RECOMMENDATION 626

EVALUATION OF THE QUALITY OF DIGITAL CHANNELS IN THE MARITIME MOBILE SERVICE

(Question 42/8)

(1986)

The CCIR,

CONSIDERING

(a) that the administrations of numerous countries are developing different types of equipment for the transmission of digital information on radio channels of the maritime mobile service;

(b) that specific technical Recommendations should be adopted on the basis of a comparative analysis of the overall final results of laboratory or field tests performed on the equipment offered by various administrations;

(c) that, however, it is generally difficult to carry out joint tests on different types of equipment;

(d) that owing to the variations in the probabilistic characteristics of radio channels in the maritime mobile service, the conditions of the various tests may differ considerably, which may make it difficult to provide a basis of comparison for the evaluation of the final results;

(e) that equipment performance is seriously affected by inadequate radiocommunication conditions,

CONSIDERING FURTHER:

(f) the need to provide a standard method for the evaluation of the conditions and final results of tests conducted on equipment used in digital radio channels of the maritime mobile service,

UNANIMOUSLY RECOMMENDS

1. that the main parameter adopted to characterize the effectiveness of equipment proposed by administrations for use in digital maritime radio channels should be the gain in channel quality, relative to a reference system operated just before the start of each test;

Note. – The reference system consists of a standard character generator, e.g. a pseudo-random generator connected to a modulator of the same type as used in the equipment to be tested, or a CCITT standard modem for the data speed to be tested where applicable.

2. that the most practical method of assessing the quality of such channels is based on the statistical (probabilistic) characteristics (parameters) obtained (or calculated) before and during the operation of the new equipment. These parameters may be applied for the comparative evaluation of different equipment without any joint tests;

3. that the main parameter adopted to characterize initial channel quality (before the operation of the equipment), i.e. the test conditions, should be the value of the character error probability. For test purposes, the range of variation in this value during the experiment may be from 10^{-1} to 10^{-4};

4. that the duration of a single test period (session) should, as a rule, be 10 to 12 min;

5. that the number of test periods sufficient for the statistical (probabilistic) evaluation of the final results should be in the range from 100 to 150;

6. that the main parameter adopted to characterize channel quality during operation of the equipment should also be the character error probability;

7. that the mean character error probability obtained (or calculated) should, as a rule, be represented as its integral distribution;

8. that other indicators characterizing channel quality in the use of the equipment should be as follows;

– mean link setting-up time;

– operational information processing rate (mean information transmission rate);

9. that in principle, the difference between the final and initial character error probabilities should define the effectiveness of the equipment. However, for the analysis of performance to be complete, account must also be taken of the additional indicators given under § 8 of this Recommendation, as well as of the technical characteristics (power, selectivity, antenna losses, etc.) of other radiotechnical plant and systems contributing to the formation of the digital radio channel.

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