

QUESTION ITU-R 225-5/3

The prediction of propagation factors affecting systems at LF and MF including the use of digital modulation techniques

(1995-1997-2000-2007)

The ITU Radiocommunication Assembly,

considering

- a) that Recommendation ITU-R P.368 presents ground-wave propagation curves for frequencies between 10 kHz and 30 MHz and that Recommendation ITU-R P.684 and Recommendation ITU-R P.1147 describe procedures for predicting sky-wave propagation at frequencies below about 150 kHz and at frequencies between about 150 and 1 700 kHz, respectively;
- b) that most of these and other available prediction methods are intended primarily for narrow-band or analogue systems;
- c) that under certain conditions, ground-wave and sky-wave signals of the same source may be comparable in amplitude;
- d) that there is an increasing use of digital modulation techniques, including those that use fast signalling speeds or which require good phase or frequency stability;
- e) that Recommendation ITU-R P.1321 summarizes some results of studies on propagation factors affecting systems using digital techniques at LF and MF;
- f) that, for digital systems, information will be required of the signal level and its variation as well as of time and frequency spreads within the channel,

decides that the following Question should be studied

- 1** What improvements may be made to the methods of predicting the sky-wave field strength and circuit performance at frequencies below about 1.7 MHz?
- 2** Are there significant variations in ground-wave field strength with location or with time?
- 3** How does the coexistence of ground-wave and sky-wave signals affect digital systems at LF and MF?
- 4** What are the amplitude and phase characteristics of time and frequency spreads (multipath and Doppler) of the LF/MF sky-wave signals?
- 5** What are the appropriate parameters for these signal characteristics for incorporation into a measurement data bank?

- 6** How do the sky-wave parameters vary with time, frequency, path length and other factors?
- 7** What are the appropriate methods for predicting these parameters and to what extent should different prediction models be used, dependent on the modulation methods employed for the signal?

further decides

- 1** that the results of the above studies should be included in Recommendations and/or Reports;
- 2** that the above studies should be completed by 2010.

Category: S2