

RECOMMENDATION ITU-R SM.1809

**Standard data exchange format for frequency band registrations
and measurements at monitoring stations**

(2007)

Scope

To support frequency management and the work of the ITU-R in general, monitoring and measurement campaigns are conducted. These campaigns produce large amounts of data that in many cases have to be compared or merged. This document describes a standard exchange format for frequency scan based monitoring data.

The ITU Radiocommunication Assembly,

considering

- a) that the success of monitoring campaigns lays in the total effort of the participating administrations and the combination of their monitoring and measurement data;
- b) that monitoring equipment, computer equipment and software is not standardized and the data is stored in many different, often proprietary, formats;
- c) that successful merging or combining monitoring data not only depends on the data format in which the data is stored but also on the environmental and technical conditions under which the data is gathered,

recommends

- 1 that data gathered during monitoring campaigns should be converted to the format as described in Annex 1 before it is exchanged;
- 2 that software for automated spectrum monitoring should contain the possibility to store its data or convert its data to the format as described in Annex 1;
- 3 that administrations should discuss the conditions under which a monitoring or measurement campaign is conducted and data is exchanged before starting the campaign.

Annex 1**Standard data exchange format for frequency band registrations
and measurements at monitoring stations****1 General aspects**

The format described is a format derived from the radio monitoring data format (RMDF) used by the radio astronomy service to exchange spectrum data. The format is a line based ASCII file with linefeed carriage returns after each line. Although the data files can be compressed in an efficient way no specification for compression is included in this Recommendation nor in the RMDF specification.

2 Standard data format

The data file should consist of two sections:

- A “Header” section containing the static information relating to the monitoring task such as the location used for monitoring, time information and key monitoring parameters.
- A “Data” section containing all the measured results during the period of observation.

In the original RMDF specification two separate files were used for the header and data section. In this Recommendation only one file is used to guarantee the link between header and data.

The name of the format is CEF: common data exchange format.

2.1 Header section

The following fields and fieldnames should be used. All appropriate data fields should be included in the header area before the measured results are added. The header section can contain three types of information – Essential, Optional and Additional Optional (marked E, O and AO in Table 1). Optional means that space is reserved in the header but the field containing the data is left blank.

TABLE 1
Header fields

Type	Fieldname	Data format	Array ⁽¹⁾	Description	Example
E	FileType	Text	N	Type and/or version of the datafile	Common exchange format V2.0
E	LocationName	Text	N	Name of the location where the measurements are made	NERA
E	Latitude	Text	N	DD.MM.SSx where “x” is “N” or “S”	52.10.04N
E	Longitude	Text	N	DDD.MM.SSx where “x” is “E” or “W”	005.10.09W
E	FreqStart	Numeric (real)	Y	Frequency (kHz)	1000.000
E	FreqStop	Numeric (real)	Y	Frequency (kHz)	2000.000
E	AntennaType	Text, Numeric (real), Numeric (real)	Y	Info, gain (dBi), Kfactor (dB/m) The gain and kfactor fields can be omitted if not used	LPD, 7, 10
E	FilterBandwidth	Numeric (real)	Y	In kHz	0.2
E	LevelUnits	Text	N	dBuV, dBuV/m or dBm (note that “u” is used instead of “μ”)	dBuV
E	Date	Text	N	Date of measurements in the format YYYY-MM-DD (start date if measurements span midnight). Note that time is also stored in each line in the data section	2006-06-25
E	DataPoints	Numeric (integer)	Y	Number of data elements in the data row (analyzer data points or receiver steps)	80000

TABLE 1 (end)

Type	Fieldname	Data format	Array ⁽¹⁾	Description	Example
E	ScanTime	Numeric (real)	N	The actual time taken (s) for the equipment to scan from FreqStart to FreqStop. For a digital system using fast Fourier transform (FFT) this time is the time needed to sample the data block	24.1
E	Detector	Text	N		RMS
O	Note	Text	N	General comments	
O	AntennaAzimuth	Text	Y	DDD.DD (0 = North)	181.12
O	AntennaElevation	Text	Y	DD.DD (0 = no elevation)	45.32
O	Attenuation	Numeric (integer)	Y	Equipment attenuator setting (dB)	3
O	FilterType	Text	Y	Filtertype bandwidth and shapefactor. For a digital system using FFT the window type used can be specified here	Gaussian 3 dB shapefactor 3.2
O	DisplayedNote	Text	N	A small remark of less than 40 characters containing essential information which could be displayed next to the data on any final report	
O	Multiscan	Text	N	Y or N If this optional field is not present the value is automatically N	
AO	Measurement Accuracy	Numeric	N	Total accuracy of the system	
AO	VideoFilterType	Text	Y	Video Filtertype bandwidth and shapefactor	

⁽¹⁾ An explanation can be found in § 2.4.

Additional Optional fields are fields that may be added to the header in order to provide further information, however, these will not be automatically processed or recognised by the transfer software. The header and data sections should be separated by ONE blank line.

2.2 Data section

The data area should consist of scans where for each scan a separate line is used. Each line should contain the start time of the scan in HH:MM:SS format converted to UTC (or local time if requested by the coordinator) followed by a level reading for each analyzer frequency point or receiver frequency step, all separated by commas. For a monitoring campaign where no exact level measurement data is required the signal level values can be rounded to the nearest integer value to decrease the size of the data file. For measurement campaigns an accuracy of one decimal should be used. A decimal point should always be used since the comma is used as separator. The first whitespace in each line separates the descriptor from the variable.

2.3 Example file

FileType Standard Data exchange Format 2.0
LocationName NERA