

ITU-T

TELECOMMUNICATION
STANDARDIZATION SECTOR
OF ITU

F.749.12

(08/2020)

SERIES F: NON-TELEPHONE TELECOMMUNICATION
SERVICES

Multimedia services

Framework for communication application of civilian unmanned aerial vehicle

Recommendation ITU-T F.749.12

ITU-T F-SERIES RECOMMENDATIONS
NON-TELEPHONE TELECOMMUNICATION SERVICES

TELEGRAPH SERVICE	
Operating methods for the international public telegram service	F.1–F.19
The gentex network	F.20–F.29
Message switching	F.30–F.39
The international telemessage service	F.40–F.58
The international telex service	F.59–F.89
Statistics and publications on international telegraph services	F.90–F.99
Scheduled and leased communication services	F.100–F.104
Phototelegraph service	F.105–F.109
MOBILE SERVICE	
Mobile services and multideestination satellite services	F.110–F.159
TELEMATIC SERVICES	
Public facsimile service	F.160–F.199
Teletex service	F.200–F.299
Videotex service	F.300–F.349
General provisions for telematic services	F.350–F.399
MESSAGE HANDLING SERVICES	F.400–F.499
DIRECTORY SERVICES	F.500–F.549
DOCUMENT COMMUNICATION	
Document communication	F.550–F.579
Programming communication interfaces	F.580–F.599
DATA TRANSMISSION SERVICES	F.600–F.699
MULTIMEDIA SERVICES	F.700–F.799
ISDN SERVICES	F.800–F.849
UNIVERSAL PERSONAL TELECOMMUNICATION	F.850–F.899
ACCESSIBILITY AND HUMAN FACTORS	F.900–F.999

For further details, please refer to the list of ITU-T Recommendations.

Recommendation ITU-T F.749.12

Framework for communication application of civilian unmanned aerial vehicle

Summary

The civilian unmanned aerial vehicles are widely used in industry and consumer areas such as agriculture and plant protection, power line and petroleum pipeline inspection, police and traffic security surveillance, disaster monitoring, aerial photography and videography, express delivery, forestry and forest fire monitoring, meteorological, resource and scientific research, etc.

Recommendation ITU-T F.749.12 presents the general framework for communication application of civilian unmanned aerial vehicle (CUAV) and its functional entities, reference points, etc.

History

Edition	Recommendation	Approval	Study Group	Unique ID*
1.0	ITU-T F.749.12	2020-08-13	16	11.1002/1000/14331

Keywords

Civilian unmanned aerial vehicle, communication application, framework.

* To access the Recommendation, type the URL <http://handle.itu.int/> in the address field of your web browser, followed by the Recommendation's unique ID. For example, <http://handle.itu.int/11.1002/1000/11830-en>.

FOREWORD

The International Telecommunication Union (ITU) is the United Nations specialized agency in the field of telecommunications, information and communication technologies (ICTs). The ITU Telecommunication Standardization Sector (ITU-T) is a permanent organ of ITU. ITU-T is responsible for studying technical, operating and tariff questions and issuing Recommendations on them with a view to standardizing telecommunications on a worldwide basis.

The World Telecommunication Standardization Assembly (WTSA), which meets every four years, establishes the topics for study by the ITU-T study groups which, in turn, produce Recommendations on these topics.

The approval of ITU-T Recommendations is covered by the procedure laid down in WTSA Resolution 1.

In some areas of information technology which fall within ITU-T's purview, the necessary standards are prepared on a collaborative basis with ISO and IEC.

NOTE

In this Recommendation, the expression "Administration" is used for conciseness to indicate both a telecommunication administration and a recognized operating agency.

Compliance with this Recommendation is voluntary. However, the Recommendation may contain certain mandatory provisions (to ensure, e.g., interoperability or applicability) and compliance with the Recommendation is achieved when all of these mandatory provisions are met. The words "shall" or some other obligatory language such as "must" and the negative equivalents are used to express requirements. The use of such words does not suggest that compliance with the Recommendation is required of any party.

INTELLECTUAL PROPERTY RIGHTS

ITU draws attention to the possibility that the practice or implementation of this Recommendation may involve the use of a claimed Intellectual Property Right. ITU takes no position concerning the evidence, validity or applicability of claimed Intellectual Property Rights, whether asserted by ITU members or others outside of the Recommendation development process.

As of the date of approval of this Recommendation, ITU had not received notice of intellectual property, protected by patents, which may be required to implement this Recommendation. However, implementers are cautioned that this may not represent the latest information and are therefore strongly urged to consult the TSB patent database at <http://www.itu.int/ITU-T/ipr/>.

© ITU 2020

All rights reserved. No part of this publication may be reproduced, by any means whatsoever, without the prior written permission of ITU.

Table of Contents

		Page
1	Scope	1
2	References.....	1
3	Definitions	1
	3.1 Terms defined elsewhere	1
	3.2 Terms defined in this Recommendation.....	2
4	Abbreviations and acronyms	2
5	Conventions	2
6	Introduction	2
7	High-level communication application frameworks	2
	7.1 Application layer	3
	7.2 Service support and application support layer.....	3
	7.3 Network layer	4
	7.4 Device layer.....	4
	7.5 Management	4
8	Functional entity of communication application	4
	8.1 Functional entity framework and reference points.....	4
	8.2 Application	6
	8.3 Services.....	6
	8.4 Service functionalities	7
	8.5 Network functions	8
	8.6 Device functions.....	8
	8.7 Management	9
	Appendix I – Example use case of CUAV security flight monitoring based on cellular networks (4G/5G)	11
	Bibliography.....	13

Recommendation ITU-T F.749.12

Framework for communication application of civilian unmanned aerial vehicle

1 Scope

This Recommendation defines the general framework for communication application of civilian unmanned aerial vehicle (CUAV) and its functional entities, reference points, etc. The communication applications include flight control, flight data transportation, mission payload data services and video/images services, etc. The regulations and supervision of civilian unmanned aerial vehicle flight are out scope of this Recommendation.

2 References

The following ITU-T Recommendations and other references contain provisions which, through reference in this text, constitute provisions of this Recommendation. At the time of publication, the editions indicated were valid. All Recommendations and other references are subject to revision; users of this Recommendation are therefore encouraged to investigate the possibility of applying the most recent edition of the Recommendations and other references listed below. A list of the currently valid ITU-T Recommendations is regularly published. The reference to a document within this Recommendation does not give it, as a stand-alone document, the status of a Recommendation.

[ITU-T Y.4000] Recommendation ITU-T Y.4000/Y.2060 (2012), *Overview of the Internet of things*.

3 Definitions

3.1 Terms defined elsewhere

This Recommendation uses the following terms defined elsewhere:

3.1.1 civilian unmanned aerial vehicle [b-ITU-T F.749.10]: An unmanned flying device controlled by a ground control station or telecontroller via various wireless communication means. It usually consists of an aeroplane body, a power device, aviation electrical and electronic equipment and mission payload equipment, etc., and is used in non-military application areas such as industrial and consumer areas to complete the specific operation and transportation of data including audio, video and image.

3.1.2 flight control system [b-ITU-T F.749.10]: This is the sum of all components and driving devices of instruction transferring, rudder motion. It is mainly composed of airborne and ground control terminals. The one that is airborne includes three parts: airborne sensors, steering engine and flight control units.

3.1.3 ground control station [b-ITU-T F.749.10]: A ground control station is a device which is used to realize the functions of mission planning, flight control, payload control, flight path display, parameter display, image and video display and mission information displaying, recording and distributing.

3.1.4 ISM bands [b-ITU-T F.749.10]: The industrial, scientific and medical radio bands are radio bands (portions of the radio spectrum) reserved internationally for industrial, scientific and medical purposes other than telecommunications.

3.1.5 mission payload equipment [b-ITU-T F.749.10]: The mission payload equipment consists of an audio / video / image acquisition device, signal relay device, remote electronic detection / sense device and other auxiliary devices.