KINGDOM OF BAHRAIN
Ministry of Transportation and Telecommunications

مملكة البحرين
وزارة المواصلات والاتصالات

AIR NAVIGATION TECHNICAL REGULATIONS

VOLUME III

PART 10

AERONAUTICAL TELECOMMUNICATIONS-COMMUNICATION PROCEDURES

03 May 2024

Authorisation Page

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Foreword

In accordance with Annex 10 to the Chicago Convention (1944)[1] and other international obligations the Civil Aviation Affairs of the Kingdom of Bahrain (CAA) is responsible for the provision of aeronautical telecommunications. Annex 10 Vol. II contains material that covers Communication Procedures including those with status of Procedures for Air Navigation Services (PANS).

The ICAO 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 is 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 are important for the safety or regularity of air navigation. Wherever possible, the provisions of the Annexes to the Chicago Convention have been written in such a way as would facilitate incorporation, without major textual changes, into national legislation.[2]

The Regulation at hand reproduces the provisions of ICAO Annex 10, omitting Volumes I, III, IV and V. This Regulation is ICAO Annex 10 Volume II unchanged wherever possible and adapts it to the needs of the Kingdom of Bahrain wherever necessary.

The text does not take into account any (existing or planned) difference applicable in the Kingdom of Bahrain. According to Art. 38 of the Chicago Convention the Kingdom of Bahrain is obliged to communicate any difference between their national regulations and practices and the related ICAO Standards and Recommended Practices to ICAO and to publish in the AIP.

The Procedures for Air Navigation Services (PANS) contained in PART 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.

Any reference in the text to ICAO documents may be substituted by a reference to any existing CAA document (Manual, Instruction, Handbook) covering the same matters.

Hereinafter, wherever a reference is made to an ICAO Annex followed by a number, it shall refer to the Annex to the Chicago Convention (1944) corresponding to that number.

[1] Hereinafter: ICAO Annex (number).

[2] ICAO Annex 10, Vol. II, Foreword, p. (vii).

Remarks

To avoid any misunderstanding within this document:

1. The words ‘shall’ and ‘must’ indicate that compliance is compulsory.

2. The word ‘should’ indicates a recommendation. It does not mean that the compliance is optional but rather that, where insurmountable difficulties exist, the CAA may accept an alternative means of compliance, and provided that an acceptable safety assurance from the authority shows that the safety requirements will not be reduced below that intended by the requirement.

3. The word ‘can’ or ‘may’ is used in a permissive sense to state authority or permission to do the act prescribed.

4. The word ‘will’ is used to express the future.

SECTION 1 RADIO NAVIGATION AIDS

CHAPTER 1 Definitions

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

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

Angular displacement sensitivity. The ratio of measured DDM to the corresponding angular displacement from the appropriate reference line.

Area navigation (RNAV). A method of navigation which permits aircraft operation on any desired flight path within the coverage of ground- or space-based navigation aids or within the limits of the capability of self-contained aids, or a combination of these.

DDM — Difference in depth of modulation. The percentage modulation depth of the larger signal minus the percentage modulation depth of the smaller signal, divided by 100.

Displacement sensitivity (localizer). The ratio of measured DDM to the corresponding lateral displacement from the appropriate reference line.

Effective acceptance bandwidth. The range of frequencies with respect to the assigned frequency for which reception is assured when all receiver tolerances have been taken into account.

Effective adjacent channel rejection. The rejection that is obtained at the appropriate adjacent channel frequency when all relevant receiver tolerances have been taken into account.

Elevation. The vertical distance of a point or a level, on or affixed to the surface of the earth, measured from mean sea level.

Essential radio navigation service. A radio navigation service whose disruption has a significant impact on operations in the affected airspace or aerodrome.

Facility Performance Category I — ILS. An ILS which provides guidance information from the coverage limit of the ILS to the point at which the localizer course line intersects the ILS glide path at a height of 60 m (200 ft) or less above the horizontal plane containing the threshold.

Facility Performance Category II — ILS. An ILS which provides guidance information from the coverage limit of the ILS to the point at which the localizer course line intersects the ILS glide path at a height of 15 m (50 ft) or less above the horizontal plane containing the threshold.

Facility Performance Category III — ILS. An ILS which, with the aid of ancillary equipment where necessary, provides guidance information from the coverage limit of the facility to, and along, the surface of the runway.

Fan marker beacon. A type of radio beacon, the emissions of which radiate in a vertical fan-shaped pattern.

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

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Human Factors principles. Principles which apply to design, certification, training, operations and maintenance and which seek safe interface between the human and other system components by proper consideration to human performance.

Mean power (of a radio transmitter). The average power supplied to the antenna transmission line by a transmitter during an interval of time sufficiently long compared with the lowest frequency encountered in the modulation taken under normal operating conditions
.
Navigation specification. A set of aircraft and flight crew requirements needed to support performance-based navigation operations within a defined airspace. There are two kinds of navigation specifications:

Required navigation performance (RNP) specification. A navigation specification based on area navigation that includes the requirement for performance monitoring and alerting, designated by the prefix RNP, e.g. RNP 4, RNP APCH.

Area navigation (RNAV) specification. A navigation specification based on area navigation that does not include the requirement for performance monitoring and alerting, designated by the prefix RNAV, e.g. RNAV 5, RNAV 1.

Performance-based navigation (PBN). Area navigation based on performance requirements for aircraft operating along an ATS route, on an instrument approach procedure or in a designated airspace.

Pressure-altitude. An atmospheric pressure expressed in terms of altitude which corresponds to that pressure in the Standard Atmosphere.
Protected service volume. A part of the facility coverage where the facility provides a particular service in accordance with relevant SARPs and within which the facility is afforded frequency protection.

Radio navigation service. A service providing guidance information or position data for the efficient and safe operation of aircraft supported by one or more radio navigation aids.

Touchdown. The point where the nominal glide path intercepts the runway.

Z marker beacon. A type of radio beacon, the emissions of which radiate in a vertical cone-shaped pattern.

CHAPTER 2 GENERAL PROVISIONS FOR RADIO NAVIGATION AIDS

2.1 Standard radio navigation aids

2.1.1 The standard radio navigation aids shall be:
a) the instrument landing system (ILS) conforming to the Standards contained in Chapter 3, 3.1;
b) the microwave landing system (MLS) conforming to the Standards contained in Chapter 3, 3.11;
c) the global navigation satellite system (GNSS) conforming to the Standards contained in Chapter 3, 3.7;
d) the VHF omnidirectional radio range (VOR) conforming to the Standards contained in Chapter 3, 3.3;
e) the non-directional radio beacon (NDB) conforming to the Standards contained in Chapter 3, 3.4;
f) the distance measuring equipment (DME) conforming to the Standards contained in Chapter 3, 3.5; and
g) the en-route VHF marker beacon conforming to the Standards contained in Chapter 3, 3.6.

2.1.2 Differences in radio navigation aids in any respect from the Standards of Chapter 3 shall be published in the Aeronautical Information Publication (AIP).

2.1.3 Wherever there is installed a radio navigation aid that is neither an ILS nor an MLS, but which may be used in whole or in part with aircraft equipment designed for use with the ILS or MLS, full details of parts that may be so used shall be published in the Aeronautical Information Publication (AIP).

2.1.4 GNSS-specific provisions
2.1.4.1 It shall be permissible to terminate a GNSS satellite service provided by one of its elements (Chapter 3, 3.7.2) on the basis of at least a six-year advance notice by a service provider.
2.1.4.2 Where GNSS-based operations are approved, GNSS data relevant to those operations shall be recorded.
2.1.4.3 Recordings shall be retained for a period of at least 14 days. When the recordings are pertinent to accident and incident investigations, they shall be retained until the BCAA notifies that they will no longer be required.

2.1.5 Precision approach radar
2.1.5.1 A precision approach radar (PAR) system, where installed and operated as a radio navigation aid together with equipment for two-way communication with aircraft and facilities for the efficient coordination of these elements with air traffic control, shall conform to the Standards contained in Chapter 3, 3.2.

2.1.6 When a radio navigation aid is provided to support precision approach and landing, it shall be supplemented, as necessary, by a source or sources of guidance information which, when used in conjunction with appropriate procedures, will provide effective guidance to, and efficient coupling (manual or automatic) with, the desired reference path.

2.2 Ground and flight testing

2.2.1 Radio navigation aids of the types covered by the specifications in Chapter 3 and available for use by aircraft engaged in international air navigation shall be the subject of periodic ground and flight tests.

2.3 Provision of information on the operational status of radio navigation services

2.3.1 Aerodrome control towers and units providing approach control service shall be provided with information on the operational status of radio navigation services essential for approach,

landing and take-off at the aerodrome(s) with which they are concerned, on a timely basis consistent with the use of the service(s) involved.

2.4 Power supply for radio navigation aids and communication systems

2.4.1 Radio navigation aids and ground elements of communication systems of the types specified in Annex 10 shall be provided with suitable power supplies and means to ensure continuity of service consistent with the use of the service(s) involved.

2.5 Human Factors considerations

2.5.1 Human Factors principles shall be observed in the design and certification of radio navigation aids.

CHAPTER 3 SPECIFICATIONS FOR RADIO NAVIGATION AIDS

3.1 Specification for ILS

The specifications for ILS installations shall be as described in ICAO Annex 10 Volume 1 Chapter 3.1. Recommendations included in that Annex shall be mandatory.

3.2 Specification for precision approach radar system

The specifications for precision approach radar systems shall be as described in ICAO Annex 10 Volume 1 Chapter 3.2. Recommendations included in that Annex shall be mandatory.

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3.3 Specification for VHF omnidirectional radio range (VOR)

The specification for VHF omnidirectional radio range (VOR) shall be as described in ICAO Annex 10 Volume 1 Chapter 3.3. Recommendations included in that Annex shall be mandatory.

3.4 Specification for non-directional radio beacon (NDB)

The specification for non-directional radio beacon (NDB) shall be as described in ICAO Annex 10 Volume 1 Chapter 3.4. Recommendations included in that Annex shall be mandatory.

3.5 Specification for UHF distance measuring equipment (DME)

The specification for UHF distance measuring equipment (DME) shall be as described in ICAO Annex 10 Volume 1 Chapter 3.5. Recommendations included in that Annex shall be mandatory.

3.6 Specification for en-route VHF marker beacons (75 MHz)

The specification for en-route VHF marker beacons (75 MHz) shall be as described in ICAO Annex 10 Volume 1 Chapter 3.***6.*** Recommendations included in that Annex shall be mandatory.

3.7 Requirements for the Global Navigation Satellite System (GNSS)

The requirements for the Global Navigation Satellite System (GNSS) shall be as described in ICAO Annex 10 Volume 1 Chapter 3.7, including Appendix B of that Annex. Recommendations included in that Annex shall be mandatory.

3.8 Reserved

3.9 System characteristics of airborne ADF receiving systems

The system characteristics of airborne ADF receiving systems shall be as described in ICAO Annex 10 Volume 1 Chapter 3.9. Recommendations included in that Annex shall be mandatory.

3.10 Reserved

3.11 Microwave landing system (MLS) characteristics

The Microwave landing system (MLS) characteristics shall be as described in ICAO Annex 10 Volume 1 Chapter 3.11, including Appendix A of that annex. Recommendations included in that Annex shall be mandatory.

SECTION 2

Communication Procedures including those with PANS status

CHAPTER 1. DEFINITIONS

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

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

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

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

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 station. A station in the aeronautical fixed service.

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

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 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.

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

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

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

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 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.

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.

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

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

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

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.

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

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.

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

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.

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

CPDLC message. Information exchanged between an airborne system and its ground counterpart. A CPDLC message consists of a single message element or a combination of message elements conveyed in a single transmission by the initiator.

CPDLC message set. A list of standard message elements and free text message elements.

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.

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

Free text message element. Part of a message that does not conform to any standard message element in the PANS-ATM (Doc 4444).

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.

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

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.

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

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

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.

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

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.

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.

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.

Logon address. A specified code used for data link logon to an ATS unit.

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.

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

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.

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.

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

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.

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

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.

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.

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.

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.

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.

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

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.

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

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.

Standard message element. Part of a message defined in the PANS-ATM (Doc 4444) in terms of display format, intended use and attributes.

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.

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.

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.

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 BCAA 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 BCAA 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 The authority responsible for ensuring that the international aeronautical telecommunication service is conducted in accordance with the Procedures in this Regulation is the BCAA.

2.4.2 Occasional infringements of the Procedures contained herein, when not serious, shall 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 State to which the station belongs by the authority which detects them.

2.4.4 The BCAA shall exchange information regarding the performance of systems of communication, radio navigation, operation and maintenance, unusual transmission phenomena, etc., with other competent Authorities.

2.5 SUPERFLUOUS TRANSMISSIONS

The BCAA shall ensure that there is no wilful transmission of unnecessary or anonymous signals, messages or data by any station within the Kingdom of Bahrain.

2.6 INTERFERENCE

Before authorizing tests and experiments in any station, the BCAA, 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.

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.

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 The authority in control of any station through which a message is relayed, shall 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 In cases where telephone or loudspeaker systems are used without recording facilities for the delivery of messages, a written copy shall be provided, as confirmation of delivery, as soon as possible.

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

3.3.7.5 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.

3.5.1.1.1 Aeronautical stations shall 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.

3.5.1.1.2 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 shall 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, initialing 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 two years, or until it is evident that they will be no longer required.

3.5.1.6 The following information shall be entered in written logs:

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.

3.8 Cancellation of messages

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

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).

4.1.2 Material permitted in AFS messages

4.1.2.1 The following characters are allowed in text messages:

Letters: ABCDEFGHIJKLMNOPQRSTUVWXYZ

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.

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.

4.1.2.3.1 The exchange of messages using the full IA-5 shall be subject to 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

Provisions relating to ATS direct speech communications shall be as contained in Chapter 6 of ICAO 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.

4.4 Aeronautical fixed telecommunication network (AFTN)

4.4.1 General

4.4.1.1 *Categories of messages.* Subject to the provisions of 3.3, the following categories of message shall be handled by the aeronautical fixed telecommunication network:

a) distress messages;
b) urgency messages;
c) flight safety messages;

d) meteorological messages;
e) flight regularity messages;
f) aeronautical information services (AIS) messages;
g) aeronautical administrative messages;
h) service messages.

4.4.1.1.1 *Distress messages (priority indicator SS).* This message category shall comprise those messages sent by mobile stations reporting that they are threatened by grave and imminent danger and all other messages relative to the immediate assistance required by the mobile station in distress.

4.4.1.1.2 *Urgency messages (priority indicator DD).* This category shall comprise messages concerning the safety of a ship, aircraft or other vehicles, or of some person on board or within sight.

4.4.1.1.3 Flight safety messages (priority indicator FF) shall comprise:

a) movement and control messages as defined in PANS-ATM (ICAO Doc 4444), Chapter 11;

b) messages originated by an aircraft operating agency of immediate concern to aircraft in flight or preparing to depart;

c) meteorological messages restricted to SIGMET information, special air-reports, AIRMET messages, volcanic ash and tropical cyclone advisory information and amended forecasts.

4.4.1.1.4 Meteorological messages (priority indicator GG) shall comprise:

a) messages concerning forecasts, e.g. terminal aerodrome forecasts (TAFs), area and route forecasts;

b) messages concerning observations and reports, e.g. METAR, SPECI.

4.4.1.1.5 Flight regularity messages (priority indicator GG) shall comprise:

a) aircraft load messages required for weight and balance computation;

b) messages concerning changes in aircraft operating schedules;

c) messages concerning aircraft servicing;

d) messages concerning changes in collective requirements for passengers, crew and cargo covered by deviation from normal operating schedules;

e) messages concerning non-routine landings;

f) messages concerning pre-flight arrangements for air navigation services and operational servicing for non-scheduled aircraft operations, e.g. overflight clearance requests;

g) messages originated by aircraft operating agencies reporting an aircraft arrival or departure;

h) messages concerning parts and materials urgently required for the operation of aircraft.

4.4.1.1.6 Aeronautical information services (AIS) messages (priority indicator GG) shall comprise:

a) messages concerning NOTAMs;

b) messages concerning SNOWTAMs.

4.4.1.1.7 Aeronautical administrative messages (priority indicator KK) shall comprise:

a) messages regarding the operation or maintenance of facilities provided for the safety or regularity of aircraft operations;

b) messages concerning the functioning of aeronautical telecommunication services;

c) messages exchanged between civil aviation authorities relating to aeronautical services.

4.4.1.1.8 Messages requesting information shall take the same priority indicator as the category of message being requested except where a higher priority is warranted for flight safety.

4.4.1.1.9 *Service messages (priority indicator as appropriate).* This category shall comprise messages originated by aeronautical fixed stations to obtain information or verification concerning other messages which appear to have been transmitted incorrectly by the aeronautical fixed service, confirming channel-sequence numbers, etc.

4.4.1.1.9.1 Service messages shall be prepared in the format prescribed in 4.4.2 or 4.4.15. In applying the provisions of 4.4.3.1.2 or 4.4.15.2.1.3 to service messages addressed to an aeronautical fixed station identified only by a location indicator, this indicator shall be immediately followed by the ICAO three-letter designator YFY, followed by an appropriate 8th letter.

4.4.1.1.9.2 Service messages shall be assigned the appropriate priority indicator.

4.4.1.1.9.2.1 When service messages refer to messages previously transmitted, the priority indicator assigned shall be that used for the message(s) to which they refer.

4.4.1.1.9.3 Service messages correcting errors in transmission shall be addressed to all the addressees that will have received the incorrect transmission.

4.4.1.1.9.4 A reply to a service message shall be addressed to the station which originated the initial service message.

4.4.1.1.9.5 The text of all service messages shall be as concise as possible.

4.4.1.1.9.6 A service message, other than one acknowledging receipt of SS messages, shall be further identified by the use of the abbreviation SVC as the first item in the text.

4.4.1.1.9.7 When a service message refers to a message previously handled, reference to the previous message shall be made by use of the appropriate transmission identification (see 4.4.2.1.1 b) and 4.4.15.1.1 b)) or the filing time and originator indicator groups (see 4.4.4 and 4.4.15.2.2) identifying the reference message.

4.4.1.2 *Order of priority*

4.4.1.2.1 The order of priority for the transmission of messages in the aeronautical fixed telecommunication network shall be as follows:

Transmission priority	*Priority indicator*
1	SS
2	DD FF
3	GG KK

4.4.1.2.2 Messages having the same priority indicator shall be transmitted in the order in which they are received for transmission.

4.4.1.3 *Routing of messages*

4.4.1.3.1 All communications shall be routed by the most expeditious route available to effect delivery to the addressee.

4.4.1.3.2 Predetermined diversion routing arrangements shall be made, when necessary, to expedite the movement of communication traffic. Each communication centre shall have the appropriate diversion routing lists, agreed to by the Administration(s) operating the communication centres affected and shall use them when necessary.

4.4.1.3.2.1 Diversion routing shall be initiated:

1) in a fully automatic communication centre:

    a) immediately after detection of the circuit outage, when the traffic is to be diverted via a fully automatic communication centre;

2) within a 10-minute period after detection of the circuit outage, when the traffic is to be diverted via a non-fully automatic communication centre; in a non-fully

automatic communication centre within a 10-minute period after detection of the circuit outage.

Service message notification of the diversion requirement shall be provided where no bilateral or multilateral prearranged agreements exist.

4.4.1.3.3 As soon as it is apparent that it will be impossible to dispose of traffic over the aeronautical fixed service within a reasonable period, and when the traffic is held at the station where it was filed, the originator shall be consulted regarding further action to be taken, unless:

a) otherwise agreed between the station concerned and the originator; or

b) arrangements exist whereby delayed traffic is automatically diverted to commercial telecommunication services without reference to the originator.

4.4.1.4 *Supervision of message traffic*

4.4.1.4.1 *Continuity of message traffic.* The receiving station shall check the transmission identification of incoming transmissions to ensure the correct sequence of channel-sequence numbers of all messages received over that channel.

4.4.1.4.1.1 When the receiving station detects that one or more channel-sequence numbers are missing, it shall send a complete service message (see 4.4.1.1.9) to the previous station rejecting receipt of any message that may have been transmitted with such missing number(s). The text of this service message shall comprise the signal QTA, the procedure signal MIS followed by one or more missing transmission identification (see 4.4.2.1.1.3 and 4.4.15.1.1.4) and the end-of-text signal (see 4.4.5.6 and 4.4.15.3.12).

1) *when one channel-sequence number is missing:*

SVC→QTA→MIS→ABC↑123↓<≡

2) *when several channel-sequence numbers are missing:*

SVC→QTA→MIS→ABC↑123-126↓<≡

4.4.1.4.1.1.1 When the provisions of 4.4.1.4.1.1 are applied, the station notified of the missing message(s) condition by the service message shall reassume its responsibility for transmission of the message (or messages) that it had previously transmitted with the transmission identification concerned, and shall retransmit that message (or those messages) with a new (correct in sequence) transmission identification. The receiving station shall synchronize such that the next expected channel-sequence number is the last received channel-sequence number plus one.

4.4.1.4.1.2 When the receiving station detects that a message has a channel sequence number less than that expected, it shall advise the previous station using a service message with a text comprising:

1) the abbreviation SVC;

2) the procedure signal LR followed by the transmission identification of the received message;

3) the procedure signal EXP followed by the transmission identification expected;

4) the end-of-text signal.

4.4.1.4.1.2.1 When the provisions of 4.4.1.4.1.2 are applied, the station receiving the out-of-sequence message shall synchronize such that the next expected channel-sequence number is the last received channel-sequence number plus one. The previous station shall check its outgoing channel-sequence numbers and, if necessary, correct the sequence.

4.4.1.4.2 *Misrouted messages*

4.4.1.4.2.1 When the receiving station detects that a message has been misrouted to it, it shall either:

1) send a service message (see 4.4.1.1.9) to the previous station rejecting receipt of the misrouted message; or itself assume responsibility for transmission of the message to all addressee indicators. 4.4.1.4.2.2 When the provisions of 4.4.1.4.2.1,

1) are applied, the text of the service message shall comprise the abbreviation SVC, the signal QTA, the procedure signal MSR followed by the transmission identification (see 4.4.2.1.1.3 and 4.4.15.1.1.4) of the misrouted message and the end-of-text signal (see 4.4.5.6 and 4.4.15.3.12).

4.4.1.4.2.3 When, as a result of the provisions of 4.4.1.4.2.2, a sending station is notified of the misrouted message condition by service message, it shall reassume its responsibility for the message and shall retransmit as necessary on the correct outgoing channel or channels.

4.4.1.4.3 When a circuit becomes interrupted and alternative facilities exist, the last channel-sequence numbers sent and received shall be exchanged between the stations concerned. Such exchanges shall take the form of complete service messages (see 4.4.1.1.9) with the text comprising the abbreviation SVC, the procedure signals LR and LS followed by the transmission identifications of the relevant messages and the end-of-text signal (see 4.4.5.6 and 4.4.15.3.12).

4.4.1.5 *Failure of communications*

4.4.1.5.1 Should communication on any fixed service circuit fail, the station concerned shall attempt to re-establish contact as soon as possible.

4.4.1.5.2 If contact cannot be re-established within a reasonable period on the normal fixed service circuit, an appropriate alternative circuit shall be used. If possible, attempts shall be made to establish communication on any authorized fixed service circuit available.

4.4.1.5.2.1 If these attempts fail, use of any available air-ground frequency shall be permitted only as an exceptional and temporary measure when no interference to aircraft in flight is ensured.

4.4.1.5.2.2 Where a radio circuit fails due to signal fadeout or adverse propagation conditions, a receiving watch shall be maintained on the regular fixed service frequency normally in use. In order to re-establish contact on this frequency as soon as possible there shall be transmitted:

a) the procedure signal DE;

b) the identification of the transmitting station transmitted three times;

c) the alignment function [<≡];

d) the letters RY repeated without separation for three lines of page copy;

e) the alignment function [<≡];

f) end-of-message signal (NNNN).

The foregoing sequence shall be repeated as required.

4.4.1.5.2.3 A station experiencing a circuit or equipment failure shall promptly notify other stations with which it is in direct communication if the failure will affect traffic routing by those stations. Restoration to normal shall also be notified to the same stations.

4.4.1.5.3 Where diverted traffic will not be accepted automatically or where a predetermined diversion routing has not been agreed, a temporary diversion routing shall be established by the exchange of service messages. The text of such service messages shall comprise:

1) the abbreviation SVC;

2) the procedure signal QSP;

3) if required, the procedure signal RQ, NO or CNL to request, refuse or cancel a diversion;

4) identification of the routing areas, States, territories, locations, or stations for which the diversion applies;

5) the end-of-text signal.

4.4.1.6 *Long-term retention of AFTN traffic records*

4.4.1.6.1 Copies of all messages, in their entirety, transmitted by an AFTN origin station shall be retained for a period of at least 30 days.

4.4.1.6.2 AFTN destination stations shall retain, for a period of at least 30 days, a record containing the information necessary to identify all messages received and the action taken thereon.

4.4.1.6.3 AFTN communication centres shall retain, for a period of at least 30 days, a record containing the information necessary to identify all messages relayed or retransmitted and the action taken thereon.

4.4.1.7 *Short-term retention of AFTN traffic records*

4.4.1.7.1 Except as provided in 4.4.1.7.2, AFTN communication centres shall retain, for a period of at least one hour, a copy of all messages, in their entirety, retransmitted or relayed by that communication centre.

4.4.1.7.2 In cases where acknowledgement is made between AFTN communication centres, a relay centre shall be considered as having no further responsibility for retransmission or repetition of a message for which it has received positive acknowledgement, and it may be deleted from its records.

4.4.1.8 *Test procedures on AFTN channels*

4.4.1.8.1 Test messages transmitted on AFTN channels for the purpose of testing and repairing lines shall consist of the following:

1) the start-of-message signal;
2) the procedure signal QJH;
3) the originator indicator;
4) three page-copy lines of the sequence of characters RY in ITA-2 or U(5/5) *(2/10) in IA-5; and
5) the end-of-message signal.

4.4.2 Message format - International Telegraph Alphabet No. 2 (ITA-2)

All messages, other than those prescribed in 4.4.1.8 and 4.4.9.3, shall comprise the components specified in 4.4.2.1 to 4.4.6.1 inclusive.

4.4.2.1 *Heading*

4.4.2.1.1 The heading shall comprise:

a) start-of-message signal, the characters ZCZC;
b) transmission identification comprising:
    1) circuit identification;
    2) channel-sequence number.
c) additional service information (if necessary) comprising:
    1) one SPACE;
    2) no more than ten characters.
d) spacing signal.

4.4.2.1.1.1 The circuit identification shall consist of three letters selected and assigned by the transmitting station; the first letter identifying the transmitting, the second letter the receiving end of the circuit and the third letter to identify the channel; where there is only one channel between the transmitting and receiving stations, channel letter A shall be assigned; where more than one channel between stations is provided, the channels shall be identified as A, B, C, etc. in respective order.

4.4.2.1.1.2 Three-digit channel-sequence numbers from 001 to 000 (representing 1 000) shall be assigned sequentially by telecommunication stations to all messages transmitted directly from one station to another. A separate series of these numbers shall be assigned for each channel and a new series shall be started daily at 0000 hours.

4.4.2.1.1.2.1 The use of the 4-digit channel-sequence number, to preclude duplication of the same numbers during the 24-hour period, is permitted subject to agreement between the authorities responsible for the operation of the circuit.

4.4.2.1.1.3 The transmission identification shall be sent over the circuit in the following sequence:

a) SPACE [→];

b) transmitting-terminal letter;

c) receiving-terminal letter;

d) channel-identification letter;

e) FIGURE SHIFT [↑];

f) channel-sequence number (3 digits).

Message part		*Component of the message part*	*Element of the component*	*Teletypewriter signal*
HEADING (*see* 4.4.2.1)		Start-of-Message Signal	—	**ZCZC**
		Transmission Identification	a) One SPACE b) Transmitting-terminal letter c) Receiving-terminal letter d) Channel-Identification letter e) One FIGURE SHIFT f) Channel-sequence number (3 digits) (*Example:* NRA062)	→…↑…
		(If necessary) Additional Service Indication	a) One SPACE b) No more than 10 characters (*Example:* 270930)	
		Spacing Signal	Five SPACES One LETTER SHIFT	→→→→→↓
ADDRESS (*see* 4.4.3)	THE PERMANENT PART OF A MESSAGE	Alignment Function	One CARRIAGE RETURN, one LINE FEED	<≡
		Priority Indicator	The relevant 2-letter group	..
		Addressee Indicator(s)	One SPACE An 8-letter group given in sequence for each addressee (*Example:* →**EGLLZRZX**→**EDLLYKYX**→**EGLLACAM**)	
		Alignment Function(s)	One CARRIAGE RETURN, one LINE FEED	<≡
ORIGIN (*see* 4.4.4)		Filing Time	One FIGURE SHIFT The 6-digit date-time group specifying when the message was filed for transmission One LETTER SHIFT	↑ ..... ↓
		Originator Indicator	One SPACE The 8-letter group identifying the message originator	→ .....
		Priority Alarm *(used only in teletypewriter operation for Distress Messages)*	One FIGURE SHIFT Five Signal No. 10 of Telegraph Alphabet No. 2 One LETTER SHIFT	↑ Attention ↓ Signal(s)
		Optional Heading Information	a) One SPACE b) Additional data not to exceed the remainder of the line. See 4.4.4.4.	
		Alignment Function	One CARRIAGE RETURN, one LINE FEED	<≡
TEXT (*see* 4.4.5)		Beginning of the Text	Specific identification of Addressee(s) *(if necessary) with* each followed by one CARRIAGE RETURN, one LINE FEED *(if necessary)* The English word FROM *(if necessary)* (*see* 4.4.5.2.3) Specific identification of Originator *(if necessary)* The English word STOP followed by one CARRIAGE RETURN, one LINE FEED *(if necessary)* (*see* 4.4.5.2.3); *and/or* Originator's reference *(if used)*	
		Message Text	Message Text with one CARRIAGE RETURN, one LINE FEED at the end of each printed line of the Text except for the last one (*see* 4.4.5.3)	
		Confirmation *(if necessary)*	a) One CARRIAGE RETURN, one LINE FEED b) The abbreviation CFM followed by the portion of the Text being confirmed	
		Correction *(if necessary)*	a) One CARRIAGE RETURN, one LINE FEED b) The abbreviation COR followed by the correction of an error made in the preceding Text	
		End-of-Text Signal	a) One LETTER SHIFT b) One CARRIAGE RETURN, one LINE FEED	↓<≡
ENDING (*see* 4.4.6)		Page-Feed Sequence	Seven LINE FEEDS	≡≡≡≡≡≡≡
		End-of-Message Signal	Four of the letter case of N (Signal No. 14)	NNNN
		Message-Separation Signal *(used only on message traffic transmitted to a "torn-tape" station)*	Twelve LETTER SHIFTS	↓↓↓↓↓↓↓↓↓↓↓↓
		Tape Feed (*see* 4.4.7)	Additional LETTER SHIFTS will appear at this point in instances where prior arrangements have been made for tape-feed transmissions to be employed on an incoming circuit (*see* 4.4.7).	

Legend: ↑ FIGURE SHIFT *(Signal No. 30)* ≡ LINE FEED *(Signal No. 28)* ↓ LETTER SHIFT *(Signal No. 29)*
→ SPACE *(Signal No. 31)* < CARRIAGE RETURN *(Signal No. 27)*

Figure 4-1. Message format ITA-2
(the above illustrates the teletypewriter message format prescribed in 4.4.2 to 4.4.9.1 inclusive)

4.4.2.1.2 In teletypewriter operation, the spacing signal, consisting of 5 SPACES [→→→→→] followed by 1 LETTER SHIFT [↓], shall be transmitted immediately following the transmission identification prescribed in 4.4.2.1.1.3.

4.4.2.1.3 Optional service information shall be permitted to be inserted following the transmission identification subject to agreement between the authorities responsible for the operation of the circuit. Such additional service information shall be preceded by a SPACE followed by not more than ten characters and shall not contain any alignment functions.

4.4.2.1.4 To avoid any misinterpretation of the diversion indicator especially when considering the possibility of a partly mutilated heading, the sequence of two consecutive signals no. 22 (in the letter case or in the figure case) shall not appear in any other component of the heading.

4.4.3 Address

4.4.3.1 The address shall comprise:

a) alignment function [<≡];

b) priority indicator;

c) addressee indicator(s);

d) alignment function [<≡].

4.4.3.1.1 The priority indicator shall consist of the appropriate two-letter group assigned by the originator in accordance with the following:

Message category	*Priority indicator*
distress messages (see 4.4.1.1.1)	*SS*
urgency messages (see 4.4.1.1.2)	*DD*
flight safety messages (see 4.4.1.1.3)	*FF*
meteorological messages (see 4.4.1.1.4)	*GG*
flight regularity messages (see 4.4.1.1.5)	*GG*
aeronautical information services messages (see 4.4.1.1.6)	*GG*
aeronautical administrative messages (see 4.4.1.1.7)	*KK*
service messages (see 4.4.1.1.9)	*(as appropriate)*

4.4.3.1.2 An addressee indicator, which shall be immediately preceded by a SPACE, except when it is the first address indicator of the second or third line of address shall comprise:

a) the four-letter location indicator of the place of destination;

b) the three-letter designator identifying the organization/ function (aeronautical authority, service or aircraft operating agency) addressed;

c) an additional letter, which shall represent a department, division or process within the organization/function addressed. The letter X shall be used to complete the address when explicit identification is not required.

4.4.3.1.2.1 Where a message is to be addressed to an organization that has not been allocated an ICAO three-letter designator of the type prescribed in 4.4.3.1.2, the location indicator of the place of destination shall be followed by the ICAO three-letter designator YYY (or the ICAO three-letter designator YXY in the case of a military service or organization). The name of the addressee organization shall then be included in the first item of the text of the message. The eighth position letter following the ICAO three-letter designator YYY or YXY shall be the filler letter X.

4.4.3.1.2.2 Where a message is to be addressed to an aircraft in flight and, therefore, requires handling over the AFTN for part of its routing before retransmission over the aeronautical mobile service, the location indicator of the aeronautical station which is to relay the message to the aircraft shall be followed by the ICAO three-letter designator ZZZ. The identification of the

aircraft shall then be included in the first item of the text of the message. The eighth position letter following the ICAO three-letter designator ZZZ shall be the filler letter X.

4.4.3.1.2.3 The complete address shall be restricted to three lines of page-printing copy and, except as provided in 4.4.14, a separate addressee indicator shall be used for each addressee whether at the same or at different locations.

4.4.3.1.2.3.1 Where messages are offered in page-copy form for transmission and contain more addressee indicators than can be accommodated on three lines of a page-copy, such message shall be converted, before transmission, into two or more messages, each of which shall conform with the provisions of 4.4.3.1.2.3. During such conversion, the addressee indicators shall, in so far as practicable, be positioned in the sequence which will ensure that the minimum number of retransmissions will be required at subsequent communication centres.

4.4.3.1.2.3.2 On teletypewriter circuits, the completion of each line of addressee indicator groups in the address of a message shall be immediately followed by the alignment function [<≡].

4.4.4 Origin

The origin shall comprise:

a) filing time;

b) originator indicator;

c) priority alarm (when necessary);

d) optional heading field;

e) alignment function [<≡].

4.4.4.1 The filing time shall comprise the 6-digit date-time group indicating the date and time of filing the message for transmission (see 3.4.2); in teletypewriter operation, the filing time shall be followed by one LETTER SHIFT [↓].

4.4.4.2 An originator indicator, which shall be immediately preceded by a SPACE, shall comprise:

a) the four-letter location indicator of the place at which the message is originated;

b) the three-letter designator identifying the organization/ function (aeronautical authority, service or aircraft operating agency) which originated the message;

c) an additional letter which shall represent a department, division or process within the organization/function of the originator. The letter X shall be used to complete the address when explicit identification is not required.

4.4.4.2.1 Where a message is originated by an organization that has not been allocated an ICAO three-letter designator of the type prescribed in 4.4.4.2 b), the location indicator of the place at which the message is originated shall be followed immediately by the ICAO three-letter designator YYY followed by the filler letter X (or the ICAO three-letter designator YXY followed by the filler letter X in the case of a military service or organization). The name of the organization (or military service) shall then be included in the first item in the text of the message.

4.4.4.2.2 Where a message originated by an aircraft in flight requires handling on the AFTN for part of its routing before delivery, the originator indicator shall comprise the location indicator of the aeronautical station responsible for transferring the message to the AFTN, followed immediately by the ICAO three-letter designator ZZZ followed by the filler letter X. The identification of the aircraft shall then be included in the first item in the text of the message.

4.4.4.2.3 Messages relayed over the AFTN that have been originated in other networks shall use a valid AFTN originator indicator that has been agreed for use by the relay or gateway function linking the AFTN with the external network.

4.4.4.3 The priority alarm shall be used only for distress messages. When used, it shall consist of the following, in the order stated:

FIGURE SHIFT [↑];

a) FIVE transmissions of signal no. 10 (figure case);

b) LETTER SHIFT [↓].

4.4.4.4 The inclusion of optional data in the origin line shall be permitted provided a total of 69 characters is not exceeded and subject to agreement between the authorities concerned. The presence of the optional data field shall be indicated by one occurrence of the SPACE character immediately preceding optional data.

4.4.4.4.1 When additional addressing information in a message needs to be exchanged between source and destination addresses, it shall be conveyed in the optional data field (ODF), using the following specific format:

a) characters one and full stop (1.) to indicate the parameter code for the additional address function;

b) three modifier characters, followed by an equal sign [=] and the assigned 8-character ICAO address; and

c) the character hyphen (-) to terminate the additional address parameter field.

4.4.4.4.1.1 When a separate address for service messages or inquiries is different from the originator indicator, the modifier SVC shall be used.

4.4.4.5 The origin line shall be concluded by an alignment function [<≡].

4.4.5 Text

4.4.5.1 The text of messages shall be drafted in accordance with 4.1.2.

4.4.5.2 When an originator's reference is used, it shall appear at the beginning of the text, except as provided in 4.4.5.2.1 and 4.4.5.2.2.

4.4.5.2.1 When the ICAO three-letter designators YXY, YYY or ZZZ comprise the second element of the addressee indicator (see 4.4.3.1.2.1 and 4.4.3.1.2.2) and it, therefore, becomes necessary to identify in the text the specific addressee of the message, such identification group will precede the originator's reference (if used) and become the first item of the text.

4.4.5.2.2 When the ICAO three-letter designators YXY, YYY or ZZZ comprise the second element of the originator indicator (see 4.4.4.2.1 and 4.4.4.2.2) and it thus becomes necessary to identify in the text the name of the organization (or military service), or the aircraft, which originated the message, such identification shall be inserted in the first item of the text of the message.

4.4.5.2.3 When applying the provisions of 4.4.5.2.1 and 4.4.5.2.2 to messages where the ICAO three-letter designator(s) YXY, YYY or ZZZ is (are) used to refer to two or more different organizations (or military services), the sequence of further identification in the text shall correspond to the complete sequence used in the address and origin of the message. In such instance, each addressee identification shall be followed immediately by an alignment function. The name of the (YXY, YYY or ZZZ) organization originating the message shall then be preceded with "FROM". "STOP" followed by an alignment function shall then be included in the text at the end of these identifications to precede the remainder of the text wording.

4.4.5.3 An alignment function [<≡] shall be transmitted at the end of each printed line of the text except for the last (see 4.4.5.6).

4.4.5.4 When it is desired to confirm a portion of the text of a message in teletypewriter operation, such confirmation shall be separated from the last text group by an alignment function [<≡], and shall be indicated by the abbreviation CFM followed by the portion being confirmed.

4.4.5.5 When it is discovered that an error has been made in the text, the correction shall be separated from the last text group or confirmation, if any, by an alignment function [<≡] in the case of teletypewriter circuits. This shall be followed by the abbreviation COR and the correction.

4.4.5.5.1 Stations shall make all indicated corrections on the page-copy prior to local delivery.

4.4.5.6 At the end of the text the following end-of-text signal shall be transmitted:

1 LETTER SHIFT [↓], alignment function [<≡].

4.4.5.7 The text of the messages entered by the AFTN origin station shall not exceed 1 800 characters in length.

4.4.6 Ending

4.4.6.1 The ending shall comprise:

a) the page-feed sequence consisting of 7 LINE FEEDS [≡≡≡≡≡≡≡];

b) the end-of-message signal, consisting of the letter N (letter case of signal no. 14), appearing FOUR times in undivided sequence.

a) And in addition, on message traffic transmitted to “torn-tape” relay stations only:

b) the message-separation signal, consisting of a LETTER SHIFT [↓] transmitted 12 times in uninterrupted sequence.

4.4.6.2 AFTN messages entered by the AFTN origin station shall not exceed 2 100 characters in length.

4.4.7 Tape feed

4.4.7.1 (Intentionally left blank.)

4.4.7.1.1 When the provisions of 4.4.7.1 cannot be applied, arrangements shall be made with the transmitting station for the latter to send, at the end of a single message, or following the last message of a series, an agreed number of LETTER SHIFTS [↓] in addition to the components prescribed in 4.4.6.

4.4.8 Stripped address

When applying the provisions of 4.4.3 or 4.4.15.2.1, an AFTN communication centre shall omit from the address all the addressee indicators not required for:

a) onward transmission by the AFTN communication centre to which the message is transmitted;

b) local delivery to the addressee(s) by the AFTN destination station;

c) onward transmission or local delivery by the aggregate of stations on a multi-point circuit.

4.4.9 Teletypewriter operating procedure - general

4.4.9.1 *End-of-line functions*

4.4.9.1.1 A single line of page-copy shall not contain more than a total of 69 characters and/or spaces.

4.4.9.1.2 One CARRIAGE RETURN [<] and one LINE FEED IMPULSES [≡] shall be transmitted between each printed page-line of the text of a message.

4.4.9.2 *Duration of transmissions.* For simplex circuits, the transmission of a series of messages in a single transmission shall not continue for longer than approximately five minutes. Action shall be taken to deliver or relay each message correctly received without waiting for the end of the series.

4.4.9.3 *Channel-check transmissions.* Except as provided in 4.4.9.3.3 and 4.4.9.3.5 the following periodic transmissions shall be sent on teletypewriter circuits:

1) heading (see 4.4.2.1.1);

2) alignment function [<≡];

3) the procedure signal CH;

4) alignment function [<≡];

5) end-of-message signal [NNNN];

message-separation signal [↓↓↓↓↓↓↓↓↓↓↓↓] (if required).

The receiving station shall then check the transmission identification of this incoming transmission to ensure its correct sequence in respect of all messages received over that incoming channel.

4.4.9.3.1 Where a circuit is unoccupied, the transmission specified in 4.4.9.3 shall be sent at H + 00, H + 20, H + 40.

4.4.9.3.2 If a periodic channel check transmission is not received within a tolerance agreed for that channel, a station shall send a service message to the station from which the transmission was expected. The text of this service message shall comprise:

1) the abbreviation SVC;
2) the procedure signal MIS;
3) the procedure signal CH;
4) (optionally) the time at which the transmission was expected;
5) the procedure signal LR;
6) the transmission identification of the last message received;
7) the end-of-text signal.

4.4.9.3.3 When a teletypewriter channel is equipped with a system of controlled circuit protocol, and following agreement between the Administrations responsible, the transmission specified in 4.4.9.3 shall not be made.

4.4.9.3.4 Channel-check transmissions and station radio identifications. In order to satisfy the requirements of ITU regarding periodic transmission of the station radio identification, those AFTN stations using radioteletypewriter channels may combine the station radio identification transmission with the channel-check transmission specified in 4.4.9.3. In this case the combined transmission shall be sent as follows:

1) heading (see 4.4.2.1.1);
2) alignment function [<≡];
3) the procedure signal CH;
4) alignment function [<≡];
5) the procedure signal DE followed by one SPACE [→] and the assigned ITU radio call sign;
6) alignment function [<≡];
7) end-of-message signal [NNNN];
8) message-separation signal [↓↓↓↓↓↓↓↓↓↓↓↓] (if required).

4.4.9.3.4.1 (Intentionally left blank.)

4.4.9.3.5 When a teletypewriter circuit is associated with Automatic Error Correction (ARQ) equipment, and following agreement between the Administrations responsible, the transmissions specified in 4.4.9.3 need not be made: however stations employing radioteletypewriter channels on the AFTN for which the station radio identification is required, shall comply with the provisions of 4.4.9.3.4.

4.4.10 Normal teletypewriter transmission procedures

4.4.10.1 Messages shall be transmitted in accordance with predetermined responsibility for onward relay as agreed between the Administrations responsible for the operation of directly connected stations (see also 4.4.1.3 and 4.4.1.5.2.3).

4.4.10.1.1 Arising from the responsibility agreements established under the provisions of 4.4.10.1, each station of the AFTN shall employ and, subject to the provisions of 4.4.10.1.1.1, adhere to a Routing Directory which consists of the Routing List.

4.4.10.1.1.1 When an incoming message contains only identical location indicators in the lines-following-the-heading the receiving station shall accept responsibility for further relay. If possible

such relay shall be effected on the normal outgoing circuit to the place of destination of the message; if it is not possible to use the normal circuit, an appropriate alternative outgoing circuit shall be used. When neither of these facilities is in operation, the message shall not be retransmitted over the circuit from which it was received, without prior service message (see 4.4.1.1.9) notification of this action being given to the station that had made the previous transmission.

4.4.10.1.1.2 An AFTN message originator not capable of handling service messages shall agree with the AFTN centre it is connected to on a method of exchanging service messages.

4.4.10.1.2 Form of transmission - teletypewriter operation. All transmissions shall comprise in the following order (see Figure 4-2).

4.4.10.1.2.1 Starting pulse. When the receiving station uses equipment fitted with a time-switch to stop the teletype-writer machine motor when the channel is idle, a 20-30 millisecond SPACING IMPULSE shall be transmitted when the channel has been at rest for 30 seconds or more and at least 1.5 seconds shall be permitted to elapse before the transmission of the heading.

4.4.10.1.3 Message format. All messages shall be prepared in accordance with the provisions of 4.4.2 (ITA-2 format) or 4.4.15 (IA-5 format).

Figure 4-2. Form of transmission - teletypewriter operation (see 4.4.10.1.2)

4.4.10.1.3.1 The Heading Line, with the exception of the SOH character, shall be omitted on circuits employing one of the data link control procedures contained in 8.6.3 and 8.6.4 of ICAO Annex 10, Volume III.

4.4.10.1.4 *Reprocessing procedures*

4.4.10.1.4.1 A message requiring retransmission shall have its previous heading deleted by the station which received such message for relay. The retransmission shall commence with the new heading using the transmission identification for the outgoing channel.

4.4.10.1.4.1.1 When applying the provisions of 4.4.10.1.4.1, transmission of the address part of the message shall commence at some point during the 5 SPACES, 1 LETTER SHIFT [→→→→→↓] immediately preceding the first alignment function [<≡].

4.4.10.1.4.1.2 At tributary and “torn-tape” relay stations not equipped with automatic numbering machine devices and hence where it is necessary for a small number of additional teletypewriter characters to be perforated on a tape before the start-of-message signal to preclude risk of mutilation of the latter signal during retransmission, such additional characters, as required, shall consist of LETTER SHIFTS [↓]. Subsequent transmission on the outgoing channel shall then commence at a point as close as practicable to the start-of-message signal.

4.4.10.1.4.1.3 At stations where the heading of a message is originated by automatic equipment at the point of and time of transmission on the outgoing channel, but where preparation of the other parts of a message is by the perforation of a tape and where, therefore, it is necessary for a small number of additional teletypewriter characters to be perforated before the alignment function [<≡] at the commencement of the address so as to preclude risk of mutilation of this alignment function, such additional characters, as required, shall consist of LETTER SHIFTS [↓] or SPACES [→]. Subsequent transmission on the outgoing channel shall then commence at a point as close as practicable to the first alignment function [<≡] of the message.

4.4.10.1.4.2 At a “torn-tape” station the incoming tapes shall be torn at a position in the message-separation signal component (see 4.4.6.1 and 4.4.7.1) so that the preceding end-of-message signal remains intact. 4.4.10.1.4.2.1 Following application of the provisions of

4.4.10.1.4.2 the shortened (i.e. less than 12 LETTER SHIFTS [↓]) message-separation signal remaining on the message tape shall be deleted, if necessary by electronic methods, before retransmission to an automatic relay installation. If the retransmission is to another “torn-tape” station then:

1) the shortened message-separation signal shall be reformed to a complete [↓↓↓↓↓↓↓↓↓↓↓↓] signal by transmission of the necessary number of additional LETTER SHIFTS [↓]; or

2) the shortened message-separation signal remaining on the tape shall be removed and a new and complete message-separation signal shall be added to the message in the process of retransmission in accordance with the provisions of 4.4.6.1 c).

4.4.10.1.5 When possible in “torn-tape” or semi-automatic installations, a correct tape shall be obtained prior to onward relay; when tape is illegible or mutilated the station shall not relay the message unless good judgement indicates that this is not likely to result in malfunctioning of equipment at subsequent relay stations.

4.4.10.1.6 *Acknowledgement of receipt of messages.* In teletypewriter operation and except as provided in 4.4.10.1.6.1, a receiving station shall not transmit acknowledgement of receipt of incoming messages. In lieu thereof the provisions of 4.4.1.4.1 shall be applied.

4.4.10.1.6.1 The receipt of distress messages (priority SS - *see* 4.4.1.1.1) shall be individually acknowledged by the AFTN destination station sending a service message (see 4.4.1.1.9) to the AFTN origin station. Such acknowledgement of receipt shall take the format of a complete message addressed to the AFTN origin station, shall be assigned priority indicator SS and the associated priority alarm (see 4.4.4.3) and shall have a text comprising:

1) the procedure signal R;

2) the origin (see 4.4.4), without priority alarm, or optional heading information of the message being acknowledged;

3) the end-of-text signal [↓<≡].

4.4.10.1.7 In cases where an addressee of a multi-address message requests a repetition of the message from the origin station, the origin station shall address the repeat of the message only to the addressee requesting the repeat. Under these conditions the procedure signal DUPE shall not be included.

4.4.11 Action on mutilated or improperly formatted messages detected in teletypewriter relay stations

4.4.11.1 If, before retransmission is commenced, a relay station detects that a message has been mutilated or improperly formatted at some point ahead of the end-of-message signal, and it has reason to believe that this mutilation had occurred before the message had been received by the previous station, it shall send a service message (see 4.4.1.1.9) to the originator as identified by the originator indicator in the origin of the mutilated or improperly formatted message, requesting repetition of the incorrectly received message.

4.4.11.2 When the provisions of 4.4.11.1 are applied, the originator as identified by the originator indicator in the origin of the mutilated message shall reassume responsibility for the mutilated message, and shall comply with the provisions of 4.4.11.3.

4.4.11.3 Following application of the provisions of 4.4.11.2, the following reprocessing shall be accomplished before the unmutilated version of the message is transmitted for the second time towards the same addressee or addressees:

1) *insert* a new heading;

2) *remove* the ending of the message (see 4.4.6.1);

3) *insert* in lieu thereof the procedure signal DUPE, preceded by at least 1 LETTER SHIFT [↓] and followed by 1 CARRIAGE RETURN, 8 LINE FEEDS, end-of-message signal and, if necessary (see 4.4.6 and 4.4.7), the LETTER SHIFTS [↓] of the message-separation signal and tape feed.

4.4.11.4 If, before retransmission is commenced, a relay station detects that one or more messages have been mutilated at some point ahead of the end-of-message signal, and it has reason to believe that this mutilation had occurred during or subsequent to its transmission from the previous station, it shall send a service message (see 4.4.1.1.9) to the previous station rejecting the mutilated transmission and requesting a repetition of the incorrectly received message (or messages).

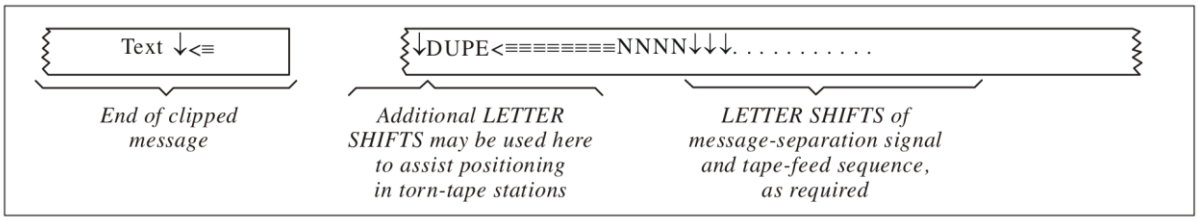

Figure 4-3. Example of application of 4.4.11.3 procedure

4.4.11.5 When the provisions of 4.4.11.4 are applied, the station receiving the service message shall reassume responsibility for the referenced message. It shall then retransmit the unmutilated copy of the referenced message with a new (i.e. correct in sequence) transmission identification (see 4.4.2.1.1 b)). If that station is not in possession of an unmutilated copy of the original message, it shall take the action prescribed in 4.4.11.1.

4.4.11.6 If, before retransmission is commenced, a relay station detects that a received message has a recognizable but mutilated end-of-message signal, it shall, where necessary, repair this mutilation before retransmission.

4.4.11.7 If, during retransmission of a message, a relay station detects that the message has been mutilated at some point ahead of the end-of-message signal and is able to take action before a correct end-of-message signal has been transmitted, it shall:

1) cancel the transmission by inserting into the channel the sequence ↓<≡QTA→QTA↓<≡ followed by a complete ending (see 4.4.6);

2) reassume responsibility for the message;

comply with the provisions of 4.4.11.1 or 4.4.11.4 as appropriate.

4.4.11.8 If, after a message has been transmitted *in toto,* a station detects that the text or the origin of the message was mutilated or incomplete, it shall transmit to all addressees concerned a service message with the following text, if an unmutilated copy of the message is available in the station:

SVC CORRECTION *(the origin of the incorrect message)*

STOP (followed by the correct text).

4.4.11.9 If, after transmission of the text of a message, a relay station detects that the message has an obviously mutilated end-of-message signal, it shall insert a proper end-of-message signal into the channel.

4.4.11.10 If, after transmission of the text material of a message, a relay station can detect that there is no complete end-of-message signal, but has no practicable means of discovering whether the irregularity has affected only the end-of-message signal or whether it may have also caused part of the original text to have been lost, it shall insert into the channel the following:

1) ↓<≡CHECK≡TEXT≡ NEW→ENDING→ADDED→

2) its own station identification;

3) ↓<≡

4) a proper ending as prescribed in 4.4.6.1.

4.4.11.11 Relay stations applying the procedural provisions of 4.4.11.9 or 4.4.11.10 shall, if practicable, ensure that the appropriate material therein prescribed is inserted prior to the transmission of a complete start-of-message signal associated with any following message.

4.4.11.12 If a relay station detects that a message was received with a completely mutilated address line, it shall send a service message to the previous station rejecting the mutilated transmission.

4.4.11.12.1 The text of this service message shall comprise:

1) the abbreviation SVC;
2) the procedure signal QTA;
3) the procedure signal ADS;
4) the transmission identification of the message rejected;
5) the indication CORRUPT;
6) the end-of-text signal.

4.4.11.12.2 The station receiving such a service message shall reassume responsibility for the referenced message, and shall retransmit the message with a corrected address line, and a new transmission identification.

4.4.11.13 If a relay station detects a received message with an invalid (i.e. length other than 8 letters) or unknown addressee indicator, it shall relay the message to those valid addresses for which it has relay responsibility using the stripped address procedure (see 4.4.8).

4.4.11.13.1 In addition, except as in 4.4.11.13.3, the station shall send a service message to the previous station requesting correction of the error. The text of this service message shall comprise:

1) the abbreviation SVC;
2) the procedure signal ADS;
3) the transmission identification of the message in error;
4) an alignment function;
5) the first address line of the message as received;
6) an alignment function;
7) either:
    a) for an invalid addressee indicator: the indication CHECK;
    b) for an unknown addressee indicator: the indication UNKNOWN;
8) the invalid or unknown addressee indicator(s);
9) the end-of-text signal.

4.4.11.13.2 A station receiving a service message as prescribed in 4.4.11.13.1 shall, if a correct addressee indicator is available, repeat the message to that addressee only using the stripped address procedure (see 4.4.8) or, if a correct addressee indicator is not available, act as prescribed in 4.4.11.13.1.

4.4.11.13.3 Where the procedure of 4.4.11.13 is applied in the case of an unknown addressee indicator, and if the origin of the message is without fault, the station shall send a service message to the originator. The text of this service message shall comprise:

1) the abbreviation SVC;
2) the procedure signal ADS;
3) the origin of the message in error;
4) an alignment function;
5) the first address line of the message as received;

6) an alignment function;

7) the indication UNKNOWN;

8) the unknown addressee indicator(s);

9) the end-of-text signal.

4.4.11.13.4 A station receiving such a service message shall obtain a correct addressee indicator and shall repeat the message to the addressee using the stripped address procedure (see 4.4.8).

4.4.11.14 When the first relay station detects that a message was received with a mutilated origin line or without any origin, it shall:

a) stop processing the message;

b) send a service message to the station from which the message was received.

4.4.11.14.1 The text of this service message shall comprise:

1) the abbreviation SVC;

2) the procedure signal QTA;

3) the procedure signal OGN;

4) the transmission identification of the message rejected;

5) the indication CORRUPT;

6) the end-of-text signal.

4.4.11.14.2 The station receiving a service message as prescribed in 4.4.11.14.1 shall reassume responsibility for the referenced message and shall retransmit the message with a correct origin line and a new transmission identification.

4.4.11.15 When the first relay station detects that a message was received with an incorrect originator indicator, it shall:

a) stop processing the message; and

b) send a service message to the station from which the message was received.

4.4.11.15.1 The text of the service message shall comprise:

1) the abbreviation SVC;

2) the procedure signal QTA;

3) the procedure signal OGN;

4) the transmission identification of the message rejected;

5) the indicator INCORRECT; and

6) the end-of-text signal.

4.4.11.15.2 The station receiving a service message as prescribed in 4.4.11.15.1 shall resume responsibility for the referenced message and shall retransmit the message with a correct originator indicator and, if applicable, a new transmission identification.

4.4.12 Correction of errors during tape preparation

4.4.12.1 Messages for which tapes are prepared at the origin station shall not be allowed to flow into the AFTN with known uncorrected errors.

4.4.12.2 Errors made ahead of the text of a message shall be corrected by discarding the incorrect tape and preparing a new one.

4.4.12.3 Where possible, errors made in the text of a message shall be corrected by back-spacing the tape and eliminating the error by operation of the LETTERS [↓] key over the undesired portion.

4.4.12.4 Where the action of 4.4.12.3 is not possible, correction to the text shall be made immediately after the error by making the error sign (→E→E→E→), transmitting the last correct word or group and then continuing with the tape preparation.

4.4.12.5 Where neither the action of 4.4.12.3 nor the action of 4.4.12.4 is possible because the error in the text is not noticed until later in the preparation process (but before the end-of-message signal has been added) the station shall comply with the provisions of 4.4.5.5.

4.4.12.6 The ending must be typed without error.

4.4.13 Correction of errors during message origination in cases where the message is flowing into the AFTN during preparation

4.4.13.1 Messages flowing into the AFTN during preparation shall not be terminated with an end-of-message signal if they contain known uncorrected errors.

4.4.13.2 Where an error is made, in this circumstance, in any part of the message which precedes the text, the unfinished message shall be cancelled by sending the sequence ↓<≡QTA→QTA↓<≡ followed by a complete ending (see 4.4.6).

4.4.13.3 Errors made in the text and noticed immediately shall be corrected by making the error sign (→E→E→E→), transmitting the last correct word or group and then continuing with the message.

4.4.13.4 In cases where errors are made in the text and not noticed until later in the origination process, the station shall comply with the provisions of 4.4.5.5.

4.4.13.5 In cases where it becomes obvious, during the origination of the text, that the message should be cancelled, the station shall take the action described in 4.4.13.2.

4.4.14 Predetermined distribution system for AFTN messages

4.4.14.1 When it has been agreed between the Administrations concerned to make use of a predetermined distribution system for AFTN messages, the system described below shall be used.

4.4.14.2 The Predetermined Distribution Addressee Indicator (PDAI) shall be constructed as follows:

a) The first and second letters:

   The first two letters of the Location Indicator of the communications centre of the State which has agreed to implement the system and which receives messages over a circuit for which it has a predetermined routing responsibility;

b) The third and fourth letters:

   The letters ZZ, indicating a requirement for special distribution;

c) The fifth, sixth and seventh letters:

   1) The fifth, sixth and seventh letters taken from the series A to Z and denoting the national and/or international distribution list(s) to be used by the receiving AFTN centre;

   2) “N” and “S”, as the fifth letter, are reserved for NOTAM and SNOWTAM respectively (see Appendix 5 to ICAO Annex 15);

d) The eighth letter:

Either the filler letter “X” or a letter taken from the series A to Z to further define the national and/or international distribution list(s) to be used by the receiving AFTN centre.

4.4.14.3 Predetermined Distribution Addressee Indicators (PDAIs) shall be used whenever possible on AFTN messages between States which have agreed to make use of the predetermined distribution system.

4.4.14.4 AFTN messages carrying Predetermined Distribution Addressee Indicators allocated by the State receiving the message shall be routed to the addressees listed on the associated list of Addressee Indicators described in 4.4.14.5.

4.4.14.5 States shall send their list of selected Predetermined Distribution Addressee Indicators together with the associated lists of Addressee Indicators to:

a) the States from which they will receive AFTN messages for predetermined distribution, to assure correct routing; and

b) the States which will originate AFTN messages for predetermined distribution to facilitate the treatment of requests for retransmission and to assist originators in using the Predetermined Distribution Addressee Indicators correctly.

4.4.14.5.1 The list of Addressee Indicators associated with a Predetermined Distribution Addressee Indicator shall include either:

a) Addressee Indicators for national distribution; or

b) Addressee Indicators for international distribution; or

c) Predetermined Distribution Addressee Indicators for international distribution; or

d) any combination of a), b) and c).

4.4.15 Message format - International Alphabet No. 5 (IA-5)

When it has been agreed between the Administrations concerned to use International Alphabet No. 5 (IA-5) the format described in 4.4.15 through 4.4.15.3 shall be used. It shall be the responsibility of Administrations using IA-5 to accommodate adjacent AFTN stations employing ITA-2 code in the format described in 4.4.2.

All messages, other than those prescribed in 4.4.1.8 and 4.4.9.3 shall comprise the components specified in 4.4.15.1 to 4.4.15.6 inclusive.

4.4.15.1 Heading

4.4.15.1.1 The heading shall comprise:

a) start-of-heading (SOH) character 0/1;

b) transmission identification comprising:

1) circuit or link identification;

2) channel-sequence number;

c) additional service information (if necessary) comprising:

1) one SPACE;

2) no more than 10 characters.

4.4.15.1.1.1 On point-to-point circuits or links, the identification shall consist of three letters selected and assigned by the transmitting station; the first letter identifying the transmitting, the second letter the receiving end of the circuit, and the third letter the channel. Where only one channel exists, the letter A shall be assigned. Where more than one channel between stations is provided, the channels shall be identified as A, B, C, etc., in respective order. On multipoint channels, the identification shall consist of three letters selected and assigned by the circuit control or master station.

4.4.15.1.1.2 Except as provided in 4.4.15.1.1.3 three-digit channel-sequence numbers from 001 to 000 (representing 1 000) shall be assigned sequentially by telecommunication stations to all messages transmitted directly from one station to another. A separate series of these numbers shall be assigned for each channel and a new series shall be started daily at 0000 hours.

4.4.15.1.1.3 The expansion of the channel-sequence number to preclude duplication of the same numbers during the 24-hour period shall be permitted subject to agreement between the Authorities responsible for the operation of the circuit.

4.4.15.1.1.4 The transmission identification shall be sent over the circuit in the following sequence:

a) transmitting-terminal letter;

receiving-terminal letter;

b) c) channel-identification letter;

c) channel-sequence number.

4.4.15.1.1.5 Additional service information shall be permitted to be inserted following the transmission identification subject to agreement between the Authorities responsible for the operation of the circuit. Such additional service information shall be preceded by a SPACE (→) followed by not more than 10 characters inserted into the heading of message immediately following the last digit of the channel-sequence number and shall not contain any alignment functions. When no such additional service information is added the information in 4.4.15.1.1.4 shall be followed immediately by that of 4.4.15.2.

4.4.15.2 *Address*

4.4.15.2.1 The address shall comprise:

a) alignment function [<≡];

b) priority indicator;

c) addressee indicator(s);

d) alignment function [<≡].

4.4.15.2.1.1 The priority indicator shall consist of the appropriate two-letter group assigned by the originator in accordance with the following:

Priority indicator	*Message category*
SS	distress messages
DD	urgency messages (see 4.4.1.1.2)
FF	flight safety messages (see 4.4.1.1.3)
GG	meteorological messages (see 4.4.1.1.4)
GG	flight regularity messages (see 4.4.1.1.5)
GG	aeronautical information services messages (see 4.4.1.1.6)
KK	aeronautical administrative messages (see 4.4.1.1.7)
as appropriate	service messages (see 4.4.1.1.9)

Message part		*Component of the message part*	*Elements of the component*	*Teletypewriter character*
THE HEADING	HEADING LINE (see 4.4.15.1.1)	Start-of-Heading Character	One Character (0/1)	SOH
		Transmission Identification	a) Transmitting-terminal letter b) Receiving-terminal letter c) Channel-identification letter d) Channel-sequence number (*Example:* NRA062)	.....
		(*If necessary*) Additional Service Indication	a) One SPACE b) No more than the remainder of the line (*Example:* 270930)	→
	ADDRESS (see 4.4.15.2.1)	Alignment Function	One CARRIAGE RETURN, one LINE FEED	<≡
		Priority Indicator	The relevant 2-letter group	..
		Addressee Indicator(s)	One SPACE An 8-letter group (*Example:* **EGLLZRZX→EGLLYKYX→EGLLACAD**) given in sequence for each addressee	
		Alignment Function(s)	One CARRIAGE RETURN, one LINE FEED	<≡
	ORIGIN (see 4.4.15.2.2)	Filing Time	6-digit date-time group specifying when the message was filed for transmission	.....
		Originator Indicator	a) One SPACE b) 8-letter group identifying the message originator	→.....
		Priority Alarm (*used only in teletypewriter operation for Distress Messages*)	Five characters (0/7)(BEL)	
		Optional Heading Information	a) One SPACE b) Additional data not to exceed the remainder of the line. See 4.4.15.2.2.6.	
		Alignment Function	One CARRIAGE RETURN, one LINE FEED	<≡
		Start-of-Text Character	One character (0/2)	STX
TEXT (see 4.4.15.3)		Beginning of the Text	Specific identification of Addressee(s) *(if necessary)* *with* each followed by one CARRIAGE RETURN, one LINE FEED *(if necessary)* The English word FROM *(if necessary)*(see 4.4.15.3.5) Specific identification of Originator *(if necessary)* The English word STOP followed by one CARRIAGE RETURN, one LINE FEED *(if necessary)* (see 4.4.15.3.5) *and/or* Originator's reference *(if used)*	
		Message Text	Message Text with one CARRIAGE RETURN, one LINE FEED at the end of each printed line of the Text except for the last one (see 4.4.15.3.6)	
		Confirmation *(if necessary)*	a) One CARRIAGE RETURN, one LINE FEED b) The abbreviation CFM followed by the portion of the Text being confirmed.	
		Correction *(if necessary)*	a) One CARRIAGE RETURN, one LINE FEED b) The abbreviation COR followed by the correction of an error made in the preceding Text	
ENDING (see 4.4.15.3.12.1)		Alignment Function	One CARRIAGE RETURN, one LINE FEED	<≡
		Page-feed Sequence	One character (0/11)	VT
		End-of-Text character	One character (0/3)	ETX

Figure 4-4. Message format International Alphabet No. 5 (IA-5)
(the above illustrates the teletypewriter message format described in 4.4.15)

4.4.15.2.1.2 The order of priority shall be the same as specified in 4.4.1.2.

4.4.15.2.1.3 An addressee indicator, which shall be immediately preceded by a SPACE, except when it is the first address indicator of the second or third line of addresses, shall comprise:

a) the four-letter location indicator of the place of destination;

b) the three-letter designator identifying the organization/ function (aeronautical authority, service or aircraft operating agency) addressed;

an additional letter, which shall represent a department, division or process within the organization/function addressed. The letter X shall be used to complete the address when explicit identification is not required.

4.4.15.2.1.3.1 Where a message is to be addressed to an organization that has not been allocated an ICAO three-letter designator of the type prescribed in 4.4.15.2.1.3 the location

indicator of the place of destination shall be followed by the ICAO three-letter designator YYY (or the ICAO three-letter designator YXY in the case of a military service or organization). The name of the addressee organization shall then be included in the first item in the text of the message. The eighth position letter following the ICAO three-letter designator YYY or YXY shall be the filler letter X.

4.4.15.2.1.3.2 Where a message is to be addressed to an aircraft in flight and, therefore, requires handling over the AFTN for part of its routing before retransmission over the Aeronautical Mobile Service, the location indicator of the aeronautical station which is to relay the message to the aircraft shall be followed by the ICAO three-letter designator ZZZ. The identification of the aircraft shall then be included in the first item of the text of the message. The eighth position letter following the ICAO three-letter designator ZZZ shall be the filler letter X.

4.4.15.2.1.4 The complete address shall be restricted to three lines of page-printing copy, and, except as provided in 4.4.16, a separate addressee indicator shall be used for each addressee whether at the same or different locations.

4.4.15.2.1.5 The completion of the addressee indicator group(s) in the address of a message shall be immediately followed by the alignment function.

4.4.15.2.1.6 Where messages are offered in page-copy form for transmission and contain more addressee indicators than can be accommodated on three lines of a page copy, such messages shall be converted, before transmission, into two or more messages, each of which shall conform with the provisions of 4.4.15.2.1.5. During such conversion, the addressee indicators shall, in so far as practicable, be positioned in the sequence which will ensure that the minimum number of retransmissions will be required at subsequent communication centres.

4.4.15.2.2 *Origin*

The origin shall comprise:

a) filing time;

b) originator indicator;

c) priority alarm (when necessary);

d) optional heading information;

e) alignment function [<≡];

f) start-of-text character, character 0/2 (STX).

4.4.15.2.2.1 The filing time shall comprise the 6-digit date-time group indicating the date and time of filing the message for transmission (see 3.4.2).

4.4.15.2.2.2 The originator indicator, which shall be immediately preceded by a SPACE, shall comprise:

a) the four-letter location indicator of the place at which the message is originated;

b) the three-letter designator identifying the organization/ function (aeronautical authority, service or aircraft operating agency) which originated the message;

c) an additional letter which shall represent a department, division or process within the organization/function of the originator. The letter X shall be used to complete the address when explicit identification is not required.

4.4.15.2.2.3 Where a message is originated by an organization that has not been allocated an ICAO three-letter designator of the type prescribed in 4.4.15.2.2.2, the location indicator of the place at which the message is originated shall be followed immediately by the ICAO three-letter designator YYY followed by the filler letter X (or the ICAO three-letter designator YXY followed by the filler letter X in the case of a military service or organization). The name of the organization (or military service) shall then be included in the first item in the text of the message.

4.4.15.2.2.3.1 Messages relayed over the AFTN that have been originated in other networks shall use a valid AFTN originator indicator that has been agreed for use by the relay or gateway function linking the AFTN with the external network.

4.4.15.2.2.4 Where a message originated by an aircraft in flight requires handling on the AFTN for part of its routing before delivery, the originator indicator shall comprise the location indicator of the aeronautical station responsible for transferring the message to the AFTN, followed immediately by the ICAO three-letter designator ZZZ followed by the filler letter X. The identification of the aircraft shall then be included in the first item in the text of the message.

4.4.15.2.2.5 The priority alarm shall be used only for distress messages. When used it shall consist of five successive BEL (0/7) characters.

4.4.15.2.2.6 The inclusion of optional data in the origin line shall be permitted provided a total of 69 characters is not exceeded and subject to agreement between the Administrations concerned. The presence of the optional data field shall be indicated by one occurrence of the SPACE character immediately preceding optional data.

4.4.15.2.2.6.1 When additional addressing information in a message needs to be exchanged between source and destination addresses, it shall be conveyed in the optional data field (ODF), using the following specific format:

a) characters one and full stop (1.) to indicate the parameter code for the additional address function;

b) three modifier characters, followed by an equal sign (=) and the assigned 8-character ICAO address; and

c) the character hyphen (-) to terminate the additional address parameter field.

4.4.15.2.2.6.1.1 When a separate address for service messages or inquiries is different from the originator indicator, the modifier SVC shall be used.

4.4.15.2.2.7 The origin line shall be concluded by an alignment function [<≡] and the start-of-text (STX) (0/2) character.

4.4.15.3 *Text*

4.4.15.3.1 The text of messages shall be drafted in accordance with 4.1.2 and shall consist of all data between STX and ETX.

4.4.15.3.2 When an originator’s reference is used, it shall appear at the beginning of the text, except as provided in 4.4.15.3.3 and 4.4.15.3.4.

4.4.15.3.3 When the ICAO three-letter designators YXY, YYY or ZZZ comprise the second element of the addressee indicator (see 4.4.15.2.1.3.1 and 4.4.15.2.1.3.2) and it, therefore, becomes necessary to identify in the text the specific addressee of the message, such identification group shall precede the originator’s reference (if used) and become the first item of the text.

4.4.15.3.4 When the ICAO three-letter designators YXY, YYY or ZZZ comprise the second element of the originator indicator (see 4.4.15.2.2.3 and 4.4.15.2.2.4) and it thus becomes necessary to identify in the text the name of the organization (or military service) or the aircraft which originated the message, such identification shall be inserted in the first item of the text of the message.

4.4.15.3.5 When applying the provisions of 4.4.15.3.3 and 4.4.15.3.4 to messages where the ICAO three-letter designator(s) YXY, YYY, ZZZ refer to two or more different organizations (or military services), the sequence of further identification in the text shall correspond to the complete sequence used in the address and originator indicator of the message. In such instance, each addressee identification shall be followed immediately by an alignment function. The name of the (YXY, YYY or ZZZ) organization originating the message shall then be preceded with “FROM”. “STOP” followed by an alignment function shall then be included in the text at the end of this identification and preceding the remainder of text.

4.4.15.3.6 An alignment function shall be transmitted at the end of each printed line of the text. When it is desired to confirm a portion of the text of a message in teletypewriter operation, such confirmation shall be separated from the last text group by an alignment function [<≡], and shall be indicated by the abbreviation CFM followed by the portion being confirmed.

4.4.15.3.7 Where messages are prepared off-line, e.g. by preparation of a paper tape, errors in the text shall be corrected by backspacing and replacing the character in error by character DEL (7/15).

4.4.15.3.8 Corrections to textual errors made in on-line operations shall be corrected by inserting →E→E→E→ following the error, then retyping the last correct word (or group).

4.4.15.3.9 When it is not discovered until later in the origination process that an error has been made in the text, the correction shall be separated from the last text group, or confirmation, if any, by an alignment function [<≡]. This shall be followed by the abbreviation COR and the correction.

4.4.15.3.10 Stations shall make all indicated corrections on the page-copy prior to local delivery or a transfer to a manually operated circuit.

4.4.15.3.11 The text of messages entered by the AFTN origin station shall not exceed 1 800 characters in length. AFTN messages exceeding 1 800 characters shall be entered by the AFTN origin station in the form of separate messages. Guidance material for forming separate messages from a single long message is given in Attachment B to Volume II. When messages or data are transmitted only on medium or high speed circuits the text may be increased to a length that exceeds 1800 characters as long as performance characteristics of the network or link are not diminished and subject to agreement between the Administrations concerned.

4.4.15.3.12 *Ending*

4.4.15.3.12.1 The ending of a message shall comprise the following in the order stated:

a) an alignment [<≡] function following the last line of text;

b) page-feed character, character 0/11 (VT);

c) end-of-text character 0/3 (ETX).

4.4.15.3.12.1.1 Station terminal equipment (page printers) on the International Alphabet Number 5 (IA-5) shall be provided with a capability to generate sufficient line feed functions for local station use upon the reception of a VERTICAL TAB character (0/11).

4.4.15.3.12.1.2 When the message does not transit ITA-2 portions of the AFTN, or where Administrations have made provisions to add automatically the second carriage return before transmission to an ITA-2 circuit, one carriage return in the alignment function and end-of-line function shall be permitted subject to agreement between the Administrations concerned.

4.4.15.3.12.1.3 Messages entered by the AFTN origin station shall not exceed 2 100 characters in length.

4.4.15.4 Except as provided in 4.4.15.5 to 4.4.15.6 and 4.4.16, the procedures of 4.4.8 and 4.4.9 to 4.4.13 shall be used for messages using IA-5 code.

4.4.15.5 *Channel-check transmissions.* In the case where continuous control of channel condition is not provided the following periodic transmissions shall be sent on tele-typewriter circuits:

1) heading line (see 4.4.15.1.1);
S
2) alignment function T;
X
3) the procedure signal CH;
E
4) alignment function T.
X

The receiving station shall then check the transmission identification of this incoming transmission to ensure its correct sequence in respect of all messages received over that incoming channel.

4.4.15.5.1 Where a circuit is unoccupied and uncontrolled, the transmission identified in 4.4.15.5 shall be sent at H + 00, H + 20, H + 40.

4.4.15.6 The receipt of distress messages (priority indicator SS, *see* 4.4.1.1.1) shall be individually acknowledged by the AFTN destination station by sending a service message (see 4.4.1.1.9) to the AFTN origin station. Such acknowledgement of receipt shall take the format of a complete message addressed to the AFTN origin station, shall be assigned priority indicator SS and the associated priority alarm (see 4.4.15.2.2.5), and shall have a text comprising:

1) the procedure signal R;

2) the origin line (see 4.4.15.2.2) without priority alarm, or optional heading information of the message being acknowledged;

3) the ending (see 4.4.15.3.12.1).

4.4.16 Action taken on mutilated messages in IA-5 detected in computerized AFTN relay stations

4.4.16.1 On channels employing continuous control the mutilation detection and subsequent recovery shall be a function of the link control procedures and shall not require the subsequent sending of service or CHECK TEXT NEW ENDING ADDED messages.

4.4.16.2 On channels not employing continuous control the relay station shall employ the following procedures:

4.4.16.2.1 If, during the reception of a message a relay station detects that the message has been mutilated at some point ahead of the end-of-text character, it shall:

1) cancel the onward routing responsibility for the message;

send a service message to the transmitting station requesting a retransmission.

4.4.16.2.2 When the provisions of 4.4.16.2.1 are applied, the station receiving the service message shall reassume responsibility for the referenced message with a new (i.e. correct in sequence) transmission identification (see 4.4.15.2.1). If that station is not in possession of an unmutilated copy of the original message, it shall send a message to the originator as identified by the originator indicator in the origin of the mutilated message, requesting repetition of the incorrectly received message.

4.4.16.3 If, after transmission of the text material of a message, a relay station can detect that there is no complete end-of-text character, but has no practical means of discovering whether the irregularity has affected only the end-of-text character, or whether it has also caused part of the original text to have been lost, it shall insert into the channel the following:

1) <≡CHECK≡TEXT≡ NEW→ENDING→ADDED

2) its own station identification;

3) (ending - *see* 4.4.15.3.12.1).

4.4.17 Transfer of AFTN messages over code and byte independent circuits and networks

When AFTN messages are transferred across code and byte independent circuits and networks of the AFS, the following shall apply.

4.4.17.1 Except as provided in 4.4.17.3 the heading line of the message shall be omitted. The message shall start with an alignment function followed by the address.

4.4.17.2 The message shall end with a complete ending.

4.4.17.3 For the purposes of technical supervision, entry centres shall be permitted to insert additional data preceding the first alignment function and/or following the ending of the message. Such data may be disregarded by the receiving station.

4.4.17.3.1 When the provisions of 4.4.17.3 are applied, the data added shall not include either carriage return or line feed characters or any of the combinations listed in 4.1.2.4.

4.5 Common ICAO Data Interchange Network (CIDIN)

Reserved

4.6 ATS Message Handling Services (ATSMHS)

The ATS message service of the ATS (air traffic services) message handling service (ATSMHS) application shall be used to exchange ATS messages between users over the aeronautical telecommunication network (ATN) internet.

Table 4-1. Communications between ATN end systems implementing ATS message handling services

ATN End System 1	ATN End System 2
ATS Message Server	ATS Message Server
ATS Message Server	AFTN/AMHS Gateway
ATS Message Server	ATS Message User Agent
AFTN/AMHS Gateway	AFTN/AMHS Gateway

4.7 Inter-Centre Communications (ICC)

The intercentre communications (ICC) applications set shall be used to exchange ATS messages between air traffic service users over the ATN internet.

CHAPTER 5 Aeronautical Mobile Service - Voice Communications

5.1 General

5.1.1 In all communications the highest standard of discipline shall be observed at all times.

5.1.1.1 ICAO standardized phraseology shall be used in all situations for which it has been specified. Only when standardized phraseology cannot serve an intended transmission, plain language shall be used.

5.1.1.2 The transmission of messages, other than those specified in 5.1.8, on aeronautical mobile frequencies when the aeronautical fixed services are able to serve the intended purpose, shall be avoided.

5.1.1.3 In all communications, the consequences of human performance which could affect the accurate reception and comprehension of messages shall be taken into consideration.

5.1.2 Where it is necessary for an aircraft station to send signals for testing or adjustment which are liable to interfere with the working of a neighbouring aeronautical station, the consent of the station shall be obtained before such signals are sent. Such transmissions shall be kept to a minimum.

5.1.3 When it is necessary for a station in the aeronautical mobile service to make test signals, either for the adjustment of a transmitter before making a call or for the adjustment of a receiver, such signals shall not continue for more than 10 seconds and shall be composed of spoken numerals (ONE, TWO, THREE, etc.) in radiotelephony, followed by the radio call sign of the station transmitting the test signals. Such transmissions shall be kept to a minimum.

5.1.4 Except as otherwise provided, the responsibility of establishing communication shall rest with the station having traffic to transmit.

5.1.5 After a call has been made to the aeronautical station, a period of at least 10 seconds shall elapse before a second call is made. This shall eliminate unnecessary transmissions while the aeronautical station is getting ready to reply to the initial call.

5.1.6 When an aeronautical station is called simultaneously by several aircraft stations, the aeronautical station shall decide the order in which aircraft shall communicate.

5.1.7 In communications between aircraft stations, the duration of communication shall be controlled by the aircraft station which is receiving, subject to the intervention of an aeronautical station. If such communications take place on an ATS frequency, prior permission of the aeronautical station shall be obtained. Such requests for permission are not required for brief exchanges.

5.1.8 Categories of messages

The categories of messages handled by the aeronautical mobile service and the order of priority in the establishment of communications and the transmission of messages shall be in accordance with the following table.

Message category and order of priority	*Radiotelephony signal*
a) Distress calls, distress messages and distress traffic	MAYDAY
b) Urgency messages, including messages preceded by the medical transports signal	PAN, PAN *or* PAN, PAN MEDICAL
c) Communications relating to direction finding	-
d) Flight safety messages	-
e) Meteorological messages	-
f) Flight regularity messages	-

5.1.8.1 *Distress messages and distress traffic* shall be handled in accordance with the provisions of 5.3.

5.1.8.2 *Urgency messages and urgency traffic,* including messages preceded by the medical transports signal, shall be handled in accordance with the provisions of 5.3.

5.1.8.3 *Communications relating to direction finding* shall be handled in accordance with Chapter 6.

5.1.8.4 *Flight safety messages* shall comprise the following:

1) movement and control messages [see PANS-ATM (ICAO Doc 4444)];
2) messages originated by an aircraft operating agency or by an aircraft, of immediate concern to an aircraft in flight;
3) meteorological advice of immediate concern to an aircraft in flight or about to depart (individually communicated or for broadcast);
4) other messages concerning aircraft in flight or about to depart.

5.1.8.5 *Meteorological messages* shall comprise meteorological information to or from aircraft, other than those in 5.1.8.4, 3).

5.1.8.6 *Flight regularity messages* shall comprise the following:

1) messages regarding the operation or maintenance of facilities essential for the safety or regularity of aircraft operation;
2) messages concerning the servicing of aircraft;
3) instructions to aircraft operating agency representatives concerning changes in requirements for passengers and crew caused by unavoidable deviations from normal operating schedules. Individual requirements of passengers or crew shall not be admissible in this type of message;
4) messages concerning non-routine landings to be made by the aircraft;
5) messages concerning aircraft parts and materials urgently required;
6) messages concerning changes in aircraft operating schedules.

5.1.8.6.1 Air traffic services units using direct pilot-controller communication channels shall only be required to handle flight regularity messages provided this can be achieved without interference with their primary role and no other channels are available for the handling of such messages.

5.1.8.7 Messages having the same priority shall, in general, be transmitted in the order in which they are received for transmission.

5.1.8.8 Interpilot air-to-air communication shall comprise messages related to any matter affecting safety and regularity of flight. The category and priority of these messages shall be determined on the basis of their content in accordance with 5.1.8.

5.1.9 Cancellation of messages

5.1.9.1 *Incomplete transmissions.* If a message has not been completely transmitted when instructions to cancel are received, the station transmitting the message shall instruct the receiving station to disregard the incomplete transmission. This shall be effected in radiotelephony by use of an appropriate phrase.

5.1.9.2 *Complete transmissions*

When a completed message transmission is being held pending correction and the receiving station is to be informed to take no forwarding action, or when delivery or onward relay cannot be accomplished, transmission shall be cancelled. This shall be effected in radiotelephony by the use of an appropriate phrase.

5.1.9.3 The station cancelling a transmission shall be responsible for any further action required.

5.2 Radiotelephony procedures

5.2.1 General

5.2.1.1 When a controller or pilot communicates via voice, the response shall be via voice. Except as provided by 8.2.12.1, when a controller or pilot communicates via CPDLC, the response shall be via CPDLC.

5.2.1.2 *Language to be used*

5.2.1.2.1 The air-ground radiotelephony communications shall be conducted in the language normally used by the station on the ground or in the English language.

5.2.1.2.2 The English language shall be available, on request from any aircraft station, at all stations on the ground serving designated airports and routes used by international air services.

5.2.1.2.3 The languages available at a given station on the ground shall form part of the Aeronautical Information Publications and other published aeronautical information concerning such facilities.

5.2.1.3 *Word spelling in radiotelephony.* When proper names, service abbreviations and words of which the spelling is doubtful are spelled out in radiotelephony the alphabet in Figure 5-1 shall be used.

Letter	*Word*	*Approximate pronunciation*	
		International Phonetic Convention	*Latin alphabet representation*
A	**Alfa**	'ælfa	AL FAH
B	**Bravo**	'bra:'vo	BRAH VOH
C	**Charlie**	'tʃɑ:li *or* 'ʃɑ:li	CHAR LEE *or* SHAR LEE
D	**Delta**	'deltɑ	DELL TAH
E	**Echo**	'eko	ECK OH
F	**Foxtrot**	'fɔkstrɔt	FOKS TROT
G	**Golf**	gʌlf	GOLF
H	**Hotel**	ho:'tel	HO TELL
I	**India**	'indi•ɑ	IN DEE AH
J	**Juliett**	'dʒu:li•'et	JEW LEE ETT
K	**Kilo**	'ki:lo	KEY LOH
L	**Lima**	'li:mɑ	LEE MAH
M	**Mike**	mɑik	MIKE
N	**November**	no'vembə	NO VEM BER
O	**Oscar**	'ɔskɑ	OSS CAH
P	**Papa**	pə'pɑ	PAH PAH
Q	**Quebec**	ke'bek	KEH BECK
R	**Romeo**	'ro:mi•o	ROW ME OH
S	**Sierra**	si'erɑ	SEE AIR RAH
T	**Tango**	'tængo	TANG GO
U	**Uniform**	'ju:nifɔ:m *or* 'u:nifɔrm	YOU NEE FORM *or* OO NEE FORM
V	**Victor**	'viktɑ	VIK TAH
W	**Whiskey**	'wiski	WISS KEY
X	**X-ray**	'eks'rei	ECKS RAY
Y	**Yankee**	'jænki	YANG KEY
Z	**Zulu**	'zu:lu:	ZOO LOO

Note.— In the approximate representation using the Latin alphabet, syllables to be emphasized are underlined.

Figure 5-1. The Radiotelephony Spelling Alphabet (see 5.2.1.3)

5.2.1.4 *Transmission of numbers in radiotelephony*

5.2.1.4.1 *Transmission of numbers*

5.2.1.4.1.1 All numbers, except as prescribed in 5.2.1.4.1.2, shall be transmitted by pronouncing each digit separately.

5.2.1.4.1.2 All numbers used in the transmission of altitude, cloud height, visibility and runway visual range (RVR) information, which contain whole hundreds and whole thousands, shall be transmitted by pronouncing each digit in the number of hundreds or thousands followed by the word HUNDRED or THOUSAND as appropriate. Combinations of thousands and whole hundreds shall be transmitted by pronouncing each digit in the number of thousands followed by the word THOUSAND followed by the number of hundreds followed by the word HUNDRED.

5.2.1.4.1.3 Numbers containing a decimal point shall be transmitted as prescribed in 5.2.1.4.1.1 with the decimal point in appropriate sequence being indicated by the word DECIMAL.

5.2.1.4.1.4 When transmitting time, only the minutes of the hour shall normally be required. Each digit shall be pronounced separately. However, the hour shall be included when any possibility of confusion is likely to result.

5.2.1.4.2 Verification of numbers

5.2.1.4.2.1 When it is desired to verify the accurate reception of numbers the person transmitting the message shall request the person receiving the message to read back the numbers.

5.2.1.4.3 Pronunciation of numbers

5.2.1.4.3.1 When the language used for communication is English, numbers shall be transmitted using the following pronunciation:

Numeral or numeral element	*Pronunciation*
0	ZE-RO
1	WUN
2	TOO
3	TREE
4	FOW-er
5	FIFE
6	SIX
7	SEV-en
8	AIT
9	NIN-er
Decimal	DAY-SEE-MAL
Hundred	HUN-dred
Thousand	TOU-SAND

5.2.1.5 Transmitting technique

5.2.1.5.1 Each written message shall be read prior to commencement of transmission in order to eliminate unnecessary delays in communications.

5.2.1.5.2 Transmissions shall be conducted concisely in a normal conversational tone.

5.2.1.5.3 Speech transmitting technique shall be such that the highest possible intelligibility is incorporated in each transmission. Fulfilment of this aim requires that air crew and ground personnel shall:

a) enunciate each word clearly and distinctly;

b) maintain an even rate of speech not exceeding 100 words per minute. When a message is transmitted to an aircraft and its contents need to be recorded the speaking rate should be at a slower rate to allow for the writing process. A slight pause preceding and following numerals makes them easier to understand;

c) maintain the speaking volume at a constant level;

d) be familiar with the microphone operating techniques particularly in relation to the maintenance of a constant distance from the microphone if a modulator with a constant level is not used;

e) suspend speech temporarily if it becomes necessary to turn the head away from the microphone.

5.2.1.5.4 Speech transmitting technique shall be adapted to the prevailing communications conditions.

5.2.1.5.5 Messages accepted for transmission should be transmitted in plain language or ICAO phraseologies without altering the sense of the message in any way. Approved ICAO abbreviations contained in the text of the message to be transmitted to aircraft should normally be converted into the unabbreviated words or phrases which these abbreviations represent in the language used, except for those which, owing to frequent and common practice, are generally understood by aeronautical personnel.

5.2.1.5.6 To expedite communication, the use of phonetic spelling should be dispensed with, if there is no risk of this affecting correct reception and intelligibility of the message.

5.2.1.5.7 The transmission of long messages should be interrupted momentarily from time to time to permit the transmitting operator to confirm that the frequency in use is clear and, if necessary, to permit the receiving operator to request repetition of parts not received.

5.2.1.5.8 The following words and phrases shall be used in radiotelephony communications as appropriate and shall have the meaning ascribed hereunder:

Phrase	*Meaning*
ACKNOWLEDGE	“Let me know that you have received and understood this message.”
AFFIRM	“Yes.”
APPROVED	“Permission for proposed action granted.”
BREAK	“I hereby indicate the separation between portions of the message.” *(To be used where there is no clear distinction between the text and other portions of the message.)*
BREAK BREAK	“I hereby indicate the separation between messages transmitted to different aircraft in a very busy environment.”
CANCEL	“Annul the previously transmitted clearance.”
CHECK	“Examine a system or procedure.” *(Not to be used in any other context. No answer is normally expected.)*
CLEARED	“Authorized to proceed under the conditions specified.”
CONFIRM	“I request verification of: (clearance, *instruction, action, information).”*

Phrase	*Meaning*
CONTACT	“Establish communications with...”
CORRECT	“True” or “Accurate”.
CORRECTION	“An error has been made in this transmission (or message indicated). The correct version is...”
DISREGARD	“Ignore.”
HOW DO YOU READ	“What is the readability of my transmission?” (see 5.2.1.8.4.)
I SAY AGAIN	“I repeat for clarity or emphasis.”
MAINTAIN	“Continue in accordance with the condition(s) specified” or in its literal sense, e.g. “Maintain VFR”.
MONITOR	“Listen out on (frequency).”
NEGATIVE	“No” *or* “Permission not granted” *or* “That is not correct” *or* “Not capable”.
OVER	“My transmission is ended, and I expect a response from you.”
OUT	“This exchange of transmissions is ended and no response is expected.”
READ BACK	“Repeat all, or the specified part, of this message back to me exactly as received.”
RECLEARED	“A change has been made to your last clearance and this new clearance supersedes your previous clearance or part thereof.”
REPORT	“Pass me the following information...”
REQUEST	“I should like to know...” *or* “I wish to obtain...”
ROGER	“I have received all of your last transmission.”
SAY AGAIN	“Repeat all, or the following part, of your last transmission.”
SPEAK SLOWER	“Reduce your rate of speech.”
STANDBY	“Wait and I will call you.”
UNABLE	“I cannot comply with your request, instruction, or clearance.”
WILCO	*(Abbreviation for “will comply”.)* “I understand your message and will comply with it.”
WORDS TWICE	a) *As a request:* “Communication is difficult. Please send every word, or group of words, twice.” b) *As information:* “Since communication is difficult, every word, or group of words, in this message will be sent twice.”

5.2.1.6 Composition of messages

5.2.1.6.1 Messages handled entirely by the aeronautical mobile service shall comprise the following parts in the order stated:

a) call indicating the addressee and the originator (see 5.2.1.7.3);

b) text (see 5.2.1.6.2.1.1).

5.2.1.6.2 Messages requiring handling by the AFTN for part of their routing and similarly messages which are not handled in accordance with predetermined distribution arrangements (see 3.3.7.1) shall be composed as follows:

5.2.1.6.2.1 When originated in an aircraft:

1) call (see 5.2.1.7.3);

2) the word FOR;

3) the name of the organization addressed;

4) the name of the station of destination;

5) the text.

5.2.1.6.2.1.1 The text shall be as short as practicable to convey the necessary information; full use shall be made of ICAO phraseologies.

5.2.1.6.2.2 *When addressed to an aircraft.* When a message, prepared in accordance with 4.4.2, is retransmitted by an aeronautical station to an aircraft in flight, the heading and address of the AFTN message format shall be omitted during the retransmission on the aeronautical mobile service.

5.2.1.6.2.2.1 When the provisions of 5.2.1.6.2.2 are applied, the aeronautical mobile service message transmission shall comprise:

a) the text [incorporating any corrections (COR) contained in the AFTN message];

b) the word FROM;

c) the name of the originating organization and its location (taken from the origin section of the AFTN message).

5.2.1.6.2.2.2 When the text of a message to be transmitted by an aeronautical station to an aircraft in flight contains approved ICAO abbreviations, these abbreviations shall normally be converted during the transmission of the message into the unabbreviated words or phrases which the abbreviations represent in the language used, except for those which, owing to frequent or common practice, are generally understood by aeronautical personnel.

5.2.1.7 Calling

5.2.1.7.1 Radiotelephony call signs for aeronautical stations

5.2.1.7.1.1 Aeronautical stations in the aeronautical mobile service shall be identified by:

a) the name of the location; and

b) the unit or service available.

5.2.1.7.1.2 The unit or service shall be identified in accordance with the table below except that the name of the location or the unit/service may be omitted provided satisfactory communication has been established.

Unit/service available	*Call sign suffix*
area control centre	CONTROL
approach control	APPROACH
approach control radar arrivals	ARRIVAL
approach control radar departures	DEPARTURE
aerodrome control	TOWER

surface movement control	GROUND
radar (in general)	RADAR
precision approach radar	PRECISION
direction-finding station	HOMER
flight information service	INFORMATION
clearance delivery	DELIVERY
apron control	APRON
company dispatch	DISPATCH
aeronautical station	RADIO

5.2.1.7.2 *Radiotelephony call signs for aircraft*

5.2.1.7.2.1 *Full call signs*

5.2.1.7.2.1.1 An aircraft radiotelephony call sign shall be one of the following types:

Type a) - the characters corresponding to the registration marking of the aircraft; or

Type b) - the telephony designator of the aircraft operating agency, followed by the last four characters of the registration marking of the aircraft;

Type c) - the telephony designator of the aircraft operating agency, followed by the flight identification.

5.2.1.7.2.2 *Abbreviated call signs*

5.2.1.7.2.2.1 The aircraft radiotelephony call signs shown in 5.2.1.7.2.1.1, with the exception of Type c), may be abbreviated in the circumstances prescribed in 5.2.1.7.3.3.1. Abbreviated call signs shall be in the following form:

Type a) - the first character of the registration and at least the last two characters of the call sign;

Type b) - the telephony designator of the aircraft operating agency, followed by at least the last two characters of the call sign;

Type c) - no abbreviated form.

Table 5-1. Examples of full call signs and abbreviated call signs
(see 5.2.1.7.2.1 and 5.2.1.7.2.2)

		Type a)		*Type b)*	*Type c)*
Full call sign	N 57826	CESSNA FABCD	CITATION FABCD	VARIG PVMA	SCANDINAVIAN 937
Abbreviated call sign	N26 or N826	CESSNA CD or CESSNA BCD	CITATION CD or CITATION BCD	VARIG MA or VARIG VMA	(no abbreviated form)

5.2.1.7.3 Radiotelephony procedures

5.2.1.7.3.1 An aircraft shall not change the type of its radiotelephony call sign during flight, except temporarily on the instruction of an air traffic control unit in the interests of safety.

5.2.1.7.3.1.1 Except for reasons of safety no transmission shall be directed to an aircraft during take-off, during the last part of the final approach or during the landing roll.

5.2.1.7.3.2 Establishment of radiotelephony communications

5.2.1.7.3.2.1 Full radiotelephony call signs shall always be used when establishing communication. The calling procedure of an aircraft establishing communication shall be in accordance with Table 5-2.

5.2.1.7.3.2.2 Stations having a requirement to transmit information to all stations likely to intercept shall preface such transmission by the general call ALL STATIONS, followed by the identification of the calling station.

5.2.1.7.3.2.3 The reply to the above calls shall be in accordance with Table 5-3. The use of the calling aeronautical station's call sign followed by the answering aeronautical station's call sign shall be considered the invitation to proceed with transmission by the station calling.

5.2.1.7.3.2.4 When a station is called but is uncertain of the identification of the calling station, it shall reply by transmitting the following:

STATION CALLING . . . (station called) SAY AGAIN YOUR CALL SIGN

5.2.1.7.3.2.5 Communications shall commence with a call and a reply when it is desired to establish contact, except that, when it is certain that the station called will receive the call, the calling station may transmit the message, without waiting for a reply from the station called.

5.2.1.7.3.2.6 Interpilot air-to-air communication shall be established on the air-to-air channel 123.45 MHz by either a directed call to a specific aircraft station or a general call, taking into account conditions pertaining to use of this channel.

5.2.1.7.3.2.6.1 As the aircraft may be guarding more than one frequency, the initial call shall include the distinctive channel identification "INTERPILOT".

Table 5-2. Radiotelephony calling procedure* (see 5.2.1.7.3.2.1)

	Type a)	*Type b)*	*Type c)*
Designation of the station called	NEW YORK RADIO	NEW YORK RADIO	NEW YORK RADIO
Designation of the station calling	GABCD**	SPEEDBIRD ABCD**	AEROFLOT 321**

* *In certain cases where the call is initiated by the aeronautical station, the call may be effected by transmission of coded tone signals.*

** *With the exception of the telephony designators and the type of aircraft, each character in the call sign shall be spoken separately. When individual letters are spelled out, the radiotelephony spelling alphabet prescribed in 5.2.1.3 shall be used. Numbers are to be spoken in accordance with 5.2.1.4.*

Table 5-3. Radiotelephony reply procedure (see 5.2.1.7.3.2.3)

	Type a)	*Type b)*	*Type c)*
Designation of the station called	GABCD*	SPEEDBIRD ABCD*	AEROFLOT 321*
Designation of the answering station	NEW YORK RADIO	NEW YORK RADIO	NEW YORK RADIO

** With the exception of the telephony designators and the type of aircraft, each character in the call sign shall be spoken separately. When individual letters are spelled out, the radiotelephony spelling alphabet prescribed in 5.2.1.3 shall be used. Numbers are to be spoken in accordance with 5.2.1.4.*

5.2.1.7.3.3 Subsequent radiotelephony communications

5.2.1.7.3.3.1 Abbreviated radiotelephony call signs, as prescribed in 5.2.1.7.2.2, shall be used only after satisfactory communication has been established and provided that no confusion is likely to arise. An aircraft station shall use its abbreviated call sign only after it has been addressed in this manner by the aeronautical station.

5.2.1.7.3.3.2 After contact has been established, continuous two-way communication shall be permitted without further identification or call until termination of the contact.

5.2.1.7.3.3.3 In order to avoid any possible confusion, when issuing ATC clearances and reading back such clearances, controllers and pilots shall always add the call sign of the aircraft to which the clearance applies.

5.2.1.7.3.4 Indication of transmitting channel

5.2.1.7.3.4.1 As the aeronautical station operator generally guards more than one frequency, the call should be followed by an indication of the frequency used, unless other suitable means of identifying the frequency are known to exist.

5.2.1.7.3.4.2 When no confusion is likely to arise, only the first two digits of the High Frequency (in kHz) need be used to identify the transmitting channel.

5.2.1.7.3.4.3 Except as specified in 5.2.1.7.3.4.4 all six digits of the numerical designator shall be used to identify the transmitting channel in VHF radiotelephony communications, except in the case of both the fifth and sixth digits being zeros, in which case only the first four digits shall be used.

5.2.1.7.3.4.4 In airspace where all VHF voice communications channels are separated by 25 kHz or more and the use of six digits as in 5.2.1.7.3.4.3 is not substantiated by the operational requirement determined by the appropriate authorities, the first five digits of the numerical designator shall be used, except in the case of both the fifth and sixth digits being zeros, in which case only the first four digits shall be used.

5.2.1.8 Test procedures

5.2.1.8.1 The form of test transmissions shall be as follows:

a) the identification of the station being called;

b) the aircraft identification;

c) the words "RADIO CHECK";

d) the frequency being used.

5.2.1.8.2 The reply to a test transmission shall be as follows*:*

a) the identification of the aircraft;

b) the identification of the aeronautical station replying;

c) *information regarding the readability of the aircraft transmission.*

5.2.1.8.3 The test transmission and reply thereto shall be recorded at the aeronautical station.

5.2.1.8.4 When the tests are made, the following readability scale shall be used:

Readability Scale

1) Unreadable

2) Readable now and then

3) Readable but with difficulty 4 Readable

4) Perfectly readable

5.2.1.9 Exchange of communications

5.2.1.9.1 Communications shall be concise and unambiguous, using standard phraseology whenever available.

5.2.1.9.1.1 Abbreviated procedures shall only be used after initial contact has been established and where no confusion is likely to arise.

5.2.1.9.2 Acknowledgement of receipt. The receiving operator shall make certain that the message has been received correctly before acknowledging receipt.

5.2.1.9.2.1 When transmitted by an aircraft station, the acknowledgement of receipt of a message shall comprise the call sign of that aircraft.

5.2.1.9.2.2 An aircraft station shall acknowledge receipt of important air traffic control messages or parts thereof by reading them back and terminating the readback by its radio call sign.

5.2.1.9.2.3 When acknowledgement of receipt is transmitted by an aeronautical station:

1) *to an aircraft station:* it shall comprise the call sign of the aircraft, followed if considered necessary by the call sign of the aeronautical station;

2) *to another aeronautical station:* it shall comprise the call sign of the aeronautical station that is acknowledging receipt.

5.2.1.9.2.3.1 An aeronautical station shall acknowledge position reports and other flight progress reports by reading back the report and terminating the readback by its call sign, except that the readback procedure may be suspended temporarily whenever it will alleviate congestion on the communication channel.

5.2.1.9.2.4 It is permissible for verification for the receiving station to read back the message as an additional acknowledgement of receipt. In such instances, the station to which the information is read back shall acknowledge the correctness of readback by transmitting its call sign.

5.2.1.9.2.5 If both position report and other information - such as weather reports - are received in the same message, the information shall be acknowledged with the words such as “WEATHER RECEIVED” after the position report has been read back, except when intercept of the information is required by other network stations. Other messages shall be acknowledged, the aeronautical station transmitting its call sign only.

5.2.1.9.3 End of conversation. A radiotelephone conversation shall be terminated by the receiving station using its own call sign.

5.2.1.9.4 Corrections and repetitions

5.2.1.9.4.1 When an error has been made in transmission, the word “CORRECTION” shall be spoken, the last correct group or phrase repeated, and then the correct version transmitted.

5.2.1.9.4.2 If a correction can best be made by repeating the entire message, the operator shall use the phrase “CORRECTION, I SAY AGAIN” before transmitting the message a second time.

5.2.1.9.4.3 (Intentionally left blank.)

5.2.1.9.4.4 If the receiving operator is in doubt as to the correctness of the message received, he shall request repetition either in full or in part.

5.2.1.9.4.5 If repetition of an entire message is required, the words “SAY AGAIN” shall be spoken. If repetition of a portion of a message is required, the operator shall state: “SAY AGAIN ALL BEFORE...(first word satisfactorily received)”; or “SAY AGAIN...(word before missing

portion) TO...(word after missing portion)"; or "SAY AGAIN ALL AFTER...(last word satisfactorily received)".

5.2.1.9.4.6 Specific items shall be requested, as appropriate, such as "SAY AGAIN ALTIMETER", "SAY AGAIN WIND".

5.2.1.9.4.7 If, in checking the correctness of a readback, an operator notices incorrect items, he shall transmit the words "NEGATIVE I SAY AGAIN" at the conclusion of the readback followed by the correct version of the items concerned.

5.2.1.9.5 "Operations normal" reports

When "operations normal" reports are transmitted by aircraft, they shall consist of the prescribed call followed by the words "OPERATIONS NORMAL".

5.2.2 Establishment and assurance of communications

5.2.2.1 Communications watch / Hours of service

5.2.2.1.1 During flight, aircraft stations shall maintain watch as required by the appropriate Authority and shall not cease watch, except for reasons of safety, without informing the aeronautical station(s) concerned.

5.2.2.1.1.1 Aircraft on long over-water flights, or on flights over designated areas over which the carriage of an emergency locator transmitter (ELT) is required, shall continuously guard the VHF emergency frequency 121.5 MHz, except for those periods when aircraft are carrying out communications on other VHF channels or when airborne equipment limitations or cockpit duties do not permit simultaneous guarding of two channels.

5.2.2.1.1.2 Aircraft shall continuously guard the VHF emergency frequency 121.5 MHz in areas or over routes where the possibility of interception of aircraft or other hazardous situations exist, and a requirement has been established by the appropriate authority.

5.2.2.1.1.3 Aircraft on flights other than those specified in 5.2.2.1.1.1 and 5.2.2.1.1.2 shall guard the emergency frequency 121.5 MHz to the extent possible.

5.2.2.1.1.4 The user of the air-to-air VHF communications channel shall ensure that adequate watch is maintained on designated ATS frequencies, the frequency of the aeronautical emergency channel, and any other mandatory watch frequencies.

5.2.2.1.2 Aeronautical stations shall maintain watch as required by the appropriate Authority.

5.2.2.1.3 Aeronautical stations shall maintain a continuous listening watch on VHF emergency channel 121.5 MHz during the hours of service of the units at which it is installed.

5.2.2.1.4 When it is necessary for an aircraft station or aeronautical station to suspend operation for any reason, it shall, if possible, so inform other stations concerned, giving the time at which it is expected that operation will be resumed. When operation is resumed, other stations concerned shall be so informed.

5.2.2.1.4.1 When it is necessary to suspend operation beyond the time specified in the original notice, a revised time of resumption of operation shall, if possible, be transmitted at or near the time first specified.

5.2.2.1.5 When two or more ATS frequencies are being used by a controller, consideration shall be given to providing facilities to allow ATS and aircraft transmissions on any of the frequencies to be simultaneously retransmitted on the other frequencies in use thus permitting aircraft stations within range to hear all transmissions to and from the controller.

5.2.2.2 Principles of network operation (HF communications)

5.2.2.2.1 The aeronautical stations of a radiotelephony network shall assist each other in accordance with the following network principles, in order to provide the air-ground communication service required of the network by aircraft flying on the air routes for which the network is responsible.

5.2.2.2.2 When the network comprises a large number of stations, network communications for flights on any individual route segment shall be provided by selected stations, termed "regular stations" for that segment.

5.2.2.2.3 In areas or on routes where radio conditions, length of flights or distance between aeronautical stations require additional measures to ensure continuity of air-ground communication throughout the route segment, the regular stations shall share between them a responsibility of primary guard whereby each station will provide the primary guard for that portion of the flight during which the messages from the aircraft can be handled most effectively by that station.

5.2.2.2.4 During its tenure of primary guard, each regular station shall, among other things:

a) be responsible for designating suitable primary and secondary frequencies for its communications with the aircraft;

b) receive all position reports and handle other messages from and to the aircraft essential to the safe conduct of the flight;

be responsible for the action required in case of failure of communications (see 5.2.2.7.2).

5.2.2.2.5 The transfer of primary guard from one station to the next will normally take place at the time of the traversing of flight information region or control area boundaries, this guard being provided at any time, as far as possible, by the station serving the flight information centre or area control centre in whose area the aircraft is flying. However, where communication conditions so demand, a station may be required to retain primary guard beyond such geographical boundaries or release its guard before the aircraft reaches the boundary, if appreciable improvement in air-ground communication can be effected thereby.

5.2.2.3 Frequencies to be used

5.2.2.3.1 Aircraft stations shall operate on the appropriate radio frequencies.

5.2.2.3.1.1 The air-ground control radio station shall designate the frequency(ies) to be used under normal conditions by aircraft stations operating under its control.

5.2.2.3.1.2 In network operation, the initial designation of primary and secondary frequencies shall be made by the network station with which the aircraft makes pre-flight check or its initial contact after take-off. This station shall also ensure that other network stations are advised, as required, of the frequency(ies) designated.

5.2.2.3.2 An aeronautical station, when designating frequencies in accordance with 5.2.2.3.1.1 or 5.2.2.3.1.2, shall take into account the appropriate propagation data and distance over which communications are required.

5.2.2.3.3 If a frequency designated by an aeronautical station proves to be unsuitable, the aircraft station shall suggest an alternative frequency.

5.2.2.3.4 When, notwithstanding the provisions of 5.1.1, air-ground frequencies are used for the exchange between network stations of messages essential for coordination and cooperation between the stations, such communication shall, so far as possible, be effected over network frequencies not being used at that time for the bulk of the air-ground traffic. In all cases, the communication with aircraft stations shall take priority over the inter-ground station communications.

5.2.2.4 Establishment of communications

5.2.2.4.1 Aircraft stations shall, if possible, communicate directly with the air-ground control radio station appropriate to the area in which the aircraft are flying. If unable to do so, aircraft stations shall use any relay means available and appropriate to transmit messages to the air-ground control radio station.

5.2.2.4.2 When normal communications from an aeronautical station to an aircraft station cannot be established, the aeronautical station shall use any relay means available and appropriate to transmit messages to the aircraft station. If these efforts fail, the originator shall be advised in accordance with procedures prescribed by the appropriate Authority.

5.2.2.4.3 When, in network operation, communication between an aircraft station and a regular station has not been established after calls on the primary and secondary frequencies, aid shall be rendered by one of the other regular stations for that flight, either by calling the attention of the station first called or, in the case of a call made by an aircraft station, by answering the call and taking the traffic.

5.2.2.4.3.1 Other stations of the network shall render assistance by taking similar action only if attempts to establish communications by the regular stations have proved unsuccessful.

5.2.2.4.4 The provisions of 5.2.2.4.3 and 5.2.2.4.3.1 shall also be applied:

a) on request of the air traffic services unit concerned;

b) when an expected communication from an aircraft has not been received within a time period such that the occurrence of a communication failure is suspected.

5.2.2.5 Transfer of HF communications

5.2.2.5.1 An aircraft station shall be advised by the appropriate aeronautical station to transfer from one radio frequency or network to another. In the absence of such advice, the aircraft station shall notify the appropriate aeronautical station before such transfer takes place.

5.2.2.5.2 In the case of transfer from one network to another, the transfer shall preferably take place while the aircraft is in communication with a station operating in both networks to ensure continuity of communications. If, however, the change of network must take place concurrently with the transfer of communication to another network station, the transfer shall be coordinated by the two network stations prior to advising or authorizing the frequency change. The aircraft shall also be advised of the primary and secondary frequencies to be used after the transfer.

5.2.2.5.3 An aircraft station which has transferred communications watch from one radio frequency to another shall, when so required by the appropriate ATS Authority, inform the aeronautical station concerned that communications watch has been established on the new frequency.

5.2.2.5.4 When entering a network after take-off, an aircraft station shall transmit its take-off time or time over the last check-point, to the appropriate regular station.

5.2.2.5.5 When entering a new network, an aircraft station shall transmit the time over the last checkpoint, or of its last reported position, to the appropriate regular station.

5.2.2.5.6 Before leaving the network, an aircraft station shall in all cases advise the appropriate regular station of its intention to do so by transmitting one of the following phrases, as appropriate:

a) when transferring to a pilot-to-controller channel: Aircraft: CHANGING TO *... (air traffic services unit concerned)*

b) after landing: Aircraft: LANDED *... (location) ... (time)*

5.2.2.6 Transfer of VHF communications

5.2.2.6.1 An aircraft shall be advised by the appropriate aeronautical station to transfer from one radio frequency to another in accordance with agreed procedures. In the absence of such advice, the aircraft station shall notify the appropriate aeronautical station before such a transfer takes place.

5.2.2.6.2 When establishing initial contact on, or when leaving, a VHF frequency, an aircraft station shall transmit such information as may be prescribed by the appropriate Authority.

5.2.2.7 Voice communications failure

5.2.2.7.1 Air-ground

5.2.2.7.1.1 When an aircraft station fails to establish contact with the appropriate aeronautical station on the designated channel, it shall attempt to establish contact on the previous channel used and, if not successful, on another channel appropriate to the route. If these attempts fail, the aircraft station shall attempt to establish communication with the appropriate aeronautical station, other aeronautical stations or other aircraft using all available means and advise the aeronautical station that contact on the assigned channel could not be established. In addition, an aircraft operating within a network shall monitor the appropriate VHF channel for calls from nearby aircraft.

5.2.2.7.1.2 If the attempts specified under 5.2.2.7.1.1 fail, the aircraft station shall transmit its message twice on the designated channel(s), preceded by the phrase “TRANSMITTING BLIND” and, if necessary, include the addressee(s) for which the message is intended.

5.2.2.7.1.2.1 In network operation, a message which is transmitted blind shall be transmitted twice on both primary and secondary channels. Before changing channel, the aircraft station shall announce the channel to which it is changing.

5.2.2.7.1.3 Receiver failure

5.2.2.7.1.3.1 When an aircraft station is unable to establish communication due to receiver failure, it shall transmit reports at the scheduled times, or positions, on the channel in use, preceded by the phrase “TRANSMITTING BLIND DUE TO RECEIVER FAILURE”. The aircraft station shall transmit the intended message, following this by a complete repetition. During this procedure, the aircraft shall also advise the time of its next intended transmission.

5.2.2.7.1.3.2 An aircraft which is provided with air traffic control or advisory service shall, in addition to complying with 5.2.2.7.1.3.1, transmit information regarding the intention of the pilot-in-command with respect to the continuation of the flight of the aircraft.

5.2.2.7.1.3.3 When an aircraft is unable to establish communication due to airborne equipment failure it shall, when so equipped, select the appropriate SSR code to indicate radio failure.

5.2.2.7.2 Ground-to-air

5.2.2.7.2.1 When an aeronautical station has been unable to establish contact with an aircraft station after calls on the frequencies on which the aircraft is believed to be listening, it shall:

a) request other aeronautical stations to render assistance by calling the aircraft and relaying traffic, if necessary;

request aircraft on the route to attempt to establish communication with the aircraft and relay traffic, if necessary.

5.2.2.7.2.2 The provisions of 5.2.2.7.2.1 shall also be applied:

a) on request of the air traffic services unit concerned;

b) when an expected communication from an aircraft has not been received within a time period such that the occurrence of a communication failure is suspected.

5.2.2.7.2.3 If the attempts specified in 5.2.2.7.2.1 fail, the aeronautical station shall transmit messages addressed to the aircraft, other than messages containing air traffic control clearances, by blind transmission on the frequency(ies) on which the aircraft is believed to be listening.

5.2.2.7.2.4 Blind transmission of air traffic control clearances shall not be made to aircraft, except at the specific request of the originator.

5.2.2.7.3 *Notification of communications failure.* The air-ground control radio station shall notify the appropriate air traffic services unit and the aircraft operating agency, as soon as possible, of any failure in air-ground communication.

5.2.3 HF message handling

5.2.3.1 *General*

5.2.3.1.1 When operating within a network, an aircraft station shall, in principle, whenever communications conditions so permit, transmit its messages to the stations of the network from which they can be most readily delivered to their ultimate destinations. In particular, aircraft reports required by air traffic services shall be transmitted to the network station serving the flight information centre or area control centre in whose area the aircraft is flying. Conversely, messages to aircraft in flight shall, whenever possible, be transmitted directly to the aircraft by the network station serving the location of the originator.

5.2.3.1.2 Messages passed from an aircraft to a network station shall, whenever possible, be intercepted and acknowledged by other stations of the network, which serve locations where the information is also required.

5.2.3.1.2.1 Acknowledgement of intercept shall be made immediately after the acknowledgement of receipt by the station to which the message was passed.

5.2.3.1.2.2 Acknowledgement of an intercept message shall be made by transmitting the radio call sign of the station having intercepted the message, followed by the word ROGER, if desired, and the call sign of the station having transmitted the message.

5.2.3.1.2.3 In the absence of acknowledgement of intercept within one minute, the station accepting the message from the aircraft shall forward it, normally over the aeronautical fixed service, to the station(s) which have failed to acknowledge intercept.

5.2.3.1.2.3.1 If, in abnormal circumstances, forwarding is necessary using the air-ground channels, the provisions of 5.2.2.3.4 shall be observed.

5.2.3.1.2.4 When such forwarding is done over the aeronautical fixed telecommunication network, the messages shall be addressed to the network station(s) concerned.

5.2.3.1.2.5 The station(s) to which the messages have been forwarded shall carry out local distribution of them in the same way as if they had been received directly from the aircraft over the air-ground channel.

5.2.3.1.2.6 The aeronautical station receiving an air-report or a message containing meteorological information transmitted by an aircraft in flight shall forward the message without delay:

1) to the air traffic services unit and meteorological offices associated with the station;

2) to the aircraft operating agency concerned or its representative when that agency has made a specific request to receive such messages.

5.2.3.1.3 The provisions of 5.2.3.1.2 shall also be applied, if practicable, in non-network operation.

5.2.3.1.4 When a message addressed to an aircraft in flight is received by the aeronautical station included in the address, and when that station is not able to establish communication with the aircraft to which the message is addressed, the message shall be forwarded to those aeronautical stations on the route which may be able to establish communication with the aircraft.

5.2.3.1.4.1 If the aeronautical station to which the message is addressed is unable to dispose of the message in accordance with 5.2.3.1.4, the station of origin shall be advised.

5.2.3.1.4.2 The aeronautical station forwarding the message shall amend the address thereof, by substituting for its own location indicator the location indicator of the aeronautical station to which the message is being forwarded.

5.2.3.2 *Transmission of ATS messages to aircraft*

5.2.3.2.1 If it is not possible to deliver an ATS message to the aircraft within the time specified by ATS, the aeronautical station shall notify the originator. Thereafter, it shall take no further action with respect to this message unless specifically instructed by ATS.

5.2.3.2.2 If delivery of an ATS message is uncertain because of inability to secure an acknowledgement, the aeronautical station shall assume that the message has not been received by the aircraft and shall advise the originator immediately that, although the message has been transmitted, it has not been acknowledged.

5.2.3.2.3 The aeronautical station, having received the message from ATS, shall not delegate to another station the responsibility for delivery of the message to the aircraft. However, in case of communication difficulties, other stations shall assist, when requested, in relaying the message to the aircraft. In this case, the station having received the message from ATS shall obtain without delay definite assurance that the aircraft has correctly acknowledged the message.

5.2.3.3 Recording of air-ground communications on teletypewriter

5.2.3.3.1 When recording on teletypewriter, the following procedure shall be used:

a) each line shall begin at the left margin;

b) a new line shall be used for each transmission;

c) each communication shall contain some or all of the following items in the order shown:

1) call sign of the calling station;

2) text of the message;

3) call sign of the station called or the receiving station, followed by the appropriate abbreviation to indicate “Received”, “Readback”, or “No reply heard”;

4) call sign of station(s) acknowledging intercept followed by appropriate abbreviation to indicate “Received”;

5) designation of frequency used;

6) time in UTC of the communication;

d) missing parts of the message text shall be indicated by typing the three periods (space . space . space . space) or three letters M (space M space M space M space);

e) correction of typing errors shall be made by keyboard manipulation (space E space E space E space), followed by the correct information. Errors detected after the completion of the entry shall be corrected after the last entry, using the abbreviation COR, followed by the correct information.

5.2.4 SELCAL procedures

5.2.4.1 *General*
SELCAL procedures shall be as described by ICAO Annex 10 Volume 2, 5.2.4.

5.3 Distress and urgency radiotelephony communication procedures

5.3.1 General

5.3.1.1 Distress and urgency traffic shall comprise all radiotelephony messages relative to the distress and urgency conditions respectively. Distress and urgency conditions are defined as:

a) *Distress: a condition of being threatened by serious and/or* imminent danger and of requiring immediate assistance.

b) *Urgency:* a condition concerning the safety of an aircraft or other vehicle, or of some person on board or within sight, but which does not require immediate assistance.

5.3.1.2 The radiotelephony distress signal MAYDAY and the radiotelephony urgency signal PAN PAN shall be used at the commencement of the first distress and urgency communication respectively.

5.3.1.2.1 At the commencement of any subsequent communication in distress and urgency traffic, it shall be permissible to use the radiotelephony distress and urgency signals.

5.3.1.3 The originator of messages addressed to an aircraft in distress or urgency condition shall restrict to the minimum the number and volume and content of such messages as required by the condition.

5.3.1.4 If no acknowledgement of the distress or urgency message is made by the station addressed by the aircraft, other stations shall render assistance, as prescribed in 5.3.2.2 and 5.3.3.2 respectively.

5.3.1.5 Distress and urgency traffic shall normally be maintained on the frequency on which such traffic was initiated until it is considered that better assistance can be provided by transferring that traffic to another frequency.

5.3.1.6 In cases of distress and urgency communications, in general, the transmissions by radiotelephony shall be made slowly and distinctly, each word being clearly pronounced to facilitate transcription.

5.3.2 Radiotelephony distress communications

5.3.2.1 *Action by the aircraft in distress*

5.3.2.1.1 In addition to being preceded by the radiotelephony distress signal MAYDAY (see 5.3.1.2), preferably spoken three times, the distress message to be sent by an aircraft in distress shall:

a) be on the air-ground frequency in use at the time;

b) consist of as many as possible of the following elements spoken distinctly and, if possible, in the following order:

1) name of the station addressed (time and circumstances permitting);

2) the identification of the aircraft;

3) the nature of the distress condition;

4) intention of the person in command;

5) present position, level (i.e. flight level, altitude, etc., as appropriate) and heading.

5.3.2.2 Action by the station addressed or first station acknowledging the distress message

5.3.2.2.1 The station addressed by aircraft in distress, or first station acknowledging the distress message, shall:

a) immediately acknowledge the distress message;

b) take control of the communications or specifically and clearly transfer that responsibility, advising the aircraft if a transfer is made;

c) take immediate action to ensure that all necessary information is made available, as soon as possible, to:

1) the ATS unit concerned;

2) the aircraft operating agency concerned, or its representative, in accordance with pre-established arrangements;

d) warn other stations, as appropriate, in order to prevent the transfer of traffic to the frequency of the distress communication.

5.3.2.3 *Imposition of silence*

5.3.2.3.1 The station in distress, or the station in control of distress traffic, shall be permitted to impose silence, either on all stations of the mobile service in the area or on any station which interferes with the distress traffic. It shall address these instructions “to all stations”, or to one station only, according to circumstances. In either case, it shall use:

- STOP TRANSMITTING;
- the radiotelephony distress signal MAYDAY.

5.3.2.3.2 The use of the signals specified in 5.3.2.3.1 shall be reserved for the aircraft station in distress and for the station controlling the distress traffic.

5.3.2.4 *Action by all other stations*

5.3.2.4.1 The distress communications have absolute priority over all other communications, and a station aware of them shall not transmit on the frequency concerned, unless:

a) the distress is cancelled or the distress traffic is terminated;

b) all distress traffic has been transferred to other frequencies;

c) the station controlling communications gives permission;

d) it has itself to render assistance.

5.3.2.4.2 Any station which has knowledge of distress traffic, and which cannot itself assist the station in distress, shall nevertheless continue listening to such traffic until it is evident that assistance is being provided.

5.3.2.5 *Termination of distress communications and of silence*

5.3.2.5.1 When an aircraft is no longer in distress, it shall transmit a message cancelling the distress condition.

5.3.2.5.2 When the station which has controlled the distress communication traffic becomes aware that the distress condition is ended, it shall take immediate action to ensure that this information is made available, as soon as possible, to:

1) the ATS unit concerned;

2) the aircraft operating agency concerned, or its representative, in accordance with pre-established arrangements.

5.3.2.5.3 The distress communication and silence conditions shall be terminated by transmitting a message, including the words “DISTRESS TRAFFIC ENDED”, on the frequency or frequencies being used for the distress traffic. This message shall be originated only by the station controlling the communications when, after the reception of the message prescribed in 5.3.2.5.1, it is authorized to do so by the appropriate authority.

5.3.3 Radiotelephony urgency communications

5.3.3.1 *Action by the aircraft reporting an urgency condition except as indicated in 5.3.3.4*

5.3.3.1.1 In addition to being preceded by the radiotelephony urgency signal PAN PAN (see 5.3.1.2), preferably spoken three times and each word of the group pronounced as the French word “panne”, the urgency message to be sent by an aircraft reporting an urgency condition shall:

a) be on the air-ground frequency in use at the time;

b) consist of as many as required of the following elements spoken distinctly and, if possible, in the following order:

1) the name of the station addressed;

2) the identification of the aircraft;

3) the nature of the urgency condition;

4) the intention of the person in command;

5) present position, level (i.e. flight level, altitude, etc., as appropriate) and heading;

6) any other useful information.

5.3.3.2 Action by the station addressed or first station acknowledging the urgency message

5.3.3.2.1 The station addressed by an aircraft reporting an urgency condition, or first station acknowledging the urgency message, shall:

a) acknowledge the urgency message;
b) take immediate action to ensure that all necessary information is made available, as soon as possible, to:

1) the ATS unit concerned;

2) the aircraft operating agency concerned, or its representative, in accordance with pre-established arrangements;

c) if necessary, exercise control of communications.

5.3.3.3 *Action by all other stations*

5.3.3.3.1 The urgency communications have priority over all other communications, except distress, and all stations shall take care not to interfere with the transmission of urgency traffic.

5.3.3.4 *Action by an aircraft used for medical transports*

5.3.3.4.1 The use of the signal described in 5.3.3.4.2 shall indicate that the message which follows concerns a protected medical transport pursuant to the 1949 Geneva Conventions and Additional Protocols.

5.3.3.4.2 For the purpose of announcing and identifying aircraft used for medical transports, a transmission of the radiotelephony urgency signal PAN PAN, preferably spoken three times, and each word of the group pronounced as the French word “panne”, shall be followed by the radiotelephony signal for medical transports MAY-DEE-CAL, pronounced as in the French “médical”. The use of the signals described above indicates that the message which follows concerns a protected medical transport. The message shall convey the following data:

a) the call sign or other recognized means of identification of the medical transports;

b) position of the medical transports;

c) number and type of medical transports;

d) intended route; estimated time en route and of departure and arrival, as appropriate; and

e) any other information such as flight altitude, radio frequencies guarded, languages used, and secondary surveillance radar modes and codes.

5.3.3.5 *Action by the station addressed or by other stations receiving a medical transports message*

5.3.3.5.1 The provisions of 5.3.3.2 and 5.3.3.3 shall apply as appropriate to stations receiving a medical transports message.

5.4 Communications related to acts of unlawful interference

The station addressed by an aircraft being subjected to an act of unlawful interference, or first station acknowledging a call from such aircraft, shall render all possible assistance, including notification of appropriate ATS units as well as any other station, agency or person in a position to facilitate the flight.

CHAPTER 6 Aeronautical Radio Navigation Service

6.1 General

6.1.1 The aeronautical radio navigation service shall comprise all types and systems of radio navigation aids in the international aeronautical service.

6.1.2 An aeronautical radio navigation aid which is not in continuous operation shall, if practicable, be put into operation on receipt of a request from an aircraft, any controlling authority on the ground, or an authorized representative of an aircraft operating agency.

6.1.2.1 Requests from aircraft shall be made to the aeronautical station concerned on the air-ground frequency normally in use.

6.1.3 Arrangements shall be made for the local aeronautical information service unit to receive without delay essential information about changes in the operational status of non-visual aids as required for pre-flight briefing and dissemination in accordance with the provisions of ICAO Annex 15.

6.2 Direction finding

6.2.1 A direction-finding station working alone shall give the following, as requested:

1) true bearing of the aircraft, using the appropriate phrase;

2) true heading to be steered by the aircraft, with no wind, to head for the direction-finding station using the appropriate phrase;

3) magnetic bearing of the aircraft, using the appropriate phrase;

4) magnetic heading to be steered by the aircraft with no wind to make for the station, using the appropriate phrase.

6.2.2 When direction-finding stations work as a network to determine the position of an aircraft, the bearings taken by each station shall be sent immediately to the station controlling the direction-finding network to enable the position of the aircraft to be determined.

6.2.2.1The station controlling the network shall, on request, give the aircraft its position in one of the following ways:

1) position in relation to a point of reference or in latitude and longitude, using the appropriate phrase;

2) true bearing of the aircraft in relation to the direction-finding station or other specified point, using the appropriate phrase, and its distance from the direction-finding station or point, using the appropriate phrase;

3) magnetic heading to steer with no wind, to make for the direction-finding station or other specified point using the appropriate phrase, and its distance from the direction-finding station or point, using the appropriate phrase.

6.2.3 Aircraft stations shall normally make requests for bearings, courses or positions, to the aeronautical station responsible, or to the station controlling the direction-finding network.

6.2.4 To request a bearing, heading or position, the aircraft station shall call the aeronautical station or the direction-finding control station on the listening frequency. The aircraft shall then specify the type of service that is desired by the use of the appropriate phrase.

6.2.5 As soon as the direction-finding station or group of stations is ready, the station originally called by the aircraft station shall where necessary request transmission for direction-finding service and, if necessary, indicate the frequency to be used by the aircraft station, the number of times the transmission should be repeated, the duration of the transmission required or any special transmission requirement.

6.2.5.1 In radiotelephony, an aircraft station which requests a bearing shall end the transmission by repeating its call sign. If the transmission has been too short for the direction-finding station to obtain a bearing, the aircraft shall give a longer transmission for two periods of approximately ten seconds, or alternatively provide such other signals as may be requested by the direction-finding station.

6.2.6 When a direction-finding station is not satisfied with its observation, it shall request the aircraft station to repeat the transmission.

6.2.7 When a heading or bearing has been requested, the direction-finding station shall advise the aircraft station in the following form:

1) the appropriate phrase;
2) bearing or heading in degrees in relation to the direction-finding station, sent as three figures;
3) class of bearing;
4) time of observation, if necessary.

6.2.8 When a position has been requested, the direction-finding control station, after plotting all simultaneous observations, shall determine the observed position of the aircraft and shall advise the aircraft station in the following form:

1) the appropriate phrase;
2) the position;
3) class of position;
4) time of observation.

6.2.9 As soon as the aircraft station has received the bearing, heading or position, it shall repeat back the message for confirmation or correction.

6.2.10 When positions are given by bearing or heading and distance from a known point other than the station making the report, the reference point shall be an aerodrome, prominent town or geographic feature. An aerodrome shall be given in preference to other places. When a large city or town is used as a reference place, the bearing or heading, and the distance given shall be measured from its centre.

6.2.11 When the position is expressed in latitude and longitude, groups of figures for degrees and minutes shall be used followed by the letter N or S for latitude and the letter E or W for longitude, respectively. In radiotelephony the words NORTH, SOUTH, EAST or WEST shall be used.

6.2.12 According to the estimate by the direction-finding station of the accuracy of the observations, bearings and positions shall be classified as follows:

Bearings:

Class A - accurate within plus or minus 2 degrees;
Class B - accurate within plus or minus 5 degrees;
Class C - accurate within plus or minus 10 degrees;
Class D - accuracy less than Class C.

Positions:

Class A - accurate within 9.3 km (5 NM);
Class B - accurate within 37 km (20 NM);
Class C - accurate within 92 km (50 NM);
Class D - accuracy less than Class C.

6.2.13 Direction-finding stations shall have authority to refuse to give bearings, heading or positions when conditions are unsatisfactory or when bearings do not fall within the calibrated limits of the station, stating the reason at the time of refusal.

CHAPTER 7 Aeronautical Broadcasting Service

7.1 General

7.1.1 Broadcast material

The text of broadcast material shall be prepared by the originator in the form desired for transmission.

7.1.2 Frequencies and schedules

7.1.2.1 Broadcasts shall be made on specified frequencies and at specified times.

7.1.2.2 Schedules and frequencies of all broadcasts shall be publicized in appropriate documents. Any change in frequencies or times shall be publicized by NOTAM at least two weeks in advance of the change.* Additionally, any such change shall, if practicable, be announced on all regular broadcasts for 48 hours preceding the change and shall be transmitted once at the beginning and once at the end of each broadcast.

7.1.2.3 Scheduled broadcasts (other than sequential collective type broadcasts), shall be started at the scheduled time by the general call. If a broadcast must be delayed, a short notice shall be transmitted at the scheduled time advising recipients to “stand by” and stating the approximate number of minutes of delay.

7.1.2.3.1 After definite advice has been given to stand by for a certain period, the broadcast shall not be started until the end of the standby period.

7.1.2.4 Where broadcasts are conducted on a time-allotment basis, transmission shall be terminated by each station promptly at the end of the allotted time period whether or not transmission of all material has been completed.

7.1.2.4.1 In sequential collective type broadcasts each station shall be ready to commence its broadcasts at the designated time. If for any reason a station does not commence its broadcast at the designated time, the station immediately following in sequence shall wait and then commence its broadcast at its own designated time.

7.1.3 Interruption of service

In the event of interruption of service at the station responsible for a broadcast, the broadcast shall, if possible, be made by another station until normal service is resumed. If this is not possible, and the broadcast is of the type intended for interception by fixed stations, the stations which are required to copy the broadcasts shall continue to listen on the specified frequencies until normal service is resumed.

7.2 Radiotelephone broadcast procedures

7.2.1 Broadcast technique

7.2.1.1 Transmissions by radiotelephone shall be as natural, short and concise as practicable consistent with clarity.

7.2.1.2 Rate of speech on radiotelephone broadcasts shall not exceed 100 words per minute.

7.2.2 Preamble of the general call

The preamble of each radiotelephone broadcast shall consist of the general call, station name, and optionally the time of broadcast (UTC).

CHAPTER 8 Aeronautical Mobile Service - Data Link Communications

8.1 General

8.1.1 Data link initiation capability (DLIC)

8.1.1.1 General

8.1.1.1.1 Before entering an airspace where data link applications are used by the ATS unit, data link communications shall be initiated between the aircraft and the ATS unit in order to register the aircraft and, when necessary, allow the start of a data link application. This shall be initiated by the aircraft, either automatically or by the pilot, or by the ATS unit on address forwarding.

8.1.1.1.2 The logon address associated with an ATS unit shall be published in the Aeronautical Information Publications in accordance with ICAO Annex 15.

8.1.1.2 Aircraft Initiation

On receipt of a valid data link initiation request from an aircraft approaching or within a data link service area, the ATS unit shall accept the request and, if able to correlate it with a flight plan, shall establish a connection with the aircraft.

8.1.1.3 ATS Unit forwarding

The ground system initially contacted by the aircraft shall provide to the next ATS unit any relevant updated aircraft information in sufficient time to permit the establishment of data link communications.

8.1.1.4 FAILURE

8.1.1.4.1 In the case of a data link initiation failure, the data link system shall provide an indication of the failure to the appropriate ATS unit(s). The data link system shall also provide an indication of the failure to the flight crew when a data link initiation failure results from a logon initiated by the flight crew.

8.1.1.4.2 The ATS unit shall establish procedures to resolve, as soon as practicable, data link initiation failures. Procedures shall include, as a minimum, verifying that the aircraft is initiating a data link request with the appropriate ATS unit (i.e. the aircraft is approaching or within the ATS unit’s control area); and if so:

a) when a flight plan is available, verify that the aircraft identification, aircraft registration, or aircraft address and other details contained in the data link initiation request correspond with details in the flight plan, and where differences are detected verify the correct information and then make the necessary changes; or

b) when a flight plan is not available, create a flight plan with sufficient information in the flight data processing system, to achieve a successful data link initiation; then

c) arrange for the re-initiation of data link.

8.1.1.4.3 The aircraft operator shall establish procedures to resolve, as soon as practicable, data link initiation failures. Procedures shall include, as a minimum, that the pilot:

a) verify the correctness and consistency of the flight plan information available in the FMS or equipment from which data link is initiated, and where differences are detected make the necessary changes; and

b) verify the correct address of the ATS unit; then

c) re-initiate data link.

8.1.2 Composition of data link messages

8.1.2.1 The text of messages shall be composed in standard message format (e.g. CPDLC message set), in plain language or in abbreviations and codes, as prescribed in 3.7. Plain language shall be avoided when the length of the text can be reduced by using appropriate

abbreviations and codes. Non-essential words and phrases, such as expressions of politeness, shall not be used.

8.1.2.2 The following characters are allowed in the composition of messages:

Letters: ABCDEFGHIJKLMNOPQRSTUVWXYZ

(upper case only)

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)

and the space character.

Characters other than those listed above shall not be used in messages.

8.1.2.3 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.

8.1.2 Display of data link messages

8.1.2.1 Ground and airborne systems shall allow for messages to be appropriately displayed, printed when required, and stored in a manner that permits timely and convenient retrieval should such action be necessary.

8.1.2.2 Whenever textual presentation is required, the English language shall be displayed as a minimum.

8.2 CPDLC procedures

8.2.1 In all communications the highest standard of discipline shall be observed at all times.

8.2.1.1 Consequences of human performance, which could affect the accurate reception and comprehension of messages, shall be taken into consideration when composing a message.

8.2.2 Ground and airborne systems shall provide controllers and pilots with the capability to review and validate any operational messages they send.

8.2.3 Ground and airborne systems shall provide controllers and pilots with the capability to review, validate and when applicable, acknowledge any operational messages they receive.

8.2.4 The controller shall be provided with the capability to respond to messages, including emergencies, to issue clearances, instructions and advisories, and to request and provide information, as appropriate.

8.2.5 The pilot shall be provided with the capability to respond to messages, to request clearances and information, to report information, and to declare or cancel an emergency.

8.2.6 The pilot and the controller shall be provided with the capability to exchange messages which do not conform to defined formats (i.e. free text messages).

8.2.7 Unless specified by the appropriate ATS authority, voice read-back of CPDLC messages shall not be required.

8.2.8 Establishment of CPDLC

8.2.8.1 The controller and the pilot shall be informed when CPDLC has been successfully established.

8.2.8.2 CPDLC shall be established in sufficient time to ensure that the aircraft is communicating with the appropriate ATC unit.

8.2.8.3 The controller and pilot shall be informed when CPDLC is available for operational use, at initial establishment, as well as on resumption of CPDLC after a failure.

8.2.8.4 The pilot shall be able to identify the air traffic control unit providing the air traffic control service at any time while the service is being provided.

8.2.8.5 When the airborne system detects that CPDLC is available for operational use, it shall send the CPDLC downlink message element CURRENT DATA AUTHORITY.

8.2.8.6 Airborne-initiated CPDLC

8.2.8.6.1 When an ATC unit receives an unexpected request for CPDLC from an aircraft, the circumstances leading to the request shall be obtained from the aircraft to determine further action.

8.2.8.6.2 When the ATC unit rejects a request for CPDLC, it shall provide the pilot with the reason for the rejection using an appropriate CPDLC message.

8.2.8.7 ATC unit-initiated CPDLC

8.2.8.7.1 An ATC unit shall only establish CPDLC with an aircraft if the aircraft has no CPDLC link established, or when authorized by the ATC unit currently having CPDLC established with the aircraft.

8.2.8.7.2 When a request for CPDLC is rejected by an aircraft, the reason for the rejection shall be provided using CPDLC downlink message element NOT CURRENT DATA AUTHORITY or message element NOT AUTHORIZED NEXT DATA AUTHORITY, as appropriate. Local procedures shall dictate whether the reason for rejection is presented to the controller. No other reasons for airborne rejection of ATC unit-initiation of CPDLC shall be permitted.

8.2.9 Exchange of operational CPDLC messages

8.2.9.1 Controllers and pilots shall construct CPDLC messages using the defined message set, a free text message or a combination of both.

8.2.9.1.1 When CPDLC is being used, and the intent of the message is included in the CPDLC message set contained in the PANS-ATM, Appendix 5, the associated message shall be used.

8.2.9.1.2 Except as provided by 8.2.12.1, when a controller or pilot communicates via CPDLC, the response should be via CPDLC. When a controller or pilot communicates via voice, the response should be via voice.

8.2.9.1.3 Whenever a correction to a message sent via CPDLC is deemed necessary or the contents of a message needs to be clarified, the controller or pilot shall use the most appropriate means available for issuing the correct details or for providing clarification.

8.2.9.1.3.1 When voice communications are used to correct a CPDLC message for which no operational response has yet been received, the controller’s or pilot’s transmission shall be prefaced by the phrase: “DISREGARD CPDLC (message type) MESSAGE, BREAK” - followed by the correct clearance, instruction, information or request.

8.2.9.1.3.2 When referring to and identifying the CPDLC message to be disregarded, caution should be exercised in its phrasing so as to avoid any ambiguity with the issuance of the accompanying corrected clearance, instruction, information or request.

8.2.9.1.3.3 If a CPDLC message that requires an operational response is subsequently negotiated via voice, an appropriate CPDLC message closure response shall be sent to ensure proper synchronization of the CPDLC dialogue. This could be achieved either by explicitly instructing the recipient of the message via voice to close the dialogue or by allowing the system to automatically close the dialogue.

8.2.9.2 The composition of a CPDLC message shall not exceed five message elements, only two of which may contain the route clearance variable.

8.2.9.2.1 The use of long messages or messages with multiple clearance elements, multiple clearance request elements or messages with a combination of clearances and information should be avoided where possible.

8.2.9.3 CPDLC ground systems and airborne systems shall be capable of using the CPDLC message urgency and alert attributes to alter presentations in order to draw attention to higher priority messages.

Table 8-1. Urgency Attribute (Uplink and Downlink)

Type	*Description*	*Precedence*
D	Distress	1
U	Urgent	2
N	Normal	3
L	Low	4

Table 8-2. Alert Attribute (Uplink and Downlink)

Type	*Description*	*Precedence*
H	High	1
M	Medium	2
L	Low	3
N	No alerting required	4

Table 8-3. Response Attribute (Uplink)

Type	*Response required*	*Valid responses*	*Precedence*
W/U	Yes	WILCO, UNABLE, STANDBY, NOT CURRENT DATA AUTHORITY, NOT AUTHORIZED NEXT DATA AUTHORITY, LOGICAL ACKNOWLEDGEMENT (only if required), ERROR	1
A/N	Yes	AFFIRM, NEGATIVE, STANDBY, NOT CURRENT DATA AUTHORITY, NOT AUTHORIZED NEXT DATA AUTHORITY, LOGICAL ACKNOWLEDGEMENT (only if required), ERROR	2
R	Yes	ROGER, UNABLE, STANDBY, NOT CURRENT DATA AUTHORITY, NOT AUTHORIZED NEXT DATA AUTHORITY, LOGICAL ACKNOWLEDGEMENT (only if required), ERROR	3
Y	Yes	Any CPDLC downlink message, LOGICAL ACKNOWLEDGEMENT (only if required)	4
N	No, unless logical acknowledgement required	LOGICAL ACKNOWLEDGEMENT (only if required), NOT CURRENT DATA AUTHORITY, NOT AUTHORIZED NEXT DATA AUTHORITY, ERROR	5

Table 8-4. Response Attribute (Downlink)

Type	*Response required*	*Valid responses*	*Precedence*
Y	Yes	Any CPDLC uplink message, LOGICAL ACKNOWLEDGEMENT (only if required)	1
N	No, unless logical acknowledgement required	LOGICAL ACKNOWLEDGEMENT (only if required), SERVICE UNAVAILABLE, FLIGHT PLAN NOT HELD, ERROR	2

8.2.9.3.1 The urgency attribute shall delineate the queuing requirements for received messages that are displayed to the end-user. Urgency types are presented in Table 8-1.

8.2.9.3.2 The alert attribute shall delineate the type of alerting required upon message receipt. Alert types are presented in Table 8-2.

8.2.9.3.3 The response attribute shall delineate valid responses for a given message element. Response types are presented in Table 8-3 for uplink messages and Table 8-4 for downlink messages.

8.2.9.3.3.1 When a multi-element message requires a response, and the response is in the form of a single message element, the response shall apply to all message elements.

8.2.9.3.3.2 When a single message element clearance or any part of a multi-element clearance message cannot be complied with, the pilot shall send an UNABLE response for the whole message.

8.2.9.3.3.3 The controller shall respond with an UNABLE message that applies to all elements of the request when no element(s) of a single or multi-element clearance request can be approved. The current clearance(s) shall not be restated.

8.2.9.3.3.4 When a multi-element clearance request can only be partially accommodated, the controller shall respond with an UNABLE message applying to all the message elements of the request and, if appropriate, include a reason and/or information on when a clearance may be expected.

8.2.9.3.3.5 When all elements of a single or multi-element clearance request can be accommodated, the controller shall respond with clearances corresponding to each element of the request. This response should be a single uplink message.

8.2.9.3.3.6 When a CPDLC message contains more than one message element and the response attribute for the message is Y, when utilized, the single response message shall contain the corresponding number of replies in the same order.

8.2.9.4 When a ground or airborne system generates the CPDLC message ERROR, the reason for the error shall be included in the message.

8.2.9.5 The appropriate ATS authority shall select those message elements contained in PANS-ATM, Appendix 5 that support operations in their airspace. Should an ATS authority choose to select a subset of the message elements, and a received message does not belong to this subset, the ATC unit shall respond by uplinking the message element SERVICE UNAVAILABLE.

8.2.9.5.1 Only the uplink messages appropriate to a particular control sector's operations shall be provided to the controller.

8.2.9.5.2 When considered necessary by the appropriate ATS authority, additional pre-formatted free text messages shall be made available to the controller for those occasions where the CPDLC message set contained in the PANS-ATM does not provide for specific requirements. In such cases, a list of pre-formatted free text messages shall be established by the appropriate ATS authority, in consultation with operators and other ATS authorities that may be concerned.

8.2.9.5.3 Information concerning CPDLC message element subsets utilized and, if applicable, any additional preformatted free text messages, shall be published in aeronautical information publications.

8.2.9.6 Transfer of CPDLC

8.2.9.6.1 When CPDLC is transferred, the transfer of voice communications and CPDLC shall commence concurrently.

8.2.9.6.2 When an aircraft is transferred from an ATC unit where CPDLC is available to an ATC unit where CPDLC is not available, CPDLC termination shall commence concurrent with the transfer of voice communications.

8.2.9.6.3 When a transfer of CPDLC results in a change of data authority, and there are still messages for which the closure response has not been received (i.e. messages outstanding), the controller transferring the CPDLC shall be informed.

8.2.9.6.3.1 If the controller needs to transfer the aircraft without replying to any downlink message(s) outstanding, the system shall have the capability to automatically send the appropriate closure response message(s). In such cases, the contents of any automatically sent closure response message(s) shall be promulgated in local instructions.

8.2.9.6.3.2 When the controller decides to transfer the aircraft without receiving pilot responses to any uplink message(s) outstanding, the ground system shall have the capability to automatically end the dialogue for each message prior to the transfer.

8.2.9.6.3.2.1 The controller shall revert to voice communications to clarify any ambiguity associated with the message(s) outstanding.

8.2.9.6.4 When a transfer of CPDLC does not result in a change of data authority, and there are still messages outstanding, these messages shall either be forwarded to the appropriate controller or shall be closed in accordance with local instructions and, if necessary, letters of agreement.

8.2.10 Display of CPDLC messages

ATC units utilizing a CPDLC message contained in the PANS-ATM shall display the associated text pertaining to that message as presented in the PANS-ATM, Appendix 5.

8.2.11 Free text messages

The use of free text messages by controllers or pilots, other than pre-formatted free text messages referred to in paragraph 8.2.9.5.2, shall be avoided.

8.2.12 Emergencies, hazards and equipment failure procedures

8.2.12.1 When a CPDLC emergency message is received, the controller shall acknowledge receipt of the message by the most efficient means available.

8.2.12.2 When responding via CPDLC to a report indicating unlawful interference, uplink message ROGER 7500 shall be used.

8.2.12.3 When responding via CPDLC to all other emergency or urgency messages, uplink message ROGER shall be used.

8.2.12.4 When a CPDLC message requires a logical acknowledgement and/or an operational response, and such a response is not received, the pilot or controller, as appropriate, shall be alerted.

8.2.12.4.1 A CPDLC failure shall be detected in a timely manner.

8.2.12.5 Failure of CPDLC

8.2.12.5.1 A CPDLC failure shall be detected in a timely manner.

8.2.12.5.2 The controller and pilot shall be alerted to a failure of CPDLC as soon as a failure has been detected.

8.2.12.5.3 When a controller or pilot is alerted that CPDLC has failed, and the controller or pilot needs to communicate prior to CPDLC being restored, the controller or pilot shall revert to voice, if possible, and preface the information with the phrase:

CPDLC FAILURE.

8.2.12.5.4 Controllers having a requirement to transmit information concerning a complete CPDLC ground system failure to all stations likely to intercept shall preface such a transmission by the general call ALL STATIONS CPDLC FAILURE, followed by the identification of the calling station.

8.2.12.5.5 When CPDLC fails and communications revert to voice, all CPDLC messages outstanding shall be considered not delivered and the entire dialogue involving the messages outstanding shall be recommenced by voice.

8.2.12.5.6 When CPDLC fails but is restored prior to a need to revert to voice communications, all messages outstanding shall be considered not delivered and the entire dialogue involving the messages outstanding shall be recommenced via CPDLC.

8.2.12.6 Intentional shutdown of CPDLC

8.2.12.6.1 When a system shutdown of the communications network or the CPDLC ground system is planned, a NOTAM shall be published to inform all affected parties of the shutdown period and if necessary, the details of the voice communication frequencies to be used.

8.2.12.6.2 Aircraft currently in communication with the ATC unit shall be informed by voice or CPDLC of any imminent loss of CPDLC service.

8.2.12.6.3 The controller and pilot shall be provided with the capability to abort CPDLC.

8.2.12.7 Failure of a single CPDLC message

When a controller or pilot is alerted that a single CPDLC message has failed, the controller or pilot shall take one of the following actions, as appropriate:

a) via voice, confirm the actions that will be undertaken with respect to the related dialogue, prefacing the information with the phrase:

CPDLC MESSAGE FAILURE;

b) via CPDLC, reissue the CPDLC message that failed. 8.2.12.8 *Discontinuation of the use of CPDLC pilot requests*

8.2.12.8.1 When a controller requires all stations or a specific flight to avoid sending CPDLC requests for a limited period of time, the following phrase shall be used:

((call sign) or ALL STATIONS) STOP SENDING CPDLC REQUESTS [UNTIL ADVISED] [(reason)]

8.2.12.8.2 The resumption of the normal use of CPDLC shall be advised by using the following phrase:

((call sign) or ALL STATIONS) RESUME NORMAL CPDLC OPERATIONS

8.2.13 Where the testing of CPDLC with an aircraft could affect the air traffic services being provided to the aircraft, coordination shall be effected prior to such testing.

SECTION 3

Communication Systems

1.The following systems used in aviation communications shall be installed with the standards described by, and operated to the procedures described in, ICAO Annex 10 Volume 3:
a) Aeronautical Telecommunication Networks
b) Aeronautical Mobile-Satellite (Route) Services (AMS(R)S)
c) SSR Mode S Air-Ground Data Links
d) VHF Air-Ground Digital Links (VDL)
e) Aeronautical Mobile Airport Communications System (AeroMACS)
f) AFTN Networks
g) Aircraft Addressing System
h) Point-to-Multipoint Communications
i) HF Data Links
j) Universal Access Transceivers (UAT)
k) Aeronautical Mobile Services
l) SELCAL Systems
m) Aeronautical Speech Circuits
n) Emergency Locator Transmitters (ELT) for Search and Rescue

SECTION 4

Surveillance and Collision Avoidance Systems

1.The following systems used in aviation surveillance and collision avoidance shall be installed with the standards described by, and operated to the procedures described in, ICAO Annex 10 Volume 4:
a) Surveillance systems
b) Airborne collision avoidance systems
c) Mode S extended squitter systems
d) Multilateration systems

SECTION 5

Aeronautical Radio Frequency Spectrum Utilization

CHAPTER 1. DEFINITIONS

When the following terms are used in this Section, they have the following meanings:

Alternative means of communication. A means of communication provided with equal status, and in addition to the primary means.

Double channel simplex. Simplex using two frequency channels, one in each direction.

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

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

Offset frequency simplex. A variation of single channel simplex wherein telecommunication between two stations is effected by using in each direction frequencies that are intentionally slightly different but contained within a portion of the spectrum allotted for the operation.

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.

Primary means of communication. The means of communication to be adopted normally by aircraft and ground stations as a first choice where alternative means of communication exist.

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

Single channel simplex. Simplex using the same frequency channel in each direction.

VHF digital link (VDL). A constituent mobile subnetwork of the aeronautical telecommunication network (ATN), operating in the aeronautical mobile VHF frequency band. In addition, the VDL may provide non-ATN functions such as, for instance, digitized voice.

CHAPTER 2. DISTRESS FREQUENCIES

2.1 Frequencies for emergency locator transmitters (ELTs) for search and rescue

2.1.1 All emergency locator transmitters carried in compliance with Standards of Annex 6, Parts I, II and III shall operate on both 406 MHz and 121.500 MHz.

2.2 Search and rescue frequencies

2.2.1 Where there is a requirement for the use of high frequencies for search and rescue scene of action coordination purposes, the frequencies 3 023 kHz and 5 680 kHz shall be employed.
2.2.2 Where specific frequencies are required for communication between rescue coordination centres and aircraft engaged in search and rescue operations, they shall be selected by the BCAA from the appropriate aeronautical mobile frequency bands in light of the nature of the provisions made for the establishment of search and rescue aircraft.

CHAPTER 3. UTILIZATION OF FREQUENCIES BELOW 30 MHz

3.1 Method of operations

3.1.1 In the aeronautical mobile service, single channel simplex shall be used in radiotelephone communications utilizing radio frequencies below 30 MHz in the bands allocated exclusively to the aeronautical mobile (R) service.
3.1.2 Assignment of single sideband channels
3.1.2.1 Single sideband channels shall be assigned in accordance with Annex 10, Volume III, Part II, Chapter 2, 2.4.
3.1.2.2 For the operational use of the channels concerned, administrations shall take into account the provisions of 27/19 of Appendix 27 of the ITU Radio Regulations.
3.1.2.3 The use of aeronautical mobile (R) frequencies below 30 MHz for international operations shall be coordinated as specified in Appendix 27 of the ITU Radio Regulations.
3.1.2.4 Where international operating requirements for HF communications cannot be satisfied by the Frequency Allotment Plan at Part 2 of Appendix 27 to the Radio Regulations, an appropriate frequency may be assigned as specified in Appendix 27.
3.1.2.5 The use of classes of emission J7B and J9B shall be subject to the following provisions of Appendix 27:
27/12 For radiotelephone emissions, the audio frequencies will be limited to between 300 and 2 700 Hz and the occupied bandwidth of other authorized emissions will not exceed the upper limit of J3E emissions. In specifying these limits, however, no restriction in their extension is implied in so far as emissions other than J3E are concerned, provided that the limits of unwanted emissions are met (see Nos. 27/73 and 27/74).
27/14 On account of the possibility of interference, a given channel should not be used in the same allotment area for radiotelephony and data transmissions.
27/15 The use of channels derived from the frequencies indicated in 27/18 for the various classes of emissions other than J3E and H2B will be subject to special arrangements by the Administrations concerned and affected in order to avoid harmful interference which may result from the simultaneous use of the same channel for several classes of emission.
3.1.3 Assignment of frequencies for aeronautical operational control communications
3.1.3.1 Worldwide frequencies for aeronautical operational control communications are required to enable aircraft operating agencies to meet the obligations prescribed in Annex 6, Part I. Assignment of these frequencies shall be in accordance with the provisions of Appendix 27.

3.2 NDB frequency management

3.2.1 NDB frequency management shall take into account the following:
a) the interference protection required at the edge of the rated coverage;
b) the application of the figures shown for typical ADF equipment;
c) the geographical spacings and the respective rated coverages;

d) the possibility of interference from spurious radiation generated by non-aeronautical sources (e.g. electric power services, power line communication systems, industrial radiation, etc.).
3.2.2 To alleviate frequency congestion problems at locations where two separate ILS facilities serve opposite ends of a single runway, the assignment of a common frequency to both of the outer locators should be permitted, and the assignment of a common frequency to both of the inner locators should be permitted, provided that:
a) the operational circumstances permit;
b) each locator is assigned a different identification signal; and
c) arrangements are made whereby locators using the same frequency cannot radiate simultaneously.

CHAPTER 4. UTILIZATION OF FREQUENCIES ABOVE 30 MHz

4.1 Utilization in the frequency band 117.975 – 137.000 MHz

4.1.1 General allotment of frequency band 117.975 – 137.000 MHz
4.1.1.1 The block allotment of the frequency band 117.975 – 137.000 MHz shall be as shown in ICAO Annex 10 Volume 5 Table 4-1.
4.1.2 Frequency separation and limits of assignable frequencies
4.1.2.1 In the frequency band 117.975 – 137.000 MHz, the lowest assignable frequency shall be 118.000 MHz and the highest 136.975 MHz.
4.1.2.2 The minimum separation between assignable frequencies in the aeronautical mobile (R) service shall be 8.33 kHz.
4.1.2.3 Requirements for mandatory carriage of equipment specifically designed for 8.33 kHz channel spacing shall be made by the BCAA on the basis of regional air navigation agreements which specify the airspace of operation and the implementation timescales for the carriage of equipment, including the appropriate lead time.
4.1.2.4 Requirements for mandatory carriage of equipment specifically designed for VDL Mode 2, VDL Mode 3 and VDL Mode 4 shall be made by the BCAA on the basis of regional air navigation agreements which specify the airspace of operation and the implementation timescales for the carriage of equipment, including the appropriate lead time.
4.1.2.4.1 The agreement indicated in 4.1.2.4 shall provide at least two years' notice of mandatory carriage of airborne systems.
4.1.2.5 In regions where 25 kHz channel spacing (DSB-AM and VHF digital link (VDL)) and 8.33 kHz DSB-AM channel spacing are in operation, the publication of the assigned frequency or channel of operation shall conform to the channel contained in ICAO Annex 10 Volume 5 Table 4-1 (*bis*).
4.1.3 Frequencies used for particular functions
4.1.3.1 Emergency channel
4.1.3.1.1 The emergency channel (121.500 MHz) shall be used only for genuine emergency purposes.
4.1.3.1.2 The frequency 121.500 MHz shall be provided at:
a) all area control centres and flight information centres;
b) aerodrome control towers and approach control offices serving international aerodromes and international alternate aerodromes; and
c) any additional location designated by the appropriate ATS authority, where the provision of that frequency is considered necessary to ensure immediate reception of distress calls or to serve the purposes specified in 4.1.3.1.1.
4.1.3.1.3 The frequency 121.500 MHz shall be available to intercept control units where considered necessary.
4.1.3.1.4 The emergency channel shall be guarded continuously during the hours of service of the units at which it is installed.
4.1.3.1.5 The emergency channel shall be guarded on a single channel simplex operation basis.
4.1.3.1.6 The emergency channel (121.500 MHz) shall be available only with the characteristics as contained in Annex 10, Volume III, Part II, Chapter 2 (25 kHz).
4.1.3.2 Air-to-air communications channel
4.1.3.2.1 An air-to-air VHF communications channel on the frequency of 123.450 MHz shall be designated 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.
4.1.3.2.2 In remote and oceanic areas out of range of VHF ground stations, the air-to-air VHF communications channel on the frequency 123.450 MHz shall be available only with the characteristics as contained in Annex 10, Volume III, Part II, Chapter 2 (25 kHz).
4.1.3.3 Common signalling channels for VDL
4.1.3.3.1 Common signalling channel VDL Mode 2. The frequency 136.975 MHz is reserved on a worldwide basis to provide a common signalling channel (CSC) to the VHF digital link Mode 2 (VDL Mode 2). This CSC uses the Mode 2 VDL modulation scheme and carrier sense multiple access (CSMA).
4.1.3.3.2 Common signalling channels VDL Mode 4. In areas where VDL Mode 4 is implemented, the frequencies 136.925 MHz and 113.250 MHz shall be provided as common signalling channels (CSCs) to the VHF digital link Mode 4 (VDL Mode 4). These CSCs use the VDL Mode 4 modulation scheme.
4.1.3.4 Auxiliary frequencies for search and rescue operations
4.1.3.4.1 Where a requirement is established for the use of a frequency auxiliary to 121.500 MHz, as described in 4.1.3.1.1 c), the frequency 123.100 MHz shall be used.
4.1.3.4.2 The auxiliary search and rescue channel (123.100 MHz) shall be available only with the characteristics as contained in Annex 10, Volume III, Part II, Chapter 2 (25 kHz).
4.1.4 Provisions concerning the deployment of VHF frequencies and the avoidance of harmful interference
4.1.4.1 The geographical separation between facilities operating on the same frequency shall, except where there is an operational requirement for the use of common frequencies for groups of facilities, be such that the protected service volume of one facility is separated from the protected service volume of another facility by a distance not less than that required to provide a desired to undesired signal ratio of 20 dB or by a separation distance not less than the sum of the distances to the associated radio horizon of each service volume, whichever is smaller.
4.1.4.2 For areas where frequency assignment congestion is severe or is anticipated to become severe, the geographical separation between facilities operating on the same frequency shall, except where there is an operational requirement for the use of common frequencies for groups of facilities, be such that the protected service volume of one facility is separated from the protected service volume of another facility by a distance not less than that required to provide a desired to undesired signal ratio of 14 dB or by a separation distance not less than the sum of the distances to the associated radio horizon of each service volume, whichever is smaller. This provision shall be implemented on the basis of a regional air navigation agreement.
4.1.4.3 The geographical separation between facilities operating on adjacent channels shall be such that points at the edge of the protected service volume of each facility are separated by a distance sufficient to ensure operations free from harmful interference.
4.1.4.4 The protection height shall be a height above a specified datum associated with a particular facility, such that below it harmful interference is improbable.
4.1.4.5 The protection height to be applied to functions or to specific facilities shall be determined by the BCAA, taking into consideration the following factors:
a) the nature of the service to be provided;
b) the air traffic pattern involved;
c) the distribution of communication traffic;
d) the availability of frequency channels in airborne equipment;
e) probable future developments.
4.1.4.6 Where the protected service volume is less than operationally desirable, separation between facilities operating on the same frequency shall not be less than that necessary to ensure that an aircraft at the upper edge of the operational service volume of one facility does not come above the radio horizon with respect to emissions belonging to the service of adjacent facilities.
4.1.4.7 The geographical separation between VHF VOLMET stations shall be determined regionally and shall be such that operations free from harmful interference are secured throughout the protected service volume of each VOLMET station.
4.1.4.8 In the frequency band 117.975 – 137.000 MHz, the frequencies used for National Aeronautical Mobile Services, unless worldwide or regionally allotted to this specific purpose, shall be so deployed that no harmful interference is caused to facilities in the International Aeronautical Mobile Services.

4.1.4.9 The problem of inter-State interference shall be resolved by consultation between the BCAA and States concerned.
4.1.4.10 The communication coverage provided by a VHF ground transmitter shall, in order to avoid harmful interference to other stations, be kept to the minimum consistent with the operational requirement for the function.
4.1.5 Method of operation
4.1.5.1 Single channel simplex operation shall be used in the frequency band 117.975 – 137.000 MHz at all stations providing service for aircraft engaged in international air navigation.
4.1.5.2 In addition to the above, the ground-to-air voice channel associated with an ICAO standard radio navigation aid may be used, subject to regional agreement, for broadcast or communication purposes or both.
4.1.6 Plan of assignable VHF radio frequencies for use in the international aeronautical mobile service
4.1.6.1 The frequencies in the frequency band 117.975 – 137.000 MHz for use in the aeronautical mobile (R) service shall be selected from the lists in 4.1.6.1.1.
4.1.6.1.1 List of assignable frequencies:
List A — assignable frequencies in regions or areas where 25 kHz frequency assignments are deployed:
118.000 – 121.450 MHz in 25 kHz steps
121.550 – 123.050 MHz in 25 kHz steps
123.150 – 136.975 MHz in 25 kHz steps
List B — assignable frequencies in regions or areas where 8.33 kHz frequency assignments are deployed:
118.000 – 121.450 MHz in 8.33 kHz steps
121.550 – 123.050 MHz in 8.33 kHz steps
123.150 – 136.475 MHz in 8.33 kHz steps
4.1.6.1.2 Frequencies for operational control communications may be required to enable aircraft operating agencies to meet the obligations prescribed in Annex 6, Part I, in which case they shall be selected from a dedicated band which is determined by the BCAA.
4.1.6.2 The frequencies that may be allotted for use in the aeronautical mobile (R) service in this region region shall be limited to the number determined as being necessary for operational needs of the BCAA.

4.2 Utilization in the frequency band 108 – 117.975 MHz

4.2.1 The block allotment of the frequency band 108 – 117.975 MHz shall be as follows:
— Band 108 – 111.975 MHz:
a) ILS in accordance with 4.2.2 and Annex 10, Volume I, 3.1.3;
b) VOR provided that:
1) no harmful adjacent channel interference is caused to ILS;
2) only frequencies ending in either even tenths or even tenths plus a twentieth of a megahertz are used.
c) GNSS ground-based augmentation system (GBAS) in accordance with Annex 10, Volume I, 3.7.3.5, provided that no harmful interference is caused to ILS and VOR.
Band 111.975 – 117.975 MHz:
a) VOR;
b) GNSS ground-based augmentation system (GBAS) in accordance with Annex 10, Volume I, 3.7.3.5, provided that no harmful interference is caused to VOR.
4.2.2 For regional assignment planning, the frequencies for ILS facilities shall be selected in the following order:
a) localizer channels ending in odd tenths of a megahertz and their associated glide path channels;
b) localizer channels ending in odd tenths plus a twentieth of a megahertz and their associated glide path channels.
4.2.2.1 ILS channels identified by localizer frequencies ending in an odd tenth plus one twentieth of a megahertz in the band 108 – 111.975 MHz shall be permitted to be utilized on the basis of regional agreement.
4.2.3 For regional assignment planning, the frequencies for VOR facilities shall be selected in the following order:
a) frequencies ending in odd tenths of a megahertz in the band 111.975 – 117.975 MHz;

b) frequencies ending in even tenths of a megahertz in the band 111.975 – 117.975 MHz;
c) frequencies ending in even tenths of a megahertz in the band 108 – 111.975 MHz;
d) frequencies ending in 50 kHz in the band 111.975 – 117.975 MHz, except as provided in 4.2.3.1;
e) frequencies ending in even tenths plus a twentieth of a megahertz in the band 108 – 111.975 MHz except as provided in 4.2.3.1.
4.2.3.1 Frequencies for VOR facilities ending in even tenths plus a twentieth of a megahertz in the band 108 – 111.975 MHz and all frequencies ending in 50 kHz in the band 111.975 – 117.975 MHz shall be permitted to be utilized on the basis of a regional agreement when they have become applicable in accordance with the following:
a) in the band 111.975 – 117.975 MHz for restricted use;
b) for general use in the band 111.975 – 117.975 MHz at a date fixed by the Council but at least one year after the approval of the regional agreement concerned;
c) for general use in the band 108 – 111.975 MHz at a date fixed by the Council but giving a period of two years or more after the approval of the regional agreement concerned.
4.2.4 To protect the operation of airborne equipment during the initial stages of deploying VORs utilizing 50 kHz channel spacing in an area where the existing facilities may not fully conform with the Standards in Annex 10, Volume I, Chapter 3, all existing VORs within interference range of a facility utilizing 50 kHz channel spacing shall be modified to comply with the provisions of Annex 10, Volume I, 3.3.5.7.
4.2.5 Frequency deployment. The geographical separation between facilities operating on the same and adjacent frequencies shall be determined regionally and shall be based on the following criteria:
a) the required functional service radii of the facilities;
b) the maximum flight altitude of the aircraft using the facilities;
c) the desirability of keeping the minimum IFR altitude as low as the terrain will permit.
4.2.6 To alleviate frequency congestion problems at locations where two separate ILS facilities serve opposite ends of the same runway or different runways at the same airport, the assignment of identical ILS localizer and glide path paired frequencies shall be permitted, provided that:
a) the operational circumstances permit;
b) each localizer is assigned a different identification signal; and
c) arrangements are made whereby the localizer and glide path not in operational use cannot radiate.

4.3 Utilization in the frequency band 960 – 1 215 MHz for DME

4.3.1 DME operating channels bearing the suffix “X” or “Y” in Table A, Chapter 3 of Annex 10, Volume I shall be chosen on a general basis without restriction.
4.3.2 DME channels bearing the suffix “W” or “Z” in Table A, Chapter 3 of Annex 10, Volume I, shall be chosen on the basis of regional agreement.
4.3.3 Reserved
4.3.4 Coordination of regional DME channel assignments shall be effected by the BCAA through ICAO.

4.4 Utilization in the frequency band 5 030.4 – 5 150.0 MHz

4.4.1 The MLS channels shall be selected from Table A, Chapter 3 of Annex 10, Volume I.
4.4.2 For regional planning purposes, MLS channels shall be selected in accordance with the conditions specified in 4.3.3 for the associated DME facility.
4.4.3 Channel assignments in addition to those specified in 4.4.1 shall be made within the 5 030.4 – 5 150.0 MHz subband as necessary to satisfy future air navigation requirements.