



Recommendation ITU-R SM.1837-1
(08/2013)

**Test procedure for measuring the 3rd order
intercept point (IP₃) level of
radio monitoring receivers**

SM Series
Spectrum management



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Foreword

The role of the Radiocommunication Sector is to ensure the rational, equitable, efficient and economical use of the radio-frequency spectrum by all radiocommunication services, including satellite services, and carry out studies without limit of frequency range on the basis of which Recommendations are adopted.

The regulatory and policy functions of the Radiocommunication Sector are performed by World and Regional Radiocommunication Conferences and Radiocommunication Assemblies supported by Study Groups.

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Series of ITU-R Recommendations

(Also available online at <http://www.itu.int/publ/R-REC/en>)

Series	Title
BO	Satellite delivery
BR	Recording for production, archival and play-out; film for television
BS	Broadcasting service (sound)
BT	Broadcasting service (television)
F	Fixed service
M	Mobile, radiodetermination, amateur and related satellite services
P	Radiowave propagation
RA	Radio astronomy
RS	Remote sensing systems
S	Fixed-satellite service
SA	Space applications and meteorology
SF	Frequency sharing and coordination between fixed-satellite and fixed service systems
SM	Spectrum management
SNG	Satellite news gathering
TF	Time signals and frequency standards emissions
V	Vocabulary and related subjects

Note: This ITU-R Recommendation was approved in English under the procedure detailed in Resolution ITU-R 1.

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RECOMMENDATION ITU-R SM.1837-1

Test procedure for measuring the 3rd order intercept point (IP₃) level of radio monitoring receivers

(2007-2013)

Scope

This Recommendation belongs to a set of Recommendations describing the test methods to determine technical parameters of radio monitoring receivers that are important for the users of these receivers. When the described methods are followed by manufacturers, comparing different receivers is made easier. This Recommendation specifies the test procedure for the determination of the IP₃ of a monitoring receiver. This test procedure definition is recommended to all the manufacturers, with the advantage for the users of such receivers, that an easier and more objective assessment of product quality is possible.

The ITU Radiocommunication Assembly,

considering

- a) that ITU-R has published the Typical recommended specifications for analogue and digital monitoring receivers in the ITU Handbook on Spectrum Monitoring (2011), but that nothing is said about the test procedures behind such specifications;
- b) that the specification of the 3rd order intercept point (IP₃) strongly depends on the test procedures applied;
- c) that the IP₃ level specified in the data sheet of a receiver depends extremely on the test frequencies used, the spacing of the test signals, the levels of the test signals and the ambient temperature prevailing during the tests;
- d) that the IP₃ characteristic has a direct influence on the suitability of a receiver to fulfil certain monitoring tasks, specially under real environment conditions (high-level signals in the spectra near to the tuned frequency);
- e) that without a defined test procedure, the IP₃ specifications published by the manufacturers have to be made comparable by some kind of conversion and that this conversion might be complex or even impossible to perform;
- f) that a defined test procedure for IP₃ must be independent of the receiver design;
- g) that a well-defined test procedure for IP₃, if adopted by all the manufacturers of radio monitoring receivers, will have the advantage for the users of such receivers, that an easier and more objective assessment of products from different manufacturers is possible, avoiding ambiguities;
- h) that supplementary information about these IP₃ measurements can be found in Report ITU-R SM.2125 – Parameters of and measurement procedures on H/V/UHF monitoring receivers and stations;
- j) that when comparing the performance between two receivers, the IP₃ and the noise figure or the sensitivity are considered concurrently,

recommends

- 1 that the measurement method in Annex 1 should be used to determine the 3rd order intercept point (IP₃);