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International Standards
and Recommended Practices

Annex 10 to the Convention on International Civil Aviation

Aeronautical Telecommunications

Volume VI

Communication Systems and Procedures Relating to Remotely Piloted Aircraft Systems C2 Link

First Edition, July 2021

The first edition of Annex 10, Volume VI, was adopted by the Council on 1 March 2021
and becomes applicable on 26 November 2026.

For information regarding the applicability of the Standards and Recommended Practices, see Foreword.

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AMENDMENTS

Amendments are announced in the supplements to the *Products and Services Catalogue;* the Catalogue and its supplements are available on the ICAO website at www.icao.int. The space below is provided to keep a record of such amendments.

RECORD OF AMENDMENTS AND CORRIGENDA

AMENDMENTS			
No.	Date applicable	Date entered	Entered by

CORRIGENDA			
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FOREWORD

Historical background

Standards and Recommended Practices for Aeronautical Telecommunications were first adopted by the Council on 30 May 1949 pursuant to the provisions of Article 37 of the Convention on International Civil Aviation (Chicago 1944) and designated as Annex 10 to the Convention. They became effective on 1 March 1950. The Standards and Recommended Practices were based on recommendations of the Communications Division at its Third Session in January 1949.

Up to and including the Seventh Edition, Annex 10 was published in one volume containing four parts together with associated attachments: Part I — Equipment and Systems, Part II — Radio Frequencies, Part III — Procedures, and Part IV — Codes and Abbreviations.

By Amendment 42, Part IV was deleted from the Annex; the codes and abbreviations contained in that part were transferred to a new document, Doc 8400.

As a result of the adoption of Amendment 44 on 31 May 1965, the Seventh Edition of Annex 10 was replaced by two volumes: Volume I (First Edition) containing Part I — Equipment and Systems, and Part II — Radio Frequencies, and Volume II (First Edition) containing Communication Procedures.

As a result of the adoption of Amendment 70 on 20 March 1995, Annex 10 was restructured to include five volumes: Volume I — *Radio Navigation Aids*; Volume II — *Communication Procedures*; Volume III — *Communication Systems*; Volume IV — *Surveillance Radar and Collision Avoidance Systems*; and Volume V — *Aeronautical Radio Frequency Spectrum Utilization*. By Amendment 70, Volumes III and IV were published in 1995 and Volume V was published in 1996 with Amendment 71.

As a result of its adoption by the Council at the fifth meeting of its 222nd Session on 1 March 2021, the first edition of Annex 10 — *Aeronautical Telecommunications*, Volume VI — *Communication Systems and Procedures Relating to Remotely Piloted Aircraft Systems C2 Link* was published.

Table A shows the origin of Annex 10, Volume VI, together with a summary of the principal subjects involved and the dates on which the Volume was adopted by Council, when it will become effective and when it will become applicable.

Action by Contracting States

Notification of differences. The attention of Contracting States is drawn to the obligation imposed by Article 38 of the Convention by which Contracting States are required to notify the Organization of any differences between their national regulations and practices and the International Standards contained in this Annex and any amendments thereto. Contracting States are invited to extend such notification to any differences from the Recommended Practices contained in this Annex and any amendments thereto, when the notification of such differences is important for the safety of air navigation. Further, Contracting States are invited to keep the Organization currently informed of any differences which may subsequently occur, or of the withdrawal of any differences previously notified. A specific request for notification of differences will be sent to Contracting States immediately after the adoption of each amendment to this Annex.

The attention of States is also drawn to the provisions of Annex 15 related to the publication of differences between their national regulations and practices and the related ICAO Standards and Recommended Practices through the Aeronautical Information Service, in addition to the obligation of States under Article 38 of the Convention.

Promulgation of information. The establishment and withdrawal of and changes to facilities, services and procedures affecting aircraft operations provided in accordance with the Standards, Recommended Practices and Procedures specified in Annex 10 should be notified and take effect in accordance with the provisions of Annex 15.

Use of the text of the Annex in national regulations. The Council, on 13 April 1948, adopted a resolution inviting the attention of Contracting States to the desirability of using in their own national regulations, as far as practicable, the precise language of those ICAO Standards that are of a regulatory character and also of indicating departures from the Standards, including any additional national regulations that were important for the safety or regularity of air navigation. Wherever possible, the provisions of this Annex have been deliberately written in such a way as would facilitate incorporation, without major textual changes, into national legislation.

Status of Annex components

An Annex is made up of the following component parts, not all of which, however, are necessarily found in every Annex; they have the status indicated:

1.— *Material comprising the Annex proper:*

a) *Standards* and *Recommended Practices* adopted by the Council under the provisions of the Convention. They are defined as follows:

Standard: Any specification for physical characteristics, configuration, matériel, performance, personnel or procedure, the uniform application of which is recognized as necessary for the safety or regularity of international air navigation and to which Contracting States will conform in accordance with the Convention; in the event of impossibility of compliance, notification to the Council is compulsory under Article 38.

Recommended Practice: Any specification for physical characteristics, configuration, matériel, performance, personnel or procedure, the uniform application of which is recognized as desirable in the interest of safety, regularity or efficiency of international air navigation, and to which Contracting States will endeavour to conform in accordance with the Convention.

b) *Appendices* comprising material grouped separately for convenience but forming part of the Standards and Recommended Practices adopted by the Council.

c) *Definitions* of terms used in the Standards and Recommended Practices which are not self-explanatory in that they do not have accepted dictionary meanings. A definition does not have independent status but is an essential part of each Standard and Recommended Practice in which the term is used, since a change in the meaning of the term would affect the specification.

d) *Tables* and *Figures* which add to or illustrate a Standard or Recommended Practice and which are referred to therein, form part of the associated Standard or Recommended Practice and have the same status.

2.— *Material approved by the Council for publication in association with the Standards and Recommended Practices*:

a) *Forewords* comprising historical and explanatory material based on the action of the Council and including an explanation of the obligations of States with regard to the application of the Standards and Recommended Practices ensuing from the Convention and the Resolution of Adoption;

b) *Introductions* comprising explanatory material introduced at the beginning of parts, chapters or sections of the Annex to assist in the understanding of the application of the text;

c) *Notes* included in the text, where appropriate, to give factual information or references bearing on the Standards or Recommended Practices in question, but not constituting part of the Standards or Recommended Practices;

d) *Attachments* comprising material supplementary to the Standards and Recommended Practices, or included as a guide to their application.

Disclaimer regarding patents

Attention is drawn to the possibility that certain elements of Standards and Recommended Practices in this Annex may be the subject of patents or other intellectual property rights. ICAO shall not be responsible or liable for not identifying any or all such rights. ICAO takes no position regarding the existence, validity, scope or applicability of any claimed patents or other intellectual property rights, and accepts no responsibility or liability therefore or relating thereto.

Selection of language

Annex 10, Volume VI has been adopted in six languages — English, Arabic, Chinese, French, Russian and Spanish. Each Contracting State is requested to select one of those texts for the purpose of national implementation and for other effects provided for in the Convention, either through direct use or through translation into its own national language, and to notify the Organization accordingly.

Editorial practices

The following practice has been adhered to in order to indicate at a glance the status of each statement: *Standards* have been printed in light face roman; *Recommended Practices* have been printed in light face italics, the status being indicated by the prefix **Recommendation**; *Notes* have been printed in light face italics, the status being indicated by the prefix *Note*.

The following editorial practice has been followed in the writing of specifications: for Standards the operative verb “shall” is used, and for Recommended Practices the operative verb “should” is used.

The units of measurement used in this document are in accordance with the International System of Units (SI) as specified in Annex 5 to the Convention on International Civil Aviation. Where Annex 5 permits the use of non-SI alternative units these are shown in parentheses following the basic units. Where two sets of units are quoted it must not be assumed that the pairs of values are equal and interchangeable. It may, however, be inferred that an equivalent level of safety is achieved when either set of units is used exclusively.

Any reference to a portion of this document, which is identified by a number and/or title, includes all subdivisions of that portion.

Table A. Amendments to Annex 10, Volume VI

Amendment	*Source(s)*	*Subject(s)*	*Adopted* *Effective* *Applicable*
1st Edition	Thirteenth meeting of the Remotely Piloted Aircraft Systems Panel (RPASP/13)	Standards and Recommended Practices concerning the “C2 Link Procedures” and the “C2 Link Systems”.	1 March 2021 12 July 2021 26 November 2026

INTERNATIONAL STANDARDS AND RECOMMENDED PRACTICES

PART I. C2 LINK PROCEDURES

CHAPTER 1. DEFINITIONS

C2 Link. The data link between the remotely piloted aircraft and the remote pilot station for the purposes of managing the flight.

C2 Link communication service provider (C2CSP). An entity which provides a portion of, or all of, the C2 Link service for the operation of an RPAS.

Note.— An RPAS operator may also be its own C2CSP.

C2 Link coverage area. The area in which the C2 Link service can be received including the area where the QoSD does not meet the QoSR.

C2 Link interruption. Any temporary situation where the C2 Link is unavailable, discontinuous, introduces too much delay, or has inadequate integrity; but where the lost C2 Link decision time has not been exceeded.

C2 Link log. A record of the activities related to the C2 Link.

C2 Link service. A communication service providing the C2 Link.

C2 Link service area. The area within the C2 Link coverage area where the C2 Link QoSD meets the QoSR.

C2 Link specification. The minimum performance to be achieved by the C2 Link equipment in conformity with the applicable airworthiness system design requirements.

Handover. The act of passing piloting control from one remote pilot station to another.

Lost C2 Link decision state. The state of the RPAS in which a C2 Link interruption has occurred, but the duration of which does not exceed the lost C2 Link decision time.

Lost C2 Link decision time. The maximum length of time permitted before declaring a lost C2 Link state during which the C2 Link performance is not sufficient to allow the remote pilot to actively manage the flight in a safe and timely manner appropriate to the airspace and operational conditions.

Lost C2 Link state. The state of the RPAS in which the C2 Link performance has degraded, as a result of a C2 Link interruption that is longer than the lost C2 Link decision time, to a point where it is not sufficient to allow the remote pilot to actively manage the flight in a safe and timely manner.

Nominal C2 Link state. The state of the RPAS when the C2 Link performance is sufficient to allow the remote pilot to actively manage the flight of the RPA in a safe and timely manner appropriate to the airspace and operational conditions.

Quality of service (QoS). The totality of the characteristics of an entity that bear on its ability to satisfy stated and implied needs.

Quality of service delivered (QoSD). A statement of the QoS achieved or delivered to the RPAS operator by the C2CSP.

Quality of service experienced (QoSE). A statement expressing the QoS that the remote pilot believes they have experienced.

Quality of service required (QoSR). A statement of the QoS requirements of the RPAS operator to the C2CSP.

Note.— The QoSR may be expressed in descriptive terms (criteria) listed in the order of priority, with preferred performance value for each criterion. The C2CSP then translates these into parameters and metrics pertinent to the service.

Remote pilot station (RPS). The component of the remotely piloted aircraft system containing the equipment used to pilot the remotely piloted aircraft.

Remotely piloted aircraft (RPA). An unmanned aircraft which is piloted from a remote pilot station.

Remotely piloted aircraft system (RPAS). A remotely piloted aircraft, its associated remote pilot station(s), the required C2 Link(s) and any other component as specified in the type design.

Service level agreement (SLA). The agreement between the C2CSP and the RPAS operator covering the safety, performance, service area and security of the C2 Link provision as required for the RPAS operator's intended operations.

Switchover. The act of transferring the active data link path between the RPS and the RPA from one of the links or networks that constitutes the C2 Link to another link or network that constitutes the C2 Link.

CHAPTER 2. SPECIFICATIONS

2.1 GENERAL

Note. 1— The C2 Link is the logical connection, however physically realized, used for the exchange of information between the remote pilot station (RPS) and the remotely piloted aircraft (RPA). It enables the remote pilot's manipulation of the flight controls in the RPS to be sent to the RPA and for the RPA to return its status to the remote pilot. The C2 Link also enables the remote pilot to manage the safe integration of the remotely piloted aircraft system (RPAS) into the global aviation, communications, navigation and surveillance operational environment.

Note 2.— Guidance on the systems and procedures relating to the C2 Link is included in the Manual on Remotely Piloted Aircraft Systems (RPAS) *(Doc 10019).*

2.1.1 Any time reference to the C2 Link service and time-stamping of the information carried by the C2 Link shall be in Coordinated Universal Time (UTC).

Note 1.— This does not apply to the time-stamping internal to the network communication protocol.

Note 2.— The time stamp includes the date and time.

2.2 SUPPORTED FUNCTIONS

2.2.1 The C2 Link shall only support the remote pilot tasks required for the safe and efficient operation of the RPAS.

Note.— Annex 6 contains requirements for safe operation of the RPAS.

2.2.2 When the C2 Link includes support for the remote pilot tasks required for air traffic control (ATC) purposes, such as relay of ATC communications, the C2 Link performance shall, in a secure manner, meet the performance required for those tasks appropriate to the airspace requirements.

Note 1.— Airspace requirements vary depending upon air traffic density and complexity and may be reflected in equipage or separation requirements.

Note 2.— Alternate means of communications between the remote pilot and air traffic control may obviate the need for the C2 Link to be used for ATC communications.

2.3 SERVICE PROVISION

2.3.1 The C2 Link service shall only be used for the transmission of information relating to the safe and efficient operation of the RPAS and be limited to the information described in 2.2.1.

2.3.2 Each State shall designate the authority responsible for documenting and implementing a C2CSP oversight process, in accordance with Annex 6.

Note.— Details on State and C2CSP responsibilities related to the oversight of C2 Link service provision can be found in Annex 6.

2.3.3 The duration between C2 Link initiation and C2 Link termination shall not exceed the time of flight and ground operations, plus the time necessary to perform safety and security checking before and after each flight.

Note.— Efficient use of the limited frequency spectrum resource requires that a link be released and made available to other users when not in use.

2.3.4 The C2 Link specification shall be commensurate with the C2 Link performance required for safe operations.

2.3.5 The C2 Link's QoSR shall be commensurate with the C2 Link specification required for safe operations.

2.3.6 The C2 Link's QoSD shall be commensurate with the C2 Link QoSR.

2.3.7 The C2 Link service area geographical coordinates and time of provision, intended for RPAS operational use, shall be validated and verified to ensure that the C2 Link service area is safe for use by its intended recipients.

Note 1.— The World Geodetic System — 1984 (WGS-84) Manual *(Doc 9674) contains requirements for data quality.*

Note 2.— Intended recipients can be remote pilot or ATC units concerned.

2.3.8 A proactive process for anticipating and mitigating interrupted or lost C2 Link states shall be implemented and described by the C2CSP to the RPAS operator.

2.3.8.1 The C2CSP shall notify the RPAS operator of any scheduled outages of the C2 Link service provision.

2.3.8.2 Arrangements shall be in place to ensure that the scheduled outage does not affect any RPA during any phase of flight.

2.3.9 The C2CSP shall notify the RPAS operator of any unscheduled degradation in their service provision, the kind of degradation being experienced and an estimated duration for that degradation.

2.3.10 Before providing any C2 Link service, the C2CSP shall demonstrate to the responsible authority initial compliance with the provisions contained in 2.3.1 and 2.3.3 through 2.3.8.

2.4 C2 LINK SERVICE AREA

2.4.1 The C2 Link service area shall be compatible with the planned areas of operation (including contingency operations) of the RPA and the location of all of the RPS involved in the operation.

2.4.2 The RPA and RPS shall always remain within the C2 Link service area.

2.4.3 **Recommendation.**— *To ensure the QoSR is always met, a margin to account for the expected worst-case propagation fluctuations in the received signal level should be included when determining the C2 Link service area.*

CHAPTER 3. PROCEDURES

Note.— Provisions contained in Annex 6 require an operator to provide, for the use and guidance of personnel concerned, an operations manual containing all the instructions and information necessary for operations personnel to perform their duties.

3.1 GENERAL

3.1.1 Prior to the flight, the C2CSP shall provide the RPAS operator with appropriate means to establish that the C2 Link QoSD, security, and service area meet the requirements for safe operation of the planned flight (including contingency operations).

3.1.2 **Recommendation.**— *In the case where the C2 Link service can be provided by more than one link, the RPAS should use the link with the highest QoSD.*

3.2 ESTABLISHMENT, ASSURANCE AND TERMINATION OF THE C2 LINK

3.2.1 Human factors principles shall be considered in the design of the RPS, in order for the remote pilot to manage the C2 Link during the flight and prevent its unintentional termination.

Note.— Situations may occur in which the C2 Link would need to be terminated during the flight in order to increase the safety level of the flight. However, unintentional termination must be prevented.

3.2.2 Appropriate technical and procedural means shall be provided to the remote pilot to establish and maintain the C2 Link, including the interaction with the C2CSP. These means shall be documented in the operations manual.

3.2.3 An indication shall be provided to the remote pilot when the C2 Link has been successfully established between the RPS and the RPA and when it is interrupted, lost or terminated.

3.2.4 Information about any C2 Link-related outages that are planned to occur during the expected duration of the flight shall be provided to the remote pilot during flight planning.

3.2.5 Means shall be provided to the remote pilot to verify that the C2 Link meets the QoSR as part of the pre-flight check of the RPAS.

3.2.6 The procedure supporting the switchover between links or networks that comprise the entire C2 Link shall be contained in the operations manual.

3.2.7 Before performing a switchover to another link or network, the remote pilot shall be provided with sufficient information on the QoSD of the accepting link or network to confirm that it will meet the QoSR.

3.2.8 **Recommendation.**— *Switchovers between the links or networks that constitute the C2 Link during flight should be minimized.*

3.2.9 The procedure and the phraseology supporting handover of the C2 Link provision between RPS shall be contained in the operations manual.

3.2.10 The procedure supporting the handover shall include a report on the status of the QoSE of the C2 Link prior to initiating the handover.

3.2.11 A handover shall only be initiated if the accepting RPS is able to confirm that its C2 Link with the RPA achieves the QoSR needed to ensure that the handover will be successful.

3.2.12 The condition of a lost C2 Link state shall be initiated by the RPAS or through an action by the remote pilot when the performance of the C2 Link has been insufficient to enable active management of the RPA for longer than the lost C2 Link decision time.

3.2.13 The duration of the lost C2 Link decision time shall be in accordance with the operational management and safety requirements of the airspace.

3.2.14 Only the remote pilot shall terminate or authorize the termination of the C2 Link.

3.2.15 The C2CSP shall not intentionally terminate a C2 Link without the explicit consent of the remote pilot.

3.3 ESTABLISHMENT AND ASSURANCE OF ATC COMMUNICATIONS

3.3.1 ATC communications relayed through the RPA and the C2 Link shall be consistent with those defined for manned aircraft.

Note.— ATC communication procedures contained in Annex 10 — Aeronautical Telecommunications, *Volume II —* Communication Procedures including those with PANS status*, and the* Procedures for Air Navigation Services — Air Traffic Management *(PANS-ATM, Doc 4444).*

3.3.2 **Recommendation.**— *Switchovers between links and networks that make up the C2 Link should be avoided during transfer of ATC communications.*

3.4 CONTINGENCY AND EMERGENCY PROCEDURES

3.4.1 The remote pilot shall be provided with all the available RPAS status information pertinent to expedite the recovery of the C2 Link.

3.4.2 Technical and procedural means shall be provided to indicate to the remote pilot/RPS and the RPA when the C2 Link has been successfully restored after a lost C2 Link state has occurred.

3.4.3 From the lost C2 Link decision state, the RPAS shall either return to the nominal C2 Link state or enter the lost C2 Link state once the lost C2 Link decision time has been exceeded.

3.4.4 After being in a lost C2 Link state, a remote pilot action shall be required to return the RPAS to a nominal C2 Link state, in accordance with the procedures contained in the operations manual.

3.5 SECURITY

3.5.1 Information exchange between the RPS and RPA carried on the C2 Link shall be sufficiently secure to prevent unauthorized interference with the RPAS.

3.5.2 The RPAS C2 Link design, monitoring system and operating procedures shall be such as to minimize the potential for any unauthorized control of the RPA or the RPS during any operating phases.

3.6 DISPLAY

3.6.1 RPS controls and displays shall present data in a manner minimizing the potential for errors, misinterpretation or misunderstandings.

3.6.2 The C2 Link state information shall be presented to the remote pilot.

3.6.2.1 An indication of the C2 Link QoSD, in real time, shall be provided to the remote pilot.

3.7 MONITORING

3.7.1 An automatic monitoring system shall be implemented in the RPA and RPS, to provide an alert to the remote pilot if any of the following occur within the period of operation:

a) RPA or RPS C2 Link and/or subsystem link and/or C2CSP emission has ceased;

b) RPA or RPS C2 Link and/or subsystem link and/or C2CSP reception has ceased;

c) transmission of the amount of information required for the safe control of the aircraft has fallen below a level specified by the type certificate holder;

d) interruption of the C2 Link has occurred; or

e) the C2 Link QoSD has degraded below the stated QoSR.

3.7.2 The monitoring system shall provide an alert to the remote pilot in the event of the failure of the monitoring system itself.

3.8 RECORDS

3.8.1 A C2 Link log, written or electronic, shall be maintained in each RPS.

3.8.2 The record shall commence as soon as the C2 Link is established and end only after the C2 Link is terminated.

3.8.3 Written log entries shall be made only by authorized and on-duty persons in the RPS.

Note.— Authorized on-duty persons can be remote pilots or any other person having knowledge of facts pertinent to the entries.

3.8.4 All entries shall be complete, clear, correct and intelligible. Unnecessary marks or notations shall not be made in the log.

3.8.5 In written logs, any correction in the log shall be made by the authorized on-duty person.

3.8.5.1 Corrections shall be initialled, dated and a rationale given for traceability.

3.8.6 The following information shall be entered in logs by the authorized on-duty person:

a) the name of the authorized on-duty person in charge of the log;

b) the identification of the RPS;

c) the date;

d) the time of opening and closing of the RPS;

e) the time of establishment and termination of the C2CSP service;

f) the time of establishment and termination of the C2 Link;

g) the QoSE of the links and networks used;

h) the reason for the switchover of links and networks that make up the C2 Link;

i) the signature of the authorized on-duty person;

j) all lost C2 Link and lost C2 Link decision state events, location of the RPA with the time of occurrence, and probable assessed cause when practicable;

k) any detected harmful or notable radio frequency interference, with as much detail as possible; and

l) any information relevant to C2 Link provision considered by the remote pilot as valuable.

3.8.6.1 In the log, all time-related information shall use a UTC reference and all geographical related information shall use a WGS-84 reference.

3.8.7 The C2 Link messages related to the C2 Link management shall be electronically recorded in the RPA and in any RPS which is in control of the RPA.

3.8.8 The C2 Link management message record shall be retained for at least 30 days after completion of the flight. When the record is pertinent to accident and incident investigations, it shall be retained for longer periods until it is evident that the record will no longer be required.

3.8.9 The RPA shall maintain an electronic log, automatically recording any information described in 3.8.1 to 3.8.8 that is available to the RPA.

3.8.10 The RPA shall maintain an automatically recorded electronic log of any received or transmitted ATC/remote pilot communication, as either voice or data, if relayed through the RPA.

3.8.11 The RPS shall maintain an automatically recorded electronic log of any received and transmitted ATC/remote pilot communication, as either voice or data.

PART II. C2 LINK SYSTEMS

CHAPTER 1. DEFINITIONS

To be developed

CHAPTER 2. GENERAL

2.1 SYSTEM DESCRIPTION

2.1.1 The RPAS communication system shall comprise the following systems.

2.1.1.1 A communication system supporting communications external to the RPAS dedicated to the airspace requirements functions.

2.1.1.2 A C2 Link communication system supporting communications internal to the RPAS, which comprises at a minimum:

a) an interface with the RPS;

b) an interface with the RPA;

c) a transmitter located in the RPS communicating with a receiver located in the RPA; and

d) a transmitter located in the RPA communicating with a receiver located in the RPS.

Note 1.— The C2 Link communication system between the RPS and the RPA may comprise one or more different communication links and may be provided by one or more C2CSPs.

Note 2.— The C2 Link communication system may comprise ground and/or airborne and/or satellite links and systems.

2.1.2 The RPAS shall be equipped with a lost C2 Link state detection system designed with a level of assurance that is in accordance with the intended operation.

2.2 SPECTRUM

2.2.1 The RPAS C2 Link system shall be operated only in frequency bands which are appropriately allocated and protected by the ITU Radio Regulations.

2.2.2 C2 Link system frequency assignment planning shall be designed to provide immunity from harmful interference and not create harmful interference.

Note.— Provision for international frequency channel assignment planning can be found in the C2 Link System Guidance Manual *(in preparation).*

2.3 SYSTEM CHARACTERISTICS

2.3.1 The C2 Link system shall enable the RPA to unambiguously and at any time ensure that it is controlled by an authorized RPS.

2.3.2 The total period of radiation of the C2 Link system transmitters shall be as short as practicable, consistent with the need for avoiding saturation of the spectrum while limiting interruption of the C2 Link.

2.3.3 The C2 Link system radio frequency transmitters shall radiate no more power than is necessary to achieve the C2 Link specification.

2.4 DATA TRANSMISSION CHARACTERISTICS

2.4.1 The C2 Link system message sequencing shall be based on priority criteria.

2.4.2 The C2 Link system message sequence management shall use time-stamping.

2.4.3 The order of priority of the transmission of information between the RPS and the RPA shall be:

a) RPA flight control and configuration messages;

b) high priority detect and avoid (DAA) messages;

c) air traffic control communications including distress calls and urgency messages;

d) flight safety telemetry messages including low priority DAA messages;

e) other flight safety messages;

f) routine telemetry messages;

g) air traffic services other than ATC communications; and

h) other messages.

Note 1.— The above order of priority is for the transmission of information over the C2 Link. The order of priority of messages transmitted by communication systems other than the C2 Link will remain as listed in Annex 10, Volume II, Chapter 4 and Volume III, Part I, Table 3-1.

Note 2.— Distress and urgency messages are defined in Annex 10, Volume II, 5.3.1.1.

2.5 SIGNAL ACQUISITION AND TRACKING

To be developed

2.6 PRIORITY AND PRE-EMPTIVE ACCESS

To be developed

2.7 PERFORMANCE REQUIREMENTS

2.7.1 The QoSD of the C2 Link system shall be sufficient to support the operational and performance requirements for ATC service in the planned and contingency areas of operation of the RPA.

Note.— These requirements include required communication performance (RCP), required surveillance performance (RSP) and required navigation performance (RNP) when appropriate.

2.8 SYSTEMS INTERFACES

To be developed

2.9 RECORDS

To be developed

2.10 C2 LINK COMMUNICATION SERVICE PROVIDER (C2CSP)

2.10.1 The RPAS operator shall establish a service level agreement (SLA) with one or more C2CSPs concerning the C2 Link service provision.

Note 1.— An SLA is required even when the operator is its own C2CSP.

Note 2.— The SLA defines the relationship and responsibilities of the two parties in accordance with the following Standards.

2.10.2 The C2CSP shall ensure that the QoSD is at any time meeting the QoSR.

2.10.2.1 The C2CSP shall conduct, with RPAS operators, real time interference monitoring, estimation and prediction of interference risks, and planning solutions for potential harmful interference scenarios under the oversight of the competent authority.

2.10.3 The C2CSPs, RPAS operators and competent authorities shall act immediately when their attention is drawn to any harmful interference.

2.10.4 The C2CSP shall have the qualified resources and adequate documentation that will allow competent authorities to perform their oversight.

2.10.5 Terrestrial C2 communication service providers

2.10.5.1 Terrestrial RPAS equipment shall operate in frequency spectrum with an allocation as described in Annex 10, Volume V, Chapter 5, section 5.2.

2.10.6 Satellite C2 communication service providers

2.10.6.1 Satellite RPAS equipment shall operate in frequency spectrum with an allocation as described in Annex 10, Volume V, Chapter 5, section 5.1.

2.10.6.2 SLAs between satellite C2CSPs and RPAS operators shall ensure that, once a satellite network has completed successful coordination, which guarantees the level of protection necessary to ensure the overall RPAS C2 Link QoSD, the protection level is not eroded as a result of subsequent satellite coordination agreements.

2.10.6.3 SLAs between satellite C2CSPs and RPAS operators shall ensure that satellite C2CSPs act immediately when their attention is drawn to any harmful interference.

2.10.6.4 The satellite C2CSP shall be responsible for ensuring that once a satellite network has completed successful coordination, the C2 Link specifications continue to be met as a result of subsequent agreements between satellite operators.

CHAPTER 3. FSS SYSTEMS

To be developed

CHAPTER 4. C-BAND SATCOM SYSTEMS

To be developed

CHAPTER 5. C-BAND TERRESTRIAL SYSTEMS

To be developed

CHAPTER 6. SELF-ORGANIZED AIRBORNE SYSTEMS

To be developed

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