to ± 3 dB |
| 2. Amplifier | Broadband over the frequency band | 2 900 to 3 100 MHz<br>and/or<br>9 300 to 9 500 MHz (9 300-9 320 MHz from 1 January, 2001) |
| | Amplification | Minimum 50 dB including antenna gain |
| | Output form | The output shall be only an amplified version of the received pulse, without any form of processing except limiting<br><br>The delay and stretching of the output shall not exceed 10% of the length of the received pulse, or 10 ns whichever is greater |
| | e.i.r.p. at limiting level | Not greater than 10 W |