International Civil Aviation Organization | Organisation de l'aviation civile internationale | Organización de Aviación Civil Internacional | Международная организация гражданской авиации | منظمة الطيران المدني الدولي | 国际民用航空组织

Tel.: +1 (514) 954-8219 ext. 6712

Ref.: AN 7/1.3.92-07/39 22 June 2007

Subject: Proposals for the amendment of Annex 10, Volume III, Parts I and II, concerning the aeronautical telecommunication network and 8.33 kHz offset carrier systems

Action required: Comments to reach Montreal by 15 October 2007

Sir/Madam,

1. I have the honour to inform you that the Air Navigation Commission, at the thirteenth meeting of its 175th Session held on 14 June 2007, considered proposals developed by the first meeting of the Aeronautical Communications Panel (ACP/1) to amend the Standards and Recommended Practices (SARPs) in Annex 10 — *Aeronautical Telecommunications*, Volume III — *Communication Systems*, Part I — *Digital Data Communication Systems* and Part II — *Voice Communication Systems* concerning the aeronautical telecommunication network and 8.33 kHz offset carrier systems, as shown in Attachments A and B respectively, and authorized their transmission to Contracting States and appropriate international organizations for comments.

2. The purpose of the proposed amendment is to:

a) introduce the Internet Protocol Suite (IPS) in the aeronautical telecommunication network (ATN). Also, the current ATN SARPs have been restructured along the principles of Assembly Resolution A35-14. The amendment concentrates on keeping high-level Standards in Annex 10 necessary to secure the global interoperability of the ATN; and

b) introduce the use of the off-set carrier (climax) system on 8.33 kHz voice channels in the very high frequency (VHF) frequency band (117.975 – 137 MHz). This is a frequency-efficient technique for using VHF frequencies over large geographical areas.

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3. Further background material on the proposed amendments to the ATN SARPs is available in the report of the ACP/1 Meeting at http://www.icao.int/anb/panels/acp. In this regard I should like to draw your attention to Appendix C of the report of the ACP/1 Meeting on Agenda Item 3, which contains detailed technical specifications for the IPS communication service.

4. In examining the proposed amendments, you should not feel obliged to comment on editorial aspects as such matters will be addressed by the Air Navigation Commission during its final review of the draft amendment.

5. May I request that any comments you may wish to make on the amendment proposals be dispatched to reach me not later than 15 October 2007. The Air Navigation Commission has asked me to specifically indicate that comments received after the due date may not be considered by the Commission and the Council. In this connection, should you anticipate a delay in the receipt of your reply, please let me know in advance of the due date.

6. For your information, the proposed amendment to Annex 10, Volume III, Parts I and II, is envisaged for applicability on 20 November 2008. Any comments you may have thereon would be appreciated.

7. The subsequent work of the Air Navigation Commission and the Council would be greatly facilitated by specific statements on the acceptability or otherwise of the proposals. Please note that, for the review of your comments by the Air Navigation Commission and the Council, replies are normally classified as “agreement with or without comments”, “disagreement with or without comments” or “no indication of position”. If in your reply the expressions “no objections” or “no comments” are used, they will be taken to mean “agreement without comment” and “no indication of position”, respectively. In order to facilitate proper classification of your response, a form has been included in Attachment C which may be completed and returned together with your comments, if any, on the proposals in Attachments A and B.

Accept, Sir/Madam, the assurances of my highest consideration.

Taïeb Chérif
Secretary General

Enclosures:

A — Proposed amendment to Annex 10, Volume III, Part I
B — Proposed amendment to Annex 10, Volume III, Part II
C — Response form

ATTACHMENT A to State letter AN 7/1.3.92-07/39

PROPOSED AMENDMENT TO ANNEX 10, VOLUME III, PART I

NOTES ON THE PRESENTATION OF THE PROPOSED AMENDMENT

The text of the amendment is arranged to show deleted text with a line through it and new text highlighted with grey shading, as shown below:

1.	~~Text to be deleted is shown with a line through it~~.	text to be deleted
2.	New text to be inserted is highlighted with grey shading.	new text to be inserted
3.	~~Text to be deleted is shown with a line through it~~ followed by the replacement text which is highlighted with grey shading.	new text to replace existing text

PROPOSED AMENDMENT TO

**INTERNATIONAL STANDARDS
AND RECOMMENDED PRACTICES**

AERONAUTICAL TELECOMMUNICATIONS

ANNEX 10

TO THE CONVENTION ON INTERNATIONAL CIVIL AVIATION

**VOLUME III
(COMMUNICATION SYSTEMS)**

PART I — DIGITAL DATA COMMUNICATION SYSTEMS

CHAPTER 1. DEFINITIONS

Note 1.— All references to "Radio Regulations" are to the Radio Regulations published by the International Telecommunication Union (ITU). Radio Regulations are amended from time to time by the decisions embodied in the Final Acts of World Radiocommunication Conferences held normally every two to three years. Further information on the ITU processes as they relate to aeronautical radio system frequency use is contained in the Handbook on Radio Frequency Spectrum Requirements for Civil Aviation including statement of approved ICAO policies *(Doc 9718).*

*Note 2.— This Part of Annex 10 includes Standards and Recommended Practices for certain forms of equipment for communication systems. While the Contracting State will determine the necessity for specific installations in accordance with the conditions prescribed in the relevant Standard or Recommended Practice, review of the need for specific installation and the formulation of ICAO opinion and recommendations to Contracting States concerned, is carried out periodically by Council, ordinarily on the basis of recommendations of Regional Air Navigation Meetings (*Doc 8144*, Directives to Regional Air Navigation Meetings and Rules of Procedure for their Conduct).*

Note 3.— This chapter contains general definitions relevant to communication systems. Definitions specific to each of the systems included in this volume are contained in the relevant chapters.

Note 4.— Material on secondary power supply and guidance material concerning reliability and availability for communication systems is contained in Annex 10, Volume I, 2.9 and Volume I, Attachment F, respectively.

Aeronautical telecommunication network (ATN). ~~An~~ A global internetwork architecture that allows ground, air-ground and avionic data subnetworks to ~~interoperate by adopting common interface services and protocols based on the International Organization for Standardization (ISO) Open Systems Interconnection (OSI) reference model~~ exchange digital data for the safety of air navigation and for the regular, efficient and economic operation of air traffice services.

Aeronautical administrative communications (AAC). Communications necessary for the exchange of aeronautical administrative messages (Re. Annex 10, Volume II, paragraph 4.4.1.1.7).

Aeronautical operational control (AOC). Communication required for the exercise of authority over the initiation, continuation, diversion or termination of flight for safety, regularity and efficiency reasons (Re. Annex 6, Part I, Chapter 1 – Definitions).

Aircraft address. A unique combination of twenty-four bits available for assignment to an aircraft for the purpose of air-ground communications, navigation and surveillance.

Air traffic service. A generic term meaning variously, flight information service, alerting service, air traffic advisory service, air traffic control service (area control service, approach control service or aerodrome control service) (Re. Annex 11, Chapter 1 – Definitions).

Aircraft earth station (AES). A mobile earth station in the aeronautical mobile-satellite service located on board an aircraft (see also "GES").

Automatic Dependent Surveillance- Contract (ADS-C). A means by which the terms of an ADS agreement will be exchanged between the ground system and the aircraft, via a data link, specifying under what condition ADS-C reports would be initiated and what data would be contained in the report. (Re. Annex 11, Chapter 1 – Definitions).

Automatic terminal information service (ATIS). The automatic provision of current, routine information to arriving and departing aircraft throughout 24 hours or a specified portion thereof. (Re. Annex 11, Chapter 1 – Definitions).

Data link-automatic terminal information service (D-ATIS). The provision of ATIS via data link.

Voice-automatic terminal information service (Voice-ATIS). The provision of ATIS by means of continuous and repetitive voice broadcasts.

Bit error rate (BER). The number of bit errors in a sample divided by the total number of bits in the sample, generally averaged over many such samples.

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Circuit mode. A configuration of the communications network which gives the appearance to the application of a dedicated transmission path.

Controller pilot data link communication (CPDLC). A means of communication between controller and pilot, using data link for ATC communications. (Re. Annex 11, Chapter 1 – Definitions).

Data link flight information service (D-FIS). The provision of FIS via data link(Re. Annex 11, Chapter 1 – Definitions).

Doppler shift. The frequency shift observed at a receiver due to any relative motion between transmitter and receiver.

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Equivalent isotropically radiated power (e.i.r.p). The product of the power supplied to the antenna and the antenna gain in a given direction relative to an isotropic antenna (absolute or isotropic gain).

Flight information service (FIS). A service provided for the purpose of giving advice and information useful for the safe and efficient conduct of flights. (Re. Annex 11, Chapter 1 – Definitions).

Forward error correction (FEC). The process of adding redundant information to the transmitted signal in a manner which allows correction, at the receiver, of errors incurred in the transmission.

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Mode S subnetwork. A means of performing an interchange of digital data through the use of secondary surveillance radar (SSR) Mode S interrogators and transponders in accordance with defined protocols.

~~***Packet.*** The basic unit of data transfer among communications devices within the network layer.~~

~~***Packet layer protocol (PLP).*** A protocol to establish and maintain a connection between peer level entities at the network layer, and to transfer data packets between them. In the context of this standard, the term refers to the protocol defined by the ISO 8208 standard used in this document.~~

Point-to-point. Pertaining or relating to the interconnection of two devices, particularly end-user instruments. A communication path of service intended to connect two discrete end-users; as distinguished from broadcast or multipoint service.

Slotted aloha. A random access strategy whereby multiple users access the same communications channel independently, but each communication must be confined to a fixed time slot. The same timing slot structure is known to all users, but there is no other co-ordination between the users.

~~***Switched virtual circuit (SVC).*** The primary circuit management technique provided within the ISO 8208 protocol. The network resources are dynamically allocated when needed and released when no longer required.~~

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CHAPTER 3. AERONAUTICAL TELECOMMUNICATION NETWORK

Note 1.— Detailed technical specifications for ATN/OSI applications are contained in the Manual of Detailed Technical Specifications for the ATN *using ISO/OSI standards and protocols* (Doc 9880).

Note 2.— Detailed technical specifications for ATN/IPS applications are contained in the Manual of Detailed Technical Specifications for the ATN using IPS standards and protocols (Doc xxxx).

3.1 DEFINITIONS

~~*Note 1.— The following definitions were taken from ISO/IEC 7498-1,* Information technology—Open Systems Interconnection—Basic Reference Model *(Reference: ITU-T Rec. X.200 (1994)) and from ICAO Doc 9705—*Manual of Technical Provisions for the Aeronautical Telecommunication Network (ATN).~~

~~*Note 2. — ICAO Doc 9705 has evolved through multiple editions. Each sub-volume of that document indicates the evolution of the provisions between successive editions.*~~

~~*Note 3. — Sub-volume I of ICAO Doc 9705 provides a cross-reference chart between versions (i.e. embedded software capabilities) and editions (i.e. technical provisions).*~~

~~***Accounting management.*** An ATN systems management facility to monitor users for use of network resources and to limit the use of those resources.~~

~~***ADS application.*** An ATN application that provides ADS data from the aircraft to the ATS unit(s) for surveillance purposes.~~

~~***Aeronautical administrative communication (AAC).*** Communication used by aeronautical operating agencies related to the business aspects of operating their flights and transport services. This communication is used for a variety of purposes, such as flight and ground transportation, bookings, deployment of crew and aircraft or any other logistical purposes that maintain or enhance the efficiency of over-all flight operation.~~

~~***Aeronautical operational control (AOC).*** Communication required for the exercise of authority over the initiation, continuation, diversion or termination of flight for safety, regularity and efficiency reasons.~~

~~***Aeronautical passenger communication (APC).*** Communication relating to the non-safety voice and data services to passengers and crew members for personal communication.~~

~~***AIDC application.*** An ATN application dedicated to exchanges between ATS units (ATSUs) of air traffic control (ATC) information in support of flight notification, flight coordination, transfer of control, transfer of communication, transfer of surveillance data and transfer of general data.~~

~~***Air traffic service.*** A generic term meaning variously, flight information service, alerting service, air traffic advisory service, air traffic control service (area control service, approach control service or aerodrome control service).~~

~~***Application.*** The ultimate use of an information system, as distinguished from the system itself.~~

Application entity (AE). An AE represents a set of OSI communication capabilities of a particular application process. (Re. ISO Doc 9545 for further details) ~~Part of an application process that is concerned with communication within the OSI environment. The aspects of an application process that need to be taken into account for the purposes of OSI are represented by one or more AEs.~~

~~***Application information.*** Refers to the application names (e.g. AE qualifiers such as ADS and CPC), version numbers, and addresses (the long or short TSAP, as required) of each application.~~

~~***ATIS application.*** A FIS application that supports the D-ATIS.~~

~~***ATN directory services (DIR)***. A service which provides the capability for an application entity or user in the ATN community to query a distributed directory data base and retrieve addressing, security and technical capabilities information relating to other users or entities within the ATN community.~~

ATN security services. A set of information security provisions allowing the receiving end system or intermediate system to unambiguously identify (i.e. authenticate) the source of the received information and to verify the integrity of that information.

~~***ATN systems management (SM).*** A collection of facilities to control, coordinate and monitor the resources which allow communications to take place in the ATN environment. These facilities include fault management, accounting management, configuration management, performance management and security management.~~

~~***ATSC class.*** The ATSC class parameter enables the ATSC user to specify the quality of service expected for the offered data. The ATSC class value is specified in terms of ATN end-to-end transit delay at 95 per cent probability.~~

~~***ATS communications (ATSC).*** Communication related to air traffic services including air traffic control, aeronautical and meteorological information, position reporting and services related to safety and regularity of flight. This communication involves one or more air traffic service administrations. This term is used for purposes of address administration.~~

ATS interfacility data communication (AIDC). Automated data exchange between air traffic services units in support of flight notification, flight coordination, transfer of control and transfer of communication.~~, particularly in regard to co-ordination and transfer of flights.~~

. . .

~~***ATS unit (ATSU).*** A generic term meaning variously, air traffic control unit, flight information centre or air traffic services reporting office.~~

~~***Authentication***. A process used to ensure the identity of a person/user/network entity.~~

Authorized path. A communication path ~~that the administrator(s) of the routing domain(s) has pre-defined as~~ suitable for a given ~~traffic type and~~ message category.

~~***Automatic dependent surveillance (ADS).*** A surveillance technique in which aircraft automatically provide, via a data link, data derived from on-board navigation and position-fixing systems, including aircraft identification, four-dimensional position, and additional data as appropriate.~~

~~***Automatic terminal information service (ATIS)***. The automatic provision of current, routine information to arriving and departing aircraft throughout 24 hours or a specified portion thereof.~~

~~*Data link automatic terminal information service (D-ATIS).* The provision of ATIS via data link.~~

~~*Voice automatic terminal information service (Voice-ATIS).* The provision of ATIS by means of continuous and repetitive voice broadcasts.~~

~~***Configuration management.*** An ATN systems management facility for managers to change the configuration of remote elements.~~

~~***Context management (CM) application.*** An ATN application that provides a log-on service allowing initial aircraft introduction into the ATN and a directory of all other data link applications on the aircraft. It also includes functionality to forward addresses between ATS units.~~

~~*Note. — Context management is a recognized OSI presentation layer term. The OSI use and the ATN use have nothing in common.*~~

~~***Context management (CM) server.*** An ATS facility that is capable of providing application information relating to other ATSUs to requesting aircraft or ATSUs.~~

~~***Controller-pilot data link communication (CPDLC).*** A means of communication between controller and pilot, using data link for ATC communications.~~

~~***CPDLC application***. An ATN application that provides a means of ATC data communication between controlling, receiving or downstream ATS units and the aircraft, using air-ground and ground-ground subnetworks, and which is consistent with the ICAO phraseology for the current ATC voice communication.~~

~~***Data integrity.*** The probability that data has not been altered or destroyed.~~

Data link initiation capability (DLIC). A data link application that provides the ability to exchange addresses, names and version numbers necessary to initiate data link applications. (Re. Doc 4444).

~~***D-METAR.*** The symbol used to designate data link aviation weather report service.~~

~~***End system (ES)***. A system that contains the OSI seven layers and contains one or more end-user application processes.~~

~~***End-to-end.*** Pertaining or relating to an entire communication path, typically from (1) the interface between the information source and the communication system at the transmitting end to (2) the interface between the communication system and the information user or processor or application at the receiving end.~~

~~***Entity.*** An active element in any layer which can be either a software entity (such as a process) or a hardware entity (such as an intelligent I/O chip).~~

~~***Fault management.*** An ATN systems management facility to detect, isolate and correct problems.~~

~~***FIS application.*** An ATN application that provides to aircraft information and advice useful for the safe and efficient conduct of flights.~~

~~***Flight information service (FIS).*** A service provided for the purpose of giving advice and information useful for the safe and efficient conduct of flights.~~

~~***Inter-centre communications (ICC).*** ICC is data communication between ATS units to support ATS, such as notification, coordination, transfer of control, flight planning, airspace management and air traffic flow management.~~

~~***Intermediate system (IS).*** A system which performs relaying and routing functions and comprises the lowest three layers of the OSI reference model.~~

~~***Internet communications service.*** The internet communications service is an internetwork architecture which allows ground, air-to-ground and avionics data subnetworks to interoperate by adopting common interface services and protocols based on the ISO/OSI reference model.~~

~~***METAR application***. A FIS application that supports the D-METAR.~~

~~***Open systems interconnection (OSI) reference model***. A model providing a standard approach to network design introducing modularity by dividing the complex set of functions into seven more manageable, self-contained, functional layers. By convention these are usually depicted as a vertical stack.~~

~~*Note.— The OSI reference model is defined by ISO/IEC 7498-1.*~~

~~***Performance management.*** An ATN systems management facility to monitor and evaluate the performance of the systems.~~

Required communication performance (RCP). A statement of the performance requirements for operational communication in support of specific ATM functions. Re. *Manual on Required Communication Performance (RCP)* (Doc 9869).

~~***Security management.*** An ATN systems management facility for access control, authentication and data integrity.~~

~~***Subnetwork.*** An actual implementation of a data network that employs a homogeneous protocol and addressing plan and is under control of a single authority.~~

~~***System level requirement.*** The system level requirement is a high-level technical requirement that has been derived from operational requirements, technological constraints and regulatory constraints (administrative and institutional). The system level requirements are the basis for the functional requirements and lower-level requirements.~~

~~***Transit delay.*** In packet data systems, the elapsed time between a request to transmit an assembled data packet and an indication at the receiving end that the corresponding packet has been received and is ready to be used or forwarded.~~

~~***Upper layers (UL) communications service.*** A term pertaining to the session, presentation and application layers of the OSI reference model.~~

3.2 INTRODUCTION

~~3.2.1 The aeronautical telecommunication network (ATN) comprises application entities and communication services which allow ground, air-to-ground and avionics data subnetworks to interoperate by adopting common interface services and protocols based on the International Organization for Standardization (ISO) open systems interconnection (OSI) reference model. The conceptual model of the ATN is shown in Figure 3-1.*~~

~~3.2.2 The ATN and the associated application processes have been designed in support of the communications, navigation, surveillance and air traffic management (CNS/ATM) systems.~~ The ATN~~:~~

~~a)~~ is specifically and exclusively intended to provide digital data communications services to air traffic service provider organizations and aircraft operating agencies in support of :~~supporting the following types of communications traffic:~~

~~1~~a) air traffic services communication (ATSC) with aircraft;

b) air traffic services communications between ATS units;

~~2~~c) aeronautical operational control communications (AOC); and

~~3~~d) aeronautical administrative communication (AAC).~~; and~~

~~4) aeronautical passenger communication (APC);~~

~~b) provides, in a manner transparent to the user, a reliable end-to-end communications service essential to support the provision of safe and efficient air traffic services, between:~~

~~1) airborne systems and ground systems; and~~

~~2) multiple ground systems;~~

~~c) provides a data communication service which is capable of meeting the security and safety requirements of the users;~~

~~d) is based on internationally recognized data communications standards which will facilitate the development of compliant systems and encourage the competitive provision of network services;~~

~~e) accommodates differing types/categories/classes of service (including preferred/selected air-ground subnetwork) required by the various applications;~~

~~f) defines an architecture that enables the integration of public and private subnetworks, both air-ground and ground-ground. This allows the use of existing/planned infrastructure and network technologies, as well as giving implementors the freedom to scale the network to meet the increasing needs of the users; and~~

~~g) efficiently uses the bandwidth limited air-ground sub-networks and consequently reduces the associated costs.~~

~~3.2.3 The ATN applications presently defined have been developed to provide aeronautical communication, surveillance, and information services. These applications are intended to support the following air traffic management services:~~

~~a) air traffic services (ATS);~~

~~1) air traffic control service;~~

~~2) flight information service (FIS); and~~

~~3) alerting service.~~

~~b) air traffic flow management (ATFM); and~~

~~c) airspace management.~~

~~3.2.4 This chapter contains broad and general provisions for the ATN. The detailed technical provisions are found in Doc 9705. The remainder of this chapter is organized to address the following requirements and functions:~~

~~a) general;~~

~~b) system level requirements;~~

~~c) ATN applications requirements;~~

~~d) ATN communications service requirements;~~

~~e) ATN naming and addressing;~~

~~f) ATN systems management requirements; and~~

~~g) ATN security requirements.~~

3.3 GENERAL

Note — The Standards and Recommended Practices in sections 3.4 – 3.8 below define the minimum required protocols and services that will enable the global implementation of the ICAO Aeronautical Telecommunication Network (ATN).

~~3.3.1 The aeronautical telecommunication network (ATN) shall provide data communication services and application entities in support of:~~

~~a) the delivery of air traffic services (ATS) to aircraft;~~

~~b) the exchange of ATS information between ATS units; and~~

~~c) other applications such as aeronautical operational control (AOC) and aeronautical administrative communication (AAC).~~

~~*Note 1.— Provisions have been made to accommodate the exchange of information such as weather, flight plans, notices to airmen and dynamic real time air traffic flow management between aircraft operating agencies' ground-based systems and ATS units.*~~

~~*Note 2.— Provisions have also been made to accommodate aeronautical passenger communication (APC).*~~

~~3.3.2 When the ATN is used in support of air traffic services, it shall conform with the provisions of this chapter.~~

3.3.1 ATN communication services shall support ATN applications.

3.3.~~3~~ 2 Requirements for implementation ~~use~~ of the ATN shall be made on the basis of regional air navigation agreements. These agreements shall specify the area in which the communication standards for the ATN/OSI or the ATN/IPS are applicable.

~~3.3.4 **Recommendation.**— *Civil aviation authorities should co-ordinate, with national authorities and aeronautical industry, those implementation aspects of the ATN which will permit its world-wide safety, interoperability and efficient use, as appropriate.*~~

3.4 GENERAL ~~SYSTEM LEVEL~~ REQUIREMENTS

~~*Note.— The system level requirements are high-level technical requirements that have been derived from operational requirements, technological constraints and regulatory constraints (administrative and institutional). These system level requirements are the basis for the functional requirements and lower-level requirements.*~~

3.4.1 The ATN shall either use International Organization for Standardization (ISO) communication standards for open systems interconnection (OSI) or use the Internet Society (ISOC) communications standards for the Internet Protocol Suite (IPS).

Note.— Interoperability between interconnecting OSI/IPS networks shall be arranged prior to implementation.

~~3.4.2 The ATN shall provide a means to facilitate migration to future versions of application entities and/or the communication services.~~

~~*Note.— It is an objective that the evolution towards future versions facilitates the backward compatibility with previous versions.*~~

3.4.~~3—~~2 The AFTN/AMHS gateway shall ensure the interoperability of AFTN and CIDIN stations and networks with the ATN ~~shall enable the transition of existing AFTN/CIDIN users and systems into the ATN architecture~~.

~~*Note.— The transition from the AFTN or from the CIDIN to the ATN is handled by AFTN/AMHS and CIDIN/AMHS gateways respectively, which are defined in Doc 9705, Sub-volume III.*~~

~~3.4.4 The ATN shall make provisions whereby only the controlling ATS unit may provide ATC instructions to aircraft operating in its airspace.~~

~~*Note.— This is achieved through the current and next data authority aspects of the controller-pilot data link communications (CPDLC) application entity.*~~

3.4.~~5—~~3 Authorized path(s)~~The ATN~~ shall be defined on the basis of ~~accommodate routing based on~~ a pre-defined routing policy.

3.4.4 The ATN shall transmit, relay and (or) deliver messages in accordance with the priority classifications and without discrimination or undue delay.

3.4.~~6—~~5 The ATN shall provide means to define data communications that can be carried only over authorized paths for the traffic type and category specified by the user.

3.4.~~7—~~6 The ATN shall provide communication in accordance with the prescribed required communication performance (RCP) (*Manual on Required Communication Performance (RCP)* (Doc 9869) refers) ~~offer ATSC classes in accordance with the criteria in Table 3-1.*~~

~~*Note 1.— When an ATSC class is specified by an ATN application, packets will be forwarded in the ATN internet communications service on a best effort basis. Best effort basis means that when a route is available of the requested ATSC class, the packet is forwarded on that route. When no such route is available, the packet will be forwarded on the first known route of the ATSC class higher than that requested, or if there is no such route, first known route of the ATSC class lower than that requested.*~~

~~*Note 2. — The ATN communications service will not inform application entities if the requested ATSC class was not achieved. It is the responsibility of the application entity to determine the actual transit delay achieved by local means such as time stamping.*~~

3.4.~~8 —~~7 The ATN shall operate in accordance with the communication priorities defined in Table 3-~~2~~ 1[*] and Table 3-~~3~~2.

3.4.~~9 —~~8 The ATN shall enable exchange of application information when one or more authorized paths exist.

3.4.~~10 —~~9 The ATN shall notify the appropriate application processes when no authorized path exists.

~~3.4.11 — The ATN shall provide means to unambiguously address all ATN end and intermediate systems.~~

~~3.4.12 — The ATN shall enable the recipient of a message to identify the originator of that message.~~

~~3.4.13 — The ATN addressing and naming plans shall allow States and organizations to assign addresses and names within their own administrative domains.~~

~~3.4.14 — The ATN shall support data communications to fixed and mobile systems.~~

~~3.4.15 — The ATN shall accommodate ATN mobile sub-networks as defined in this Annex.~~

3.4.~~16 —~~10 The ATN shall make provisions for the efficient use of limited bandwidth subnetworks.

3.4.~~17 —~~11 **Recommendation.** *The ATN ~~shall~~ should enable an aircraft intermediate system (router) to ~~be connected~~ connect to a ground intermediate system (router) via different ~~concurrent mobile~~ subnetworks*.

3.4.~~18 —~~12 **Recommendation.** *The ATN should ~~shall~~ enable an aircraft intermediate system (router) to ~~be~~ connect~~ed~~ to different ~~multiple~~ ground intermediate systems (routers)*.

3.4.~~19 —~~13 The ATN shall enable the exchange of address information between ~~application~~ applications ~~entities~~.

~~3.4.20 — The ATN shall support the context management (CM) application when any of the other air-ground applications are supported.~~

~~3.4.21 — The ATN shall be capable of establishing, maintaining, releasing and aborting peer-to-peer application associations for the context management (CM) application.~~

~~3.4.22 — The ATN shall be capable of establishing, maintaining, releasing and aborting peer-to-peer application associations for the automatic dependent surveillance (ADS) application.~~

~~3.4.23 — The ATN shall be capable of establishing, maintaining, releasing and aborting peer-to-peer application associations for the controller-pilot data link communications (CPDLC) application.~~

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[*]Tables 3-1 and 3-2 are located at the end of this chapter.

~~3.4.24 The ATN shall be capable of establishing, maintaining, releasing and aborting peer-to-peer application associations for the automatic terminal information service (ATIS) application.~~

~~3.4.25 The ATN shall be capable of establishing, maintaining, releasing and aborting application associations for the ATS message handling service (ATSMHS) application.~~

~~3.4.26 The ATN shall be capable of establishing, maintaining, releasing and aborting peer-to-peer application associations for the ATS interfacility data communication (AIDC) application.~~

3.4.~~27 —~~14 Where the absolute time of day is used within the ATN, it shall be accurate to within 1 second of coordinated universal time (UTC).

Note.— The ~~A~~ time accuracy value ~~may result~~ results in synchronization errors of up to two seconds. ~~times the stated accuracy value~~.

~~3.4.28 The end system shall make provisions to ensure that the probability of not detecting a 255-octet message being mis- delivered, non-delivered or corrupted by the internet communication service is less than or equal to 10^{-8} per message.~~

~~*Note. — It is assumed that ATN subnetworks will ensure data integrity consistent with this system level requirement.*~~

~~3.4.29 ATN end systems supporting ATN security services shall be capable of authenticating the identity of peer end systems, authenticating the source of application messages and ensuring the data integrity of the application messages.~~

~~*Note. — Application messages in this context include messages related to ATS, systems management and directory services.*~~

~~3.4.30 ATN ground and air-ground boundary intermediate systems supporting ATN security services shall be capable of authenticating the identity of peer boundary intermediate systems, authenticating the source of routing information and ensuring the data integrity of routing information.~~

~~3.4.31 The ATN shall be capable of establishing, maintaining, releasing and aborting peer-to-peer application associations for the exchange of directory information.~~

~~3.4.32 ATN systems supporting ATN systems management shall facilitate enhanced continuity of ATN operations, including the monitoring and maintenance of the quality of the communications service.~~

~~3.4.33 The ATN shall be capable of establishing, maintaining, releasing and aborting peer-to-peer application associations for the systems management (SM) application.~~

~~3.4.34 The ATN shall be capable of establishing, maintaining, releasing and aborting peer-to-peer application associations for the aviation routine weather report service (METAR) application.~~

3.5 ATN APPLICATIONS REQUIREMENTS

~~*Note 1. — Implementation of ATN application(s) within a State or region does not imply implementation of all of the ATN applications defined below.*~~

~~*Note 2. — The implementation of pre-defined subsets of the ATN application technical provisions are allowed as detailed in Doc 9705.*~~

3.5.1 System applications

Note.— System applications provide services that are necessary for operation of the ATN~~ air-ground applications, ground- ground applications and/or ATN communication services~~.

3.5.1.1 The ATN shall support the Data Link Initiation Capability (DLIC) applications as contained in Doc 9694 (*Manual on Air Traffic Services (ATS) Data Link Applications*, Part I) when air-ground data links are implemented.

~~3.5.1.1 CONTEXT MANAGEMENT (CM) APPLICATION~~

~~*Note.— The CM application provides the capability for an aircraft to log on with an ATS ground system; in some instances the ground system will request the aircraft to contact a specific ground system. Once an appropriate connection is established, CM provides for the exchange of information on each supported ATN application including the network address of each, as appropriate. For ATN systems supporting security services, CM also obtains and exchanges key and key usage information. CM also provides the capability to update log-on information and the capability for an ATS ground system to forward log-on information to another ATS ground system. The registration function of the CM allows the sharing of information with other applications on the ground or on the aircraft.*~~

~~3.5.1.1.1 The ATN shall be capable of supporting the following CM application functions:~~

~~a) log-on;~~

~~b) contact;~~

~~c) update;~~

~~d) CM server query;~~

~~e) CM server update;~~

~~f) ground forwarding; and~~

~~g) registration.~~

~~*Note. — The technical provisions for the CM application are defined in Doc 9705, Sub-volume II.*~~

~~3.5.1.2 ATN DIRECTORY SERVICES (DIR)~~

3.5.1.2~~.1~~ The ATN/OSI end system shall ~~be capable of supporting~~ support the following DIR application functions when AMHS and/or security protocols are implemented (Re. ITU-T X.500 series):

~~a) directory bind;~~

~~b~~a) directory information retrieval; and

~~c~~b) directory information modification ~~change~~.

~~*Note 1. — The ATN Directory Service provides a capability for an application or user to query a distributed directory data base and to retrieve addressing, security and technical capabilities information. Directory Service provides a capability to special, authorized users to add, delete and modify parts of the directory data base for which they are responsible. The Directory Service is offered over the ATN to all applications and users complying with the technical provisions of Doc 9705, Sub-volume VII .*~~

~~*Note 2. — Directory bind is the function of establishing an association between two directory components that support other directory functions. Directory bind sets up the application contexts and underlying communications connections for use in other directory functions.*~~

~~3.5.1.3 — OTHER SYSTEM APPLICATIONS~~

~~(to be developed)~~

3.5.2 Air-ground applications

~~*Note. — The ground components of air-ground applications include functionality to support the forwarding of the contents of air-to-ground messages along ground-ground communications paths.*~~

~~3.5.2.1 — AUTOMATIC DEPENDENT SURVEILLANCE (ADS) APPLICATION~~

~~*Note. — The ADS application comprises an airborne and ground component. The airborne ADS application component is capable of automatically providing, via the ATN communications service, to the ground component data derived from on-board navigation systems (e.g. aircraft identification, four-dimensional position, intent, and additional data as appropriate). The ADS application provides service based on contracts established between its air and ground components (i.e. demand contract, periodic contract, event contract and emergency contract) and between two ADS ground components (i.e. forward contract).*~~

3.5.2.1~~.1~~ The ATN shall be capable of supporting on or more of the following ~~ADS~~ ~~application~~ applications, in accordance with the provisions of Doc 9694 ~~functions~~:

a) ~~demand contracts~~ADS-C;

b) ~~periodic contracts~~CPDLC; and

c) ~~event contracts~~FIS (including ATIS and METAR).~~;~~

d) ~~emergency contracts; and~~

~~e) forward contracts.~~

~~*Note. — The technical provisions for the ADS application are defined in Doc 9705, Sub-volume II.*~~

~~3.5.2.2 CONTROLLER-PILOT DATA LINK COMMUNICATIONS (CPDLC) APPLICATION~~

~~*Note. The CPDLC application, comprising an airborne and ground component, provides capability for data link communications between ATS units and aircraft under their control and/or aircraft about to come under their control. The CPDLC application has the capability to establish, manage, and terminate CPDLC dialogues for controller-pilot message exchange and for ground message forwarding.*~~

~~3.5.2.2.1 The ATN shall be capable of supporting the following CPDLC application functions:~~

~~a) controller-pilot message exchange;~~

~~b) transfer of data authority;~~

~~c) downstream clearance; and~~

~~d) ground forward.~~

~~*Note. The technical provisions for the CPDLC application are defined in Doc 9880*, Manual on Detailed Technical Specifications for the Aeronautical Telecommunication Network (ATN).~~

~~3.5.2.3 FLIGHT INFORMATION SERVICE (FIS) APPLICATIONS~~

~~*Note. FIS applications provide flight information services to airspace users from ground FIS systems.*~~

~~3.5.2.3.1 *AUTOMATIC TERMINAL INFORMATION SERVICE (ATIS) APPLICATION*~~

~~3.5.2.3.1.1 The ATN shall be capable of supporting the following ATIS application functions:~~

~~a) aircraft-initiated FIS demand contracts;~~

~~b) aircraft-initiated FIS update contracts; and~~

~~c) both an aircraft- and ground-initiated FIS cancellation of contracts.~~

~~*Note. The technical provisions for the ATIS application are defined in Doc 9705, Sub-volume II.*~~

~~3.5.2.3.2 *AVIATION ROUTINE WEATHER REPORT SERVICE (METAR) APPLICATION*~~

~~3.5.2.3.2.1 The ATN shall be capable of supporting the METAR application function for aircraft-initiated FIS demand contracts.~~

~~*Note. The technical provisions for the METAR application are defined in Doc 9705, Sub-volume II.*~~

~~3.5.2.3.3 OTHER FIS APPLICATIONS~~

~~(to be developed)~~

~~3.5.2.4 OTHER AIR-GROUND APPLICATIONS~~

~~(to be developed)~~

3.5.3 Ground-ground applications

~~*Note. — Ground-ground applications are defined as those ATN applications resident in ground-based systems which solely exchange information with peer applications also resident in ground-based systems.*~~

~~3.5.3.1 INTER-CENTRE COMMUNICATIONS (ICC)~~

~~*Note. — The inter-centre communications applications set enables the exchange of information between air traffic service units.*~~

~~3.5.3.1.1 *ATS INTERFACILITY DATA COMMUNICATION (AIDC)*~~

~~*Note. — AIDC is an ATN application that is used by two air traffic service units to enable the exchange of ATS information for active flights related to flight notification, flight coordination, transfer of control, surveillance data and free (i.e. unstructured) text data.*~~

3.5.3.1~~.1.1~~ The ATN shall be capable of supporting ~~the following~~ AIDC ~~application~~ applications ~~functions:~~ as contained in Doc 9694 and ATS message handling services application (ATSMHS).

~~a) flight notification;~~

~~b) flight coordination;~~

~~c) transfer of control;~~

~~d) transfer of communications;~~

~~e) transfer of surveillance data; and~~

~~f) transfer of general data.~~

~~*Note. — The technical provisions for the AIDC application are defined in Doc 9705, Sub-volume III.*~~

~~3.5.3.2 ATS MESSAGE HANDLING SERVICE (ATSMHS) APPLICATION~~

~~*Note. — The ATS message handling service (ATSMHS) application enables ATS messages to be exchanged between service users through the provision of generic message services. The ATSMHS application includes the definition of AFTN/ATN and CIDIN/ATN gateways.*~~

~~3.5.3.2.1 The ATN shall be capable of supporting the ATS message handling service application (ATSMHS).~~

~~*Note. — The technical provisions for the ATSMHS application are defined in Doc 9705, Sub-volume III.*~~

~~3.5.3.3 OTHER GROUND-GROUND APPLICATIONS~~

~~(to be developed)~~

3.6 ATN COMMUNICATION SERVICE REQUIREMENTS

~~*Note.— The ATN communication service requirements define the requirements for layers 3 through 6, as well as part of layer 7, of the OSI reference model. These services take information produced by one of the individual ATN applications and perform the end-to-end communication service using standard protocols. These communication service requirements are divided into two parts. The upper layer communications service defines the standards for layers 5 through 7. The Internet communications service defines standards for layers 3 and 4. The requirements for layers 1 and 2 are outside the scope of ATN SARPs.*~~

~~3.6.1 Upper layer communications service~~

~~3.6.1.1 The upper layer communications service shall include the:~~

~~a) session layer;~~

~~b) presentation layer;~~

~~c) application entity structure;~~

~~d) association control service element (ACSE);~~

~~e) security application service object (ASO), for ATN systems supporting security services; and~~

~~f) control function (CF).~~

~~*Note 1.— The technical provisions for the upper layer communications service for all ATN applications, except the ATS message service function of the ATSMHS application, are defined in Doc 9705, Sub-volume IV.*~~

~~*Note 2. — The technical provisions for the upper layer communications service for the ATS message service function of the ATSMHS application are defined in Doc 9705, Sub-volume III.*~~

3.6.1 ATN/IPS upper layer communication service

3.6.1.1 An ATN host* shall be capable of supporting the ATN/IPS upper layers including an application layer.

3.6.2 ATN/OSI upper layer communications service

3.6.2.1 An ATN/OSI end system (ES)* shall be capable of supporting the OSI upper layer communications service (ULCS) including session, presentation and application layers.

Note.— The detailed technical specifications for OSI ULCS are defined in Doc 9705.

3.6.3 ATN/IPS Internet communication service

3.6.3.1 An ATN host shall be capable of supporting the ATN/IPS Internet including the:

a) transport layer in accordance with RFC 793 (TCP) and RFC 768 (UDP); and

b) network layer in accordance with RFC 2460 (IPv6).

3.6.3.2 An IPS Router shall support the ATN network layer in accordance with RFC 2460 (IPv6) and RFC 4271 (BGP), and RFC 2858 (BGP multiprotocol extensions).

3.6.~~2~~4 ATN/OSI Internet communications service

~~*Note.- The ATN Internet communications service requirements are applicable to the end system and intermediate system functional entities which together provide the ATN Internet communications service. The ATN Internet communications service is provided to its user (i.e. the upperlayers) via the transport layer service interface.*~~

3.6.~~2.~~4.1 An ATN/OSI end system ~~(ES)~~ shall be capable of supporting the ATN Internet including the:

a) transport layer in accordance with ISO/IEC 8073 (TP4) and ISO/IEC 8602 (CLTP); and

b) network layer in accordance with ISO/IEC 8473 (CLNP).

3.6.~~2.~~4.2 An ATN intermediate system (IS) shall support the ATN network layer in accordance with ISO/IEC 8473 (CLNP) and ISO/IEC 10747 (IDRP).~~provisions as appropriate to the class of ATN IS under consideration.~~

~~*Note — A number of different classes of ATN intermediate systems for which network layer profiles are defined are contained in Doc. 9705, Sub-volume V.*~~

3.7 ATN NAMING AND ADDRESSING REQUIREMENTS

Note.— The ATN naming and addressing scheme supports the principles of unambiguous identification of intermediate systems (routers) and end systems (hosts) ~~information objects~~ and provides global address standardization.

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* An ATN host is an ATN end system in OSI terminology; an ATN end-system is an ATN host in IPS terminology.

3.7.1 The ATN shall provide provisions for unambiguous application identification. ~~entity naming.~~

3.7.2 The ATN shall provide provisions for unambiguous ~~network and transport~~ addressing.

~~*Note. — The technical provisions for ATN application entity naming are defined in Doc 9705, Sub-volume IV, the provisions for network and transport addressing are defined in Sub-volume V, and the provisions for registration services are defined in Sub-volume IX of the same document.*~~

3.~~4.11~~7.3 The ATN shall provide means to unambiguously address all ATN end systems (hosts) and intermediate systems (routers).

3.~~4.13~~7.4 The ATN addressing and naming plans shall allow States and organizations to assign addresses and names within their own administrative domains.

~~3.8 ATN SYSTEMS MANAGEMENT REQUIREMENTS~~

~~*Note 1. — The ATN systems management (SM) application provides the capability for an SM manager to exchange information with an SM agent and/or another SM manager.*~~

~~*Note 2. — Support for the ATN SM services technical provisions may be required on a State or regional basis.*~~

~~3.8.1 The ATN shall be capable of supporting the following systems management application functions:~~

~~a) fault management;~~

~~b) configuration management;~~

~~c) accounting management;~~

~~d) performance management; and~~

~~e) security management.~~

~~*Note. — The technical provisions for ATN Systems Management are defined in Doc 9705, Sub-volume VI.*~~

~~3.8.1.1 ATN end systems and intermediate systems that support the ATN systems management application and SM managers shall support access to managed objects.~~

~~*Note. — The SM application managed object definitions and access provisions are defined in Doc 9705, Sub-volume VI.*~~

3.~~9~~8 ATN SECURITY REQUIREMENTS

3.~~4.4~~8.1 The ATN shall make provisions whereby only the controlling ATS unit may provide ATC instructions to aircraft operating in its airspace.

Note — This is achieved through the current and next data authority aspects of the controller-pilot data link communications (CPDLC) application~~ entity~~.

3.~~4.12~~8.2 The ATN shall enable the recipient of a message to identify the originator of that message.

3.~~4.29~~8.3 ATN end systems supporting ATN security services shall be capable of authenticating the identity of peer end systems, authenticating the source of ~~application~~ messages and ensuring the data integrity of the ~~application~~ messages.

~~3.9.1 The security of the ATN shall be achieved based on a combination of technical provisions, local physical security measures, and procedural security measures.~~

~~*Note 1. — The technical provisions for ATN security are defined in Doc 9705, and the physical and procedural security measures are defined in Annex 17 and the Security Manual.*~~

~~*Note 2. — Support for the ATN security services technical provisions may be required on a State or regional basis.*~~

~~3.9.1.1 **Recommendation.** — *The following physical and procedural techniques should be used to provide security for ATN end systems, intermediate systems, network managers, directory servers and subnetworks:*~~

~~*a) — restricted physical access to ATN end systems, intermediate systems, SM workstations, directory servers and subnetwork switches, network managers, and other essential network sub-systems;*~~

~~*b) — restricted user access to ATN end systems, intermediate systems, directory servers and SM workstations to only authorized personnel; and*~~

~~*c) — non-use, or restricted use, of remote access to ATN ground end system, intermediate systems and SM workstations.*~~

~~3.9.2 — ATN security policy~~

~~*Note. — Communication monitoring and third party traffic analysis do not constitute safety hazards and are not considered security threats for the ATSC. However, some ATS and/or non-ATS users and applications may have local, or organizational, policies wherein communication monitoring and third party traffic analysis would be considered security threats based on other concerns, such as economic considerations.*~~

~~3.9.2.1 — ATS messages shall be protected from masquerade, modification and replay.~~

~~*Note 1. — This means that for data messages exchanged among ATN entities there will be a high level of assurance that a message comes from where it claims, has not been tampered with, and is not a repeat of an obsolete message.*~~

~~*Note 2. — The level of protection may vary by the type of security threat and by the level of ATN security service selected by the user or application process.*~~

~~3.9.2.2 — A request for protection of ATS messages shall be honoured.~~

Note.— A request for non-use of protection may be honoured. This means that the use of security is the default and negotiation to non-use is based on local policy.

3.~~9.2.3~~8.4 The ATN services ~~that support messages to and from the aircraft~~ shall be protected against ~~denial of~~ service attacks to a level ~~of probability~~ consistent with the ~~required~~ application service requirements~~availability as determined by local policies~~.

~~*Note 1. — The term "denial of service" describes a condition where legitimate access to information or other ATN resources is deliberately impeded.*~~

~~*Note 2. — This may mean having alternative communications paths available in case one path is* **subject to denial of service.***~~

TABLES FOR CHAPTER 3

~~**Table 3-1. — Transit delays for ATSC Classes**~~

~~*Maximum one-way ATN* end-to-end transit delay at 95% probability (seconds)~~	~~ATSC Class~~
~~Reserved~~	~~A~~
~~4.5~~	~~B~~
~~7.2~~	~~C~~
~~13.5~~	~~D~~
~~18~~	~~E~~
~~27~~	~~F~~
~~50~~	~~G~~
~~100~~	~~H~~
~~No value specified~~	~~no preference~~
~~*Note 1. The value for the ATN end-to-end transit delay represents approximately 90% of the value for the total end-to-end transit delay between the ultimate users of the system.*~~ ~~*Note 2. The 95% probability is based on the availability of a route conforming to the requested ATSC class.*~~	

Table 3-~~2~~1. Mapping of ATN communication priorities

Message categories	*ATN application*	*Corresponding protocol priority*	
		Transport layer priority	*Network layer priority*
Network/systems management	SM	0	14
Distress communications		1	13
Urgent communications		2	12
High-priority flight safety messages	CPDLC, ADS	3	11
Normal-priority flight safety messages	AIDC, ATIS	4	10
Meteorological communications	METAR	5	9
Flight regularity communications	CM, ATSMHS	6	8
Aeronautical information service messages		7	7
Network/systems administration	SM, DIR	8	6
Aeronautical administrative messages		9	5
<unassigned>		10	4
Urgent-priority administrative and U.N. Charter communications		11	3
High-priority administrative and State/Government communications		12	2
Normal priority administrative communications		13	1
Low priority administrative communications and aeronautical passenger communications		14	0
Note.- The network layer priorities shown in the table apply only to connectionless network priority and do not apply to subnetwork priority.			

Table 3-~~3~~2. Mapping of ATN network priority to mobile subnetwork priority

Message categories	*ATN network* layer priority	Corresponding mobile subnetwork priority (see Note 4)					
		AMSS	VDL Mode 2	VDL Mode 3	VDL Mode 4 (see Note 5)	SSR Mode S	HFDL
Network/systems management	14	14	see Note 1	3	~~high~~14	high	14
Distress communications	13	14	see Note 1	2	~~high~~13	high	14
Urgent communications	12	14	see Note 1	2	~~high~~12	high	14
High-priority flight safety messages	11	11	see Note 1	2	~~high~~11	high	11
Normal-priority flight safety messages	10	11	see Note 1	2	~~high~~10	high	11
Meteorological communications	9	8	see Note 1	1	~~medium~~9	low	8
Flight regularity communications	8	7	see Note 1	1	~~medium~~8	low	7
Aeronautical information service messages	7	6	see Note 1	0	~~medium~~7	low	6
Network/systems administration	6	5	see Note 1	0	~~medium~~6	low	5
Aeronautical administrative messages	5	5	not allowed	not allowed	not allowed	not allowed	not allowed
<unassigned>	4	unassigned	unassigned	unassigned	unassigned	unassigned	unassigned
Urgent-priority administrative and U.N. Charter communications	3	3	not allowed	not allowed	not allowed	not allowed	not allowed
High-priority administrative and State/Government communications	2	2	not allowed	not allowed	not allowed	not allowed	not allowed
Normal-priority administrative communications	1	1	not allowed	not allowed	not allowed	not allowed	not allowed
Low-priority administrative communications and aeronautical passenger communications	0	0	not allowed	not allowed	not allowed	not allowed	not allowed

Note 1.— VDL Mode 2 has no specific subnetwork priority mechanisms.

Note 2.— The AMSS SARPs specify mapping of message categories to subnetwork priority without explicitly referencing ATN network layer priority.

Note 3.— The term "not allowed" means that only communications related to safety and regularity of flight are authorized to pass over this subnetwork as defined in the subnetwork SARPs.

Note 4.— Only those mobile subnetworks are listed for which subnetwork SARPs exist and for which explicit support is provided by the ATN boundary intermediate system (BIS) technical provisions.

~~*Note 5.— The VDL Mode 4 subnetwork provides support for surveillance applications (e.g. ADS).*~~

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ATTACHMENT B to State letter AN 7/1.3.92-07/39

PROPOSED AMENDMENT TO ANNEX 10, VOLUME III, PART II

NOTES ON THE PRESENTATION OF THE PROPOSED AMENDMENT

The text of the amendment is arranged to show deleted text with a line through it and new text highlighted with grey shading, as shown below:

1.	~~Text to be deleted is shown with a line through it~~.	text to be deleted
2.	New text to be inserted is highlighted with grey shading.	new text to be inserted
3.	~~Text to be deleted is shown with a line through it~~ followed by the replacement text which is highlighted with grey shading.	new text to replace existing text

PROPOSED AMENDMENT TO

INTERNATIONAL STANDARDS
AND RECOMMENDED PRACTICES

AERONAUTICAL TELECOMMUNICATIONS

ANNEX 10
TO THE CONVENTION ON INTERNATIONAL CIVIL AVIATION

VOLUME III
(COMMUNICATION SYSTEMS)

PART II — VOICE COMMUNICATION SYSTEMS

. . .

CHAPTER 2. AERONAUTICAL MOBILE SERVICE

. . .

2.2 SYSTEM CHARACTERISTICS OF THE GROUND INSTALLATION

2.2.1 Transmitting function

2.2.1.1 *Frequency stability.* The radio frequency of operation shall not vary more than plus or minus 0.005 per cent from the assigned frequency. Where 25 kHz channel spacing is introduced in accordance with Volume V, the radio frequency of operation shall not vary more than plus or minus 0.002 per cent from the assigned frequency. Where 8.33 kHz channel spacing is introduced in accordance with Volume V, the radio frequency of operation shall not vary more than plus or minus 0.0001 per cent from the assigned frequency.

Note.— The above frequency stability requirements ~~tolerances~~ will not be ~~suitable~~ sufficient for offset carrier systems using 25 kHz channel spacing or higher.

2.2.1.1.1 Offset carrier systems in 8.33 kHz, 25 kHz, 50 kHz and 100 kHz channel spaced environments. The stability of individual carriers of an offset carrier system shall be such as to prevent first-order heterodyne frequencies of less than 4 kHz and, additionally, the maximum frequency excursion of the outer carrier frequencies from the assigned carrier frequency shall not exceed 8 kHz. Offset carrier systems for 8.33 kHz channel spacing shall be limited to two-carrier systems using a carrier offset of plus and minus 2.5 kHz.~~shall not be used on 8.33 kHz spaced channels.~~

Note.— Examples of the required stability of the individual carriers of offset carrier systems may be found at Attachment A to Part II.

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2.3 SYSTEM CHARACTERISTICS OF THE AIRBORNE INSTALLATION

. . .

2.3.2.2 SENSITIVITY

. . .

2.3.2.4 *Effective acceptance bandwidth for 8.33 kHz channel spacing receiving installations*. When tuned to a channel designated in Volume V, as having a width of 8.33 kHz, the receiving function shall ~~provide an adequate audio output when the signal specified at 2.3.2.2 above has a carrier frequency within plus or minus 0.0005 per cent of the assigned frequency. Further information on the effective acceptance bandwidth is contained in Attachment A to Part II.~~ensure an effective acceptance bandwidth as follows:

a) in areas where offset carrier systems are employed, the receiving function shall provide an adequate audio output when the signal specified at 2.3.2.2 above has a carrier frequency of plus or minus 2.5 kHz of the assigned frequency; and

b) in areas where offset carrier systems are not employed, the receiving function shall provide an adequate audio output when the signal specified at 2.3.2.2 above has a carrier frequency within plus or minus 0.0005 per cent of the assigned frequency. Further information on the effective acceptance bandwidth is contained in Part II, Attachment A.

Note.— The effective acceptance bandwidth includes Doppler shift.

. . .

2.3.2.7 **Recommendation.—** *In the case of receivers complying with 2.3.2.3 or 2.3.2.4 above used in areas where offset carrier systems are in force, the characteristics of the receiver should be such that:*

a) the audio frequency response precludes harmful levels of audio heterodynes resulting from the reception of two or more offset carrier frequencies;

b) the receiver muting circuits, if provided, operate satisfactorily in the presence of audio heterodynes resulting from the reception of two or more offset carrier frequencies.

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ATTACHMENT A TO PART II. GUIDANCE MATERIAL FOR COMMUNICATION SYSTEMS

. . .

1.2 Off-set carrier system in 25 kHz, 50 kHz and 100 kHz spaced channels

. . .

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ATTACHMENT C to State letter AN 7/1.3.92-07/39

RESPONSE FORM TO BE COMPLETED AND RETURNED TO ICAO TOGETHER WITH ANY COMMENTS YOU MAY HAVE ON THE PROPOSED AMENDMENTS

To: The Secretary General
International Civil Aviation Organization
999 University Street
Montreal, Quebec
Canada, H3C 5H7

(**State**) _____

Please make a checkmark (✓) against one option for each amendment. If you choose options "agreement with comments" or "disagreement with comments", **please provide your comments on separate sheets**.

	Agreement without comments	*Agreement with comments**	*Disagreement without comments*	*Disagreement with comments*	*No position*
Amendment Annex 10 — *Aeronautical Telecommunications*, Volume III — *Communication Systems*, Part I — *Digital Data Communication Systems* (Attachment A refers)					
Amendment Annex 10 — *Aeronautical Telecommunications*, Volume III — *Communication Systems*, Part II — *Voice Communication Systems* (Attachment B refers)					

* "Agreement with comments" indicates that your State or organization agrees with the intent and overall thrust of the amendment proposal; the comments themselves may include, as necessary, your reservations concerning certain parts of the proposal and/or offer an alternative proposal in this regard.

Signature _____ Date _____

— END —