

International Telecommunication Union

ITU-R
Radiocommunication Sector of ITU

Recommendation ITU-R P.2147-0
(08/2022)

**Acquisition, presentation, analysis and
use of digital products in studies of
radiowave propagation**

P Series
Radiowave propagation



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.

Policy on Intellectual Property Right (IPR)

ITU-R policy on IPR is described in the Common Patent Policy for ITU-T/ITU-R/ISO/IEC referenced in Resolution ITU-R 1. Forms to be used for the submission of patent statements and licensing declarations by patent holders are available from <http://www.itu.int/ITU-R/go/patents/en> where the Guidelines for Implementation of the Common Patent Policy for ITU-T/ITU-R/ISO/IEC and the ITU-R patent information database can also be found.

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 P.2147-0

**Acquisition, presentation, analysis and use of digital products
in studies of radiowave propagation**

(2022)

Scope

This Recommendation describes the procedures for acceptance and validation of digital products such as computer programs, digitized maps, associated reference numerical data and measurement databanks used by Study Group 3.

Keywords

Digital products, radiowave propagation, validation procedure, acceptance criteria, acquisition and presentation of digital products

The ITU Radiocommunication Assembly,

considering

- a) that prediction methods of the state of the propagation environment and of radiowave propagation characteristics are given or referred in the P-series Recommendations (Radiowave propagation) of ITU-R;
- b) that digital products which are required to apply a particular ITU-R P-series Recommendation, are defined to be integral digital products are approved in accordance with Resolution ITU-R 1 and published on the ITU-R website as part of the Recommendation;
- c) that establishing common practices and coding techniques, including the use of common programming languages, libraries and software development environments, improves efficiency of development and quality of computer programs;
- d) that establishing common and documented data structure interfaces for software modules improves reusability and maintenance of the code and permits a modular approach for the implementation of computer programs,

recognizing

that Resolution ITU-R 25 provides, *inter alia*, the basis for the submission of digital products, their evaluation and approval, and their supplemental or integral roles in support of ITU-R P-series Recommendations,

recommends

- 1 that ITU-R members submit digital products on propagation to Study Group 3 following the principles and guidelines contained in Annexes 1 and 2;
- 2 that the principles and guidelines contained in Annexes 1 and 2, apply to new or updated digital products submitted after the entry into force of this Recommendation.

NOTE – Digital products that are not required to apply a particular ITU-R P-series Recommendation are supplemental digital products which support ITU-R P-series Recommendations in Study Group 3 should be available on the ITU-R Study Group 3 website for digital products.

Annex 1

General definitions and procedures for digital products of ITU-R Study Group 3

1 Introduction

The effective use of methods of prediction of the state of the propagation environment and of propagation characteristics referred to in ITU-R P-series Recommendations often require digital products such as computer programs, digitized maps and associated reference numerical data.

This Annex provides the general information for digital products, including the procedure for their evaluation and approval. Section 2 lists the types of supplemental digital products relevant for Study Group 3 activities. Section 3 describes the procedure adopted by Study Group 3 for the evaluation of digital products. Section 4 provides the information on the ITU software copyright declaration requirements.

Specific provisions for digital products are provided in Annex 2.

2 Types of supplemental digital products for Study Group 3

Supplemental digital products are digital products that are not required to apply any ITU-R P-series Recommendations. This includes digital maps, and reference numerical data (referred to as digital datasets), and computer programs. Templates to provide a summary of new digital datasets and computer programs describing the nature and characteristics are available from the Study Group 3 website on digital products. Types of supplemental digital products are described in the templates provided on Study Group 3 web pages.

3 Procedure adopted by Study Group 3 for evaluation of digital products

Digital products are evaluated using the following procedure:

- The working party responsible for the P-series recommendation will also be responsible for the evaluation of integral and supplemental digital products associated with it. This working party will also be responsible for the approval of supplemental digital products, which, once approved, will be published on the ITU-R Study Group 3 website on digital products.
- Working Party 3M provides support to the coordination among working parties of the activities related to digital products and their evaluation. This working party is also responsible for the creation and update of the Study Group 3 registry of digital products and maintains the repository of the Study Group 3 digital products, called DIGSG3 with the support of the Radiocommunication Bureau. The responsibility for the publication of supplemental digital products lies with the Radiocommunication Bureau, supported by Working Party 3M.
- The relevant working parties can nominate a drafting group and/or correspondence group, to study a specific integral digital product. This group is defined as the reference group for the particular integral digital product.
- During the periods between working party meetings, relevant reference groups and correspondence groups of Study Group 3 that have been given the mandate by its parent working party can perform maintenance of supplemental digital products and provide clarifications to the Radiocommunication Bureau, preferably in co-operation with the original author(s).

4 Information on ITU software copyright

The ITU software copyright guidelines provide guidance for the incorporation of material protected by copyright law in ITU-R publications. The ITU software copyright guidelines apply to both integral and supplemental digital products. Any member submitting software is required to comply with these guidelines, with particular regard to the ‘Software Copyright Statement’ and the ‘Licensing Declaration’.

Annex 2

Required information for evaluation of the digital products of ITU-R Study Group 3

1 Introduction

This Annex describes how a digital product, both digital datasets and computer programs, proposed either as a supplement or as integral to a particular ITU-R P-series Recommendation are evaluated by the working parties of Study Group 3. The general information on digital products is provided in Annex 1. Section 2 outlines the administrative aspects related to the digital dataset. Section 3 describes the information to be provided for evaluation of computer programs.

2 Information for the evaluation of digital datasets

- The submitter should describe in detail the characteristics and the background information in the input document to a working party meeting. The information for the evaluation of the proposed digital dataset should be provided using the template for digital datasets.
- All the data should be provided in computer files using the file format declared in the completed digital dataset template.
- A Copyright Declaration form and Licence Statement is not required. However, the copyright owner of the submitted material shall be indicated, if different from the submitter, and the submitter shall provide the permission of the copyright owner for publication by ITU.

3 Information to be provided for evaluation of computer programs

- The submitter shall provide a signed statement of agreement to terms set in Annex B, ‘License agreement of Software for evaluation of the ITU Recommendation and use of the Software to evaluate or test output’ of the ITU Software Copyright Guidelines.
- The submitter should describe in detail the characteristics and the background information in the input document to the appropriate Study Group 3 Working Party meeting. In particular for the evaluation of the proposed computer program the submitter should provide the following information:
 - The procedure for installation and instructions to use the application.
 - The description of the performed testing and identification of proposed validation cases; including test environments, test data and expected and obtained test results.

- A statement of compliance of the proposed computer program with ITU-R Study Group 3 validation examples, if applicable. Otherwise, the submitter shall provide validation examples.
 - Templates for providing this information are available on the ITU-R Study Group 3 website.
 - When an executable file or protected code is submitted, the source code shall be made available to Study Group 3 for evaluation.
 - After evaluation, if the submission is accepted for publication, the submitter shall provide to the Radiocommunication Bureau a Copyright Declaration form and Licence statement, according to the ITU Software Copyright Guidelines, Annex C, “Copyright Notices”.
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