RECOMMENDATION ITU-R M.489-2*

TECHNICAL CHARACTERISTICS OF VHF RADIOTELEPHONE EQUIPMENT OPERATING IN THE MARITIME MOBILE SERVICE IN CHANNELS SPACED BY 25 kHz

(1974-1978-1995)

Summary

The Recommendation describes the technical characteristics of VHF radiotelephone transmitters and receivers (or transceivers) used in the maritime mobile service when operating in 25 kHz channels of Appendix S18 [Appendix 18] of the Radio Regulations (RR). It also contains those additional characteristics of transceivers required to operate digital selective calling.

The ITU Radiocommunication Assembly,

considering

a) that Resolution No. 308 of the World Administrative Radio Conference (Geneva, 1979) stipulated that:

– all maritime mobile VHF radiotelephone equipment shall conform to 25 kHz standards by 1 January 1983;

b) that RR Appendix S18 [Appendix 18] gives a table of transmitting frequencies which is based upon the principle of 25 kHz channel separations for the maritime mobile service;

c) that in Opinion 42, the International Electrotechnical Commission (IEC) has been invited to advise the ITU Radiocommunication Sector of any methods of measurement applicable to radio equipment used in land mobile services; and that such methods of measurement may also be suitable for radio equipment used in maritime mobile services;

d) that there is a need to specify the technical characteristics of VHF radiotelephone equipment operating in the maritime mobile service in channels spaced by 25 kHz,

recommends

1 that the following characteristics should be met by VHF (metric) FM radiotelephone equipment used for the maritime mobile services operating on the frequencies specified in RR Appendix S18 [Appendix 18].

1.1 General characteristics

1.1.1 The class of emission should be F3E/G3E.

1.1.2 The necessary bandwidth should be 16 kHz.

1.1.3 Only phase modulation (frequency modulation with a pre-emphasis characteristic of 6 dB/octave) should be used.

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* This Recommendation should be brought to the attention of the International Maritime Organization (IMO) and the Telecommunication Standardization Sector (ITU-T).

Note by the Secretariat: The references made to the Radio Regulations (RR) in this Recommendation refer to the RR as revised by the World Radiocommunication Conference 1995. These elements of the RR will come into force on 1 June 1998. Where applicable, the equivalent references in the current RR are also provided in square brackets.

1.1.4 The frequency deviation corresponding to 100% modulation should approach ± 5 kHz as nearly as practicable. In no event should the frequency deviation exceed ± 5 kHz. Deviation limiting circuits should be employed such that the maximum frequency deviation attainable should be independent of the input audio frequency.

1.1.5 Where duplex or semi-duplex systems are in use, the performance of the radio equipment should continue to comply with all the requirements of this Recommendation.

1.1.6 The equipment should be designed so that frequency changes between assigned channels can be carried out within 5 s.

1.1.7 Emissions should be vertically polarized at the source.

1.1.8 Stations using digital selective calling shall have the following capabilities:

a) sensing to determine the presence of a signal on 156.525 MHz (channel 70); and

b) automatic prevention of the transmission of a call, except for distress and safety calls, when the channel is occupied by calls.

1.2 Transmitters

1.2.1 The frequency tolerance for coast station transmitters should not exceed 5 parts in 10^6, and that for ship station transmitters should not exceed 10 parts in 10^6.

1.2.2 Spurious emissions on discrete frequencies, when measured in a non-reactive load equal to the nominal output impedance of the transmitter, should be in accordance with the provisions of RR Appendix S3 [Appendix 8].

1.2.3 The carrier power for coast stations should not normally exceed 50 W.

1.2.4 The carrier power for ship station transmitters should not exceed 25 W. Means should be provided to readily reduce this power to 1 W or less for use at short ranges, except for digital selective calling equipment operating on 156.525 MHz (channel 70) in which case the power reduction facility is optional (see also Recommendation ITU-R M.541 *recommends* 3.7).

1.2.5 The upper limit of the audio-frequency band should not exceed 3 kHz.

1.2.6 The cabinet radiated power should not exceed 25 μW. In some radio environments, lower values may be required.

1.3 Receivers

1.3.1 The reference sensitivity should be equal to or less than 2.0 μV, e.m.f., for a given reference signal-to-noise ratio at the output of the receiver.

1.3.2 The adjacent channel selectivity should be at least 70 dB.

1.3.3 The spurious response rejection ratio should be at least 70 dB.

1.3.4 The radio frequency intermodulation rejection ratio should be at least 65 dB.

1.3.5 The power of any conducted spurious emission, measured at the antenna terminals, should not exceed 2.0 nW at any discrete frequency. In some radio environments lower values may be required.

1.3.6 The effective radiated power of any cabinet radiated spurious emission on any frequency up to 70 MHz should not exceed 10 nW. Above 70 MHz, the spurious emissions should not exceed 10 nW by more than 6 dB/octave in frequency up to 1 000 MHz. In some radio environments, lower values may be required;

2 that reference should also be made to Recommendations ITU-R SM.331 and ITU-R SM.332 and to the relevant IEC publications on methods of measurement.