

## RECOMMENDATION ITU-R F.1762

**Characteristics of enhanced applications for high frequency (HF) radiocommunication systems**

(Question ITU-R 158/9)

(2006)

**Scope**

This Recommendation describes the technical characteristics of enhanced applications for high frequency (HF) radiocommunication systems to provide.

The ITU Radiocommunication Assembly,

*considering*

- a) that some high frequency (HF) systems can be used to provide enhanced applications for electronic messaging systems (e-mail), Internet and large file transfer provides a communications path to the Internet for exchanging data;
- b) that the increasing use of spectrum in the HF bands for enhanced applications such as electronic messaging systems, both with and without attachments, should be taken into account;
- c) that such HF systems are not standardized in use and may have different operational technical characteristics;
- d) that with electronic messaging, and other enhanced applications for HF systems, equipment interoperability is an important issue,

*noting*

- a) that such HF systems are capable of providing routine and emergency public protection and disaster relief;
- b) that additional information on such HF systems capable of providing enhanced applications can be found in ITU-R Report F.2062,

*recommends*

- 1 that the technical characteristics of those HF systems providing enhanced applications, including electronic messaging and other Internet capability, described in Annex 1 should be considered representative of those systems operating in the HF frequency bands between 2 and 30 MHz.

## Annex 1

### Characteristics of HF radio systems providing enhanced applications

#### 1 Introduction

There are three digital applications that are typical for enhanced HF systems:

- a) messaging, also known as e-mail,
- b) interactive Internet applications, and
- c) file transfer.

In the event of the collapse or overload of normal telecommunication operation due to natural disasters (e.g. earthquakes) and other emergencies, applications for enhanced HF systems using fixed, transportable and mobile stations provide one capability for emergency links in the first phase of the alarm or during the coordination of the relief operation.

#### 2 Technical characteristics

Table 1 contains technical characteristics of representative HF systems capable of providing enhanced applications. These characteristics are sufficient for general calculation to assess the compatibility between these systems and systems operating in other services.

In this Table, protection ratios are specified as the ratio of wanted-to-unwanted *average* signal powers (PY). This is in contrast to Recommendation ITU-R F.240 where the ratios are expressed in peak envelope powers (PX). Conversion from PX to PY is waveform dependent for both wanted and unwanted signals. Conversion factors can be obtained from Recommendation ITU-R SM.326.

TABLE 1  
Example RF characteristics of HF systems

Parameter	System		
Mode of operation	Groundwave	Skywave (oblique)	NVIS Near vertical
Frequency band (MHz)	2-10	3-30	2-10
Necessary bandwidth and type of emission (kHz)	3	3	3
Transmitter power PX (dBW)	10-30	0-26	10-26
Feeder loss (dB)	3	3	3
Antenna gain (dBi)	6	3	0
Maximum e.i.r.p. (dBW)	33	26	23
Antenna polarization	Vertical/ horizontal	Vertical	Horizontal
Receiver IF bandwidth (kHz)	3	3	3
Receiver RF bandwidth (kHz)	3	3	3
Receiver noise figure (dB)	16	16	16
Protection ratio PY (dB)	21	28	10
Signal-to-noise ratio (Recommendation ITU-R F.339)	21	28	10