

## RECOMMENDATION ITU-R SM.854-1

**Direction finding and location determination at monitoring stations  
of signals below 30 MHz**

(1992-2003)

The ITU Radiocommunication Assembly,

*considering*

- a) that direction-finding measurements have very great significance for administrations, the Radio Regulations Board (RRB) and the Radiocommunication Bureau in the investigation of harmful interference and in their concern with efficient use of the radio-frequency spectrum;
- b) that the accuracy of bearings and the method used for determining the most likely position of an emission source may be improved by certain procedures;
- c) that the single site location (SSL) method could add significant availability to the locating of transmitters, having the advantage of not requiring triangulation, because it permits location by only one station, in case of skywaves independently of others;
- d) that implementation of the SSL method alongside traditional direction finding leads to improved transmitter location capability,

*recommends*

- 1 that the Handbook for Spectrum Monitoring be used as guidance for direction finding at monitoring stations;
- 2 that for direction-finding purposes, systems based on goniometer, interferometer, correlative interferometer, or Doppler techniques be used in preference to simple rotatable loops or crossed loop direction finders which are less reliable, given the nature of ionospheric propagation;
- 3 that the SSL method could be used either as an alternative to, or to complement traditional direction-finding methods for skywave signals;
- 4 that SSL systems should preferably use real time ionospheric sounders rather than ionospheric models or predictions for determination of the ionosphere;
- 5 that antenna arrays and signal processing technologies, such as correlative interferometry used for SSL applications, are also suitable for establishing dense direction-finding triangulation networks, including those based on groundwave reception;

6 that trained operational personnel be used for taking bearings and determining locations in bands below 30 MHz. Experience and training are required in proper adjustments of various controls and in taking bearings especially when the signals are fading, are in presence of interference, or the bearings are swinging;

7 that, since direction-finding measurements and location determination must be made using signals of all qualities, it is imperative that operators accurately determine the parameters of the subject signal so that the quality of the bearing may be adequately judged and to assure that an accurate description of signal parameters accompanies the bearing submission;

8 that computerized enhancements of direction-finding systems be considered for improving the accuracy and confidence factor of desired bearings and for calculating direction-finding fixes;

9 that administrations should continue the study of improvements to the SSL method to increase its immunity to changing ionospheric propagation conditions and to better distinguish between one-hop and multi-hop location results.

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