International Standards
and Recommended Practices and
Procedures for Air Navigation Services

Annex 10
to the Convention on
International Civil Aviation

Aeronautical Telecommunications

Volume II
Communication Procedures
including those with PANS status

This edition incorporates all amendments adopted by the Council prior to 13 March 2001 and supersedes, on 1 November 2001, all previous editions of Annex 10, Volume II.

For information regarding the applicability of the Standards and Recommended Practices and the Procedures for Air Navigation Services, *see* Foreword.

Sixth Edition
July 2001

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AMENDMENTS

Amendments are announced in the supplements to the *Catalogue of ICAO Publications;* 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.

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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 planned for publication with Amendment 71.

Volume II contains material that has the status of Procedures for Air Navigation Services (PANS). This latter material was included, prior to the publication of the First Edition of Volume II, in *PANS — Radiotelephony Procedures* (Doc 7181), which document is now superseded.

Table A shows the origin of amendments to Annex 10 subsequent to Amendment 43, together with a list of the principal subjects involved, where appropriate, and the dates on which the Annex and the amendments were adopted by Council, when they became effective, and when they became 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.

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The Procedures for Air Navigation Services (PANS) contained in Volume II of Annex 10 do not carry the status afforded to Standards adopted by the Council as Annexes to the Convention and, therefore, do not come within the obligation imposed by Article 38 of the Convention to notify differences in the event of non-implementation. However, attention of States is drawn to the provisions of Annex 15 related to the publication in their Aeronautical Information Publications of lists of significant differences between their procedures and the related ICAO Procedures.

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

This Annex has been adopted in four languages — English, 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

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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.

With respect to the typesetting of the material in Volume II of Annex 10, *Procedures for Air Navigation Services* have been printed in light face italics, the status being indicated by the prefix **PANS**.

Table A. Amendments to Annex 10, Volume II

Amendment	*Source(s)*	*Subject(s)*	*Adopted Effective Applicable*
44	Seventh Session of the COM Division	With the creation of Volume II and the inclusion of appropriate provisions which up to that time were included in Doc 7181 — *PANS — Radiotelephony Procedures*, a general rearrangement of the provisions relating to communications procedures was necessary and was effected in the new Volume II.	31 May 1965 1 October 1965 10 March 1966
45	Sixth Meeting of the Panel of Teletypewriter Specialists; Fourth AN Conference	A number of detailed changes in the AFTN procedures; amendment to Chapters 5 and 6, to indicate more precisely the procedures to be used when communications take place directly between a pilot and an air traffic controller; and a rewording of 3.7 — Use of Abbreviations and Codes, to correct an unintentional change in meaning introduced in Amendment 42.	12 December 1966 12 April 1967 24 August 1967
46	Fifth Meeting of the ATC Automation Panel	Provisions for the transmission of ATS messages intended for use in an ATC computer.	7 June 1967 5 October 1967 8 February 1968
47	COM/OPS Divisional Meeting	Introduction of new simplified Aeronautical Mobile Distress Procedures which are better suited to the special requirements of international civil aviation.	11 December 1967 11 April 1968 22 August 1968
48	Seventh Meeting of the Panel of Teletypewriter Specialists	Introduction of changes to message classification and teletypewriter procedures in the light of experience gained in automated operation of the AFTN.	23 January 1969 23 May 1969 18 September 1969
49	First Meeting of the Automated Data Interchange Systems Panel; Sixth AN Conference	Provision concerning the use of the 7-unit code for data interchange at medium signalling rates; introduction of provisions relating to the categories of aeronautical mobile service messages. On the basis of the study of consolidation and presentation of the Regional Supplementary Procedures, it introduces provisions relating to: appropriate diversion routing lists at AFTN communication centres; early transmission of AFTN messages bearing Priority Indicators GG or higher; guarding of 121.5 MHz during long over-water flights; action by aeronautical stations receiving an air-report or a message containing meteorological information transmitted by an aircraft; and the action taken by a station receiving a distress message or an emergency message; and when it is aware that the distress condition is ended.	1 June 1970 1 October 1970 4 February 1971

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Amendment	*Source(s)*	*Subject(s)*	*Adopted* *Effective* *Applicable*
50	Fifth NAT RAN Meeting; Second Meeting of the Automated Data Interchange Systems Panel; Air Navigation Study on RAN Meeting recommendations of worldwide applicability; Sixth AN Conference	Introduction of the term "Hertz (Hz)" in place of the term "cycles per second (c/ s)" as the unit of frequency for electric and radio-technical matters; changes in the provisions relating to short-term and long-term retention of AFTN traffic records and the period of thirty days for the retention of communications logs; expansion of the Introduction to Volume II with material relating to the 7-unit coded character set; introduction of the definitions for "ATS direct speech circuit", "Meteorological operational channel" and "Meteorological operational telecommunication network"; reorganization of the provisions at Chapters 3 and 4 by grouping under Chapter 3 the general provisions for the four parts of the international aeronautical telecommunication service and under Chapter 4 the provisions relating to the aeronautical fixed service, including the aeronautical fixed telecommunication network; provisions concerning the recording of air-reports in AIREP form.	24 March 1972 24 July 1972 7 December 1972
51	Sixth EUM RAN Meeting	Introduction of provisions concerning the use of a predetermined distribution system for AFTN messages.	11 December 1972 11 April 1973 16 August 1973
52	—	No change.	—
53	—	No change.	—
54[1]	Fourth Meeting of the Automated Data Interchange Systems Panel	Insertion of cross-references in Volume I, Part I, Chapter 4, 4.12 and in the Introduction to Volume II, concerning data exchange rates.	17 June 1974 — —
55	—	No change.	—
56	—	No change.	—
57	ASIA/PAC RAN Meeting	Amendments concerning the maintenance of guard on the VHF emergency frequency 121.5 MHz by the crews of aircraft crossing designated areas, and the elimination of ocean station vessels from those aeronautical stations with which radio contact should be attempted in case of air-ground communications failure.	16 June 1976 16 October 1976 6 October 1977
58	Sixth Meeting of the Automated Data Interchange Systems Panel	Amendment concerning the material permitted in AFS messages and the procedures for requesting repetition of mutilated messages in the AFTN; also the introduction of a message format for the 7-unit coded character set.	27 June 1977 27 October 1977 23 February 1978
59	COM Divisional Meeting (1976)	Amendment concerning address part of the AFTN messages.	14 December 1977 14 April 1978 10 August 1978
60	Eighth Meeting of the EUR Air Navigation Planning Group; Third Meeting of the EUR/NAM/NAT Regional Planning Group	Designation of VHF 25 kHz channels; short-term retention of AFTN messages.	4 December 1978 4 April 1979 29 November 1979
61	Seventh Meeting of the Automated Data Interchange Systems Panel; COM Divisional Meeting (1978)	Introduction of a new series of marginal serial numbers in use by the International Telecommunication Union (ITU) and clarification of the term "Radio Regulations"; changes to the definition of the Aeronautical Fixed Telecommunication Network (AFTN); introduction of the definition of "operational control communications"; new provisions regarding stripped address procedure; changes in the provisions regarding maximum message length; changes in the provisions regarding flight regularity messages.	10 December 1979 10 April 1980 27 November 1980

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Amendment	*Source(s)*	*Subject(s)*	*Adopted* *Effective* *Applicable*
62	Eighth Meeting of the Automated Data Interchange Systems Panel	Changes and additions to the provisions related to service messages, multiple lines of address and stripped address procedure; changes and additions to the provisions related to channel-check transmissions and the use of controlled circuit protocols; changes and additions to the provisions related to the detection of mutilated messages; addition of provisions related to the transfer of AFTN messages over code and byte independent circuits and networks.	14 December 1981 14 April 1982 25 November 1982
63	Ninth Meeting of the Automated Data Interchange Systems Panel	Changes to the provisions related to message priority and priority indicators.	13 December 1982 13 April 1983 24 November 1983
64	Air Navigation Commission	Introduction of new and revised radiotelephony procedures for use in the Aeronautical Mobile Service.	30 March 1983 29 July 1983 7 June 1984
65	Recommendations of the ANC relating to the method of referencing date/time; COM/MET Divisional Meeting (1982); Third Meeting of the ATS Data Acquisition, Processing and Transfer Panel; 10th Meeting of the Automated Data Interchange Systems Panel	Coordinated universal time (UTC); changes to AFTN message text length, and priorities for movement and control messages; test procedures on AFTN channels; new material on AFTN address stripping in Attachment C.	6 December 1984 6 April 1985 21 November 1985
66	—	No change.	—
67	Eighth Meeting, 104th Session of Council; COM/MET Divisional Meeting (1982); Air Navigation Commission	Changes and editorial rearrangement of AFTN procedures resulting from the new ICAO three-letter designator; changes related to predetermined distribution system for the AFTN; introduction of new procedures concerning transmission of whole hundreds in radiotelephony; introduction of new procedures for use on VHF air-to-air communications channel; editorial rearrangement to present English language radiotelephony phraseology in all language versions of Annex 10, Volume II.	16 March 1987 27 July 1987 22 October 1987
68	Air Navigation Commission	New procedures for the formulation of aircraft radiotelephony call signs; changes to safeguard aircraft against acts of unlawful interference; new procedures related to the maintenance of guard on 121.5 MHz.	29 March 1990 30 July 1990 15 November 1990
69	COM/MET Divisional Meeting (1982); COM/MET/OPS Divisional Meeting (1990)	Changes to AFTN message procedures and addition of material related to the world area forecast system (WAFS) telecommunications requirements; addition of material related to VHF air-ground data link communications and changes to material concerning VHF off-set carrier systems.	22 March 1993 26 July 1993 11 November 1993
70 (5th Edition)	Air Navigation Commission	New phraseology for the transmission of numbers in radiotelephony. A number of changes in the AFTN procedures related to the acceptance and transmission of messages, categories of messages and removal of obsolete material related to radiotelephony.	20 March 1995 24 July 1995 9 November 1995
71	Air Navigation Commission; first meeting of the Aeronautical Telecommunication Network Panel (ATNP)	Changes to aeronautical fixed telecommunications network procedures.	12 March 1996 15 July 1996 7 November 1996
72	Air Navigation Commission; fourth meeting of the Aeronautical Mobile Communications Panel (AMCP)	Modification of R/T procedures concerning the introduction of 8.33 kHz channel spacing; deletion of definition for VDL.	12 March 1997 21 July 1997 6 November 1997

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Amendment	Source(s)	Subject(s)	Adopted Effective Applicable
73	Air Navigation Commission; second meeting of the Aeronautical Telecommunication Network Panel (ATNP)	Changes to the composition of meteorological messages sent via the AFTN; introduction of Human Factors related material.	19 March 1998 20 July 1998 5 November 1998
74	Air Navigation Commission	Introduction of interpilot air-to-air channel.	18 March 1999 19 July 1999 4 November 1999
75	—	No change.	—
76 (6th Edition)	Third meeting of the Aeronautical Telecommunication Network Panel (ATNP); the Secretariat on the basis of proposals by the Multi-Agency Air Traffic Services Procedures Coordination Group (MAPCOG); fifth meeting of the Automatic Dependent Surveillance Panel (ADSP); seventh meeting of the Aeronautical Mobile Communication Panel (AMCP); Secretariat	Aeronautical fixed service (AFS) procedural provisions for voice and data communications elements; consequential changes resulting from the introduction of a single interpilot air-to-air frequency; deletion of references to obsolete radiotelegraphy techniques; radiotelephony speech and standard phraseology; technology in relation to a number of data link applications; update of references to the ITU Radio Regulations.	12 March 2001 16 July 2001 1 November 2001
77	—	No change.	—
78	Air Navigation Commission	Language proficiency requirements.	5 March 2003 14 July 2003 27 November 2003
79	—	No change.	—
80	European Air Navigation Planning Group (EANPG); Aeronautical Communications Panel (ACP)	Changes to the procedures for indication of the transmitting channels in VHF radiotelephony communications.	25 February 2005 11 July 2005 24 November 2005
81	—	No change.	—
82	Aeronautical Communications Panel (ACP); Operational Data Link Panel (OPLINKP); Secretariat	Update of aeronautical fixed telecommunication network (AFTN)/common ICAO data interchange network (CIDIN) provisions, communication procedures related to radiotelephony (R/T) reply procedures and voice communication failure; use of controller-pilot data link communications (CPDLC).	26 February 2007 16 July 2007 22 November 2007
83	—	No change.	—
84	—	No change.	—
85	—	No change.	—
86	—	No change.	—
87	—	No change.	—
88-A	—	No change.	—

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Amendment	Source(s)	Subject(s)	Adopted Effective Applicable
88-B	—	No change.	—
89	Separation and Airspace Safety Panel (SASP) and Operational Data Link Panel (OPLINK)	Automatic dependent surveillance — broadcast IN (ADS-B IN) on-board equipment, controller-pilot data link communications (CPDLC), and in trail procedure (ITP)	3 March 2014 14 July 2014 13 November 2014

1. Did not affect any Standards or Recommended Practices.

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ANNEX 10 — VOLUME II
COMMUNICATION PROCEDURES

Introduction

The object of the international aeronautical telecommunication service is to ensure the telecommunications and radio aids to air navigation necessary for the safety, regularity and efficiency of international air navigation.

Procedures for the International Aeronautical Telecommunication Service are herein set forth for worldwide use. It is recognized that Supplementary Procedures may be required in certain cases in order to meet particular requirements of the ICAO Regions. Any Supplementary Procedure recommended for this purpose must be a requirement peculiar to the region and must not be contained in, nor conflict with, any worldwide Procedure of ICAO.

Where appropriate, specific ITU Radio Regulations have been paraphrased in this document. Users of these Procedures should note that the Radio Regulations Annex of the International Telecommunications Convention is all-embracing in character and, therefore, should be applied in all pertinent cases.

All references to "Radio Regulations" are to the Radio Regulations published by the International Telecommunication Union.

The Communication Procedures are to be used in conjunction with the Abbreviations and Codes of Doc 8400 and with such other codes and abbreviations as may be approved by ICAO for use in communications.

Volume II contains a number of provisions relating to the exchange of information which were developed primarily for low modulation rates utilizing the coded character sets of International Alphabets Nos. 2 and 3. Provisions for International Alphabet No. 5 (IA-5) for use at medium and higher signalling rates are contained in Annex 10, Volume III.

CHAPTER 1. DEFINITIONS

When the following terms are used in this publication, they have the meaning prescribed in this chapter:

Note 1.— A list of additional specialized communication terms and their definitions is contained in Attachment A.

Note 2.— 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).*

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1.1 SERVICES

Aeronautical broadcasting service. A broadcasting service intended for the transmission of information relating to air navigation.

Aeronautical fixed service (AFS). A telecommunication service between specified fixed points provided primarily for the safety of air navigation and for the regular, efficient and economical operation of air services.

Aeronautical fixed telecommunication network (AFTN). A worldwide system of aeronautical fixed circuits provided, as part of the aeronautical fixed service, for the exchange of messages and/or digital data between aeronautical fixed stations having the same or compatible communications characteristics.

Aeronautical mobile service (RR S1.32). A mobile service between aeronautical stations and aircraft stations, or between aircraft stations, in which survival craft stations may participate; emergency position-indicating radiobeacon stations may also participate in this service on designated distress and emergency frequencies.

Aeronautical mobile (R)* service (RR S1.33). An aeronautical mobile service reserved for communications relating to safety and regularity of flight, primarily along national or international civil air routes.

Aeronautical mobile-satellite service (RR S1.35). A mobile-satellite service in which mobile earth stations are located on board aircraft; survival craft stations and emergency position-indicating radiobeacon stations may also participate in this service.

Aeronautical mobile-satellite (R)* service (RR S1.36). An aeronautical mobile-satellite service reserved for communications relating to safety and regularity of flights, primarily along national or international civil air routes.

Aeronautical radio navigation service (RR S1.46). A radio navigation service intended for the benefit and for the safe operation of aircraft.

Note.— The following Radio Regulations are quoted for purposes of reference and/or clarity in understanding of the above definition of the aeronautical radio navigation service:

RR S1.10 Radio navigation: *Radiodetermination used for the purpose of navigation, including obstruction warning.*

RR S1.9 Radiodetermination: *The determination of the position, velocity and/or other characteristics of an object, or the obtaining of information relating to these parameters, by means of the propagation properties of radio waves.*

Aeronautical telecommunication service. A telecommunication service provided for any aeronautical purpose.

International telecommunication service. A telecommunication service between offices or stations of different States, or between mobile stations which are not in the same State, or are subject to different States.

1.2 STATIONS

Aerodrome control radio station. A station providing radiocommunication between an aerodrome control tower and aircraft or mobile aeronautical stations.

* route

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Aeronautical fixed station. A station in the aeronautical fixed service.

Aeronautical station (RR S1.81). A land station in the aeronautical mobile service. In certain instances, an aeronautical station may be located, for example, on board ship or on a platform at sea.

Aeronautical telecommunication station. A station in the aeronautical telecommunication service.

AFTN communication centre. An AFTN station whose primary function is the relay or retransmission of AFTN traffic from (or to) a number of other AFTN stations connected to it.

AFTN destination station. An AFTN station to which messages and/or digital data are addressed for processing for delivery to the addressee.

AFTN origin station. An AFTN station where messages and/or digital data are accepted for transmission over the AFTN.

AFTN station. A station forming part of the aeronautical fixed telecommunication network (AFTN) and operating as such under the authority or control of a State.

Air-ground control radio station. An aeronautical telecommunication station having primary responsibility for handling communications pertaining to the operation and control of aircraft in a given area.

Aircraft station (RR S1.83). A mobile station in the aeronautical mobile service, other than a survival craft station, located on board an aircraft.

Communication centre. An aeronautical fixed station which relays or retransmits telecommunication traffic from (or to) a number of other aeronautical fixed stations directly connected to it.

Mobile surface station. A station in the aeronautical telecommunication service, other than an aircraft station, intended to be used while in motion or during halts at unspecified points.

Network station. An aeronautical station forming part of a radiotelephony network.

Radio direction finding (RR S1.12). Radiodetermination using the reception of radio waves for the purpose of determining the direction of a station or object.

Radio direction-finding station (RR S1.91). A radiodetermination station using radio direction finding.

Note.— The aeronautical application of radio direction finding is in the aeronautical radio navigation service.

Regular station. A station selected from those forming an en-route air-ground radiotelephony network to communicate with or to intercept communications from aircraft in normal conditions.

Tributary station. An aeronautical fixed station that may receive or transmit messages and/or digital data but which does not relay except for the purpose of serving similar stations connected through it to a communication centre.

1.3 COMMUNICATION METHODS

Air-ground communication. Two-way communication between aircraft and stations or locations on the surface of the earth.

Air-to-ground communication. One-way communication from aircraft to stations or locations on the surface of the earth.

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Blind transmission. A transmission from one station to another station in circumstances where two-way communication cannot be established but where it is believed that the called station is able to receive the transmission.

Broadcast. A transmission of information relating to air navigation that is not addressed to a specific station or stations.

Duplex. A method in which telecommunication between two stations can take place in both directions simultaneously.

Ground-to-air communication. One-way communication from stations or locations on the surface of the earth to aircraft.

Interpilot air-to-air communication. Two-way communication on the designated air-to-air channel to enable aircraft engaged in flights over remote and oceanic areas out of range of VHF ground stations to exchange necessary operational information and to facilitate the resolution of operational problems.

Non-network communications. Radiotelephony communications conducted by a station of the aeronautical mobile service, other than those conducted as part of a radiotelephony network.

Radiotelephony network. A group of radiotelephony aeronautical stations which operate on and guard frequencies from the same family and which support each other in a defined manner to ensure maximum dependability of air-ground communications and dissemination of air-ground traffic.

Readback. A procedure whereby the receiving station repeats a received message or an appropriate part thereof back to the transmitting station so as to obtain confirmation of correct reception.

Simplex. A method in which telecommunication between two stations takes place in one direction at a time.

Telecommunication (RR S1.3). Any transmission, emission, or reception of signs, signals, writing, images and sounds or intelligence of any nature by wire, radio, optical or other electromagnetic systems.

1.4 DIRECTION FINDING

Homing. The procedure of using the direction-finding equipment of one radio station with the emission of another radio station, where at least one of the stations is mobile, and whereby the mobile station proceeds continuously towards the other station.

Radio bearing. The angle between the apparent direction of a definite source of emission of electro-magnetic waves and a reference direction, as determined at a radio direction-finding station. A *true* radio bearing is one for which the reference direction is that of true North. A *magnetic* radio bearing is one for which the reference direction is that of magnetic North.

1.5 TELETYPEWRITER SYSTEMS

Automatic relay installation. A teletypewriter installation where automatic equipment is used to transfer messages from incoming to outgoing circuits.

Note.— This term covers both fully automatic and semi-automatic installations.

Fully automatic relay installation. A teletypewriter installation where interpretation of the relaying responsibility in respect of an incoming message and the resultant setting-up of the connections required to effect the appropriate retransmissions is carried out automatically, as well as all other normal operations of relay, thus obviating the need for operator intervention, except for supervisory purposes.

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Message field. An assigned area of a message containing specified elements of data.

Semi-automatic relay installation. A teletypewriter installation where interpretation of the relaying responsibility in respect of an incoming message and the resultant setting-up of the connections required to effect the appropriate retransmissions require the intervention of an operator but where all other normal operations of relay are carried out automatically.

Teletypewriter tape. A tape on which signals are recorded in the 5-unit Start-Stop code by completely severed perforations (Chad Type) or by partially severed perforations (Chadless Type) for transmission over teletypewriter circuits.

"Torn-tape" relay installation. A teletypewriter installation where messages are received and relayed in teletypewriter tape form and where all operations of relay are performed as the result of operator intervention.

1.6 AGENCIES

Aeronautical telecommunication agency. An agency responsible for operating a station or stations in the aeronautical telecommunication service.

Aircraft operating agency. The person, organization or enterprise engaged in, or offering to engage in, an aircraft operation.

1.7 FREQUENCIES

Primary frequency. The radiotelephony frequency assigned to an aircraft as a first choice for air-ground communication in a radiotelephony network.

Secondary frequency. The radiotelephony frequency assigned to an aircraft as a second choice for air-ground communication in a radiotelephony network.

1.8 DATA LINK COMMUNICATIONS

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

Current data authority. The designated ground system through which a CPDLC dialogue between a pilot and a controller currently responsible for the flight is permitted to take place.

Downstream data authority. A designated ground system, different from the current data authority, through which the pilot can contact an appropriate ATC unit for the purposes of receiving a downstream clearance.

Free text message element. A message element used to convey information not conforming to any standardized message element in the CPDLC message set.

Next data authority. The ground system so designated by the current data authority through which an onward transfer of communications and control can take place.

Pre-formatted free text message element. A free text message element that is stored within the aircraft system or ground system for selection.

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Standardized free text message element. A message element that uses a defined free text message format, using specific words in a specific order.

Note.— Standardized free text message elements may be manually entered by the user or pre-formatted.

1.9 MISCELLANEOUS

Aeronautical fixed circuit. A circuit forming part of the aeronautical fixed service (AFS).

Aeronautical fixed telecommunication network circuit. A circuit forming part of the aeronautical fixed telecommunication network (AFTN).

Aeronautical telecommunication log. A record of the activities of an aeronautical telecommunication station.

Air-report. A report from an aircraft in flight prepared in conformity with requirements for position, and operational and/or meteorological reporting.

Note.— Details of the AIREP form are given in PANS-ATM (Doc 4444).

Altitude. The vertical distance of a level, a point or an object considered as a point, measured from mean sea level (MSL).

ATS direct speech circuit. An aeronautical fixed service (AFS) telephone circuit, for direct exchange of information between air traffic services (ATS) units.

Automatic telecommunication log. A record of the activities of an aeronautical telecommunication station recorded by electrical or mechanical means.

Flight level. A surface of constant atmospheric pressure which is related to a specific pressure datum, 1 013.2 hectopascals (hPa), and is separated from other such surfaces by specific pressure intervals.

Note 1.— A pressure type altimeter calibrated in accordance with the standard atmosphere:

a) when set to a QNH altimeter setting, will indicate altitude;

b) when set to a QFE altimeter setting, will indicate height above the QFE reference datum;

c) when set to a pressure 1 013.2 hPa, may be used to indicate flight levels.

Note 2.— The terms "height" and "altitude", used in Note 1 above, indicate altimetric rather than geometric heights and altitudes.

Frequency channel. A continuous portion of the frequency spectrum appropriate for a transmission utilizing a specified class of emission.

Note.— The classification of emissions and information relevant to the portion of the frequency spectrum appropriate for a given type of transmission (bandwidths) is specified in the ITU Radio Regulations, Article S2 and Appendix S1.

Height. The vertical distance of a level, a point or an object considered as a point, measured from a specified datum.

Human performance. Human capabilities and limitations which have an impact on the safety and efficiency of aeronautical operations.

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Location indicator. A four-letter code group formulated in accordance with rules prescribed by ICAO and assigned to the location of an aeronautical fixed station.

Meteorological operational channel. A channel of the aeronautical fixed service (AFS), for the exchange of aeronautical meteorological information.

Meteorological operational telecommunication network. An integrated system of meteorological operational channels, as part of the aeronautical fixed service (AFS), for the exchange of aeronautical meteorological information between the aeronautical fixed stations within the network.

Note.— "Integrated" is to be interpreted as a mode of operation necessary to ensure that the information can be transmitted and received by the stations within the network in accordance with pre-established schedules.

NOTAM. A notice distributed by means of telecommunication containing information concerning the establishment, condition or change in any aeronautical facility, service, procedure or hazard, the timely knowledge of which is essential to personnel concerned with flight operations.

Operational control communications. Communications required for the exercise of authority over the initiation, continuation, diversion or termination of a flight in the interest of the safety of the aircraft and the regularity and efficiency of a flight.

Note.— Such communications are normally required for the exchange of messages between aircraft and aircraft operating agencies.

Route segment. A route or portion of route usually flown without an intermediate stop.

Routing Directory. A list in a communication centre indicating for each addressee the outgoing circuit to be used.

SNOWTAM. A special series NOTAM notifying the presence or removal of hazardous conditions due to snow, ice, slush or standing water associated with snow, slush and ice on the movement area, by means of a specific format.

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CHAPTER 2. ADMINISTRATIVE PROVISIONS RELATING TO THE INTERNATIONAL AERONAUTICAL TELECOMMUNICATION SERVICE

2.1 Division of service

The international aeronautical telecommunication service shall be divided into four parts:

1) aeronautical fixed service;

2) aeronautical mobile service;

3) aeronautical radio navigation service;

4) aeronautical broadcasting service.

2.2 Telecommunication — Access

All aeronautical telecommunication stations, including end systems and intermediate systems of the aeronautical telecommunication network (ATN), shall be protected from unauthorized direct or remote access.

2.3 Hours of service

2.3.1 The Competent Authority shall give notification of the normal hours of service of stations and offices of the international aeronautical telecommunication service under its control to the aeronautical telecommunication agencies designated to receive this information by other Administrations concerned.

2.3.2 Whenever necessary and practicable, the Competent Authority shall give notification of any change in the normal hours of service, before such a change is effected, to the aeronautical telecommunication agencies designated to receive this information by other Administrations concerned. Such changes shall also, whenever necessary, be promulgated in NOTAM.

2.3.3 If a station of the international aeronautical telecommunication service, or an aircraft operating agency, requests a change in the hours of service of another station, such change shall be requested as soon as possible after the need for change is known. The station or aircraft operating agency requesting the change shall be informed of the result of its request as soon as possible.

2.4 Supervision

2.4.1 Each State shall designate the authority responsible for ensuring that the international aeronautical telecommunication service is conducted in accordance with the Procedures in this Annex.

2.4.2 **Recommendation.—** *Occasional infringements of the Procedures contained herein, when not serious, should be dealt with by direct communication between the parties immediately interested either by correspondence or by personal contact.*

2.4.3 When a station commits serious or repeated infringements, representations relating to them shall be made to the authority designated in 2.4.1 of the State to which the station belongs by the authority which detects them.

2.4.4 **Recommendation.—** *The authorities designated in 2.4.1 should exchange information regarding the performance of systems of communication, radio navigation, operation and maintenance, unusual transmission phenomena, etc.*

2.5 Superfluous transmissions

Each State shall ensure that there is no wilful transmission of unnecessary or anonymous signals, messages or data by any station within that State.

2.6 Interference

Before authorizing tests and experiments in any station, each Administration, in order to avoid harmful interference, shall prescribe the taking of all possible precautions, such as the choice of frequency and of time, and the reduction or, if possible, the suppression of radiation. Any harmful interference resulting from tests and experiments shall be eliminated as soon as possible.

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CHAPTER 3. GENERAL PROCEDURES FOR THE INTERNATIONAL AERONAUTICAL TELECOMMUNICATION SERVICE

3.1 General

The procedures outlined in this chapter are general in character and shall be applied where appropriate to the other chapters contained in this Volume.

Note.— Detailed procedures, with special application to the service concerned, are contained in Chapters 4, 5, 6, 7 and 8.

3.2 Extensions of service and closing down of stations

3.2.1 Stations of the international aeronautical telecommunication service shall extend their normal hours of service as required to provide for traffic necessary for flight operation.

3.2.2 Before closing down, a station shall notify its intention to all other stations with which it is in direct communication, confirm that an extension of service is not required and advise the time of re-opening if other than its normal hours of service.

3.2.3 When it is working regularly in a network on a common circuit, a station shall notify its intention of closing down either to the control station, if any, or to all stations in the network. It shall continue watch for two minutes and may then close down if it has received no call during this period.

3.2.4 Stations with other than continuous hours of operation, engaged in, or expected to become engaged in distress, urgency, unlawful interference, or interception traffic, shall extend their normal hours of service to provide the required support to those communications.

3.3 Acceptance, transmission and delivery of messages

3.3.1 Only those messages coming within the categories specified in 4.4.1.1 shall be accepted for transmission by the aeronautical telecommunication service.

3.3.1.1 The responsibility for determining the acceptability of a message shall rest with the station where the message is filed for transmission.

3.3.1.2 Once a message is deemed acceptable, it shall be transmitted, relayed and (or) delivered in accordance with the priority classification and without discrimination or undue delay.

3.3.1.3 **Recommendation.—** *The authority in control of any station through which a message is relayed, should make representations at a later date to the authority in control of the accepting station regarding any message which is considered unacceptable.*

3.3.2 Only messages for stations forming part of the aeronautical telecommunication service shall be accepted for transmission, except where special arrangements have been made with the telecommunication authority concerned.

3.3.2.1 Acceptance as a single message of a message intended for two or more addresses, whether at the same station or at different stations, shall be permitted subject, however, to the provisions prescribed in 4.4.3.1.2.3.

3.3.3 Messages handled for aircraft operating agencies shall be accepted only when handed in to the telecommunication station in the form prescribed herein and by an authorized representative of that agency, or when received from that agency over an authorized circuit.

3.3.4 For each station of the aeronautical telecommunication service from which messages are delivered to one or more aircraft operating agencies, a single office for each aircraft operating agency shall be designated by agreement between the aeronautical telecommunication agency and the aircraft operating agency concerned.

3.3.5 Stations of the international aeronautical telecommunication service shall be responsible for delivery of messages to addressee(s) located within the boundaries of the aerodrome(s) served by that station and beyond those boundaries only to such addressee(s) as may be agreed by special arrangements with the Administrations concerned.

3.3.6 Messages shall be delivered in the form of a written record, or other permanent means as prescribed by authorities.

3.3.6.1 **Recommendation.—** *In cases where telephone or loudspeaker systems are used without recording facilities for the delivery of messages, a written copy should be provided, as confirmation of delivery, as soon as possible.*

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3.3.7 Messages originated in the aeronautical mobile service by an aircraft in flight and which require transmission over the aeronautical fixed telecommunication network to effect delivery, shall be reprocessed by the aeronautical telecommunication station into the message format prescribed in 4.4.2 prior to transmission on the AFTN.

3.3.7.1 Messages originated in the aeronautical mobile service by an aircraft in flight and which require transmission over the aeronautical fixed service, other than on AFTN circuits, shall also be reprocessed by the aeronautical telecommunication station into the format prescribed in 4.4.2 except where, subject to the provisions of 3.3.5, prior and other arrangements have been made between the aeronautical telecommunication agency and the aircraft operating agency concerned for predetermined distribution of messages from aircraft.

3.3.7.2 Messages (including air-reports) without specific address containing meteorological information received from an aircraft in flight shall be forwarded without delay to the meteorological office associated with the point of reception.

3.3.7.3 Messages (including air-reports) without specific address containing air traffic services information from aircraft in flight shall be forwarded without delay to the air traffic services unit associated with the communication station receiving the message.

3.3.7.4 **PANS.—** *When recording the text of air-reports in AIREP form, the data conventions approved by ICAO for this purpose shall be used wherever possible.*

Note.— Provisions relating to the composition, including data conventions, of air-reports and to the order and form in which the elements of such reports are transmitted by the aircraft stations and recorded and retransmitted by the aeronautical stations, are contained in the PANS-ATM (Doc 4444).

3.3.7.5 **PANS.—** *When air-reports in AIREP form are to be retransmitted by telegraphy (including teletypewriting), the text transmitted shall be as recorded in compliance with 3.3.7.4.*

3.4 Time system

3.4.1 Universal Co-ordinated Time (UTC) shall be used by all stations in the aeronautical telecommunication service. Midnight shall be designated as 2400 for the end of the day and 0000 for the beginning of the day.

3.4.2 A date-time group shall consist of six figures, the first two figures representing the date of the month and the last four figures the hours and minutes in UTC.

3.5 Record of communications

3.5.1 General

3.5.1.1 A telecommunication log, written or automatic, shall be maintained in each station of the aeronautical telecommunication service except that an aircraft station, when using radiotelephony in direct communication with an aeronautical station, need not maintain a telecommunication log.

Note.— The telecommunication log will serve as a protection, should the operator's watch activities be investigated. It may be required as legal evidence.

3.5.1.1.1 **Recommendation.—** *Aeronautical stations should record messages at the time of their receipt, except that, if during an emergency the continued manual recording would result in delays in communication, the recording of messages may be temporarily interrupted and completed at the earliest opportunity.*

Note.— In the case of radiotelephony operation it would be desirable if voice recording were provided for use during interruption in manual recording.

3.5.1.1.2 **Recommendation.—** *When a record is maintained in an aircraft station, either in a radiotelephone log or elsewhere, concerning distress communications, harmful interference, or interruption to communications, such a record should be associated with information concerning the time and the position, and altitude of the aircraft.*

3.5.1.2 In written logs, entries shall be made only by operators on duty except that other persons having knowledge of facts pertinent to the entries may certify in the log the accuracy of operators' entries.

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

3.5.1.4 In written logs, any necessary correction in the log shall be made only by the person making the initial entry. The correction shall be accomplished by drawing or typing a single line through the incorrect entry, initialling same, recording the time and date of correction. The correct entry shall be made on the next line after the last entry.

3.5.1.5 Telecommunication logs, written or automatic, shall be retained for a period of at least thirty days. When logs are pertinent to inquiries or investigations they shall be retained for longer periods until it is evident that they will be no longer required.

3.5.1.6 The following information shall be entered in written logs:

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a) the name of the agency operating the station;

b) the identification of the station;

c) the date;

d) the time of opening and closing the station;

e) the signature of each operator, with the time the operator assumes and relinquishes a watch;

f) the frequencies being guarded and type of watch (continuous or scheduled) being maintained on each frequency;

g) except at intermediate mechanical relay stations where the provisions of this paragraph need not be complied with, a record of each communication, test transmission, or attempted communication showing text of communication, time communication completed, station(s) communicated with, and frequency used. The text of the communication may be omitted from the log when copies of the messages handled are available and form part of the log;

h) all distress communications and action thereon;

i) a brief description of communication conditions and difficulties, including harmful interference. Such entries should include, whenever practicable, the time at which interference was experienced, the character, radio frequency and identification of the interfering signal;

j) a brief description of interruption to communications due to equipment failure or other troubles, giving the duration of the interruption and action taken;

k) such additional information as may be considered by the operator to be of value as a part of the record of the station's operations.

3.6 Establishment of radiocommunication

3.6.1 All stations shall answer calls directed to them by other stations in the aeronautical telecommunication service and shall exchange communications on request.

3.6.2 All stations shall radiate the minimum power necessary to ensure a satisfactory service.

3.7 Use of abbreviations and codes

3.7.1 Abbreviations and codes shall be used in the international aeronautical telecommunication service whenever they are appropriate and their use will shorten or otherwise facilitate communication.

3.7.1.1 Where abbreviations and codes other than those approved by ICAO are contained in the text of messages, the originator shall, if so required by the aeronautical telecommunication station accepting the message for transmission, make available to that station a decode for the abbreviations and codes used.

Note.— The use of ICAO approved abbreviations and codes wherever appropriate — for example, those contained in PANS-ABC (Doc 8400) — obviates the need for application of the provisions of 3.7.1.1.

3.8 Cancellation of messages

Messages shall be cancelled by a telecommunication station only when cancellation is authorized by the message originator.

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CHAPTER 4. AERONAUTICAL FIXED SERVICE (AFS)

4.1 General

4.1.1 The aeronautical fixed service shall comprise the following systems and applications that are used for ground-ground (i.e. point-to-point and/or point-to-multipoint) communications in the international aeronautical telecommunication service:

a) ATS direct speech circuits and networks;

b) meteorological operational circuits, networks and broadcast systems;

c) the aeronautical fixed telecommunications network (AFTN);

d) the common ICAO data interchange network (CIDIN);

e) the air traffic services (ATS) message handling services; and

f) the inter-centre communications (ICC).

Note 1.— Provisions relating to ATS direct speech communications are contained in 4.2.

Note 2.— Provisions relating to meteorological operational channels and meteorological operational telecommunication networks are contained in 4.3.

Note 3.— The AFTN provides a store-and-forward messaging service for the conveyance of text messages in ITA-2 or IA-5 format, using character-oriented procedures. Provisions relating to the AFTN are contained in 4.4.

Note 4.— The CIDIN provides a common transport service for the conveyance of binary or text application messages, in support of the AFTN and OPMET applications. Procedural provisions relating to the CIDIN are contained in 4.5.

Note 5.— The ATS (air traffic services) message handling services (ATSMHS) application allows ATS messages to be exchanged between service users over the aeronautical telecommunication network (ATN) internet communication service (ICS). Procedural provisions relating to ATS message handling services are contained in 4.6.

Note 6.— The inter-centre communications applications enable the exchange of information between air traffic service units over the aeronautical telecommunication network (ATN) internet communication service (ICS), in support of notification, coordination, transfer of control, flight planning, airspace management and air traffic flow management. Procedural provisions relating to inter-centre communications are contained in 4.7.

Note 7.— The aeronautical telecommunication network through its ATSMHS and ICC applications enable the transition of existing AFTN and CIDIN users and systems into the ATN architecture.

4.1.2 Material permitted in AFS messages

Note.— The provisions contained in 4.1.2 do not apply to ATS voice communications.

4.1.2.1 The following characters are allowed in text messages:

Letters: A B C D E F G H I J K L M N O P Q R S T U V W X Y Z

Figures: 1 2 3 4 5 6 7 8 9 0

Other signs:

-	(hyphen)
?	(question mark)
:	(colon)
(	(open bracket)
)	(close bracket)
.	(full stop, period, or decimal point)
,	(comma)
’	(apostrophe)
=	(double hyphen or equal sign)
/	(oblique)
+	(plus sign)

Characters other than those listed above shall not be used in messages unless absolutely necessary for understanding of the text. When used, they shall be spelled out in full.

4.1.2.2 For the exchange of messages over the teletypewriter circuits, the following signals of the International Telegraph Alphabet No. 2 (ITA-2) shall be permitted:

signals nos. 1 to 3	—	in letter and in figure case;
signal no. 4	—	in letter case only;
signal no. 5	—	in letter and in figure case;
signals nos. 6 to 8	—	in letter case only;
signal no. 9	—	in letter and in figure case;
signal no. 10	—	in letter case only; and
signals nos. 11 to 31	—	in letter and figure case.

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Note 1.— "Letter case" and "figure case" are to be understood as the shift condition in which the equipment associated with the channel was positioned prior to the reception of the signal.

Note 2.— When using any of the above signals, account is to be taken of, amongst others, the provisions of 4.4.5.3.

Note 3.— The foregoing provisions of 4.1.2.2 are not intended to prevent the use of:

a) figure case of signals nos. 6, 7 and 8 after bilateral agreements between States having telecommunication stations directly connected to each other;

*b) figure case of signal no. 10 as the priority alarm (*see *4.4.4.3); and*

c) figure case of signal no. 4 for operational purposes only and not as part of a message.

4.1.2.3 For the exchange of messages over the teletypewriter circuits, the following characters of International Alphabet No. 5 (IA-5) shall be permitted:

— characters 0/1 to 0/3, 0/7 — in the priority alarm (*see* 4.4.15.2.2.5), 0/10, 0/11 — in the ending sequence (*see* 4.4.15.3.12.1), 0/13;
— characters 2/0, 2/7 to 2/9, 2/11 to 2/15;
— characters 3/0 to 3/10, 3/13, 3/15;
— characters 4/1 to 4/15;
— characters 5/0 to 5/10; and
— character 7/15.

Note.— The foregoing provisions of 4.1.2.3 are not intended to prevent the use of the full IA-5 after agreement between the Administrations concerned.

4.1.2.4 Roman numerals shall not be employed. If the originator of a message wishes the addressee to be informed that roman figures are intended, the arabic figure or figures shall be written and preceded by the word ROMAN.

4.1.2.5 Messages using the ITA-2 code shall not contain:

1) any uninterrupted sequence of signals nos. 26, 3, 26 and 3 (letter case and figure case) in this order, other than the one in the heading as prescribed in 4.4.2.1.1; and

2) any uninterrupted sequence of four times signal no. 14 (letter case and figure case) other than the one in the ending as prescribed in 4.4.6.1.

4.1.2.6 Messages using IA-5 shall not contain:

1) character 0/1 (SOH) other than the one in the heading as prescribed in 4.4.15.1.1 a);

2) character 0/2 (STX) other than the one in the origin line as prescribed in 4.4.15.2.2.7;

3) character 0/3 (ETX) other than the one in the ending as prescribed in 4.4.15.3.12.1;

4) any uninterrupted sequence of characters 5/10, 4/3, 5/10, 4/3 in this order (ZCZC);

5) any uninterrupted sequence of characters 2/11, 3/10, 2/11, 3/10 in this order (+:+:);

6) any uninterrupted sequence of four times character 4/14 (NNNN); and

7) any uninterrupted sequence of four times character 2/12 (,,,,).

4.1.2.7 The text of messages shall be drafted in plain language or in abbreviations and codes, as prescribed in 3.7. The originator shall avoid the use of plain language when reduction in the length of the text by appropriate abbreviations and codes is practicable. Words and phrases which are not essential, such as expressions of politeness, shall not be used.

4.1.2.8 If the originator of a message wishes alignment functions [<≡] to be transmitted at specific places in the text part of such message (*see* 4.4.5.3 and 4.4.15.3.6), the sequence [<≡] shall be written on each of those places.

4.2 ATS direct speech circuits

Note.— Provisions relating to ATS direct speech communications are contained in Chapter 6 of Annex 11.

4.3 Meteorological operational channels and meteorological operational telecommunication networks

Meteorological operational channel procedures and meteorological operational communication network procedures shall be compatible with aeronautical fixed telecommunications network (AFTN) procedures.

Note.— "Compatible" is to be interpreted as a mode of operation ensuring that the information exchanged over the meteorological operational channels also can be exchanged over the aeronautical fixed telecommunication network without harmful effect on the operation of the aeronautical fixed telecommunication network and vice versa.

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