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GHANA CIVIL AVIATION

(AIR NAVIGATION SERVICES)

DIRECTIVES

PART 23 SUBPART 2-

AERONAUTICAL TELECOMMUNICATION-COMMUNICATION PROCEDURES INCLUDING THOSE WITH PANS STATUS

INTRODUCTION

Subparts 2 of GCAD Part 23 covers two general categories of voice and data communications that serve international civil aviation. They are the ground-ground communication between points on the ground and the air-ground communication between aircraft and points on the ground. The air-ground communication provides aircraft with all necessary information to conduct flights in safety, using both voice and data. An important element of the ground-ground communication is the Aeronautical Fixed Telecommunications Network (AFTN), a worldwide network organized to meet the specific requirements of international civil aviation. Within the AFTN category, all significant ground points, which include airports, air traffic control centres, meteorological offices and the like, are joined by appropriate links designed to serve aircraft throughout all phases of flight. Messages originated at any point on the network are routed as a matter of routine to all points required for the safe conduct of flight.

This Subpart is in accordance with Amendment 95 to Annex 10 Volume II – Aeronautical Telecommunications – Communication Procedures including those with Procedures for Air Navigation (PANS) Status.

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

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

This Subpart 2 of Part 23 – Communication Procedures are to be used in conjunction with the Abbreviations and Codes of ICAO Doc 8400 and with such other codes and abbreviations as may be approved by ICAO for use in communications.

23.2 GENERAL

23.2.1 APPLICABILITY

(1) This Part shall apply to:
- (a) Air Navigation Service Providers;
- (b) Air Traffic Service Providers;
- (c) Aeronautical Telecommunication Service Providers;
- (d) Aeronautical Information Service Providers;
- (e) Aeronautical Meteorology Service Providers;
- (f) Aircraft operating agencies that use the aeronautical fixed service or air-ground data link communications;
- (g) Ghana registered aircraft; and
- (h) Aircraft of other Contracting States operating within the Accra Flight Information Region.

(2) This Part prescribes the communication procedures for the international aeronautical telecommunication service, including:
- (a) administrative and general procedures;
- (b) the aeronautical fixed service, including the AFTN, ATS message handling services, inter-centre communications and ATS direct speech circuits;
- (c) the aeronautical mobile service, voice and data link communications;
- (d) the aeronautical radio navigation service; and
- (e) the aeronautical broadcasting service.

23.2.2 DEFINITIONS

When the following terms are used in this Directive, they have the meaning prescribed in this subpart:

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

Note 2.— All references to "Radio Regulations" are to the Radio Regulations published by the International Telecommunication Union (ITU). Radio Regulations are amended from time to time by the decisions embodied in the Final Acts of World Radiocommunication Conferences held normally every two to three years. Further information on the ITU processes as they relate to aeronautical radio system frequency use is contained in the Handbook on Radio Frequency Spectrum Requirements for Civil Aviation including statement of approved ICAO policies (Doc 9718).

Aeronautical Broadcasting Service means a broadcasting service intended for the transmission of information relating to air navigation.

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

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

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

Aeronautical Mobile (R)*[1] Service (RR. S1.33) means 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)
means a mobile-satellite service in which mobile earth stations are located on board aircraft; survival craft stations and emergency position-indicating radio beacon stations may also participate in this service.

Aeronautical Mobile-Satellite (R)* Service (RR.S1.36) means 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) means a radio navigation service intended for the benefit and for the safe operation of aircraft.

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

[1] route

radio navigation service:

> *RR S1.10* Radio navigation: *Radiodetermination used for the purpose of navigation, including obstruction warning.*
>
> *RR S1.9* Radiodetermination: *The determination of the position, velocity and/or other characteristics of an object, or the obtaining of information relating to these parameters, by means of the propagation properties of radio waves.*

Aeronautical Telecommunication Service means a telecommunication service provided for any aeronautical purpose.

International Telecommunication Service means 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.

Stations

Aerodrome Control Radio Station means a station providing radio-communication between an aerodrome control tower and aircraft or mobile aeronautical stations.

Aeronautical Fixed Station means a station in the aeronautical fixed service.

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

Aeronautical Telecommunication Station means a station in the aeronautical telecommunication service.

AFTN Communication Centre means an AFTN station whose primary function is the relay or retransmission of AFTN traffic from (to) a number of other AFTN stations connected to it.

AFTN Destination Station means an AFTN station to which messages and/or digital data are addressed for processing for delivery to the addressee.

AFTN Origin Station means an AFTN station where messages and/or digital data are accepted for transmission over the AFTN.

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

Air-Ground Control Radio Station means an aeronautical telecommunication station having primary responsibility for handling communications pertaining to the operation and control of aircraft in a given area.

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

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

Mobile Surface Station means 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 means an aeronautical station forming part of a radiotelephony network.

Radio Direction Finding (RR S1.12) means 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) means a radiodetermination station using radio direction finding.

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

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

Tributary Station means 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.

(3) COMMUNICATION METHODS

AIR-GROUND COMMUNICATION means two-way communication between aircraft and stations or locations on the surface of the earth.

AIR-TO-GROUND COMMUNICATION means one-way communication from aircraft to stations or locations on the surface of the earth.

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

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

DUPLEX means a method in which telecommunication between two stations can take place in both directions simultaneously.

GROUND-TO-AIR COMMUNICATION means one-way communication from stations or locations on the surface of the earth to aircraft.

INTER PILOT AIR-TO-AIR COMMUNICATION means two-way communication on the designated air-to-air channel to enable aircraft engaged in flights over remote and oceanic areas out of range of VHF ground stations to exchange necessary operational information and to facilitate the resolution of operational problems.

NON-NETWORK COMMUNICATIONS means radiotelephony communications conducted by a station of the aeronautical mobile service, other than those conducted as part of a radiotelephony network.

RADIOTELEPHONY NETWORK means 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 means a procedure whereby the receiving station repeats

a received message or an appropriate part thereof back to the transmitting station so as to obtain confirmation of correct reception.

SIMPLEX means a method in which telecommunication between two stations takes place in one direction at a time.

Note.— In application to the aeronautical mobile service this method may be subdivided as follows:

(a) single channel simplex;

(b) double channel simplex;

(c) offset frequency simplex.

TELECOMMUNICATION *(RR S1.3)* means 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.

(4) DIRECTION FINDING.

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

RADIO BEARING means the angle between the apparent direction of a definite source of emission of electromagnetic 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.

(5) TELETYPEWRITER SYSTEMS

AUTOMATIC RELAY INSTALLATION means a teletypewriter installation where automatic equipment is used to transfer messages from incoming to outgoing circuits.

Note:-This term covers both fully automatic and semi-automatic installation

FULLY AUTOMATIC RELAY INSTALLATION means 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.

MESSAGE FIELD means an assigned area of a message containing specified elements of data.

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

TELETYPEWRITER TAPE means 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 means 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.

(6) AGENCIES

AERONAUTICAL TELECOMMUNICATION AGENCY means an agency responsible for operating a station or stations in the aeronautical telecommunication service.

AIRCRAFT OPERATING AGENCY means a person engaged in, or offering to engage in, an aircraft operation.

(7) FREQUENCIES

PRIMARY FREQUENCY means the radiotelephony frequency assigned to an aircraft as a first choice for air-ground communication in a radiotelephony network.

SECONDARY FREQUENCY means the radiotelephony frequency assigned to an aircraft as a second choice for air-ground communication in a radiotelephony network.

(8) DATA LINK COMMUNICATIONS

CONTROLLER-PILOT DATA LINK COMMUNICATIONS (CPDLC) means a means of communication between controller and pilot, using data link for ATC communications.

CPDLC MESSAGE means 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 means a list of standard message elements and free text message elements.

CURRENT DATA AUTHORITY means 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.

FREE TEXT MESSAGE ELEMENT means part of a message that does not conform to any standard message element in the PANS-ATM (Doc 4444).

LOGON ADDRESS means a specified code used for data link logon to an ATS unit.

STANDARD MESSAGE ELEMENT means part of a message defined in the PANS-ATM (Doc 4444) in terms of display format, intended use and attributes.

(9) MISCELLANEOUS

AERONAUTICAL FIXED CIRCUIT means a circuit forming part of the aeronautical fixed service (AFS).

AERONAUTICAL FIXED TELECOMMUNICATION NETWORK CIRCUIT means a circuit forming part of the aeronautical fixed telecommunication network (AFTN).

AERONAUTICAL TELECOMMUNICATION LOG means a record of the activities of an aeronautical telecommunication station.

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

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

AUTOMATIC TELECOMMUNICATION LOG means a record of the activities of an aeronautical telecommunication station recorded by electrical or mechanical means.

eFPL means the symbol used to designate a filed flight plan exchanged using FF-ICE services.

FILED FLIGHT PLAN (FPL OR eFPL) means the latest flight plan as submitted by the pilot, an operator or a designated representative for use by ATS units.

Note. — The FPL denotes a filed flight plan exchanged using aeronautical fixed service while eFPL denotes a filed flight plan exchanged using FF-ICE services. The eFPL allows for the exchange of additional information not contained within the FPL.

FLIGHT AND FLOW — INFORMATION FOR A COLLABORATIVE

ENVIRONMENT (FF-ICE) means information necessary for planning, coordination, and notification of flights, exchanged in a standardized format between members of the ATM community, including those involved in flight operations and aerodrome operations.

FLIGHT AND FLOW — INFORMATION FOR A COLLABORATIVE ENVIRONMENT (FF-ICE) SERVICE means A set of services established for the purposes of facilitating the exchange of FF-ICE, accurate assessment of demands, appropriate resource planning, and optimizing flight planning and execution.

FLIGHT AND FLOW — INFORMATION FOR A COLLABORATIVE ENVIRONMENT (FF-ICE) SERVICES UNIT means a unit designated by the ATS Provider for the provision of FF-ICE services

FLIGHT PLAN means Specified information relative to an intended flight or portion of a flight of an aircraft.

Note 1. — The term flight plan may be prefixed by the words "preliminary", "filed", "current" or "operational" to indicate the context and different stages of a flight.

Note 2. — When the word "message" is used as a suffix to this term, it denotes the content and format of the flight plan data as transmitted.

FPL means the symbol used to designate a filed flight plan exchanged via aeronautical fixed service (AFS)

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

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

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

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

(c) when set to a pressure 1013.2 hPa, may be used to indicate flight levels.

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

FREQUENCY CHANNEL means a continuous portion of the frequency spectrum appropriate for a transmission utilizing a specified class of emission.

GLOBALLY UNIQUE FLIGHT IDENTIFIER (GUFI) means an unchangeable data element associated with a flight that allows all eligible members of the ATM community to unambiguously refer to information pertaining to the flight

HEIGHT means the vertical distance of a level, a point or an object considered as a point, measured from a specified datum.

HUMAN PERFORMANCE means human capabilities and limitations which have an impact on the safety and efficiency of aeronautical operations.

LOCATION INDICATOR means a four-letter code group formulated in accordance with rules prescribed by ICAO and assigned to the location of an aeronautical fixed station.

METEOROLOGICAL OPERATIONAL CHANNEL means

a channel of the aeronautical fixed service (AFS), for the exchange of aeronautical meteorological information.

METEOROLOGICAL OPERATIONAL TELECOMMUNICATION NETWORK means 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.

NOTAM means 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 means 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.

PRELIMINARY FLIGHT PLAN (PFP) means the information related to a flight submitted by an operator or a designated representative to conduct collaborative planning of a flight, prior to filing a flight plan.

ROUTE SEGMENT means a route or portion of route usually flown without an intermediate stop.

ROUTING DIRECTORY means a list in a communication centre indicating for each addressee the outgoing circuit to be used.

23.2.2 ADMINISTRATIVE PROVISIONS RELATING TO THE INTERNATIONAL AERONAUTICAL TELECOMMUNICATION SERVICE

23.2.2.1 DIVISION OF SERVICE

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

(a) aeronautical fixed service;

(b) aeronautical mobile service;

(c) aeronautical radio navigation service;

(d) aeronautical broadcasting service.

23.2.2.2 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.

23.2.2.3 HOURS OF SERVICE

(1) The ANS Provider 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 authorities concerned.

(2) Whenever necessary and practicable, the ANS Provider 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 authorities concerned. Such changes shall also, whenever necessary, be promulgated in NOTAM.

(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.

23.2.2.4 SUPERVISION

(1) ~~In accordance with the Ghana Civil Aviation~~ Act, 2004 (Act 678~~) as amended by the Ghana Civil Aviation (Amendment) Act, 2016 (Act 906),~~ The ANS Provider shall ensure that ~~the Authority shall be responsible for ensuring~~ that the international aeronautical telecommunication service is conducted in accordance with the provisions of this Part.

(2) Occasional infringements of the provisions contained herein, when not serious, shall be dealt with by direct communication between the parties immediately interested either by correspondence or by personal contact.

(3) When a station commits serious or repeated infringements, representations relating to them shall be made to the ~~Authority~~ANS Provider by the authority which detects them.

(4) Upon receipt of the infringements referred to in section 23.2.2.4(3), the ANS Provider shall immediately notify the Authority.

(5) The ANS Provider shall, when practicable, exchange information regarding the performance of systems of communication, radio navigation, operation and maintenance, unusual transmission phenomena, etc. with designated authorities of other States.

23.2.2.5 SUPERFLUOUS TRANSMISSIONS

The ANS Provider shall ensure that there is no willful transmission of unnecessary or anonymous signals, messages or data by any station within Ghana.

23.2.2.6 INTERFERENCE

(1) No person shall conduct any tests or experiments in any station without prior authorization from the Authority.

(2) Upon receipt of authorization from the Authority, an ANS Provider shall:

(a) comply with the necessary steps prescribed by the Authority to avoid harmful interference;

(b) take all possible precautions, such as the choice of frequency and of time, and the reduction or, if possible, the suppression of radiation; and

(c) eliminate any harmful interference resulting from tests and experiments ~~shall be eliminated~~ as soon as possible.

23.2.3 GENERAL PROCEDURES FOR THE INTERNATIONAL AERONAUTICAL TELECOMMUNICATION SERVICE

23.2.3.1 GENERAL

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

Note.— Detailed procedures, with special application to the service concerned, are contained in Sections 23.2.4, 23.2.5, 23.2.6, 23.2.7 and 23.2.8 of this Part.

23.2.3.2 EXTENSIONS OF SERVICE AND CLOSING DOWN OF STATIONS

(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.

(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) 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.

(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.

23.2.3.3 ACCEPTANCE, TRANSMISSION AND DELIVERY OF MESSAGES.

(1) Only those messages coming within the categories specified in 23.2.4.4.1.(1) shall be accepted for transmission by the aeronautical telecommunication service.

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

(3) 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.

(4) 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.

(5) 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 23.2.4.4.3(6).

(6) 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.

(7) 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.

(8) 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 authorities concerned.

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

(10) 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.

(11) 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 23.2.4.4.2 prior to transmission on the AFTN.

(12) 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 23.2.4.4.2 except where, subject to the provisions of 23.2.3.3.(8), 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.

(13) 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.

(14) 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.

(15) **PANS.—** When recording the text of air-reports in AIREP form, the

data conventions approved by ICAO for this purpose shall be used wherever possible. Provisions relating to the composition, including data conventions, of air-reports and to the order and form in which the elements of such reports are transmitted by the aircraft stations and recorded and retransmitted by the aeronautical stations, are contained in the PANS-ATM Doc 4444).

(16) **PANS.—** When air-reports in AIREP form are to be retransmitted by telegraphy (including teletypewriting), the text transmitted shall be as recorded in compliance with 23.2.3.3.7(15).

23.2.3.4 TIME SYSTEM

(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.

(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.

23.2.3.5 RECORD OF COMMUNICATIONS

23.2.3.5.1 GENERAL

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

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

(2) 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.

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

(3) 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.

(4) 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.

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

(6) 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.

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

(8) 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 shall 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)

(l) 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.

23.2.3.6 ESTABLISHMENT OF RADIO COMMUNICATION

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

(2) All stations shall radiate the minimum power necessary to ensure a satisfactory service.

23.2.3.7 USE OF ABBREVIATIONS AND CODES

(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.

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

Note.— The use of ICAO approved abbreviations and codes wherever appropriate — for example, those contained in the PANS-ABC (Doc 8400) — obviates the need for application of the provisions of 23.2.3.7(2).

23.2.3.8 CANCELLATION OF MESSAGES

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

23.2.3.9 GLOBALLY UNIQUE FLIGHT IDENTIFIER (GUFI)

(1) The originator of a preliminary flight plan (PFP) or eFPL shall assign a single GUFI to a flight for which the flight plan is to be submitted.

Note 1.— Procedures and guidance concerning FF-ICE services and the use of GUFI are contained in the Procedures for Air Navigation Services — Air Traffic Management (PANS-ATM, Doc 4444) and the Manual on Flight and Flow — Information for a Collaborative Environment (FF-ICE) (Doc 9965).

Note 2. — In the context of GUFI assignment, a flight refers to a single intended operation of an aircraft with specified aircraft identification that starts at a specified departure aerodrome at a specified date and time and finishes at an arrival aerodrome.

(2) The originator of a PFP or eFPL shall ensure that all FF-ICE

messages submitted for a flight are identified by the same GUFI.

(3) When providing a response to an FF-ICE message, an FF-ICE services unit shall identify the subject flight using the GUFI contained in the message.

(4) An FF-ICE services unit shall reject an FF-ICE message if the message includes a GUFI identical to that of another flight known to the FF-ICE services unit.

(5) The format of a GUFI shall include a unique identification of the entity that generated the GUFI.

(6) The originator of a PFP or eFPL shall ensure that the GUFI assigned to the flight does not duplicate any other GUFI submitted by that originator within the past 10 years.

23.2.4 AERONAUTICAL FIXED SERVICE (AFS)

23.2.4.1 GENERAL

(7) 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 broad-cast systems;

(c) the aeronautical fixed telecommunications network (AFTN);

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

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

(f) the inter-centre communications (ICC).

Note 1.— Provisions relating to ATS direct speech communications are contained in 23.2.4.2.

Note 2.— Provisions relating to meteorological operational channels and meteorological operational telecommunication networks are contained in 23.2.4.3.

Note 3.— The AFTN provides a store-and-forward messaging service for the conveyance of text messages in ITA-2 or IA-5 format, using character-oriented procedures. Provisions relating to the AFTN are contained in 23.2.4.4.

Note 4.— The CIDIN provides a common transport service for the conveyance of binary or text application messages, in support of the AFTN and OPMET applications. Procedural provisions relating to the CIDIN are contained in 23.2.4.5.

Note 5.— The ATS (air traffic services) message handling services (ATSMHS) application allows ATS messages to be exchanged between service users over the aeronautical telecommunication network (ATN) internet communication service (ICS). Procedural provisions relating to ATS message handling services are contained in 23.2.4.6.

Note 6.— The inter-centre communications applications enable the exchange of information between air traffic service units over the aeronautical telecommunication network (ATN) internet communication service (ICS), in support of notification, coordination, transfer of control, flight planning, airspace management and air traffic flow management. Procedural provisions relating to inter-centre communications are contained in 23.2.4.7.

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

23.2.4.1.1 MATERIAL PERMITTED IN AFS MESSAGES

Note.— The provisions contained in 23.2.4.1.1 do not apply to ATS voice communications.

(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.

(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.

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

Note 2.— When using any of the above signals, account is to be taken of, amongst others, the provisions of 23.2.4.4.5(6).

Note 3.— The foregoing provisions of 23.2.4.1.1(2) are not intended to prevent the use of:

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

(b) figure case of signal no. 10 as the priority alarm (see 23.2.4.4.4(7)); and

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

(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 23.2.4.4.15.3(7), 0/10, 0/11 - in the ending sequence (see 23.2.4.4.15.5(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) The exchange of messages using the full IA-5 shall be subject to agreement between the authorities concerned

(5) 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.

(6) Messages using the ITA-2 code shall not contain:

(a) 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 23.2.4.4.2.1(1); and

(b) any uninterrupted sequence of four times signal no. 14 (letter case and figure case) other than the one in the ending as prescribed in 23.2.4.4.6(1).

(7) Messages using IA-5 shall not contain:

(a) character 0/1 (SOH) other than the one in the heading as prescribed in 23.2.4.4.15.1(1)(a);

(b) character 0/2 (STX) other than the one in the origin line as prescribed in 4 23.2.4.4.15.3(11);

(c) character 0/3 (ETX) other than the one in the ending as prescribed in 23.2.4.4.15.5(1);

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

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

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

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

(8) The text of messages shall be drafted in plain language or in abbreviations and codes, as prescribed in 23.2.3.7. 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

(9) If the originator of a message wishes alignment functions [<≡] to be transmitted at specific places in the text part of such message (see 23.2.4.4.5(6) and 23.2.4.4.15.4(6)), the sequence [<≡] shall be written on each of those places.

23.2.4.2 ATS DIRECT SPEECH CIRCUITS

Provisions relating to ATS direct speech communications shall be as contained in Part 24 of Ghana Civil Aviation (ANS) Directives.

23.2.4.3 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) or ATS message handling services (AMHS) procedures.

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

23.2.4.4 AERONAUTICAL FIXED TELECOMMUNICATION NETWORK (AFTN)

23.2.4.4.1 GENERAL

23.2.4.4.1.1 CATEGORIES OF MESSAGES.

(1) Subject to the provisions of 23.2.3.3, 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.

(2) **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.

(3) **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) **Flight Safety Messages (Priority Indicator FF)**

Flight safety messages (priority indicator FF) shall comprise:

(a) movement and control messages as defined in PANS-ATM (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 and AIRMET information; special air-reports,; AIRMET messages, volcanic ash, tropical cyclone and space weather advisory information; and amended forecasts.

(5) **Meteorological Messages (Priority Indicator GG)**

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.

(6) **Flight Regularity Messages (Priority Indicator GG)**

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. over–flight 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.

(7) **Aeronautical Information Services (AIS) Messages (Priority Indicator GG)**

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

(a) messages concerning NOTAMs;
(b) messages concerning SNOWTAMs.

(8) **Aeronautical Administrative Messages (Priority Indicator KK)**

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.

(d) 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.

(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.

(a) Service messages shall be prepared in the format prescribed in 23.2.4.4.2 or 23.2.4.4.14 . In applying the provisions of an addressee indicator, which shall be immediately preceded

(b) by a SPACE, except when it is the first address indicator of 23.2.4.4.3(3)or 23.2.4.4.1.5.(5)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.

(c) Service messages shall be assigned the appropriate priority indicator.

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

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

(f) A reply to a service message shall be addressed to the station which originated the initial service message.

(g) The text of all service messages shall be as concise as possible.

(h) 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.

(i) 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

(j) 23.2.4.4.2.1(1)(b) and 23.2.4.4.15.1(1)(b)) or the filing time and originator indicator groups (see 23.2.4.4.4 and 23.2.4.4.15.3 identifying the reference message.

23.2.4.4.1.2 ORDER OF PRIORITY

(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

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

23.2.4.4.1.3 ROUTING OF MESSAGES

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

(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.

(3) Diversion routing shall be initiated:

(a) in a fully automatic communication centre:

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

(ii) 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;

(b) 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) 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.

Note.— The expression "reasonable period" means a period of time such that it seems probable that the traffic will not be delivered to the addressee within any fixed transit period applicable to the category of traffic concerned, or, alternatively, any predetermined period agreed between originators and the telecommunication station concerned.

23.2.4.4.1.4 SUPERVISION OF MESSAGE TRAFFIC

23.2.4.4.1.4.1 Continuity of message traffic.

(1) 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.

(2) When the receiving station detects that one or more channel-sequence numbers are missing, it shall send a complete service message (see 23.2.4.4.1.1(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 23.2.4.4.2.1(5) and 23.2.4.4.15.1(5) and the end- of-text signal (see 23.2.4.4.5(10) and 23.2.4.4.15.6).

Note. The following examples illustrate application of the above- mentioned procedure. In example 2) the hyphen (-) separator is understood to mean "through" in plain language.

when one channel-sequence number is missing:

SVC→QTA→MIS→ABC↑123↓<≡

when several channel-sequence numbers are missing:

SVC→QTA→MIS→ABC↑123-126↓<≡

(3) When the provisions of 23.2.4.4.1.4(2) 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) 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:

(a) the abbreviation SVC;
(b) the procedure signal LR followed by the transmission identification of the received message;
(c) the procedure signal EXP followed by the transmission identification expected;
(d) the end-of-text signal.

Note. The following example illustrates application of the above- mentioned procedure:

SVC→LR→ABC↑123→↓EXP→ABC↑135↓<≡

(5) When the provisions of 23.2.4.4.1.4(4) 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.

23.2.4.4.1.4.2 MISROUTED MESSAGES

Note.— A message is considered to have been misrouted when it contains no relaying instructions, expressed or implied, on which the receiving station can take action.

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

(a) send a service message (see 23.2.4.4.1.1(9)) to the previous station rejecting receipt of the misrouted message; or
(b) itself assume responsibility for transmission of the message to all addressee indicators.

Note.— The procedure of 1) is preferable at stations using "torn-tape" relay methods or a semi-automatic relay technique with continuous tape. The procedure of 2) may be preferred at stations using fully automatic relay methods or a semi-automatic relay technique without continuous tape.

(2) When the provisions of 23.2.4.4.1.4.2(1)(a) 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 23.2.4.4.2.1(5) and 23.2.4.4.15.1(5)) of the misrouted message and the end-of-text signal (see 23.2.4.4.5(10) and 23.2.4.4.15.6

Note.— The following example illustrates application of the above-mentioned procedure

SVC→QTA→MSR→ABC↑123↓<≡

(3) When, as a result of the provisions of 23.2.4.4.1.4.2(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) 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 23.2.4.4.1.1(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 23.2.4.4.5(10) and 23.2.4.4.15.6)

Note.— The following example illustrates application of the above-mentioned procedure:

SVC→LR→ABC↑123↓→LS→BAC↑321↓<≡

23.2.4.4.1.5 FAILURE OF COMMUNICATIONS

(1) In the event that communication on any fixed service circuit fail, the station concerned shall attempt to re-establish contact as soon as possible.

(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.

(3) 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) Where a radio circuit fails due to signal fade- out 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.

(5) 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.

(6) 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:

(a) the abbreviation SVC;

(b) the procedure signal QSP;

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

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

(e) the end-of-text signal.

Note.— The following examples illustrate application of the above-mentioned procedures:

1) to request a diversion:
SVC→QSP→RQ→C→K→BG→BI↓<≡

2) to accept a diversion:
SVC→QSP→C→K→BG→BI↓<≡

3) to refuse a diversion:
SVC→QSP→NO→C→K→BG→BI↓<≡

4) to cancel a diversion:
SVC→QSP→CNL→C→K→BG→BI↓<≡

23.2.4.4.1.6 LONG-TERM RETENTION OF AFTN TRAFFIC RECORDS

(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.

Note.— The AFTN origin station, although responsible for ensuring that AFTN traffic is recorded, is not necessarily the unit where the records are made and retained. By local agreement BLLLLIO the State concerned may permit the originators to perform those functions.

(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.

Note.— The provision for identification of messages mentioned in 23.2.4.4.1.6.(2) may be obtained by recording the heading, address and origin parts of messages.

(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.

Note 1.— The provision for identification of messages mentioned in 23.2.4.4.1.6(3) may be obtained by recording the heading, address and origin parts of messages.

Note 2.— Provisions relating to short-term retention of AFTN traffic records in AFTN communication centres are contained in 23.2.4.4.1.7.

23.2.4.4.1.7 SHORT-TERM RETENTION OF AFTN TRAFFIC RECORDS

(1) Except as provided in 23.2.4.4.1.7(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.

(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.

Note.— Provisions relating to long-term retention of AFTN traffic records in AFTN communication centres are contained in 23.2.4.4.1.6.

23.2.4.4.1.8 TEST PROCEDURE ON AFTN CHANNELS

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

(a) the start-of-message signal;

(b) the procedure signal QJH;

(c) the originator indicator;

(d) three page-copy lines of the sequence of characters RY in ITA-2 or U(5/5) *(2/10) in IA-5; and

(e) the end-of-message signal.

23.2.4.4.2 MESSAGE FORMAT - INTERNATIONAL TELEGRAPH ALPHABET NO. 2 (ITA-2)

(1) All messages, other than those prescribed in 23.2.4.4.1.8 and 23.2.4.4.9.3, shall comprise the components specified in 23.2.4.4.2.1 to 23.2.4.4.6(1)inclusive.

Note 1.— An illustration of the ITA-2 message format is given in Figure 4-1.

Note 2.— In the subsequent Standards relative to message format the following symbols have been used in making reference to the functions assigned to certain signals in the International Telegraph Alphabet No. 2 (see section 23.3.8.2.1 of Part 23 and Table 8-1)

Symbol	*Significat*
<	CARRIAGE RETURN *(signal no. 27)*
≡	LINE FEED *(signal no. 28)*
↓	LETTER SHIFT *(signal no. 29)*
↑	FIGURE SHIFT *(signal no. 30)*
→	SPACE

23.2.4.4.2.1 HEADING

(1) The heading shall comprise:

(a) start-of-message signal, the characters ZCZC;

(b) transmission identification comprising:
(i) circuit identification;
(ii) channel-sequence number.

(c) additional service information (if necessary) comprising:

(i) one SPACE;

(ii) no more than ten characters.

(d) spacing signal.

(2) 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.

(3) Three-digit channel-sequence numbers from 001 to 000 (representing 1000) 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) The use of the 4-digit channel-sequence number, to preclude duplication of the same numbers during the 24hour period, is permitted subject to agreement between the authorities responsible for the operation of the circuit.

(5) 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).

(6) 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 23.2.4.4.2.1(5).

*Note.— The examples appearing below illustrate the application of the transmission identification Standard 23.2.4.4.2.1(1)(b)) (*see *and 23.2.4.4.2.1(5)):*

Tape	*Page-copy*
→GLB↑039→→→→→↓	GLB039

(This indicates the 39th message of the day transmitted on Channel B of the circuit from Station G to Station L.)

(7) 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.

(8) 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.

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)
		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

23.2.4.4.3 ADDRESS

(1) The address shall comprise:

(a) alignment function [<≡];

(b) priority indicator;

(c) addressee indicator(s);

(d) alignment function [<≡].

(2) 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) 23.2.4.4.1(2) . . . . . .,,,, . .	SS
urgency messages (see 23.2.4.4.1.1(3))	DD
flight safety messages (see 23.2.4.4.1.1(4)). . . . .FF	
meteorological messages (see 23.2.4.4.1.1(5))…….GG	
flight regularity messages (see 23.2.4.4.1.1(6)) . ... .GG	
aeronautical information services messages (see 23.2.4.4.1.1(7)) . . . . . .…..,,,, . . .GG	
aeronautical administrative messages (see 23.2.4.4.1.1(8)). . . . . .,,,, ... KK	
service messages (see23.2.4.4.1.1(9). . . . . (as appropriate)	

(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 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.

Note 1.— The four-letter location indicators are listed in Doc 7910 — Location Indicators.

Note 2.— The three-letter designators are listed in Doc 8585 — Designators for Aircraft Operating Agencies, Aeronautical Authorities and Services.

(4) 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 23.2.4.4.3(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 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.

(5) 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.

(6) The complete address shall be restricted to three lines of page- printing copy and, except as provided in 23.2.4.4.14, a separate addressee indicator shall be used for each addressee whether at the same or at different locations.

(7) 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 23.2.4.4.3(6). 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.

(8) 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 [<≡].

23.2.4.4.4 ORIGIN

(1) The origin shall comprise:

(a) filing time;

(b) originator indicator;

(c) priority alarm (when necessary);

(d) optional heading field

(e) alignment function [<≡].

(2) The filing time shall comprise the 6-digit date-time group indicating the date and time of filing the message for transmission (see 23.2.3.4(2)); ~~in teletypewriter operation, the filing time shall be followed by one LETTER SHIFT~~ [↓].

(3)

(4) 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.

(5) Where a message is originated by an organization that has not been allocated an ICAO three-letter designator of the type prescribed in 23.2.4.4.4(3)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.

(6) 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.

(7) 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.

Note.— The following illustrates the application of 23.2.4.4.4(5) procedure as it would appear with a message from aircraft KLM153 addressed to the Area Control Centre at CZEG, the message being handled via aeronautical station CYCB. The heading and ending of the message are not shown in this example of teletypewriter page-copy form:

(Address)	*FF CZEGZRZX*
(Origin)	*031821 CYCBZZZX*
(Text)	*KLM153 [remainder of text as received from aircraft]*

(8) The priority alarm shall be used only for distress messages. When used, it shall consist of the following, in the order

stated:

(a) FIGURE SHIFT [↑];

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

(c) LETTER SHIFT [↓].

Note 1.— The figure case of signal no. 10 of the International Telegraph Alphabet No. 2 generally corresponds to the figure case of J of teletypewriter equipment in use on aeronautical fixed service circuits.

Note 2.— Use of the priority alarm will actuate a bell (attention) signal at the receiving teletypewriter station, other than at those fully automatic stations which may provide a similar alarm on receipt of priority indicator SS, thereby alerting supervisory personnel at relay centres and operators at tributary stations, so that immediate attention may be given to the message.

(9) 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.

(10) 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.

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

(12) The origin line shall be concluded by an alignment function [<≡].

23.2.4.4.5 TEXT

(1) The text of messages shall be drafted in accordance with 23.2.4.1.1.

(2) When an originator's reference is used, it shall appear at the beginning of the text, except as provided in 23.2.4.4.5(3) and 23.2.4.4.5(4).

(3) When the ICAO three-letter designators YXY, YYY or ZZZ comprise the second element of the addressee indicator (see 23.2.4.4.3(4) and 23.2.4.4.3(5)) 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) When the ICAO three-letter designators YXY, YYY or ZZZ comprise the second element of the originator indicator (see 23.2.4.4.4(4) and 23.2.4.4.4(5)) 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.

(5) When applying the provisions of 23.2.4.4.5(3) and 23.2.4.4.5(4) 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.

(6) An alignment function [<≡] shall be transmitted at the end of each printed line of the text except for the last (see 23.2.4.4.5(10).

(7) 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.

(8) 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.

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

(10) At the end of the text the following end-of-text signal shall be transmitted:

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

(11) The text of the messages entered by the AFTN origin station shall not exceed 1800 characters in length.

Note 1. — Where it is desired that a communication with a text exceeding 1 800 characters be transmitted over the aeronautical fixed telecommunication network, 23.2.4.4.5(11) requires that such a communication be entered by the AFTN origin station in the form of separate messages, each text of which does not exceed 1 800 characters.

Note 2. — The character count includes all printing and non-printing characters in the message from, but not including, the alignment function preceding the beginning of the text to, but not including, the end-of-text signal.

23.2.4.4.6 ENDING

(1) The ending shall comprise:

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

Note.— This, together with the 1 LINE FEED of the preceding alignment function, will provide sufficient separation between messages when appearing in page-copy form.

(b) the end-of-message signal, consisting of the letter N (letter case of signal no. 14), appearing FOUR times in undivided sequence. And in addition, on message traffic transmitted to "torn tape" relay stations only:

Note.— This component, transmitted intact from the moment of the first transmission of the message until ultimate delivery, is required so that connections set up for cross-office transmission, at a semi-automatic or fully automatic relay installation, can be cleared for following message traffic.

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

(2) AFTN messages entered by the AFTN origin station shall not exceed 2100 characters in length.

23.2.4.4.7 TAPE FEED

(1) In "torn-tape" installations, and in "semi-automatic" installations using continuous tape technique, when signals additional to those prescribed in 23.2.4.4.6(1)are required to ensure that the tape is adequately advanced from the reperforator at the receiving stations, when the ending of one message is not followed immediately by the start-of-message signal of another message, local arrangements shall be made at the receiving station to avoid the need for transmission of these signals by the transmitting station.

Note.— In "torn-tape" stations, a facility is normally necessary whereby the tape can be fed from the receiving reperforator to an extent that permits the receiving operator to tear through the message-separation signal at the correct point, on occasions when the operator is ready to tear the tape but there has been no following message to cause this tape- feed to take place. In semi-automatic stations using continuous-tape techniques, a similar process may be necessary in similar circumstances to advance the tape to an extent that permits the end-of-message signal to reach the transmitter.

(2) When the provisions of 23.2.4.4.7(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 23.2.4.4.6.

23.2.4.4.8 STRIPPED ADDRESS

When applying the provisions of 23.2.4.4.3 or 23.2.4.4.15.2(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.

23.2.4.4.9 TELETYPEWRITER OPERATING PROCEDURE – GENERAL

23.2.4.4.9.1 END-OF-LINE FUNCTIONS

(1) A single line of page-copy shall not contain more than a total of 69 characters andspaces or both.

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

23.2.4.4.9.2 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.

23.2.4.4.9.3 CHANNEL-CHECK TRANSMISSIONS

(1) Except as provided in 23.2.4.4.9.2(5) and 23.2.4.4.9.4(3) the following periodic transmissions shall be sent on teletypewriter circuits:

(a) heading (see 23.2.4.4.2.1(1));

(b) alignment function [<≡];

(c) the procedure signal CH;

(d) alignment function [<≡];

(e) end-of-message signal [NNNN];

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

(2) 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.

Note.— Application of this procedure provides some measure of assurance that channel continuity is maintained.

(3) Where a circuit is unoccupied, the transmission specified in 23.2.4.4.9.3(1) shall be sent at H + 00, H + 20, H + 40.

(4) 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:

(a) the abbreviation SVC;

(b) the procedure signal MIS;

(c) the procedure signal CH;

(d) (optionally) the time at which the transmission was expected;

(e) the procedure signal LR;

(f) the transmission identification of the last message received;

(g) the end-of-text signal.

Note.— The following example illustrates application of the above-mentioned procedure:

SVC→MIS→CH→[↑1220↓→]LR→ABC↑123↓<≡

(5) When a teletypewriter channel is equipped with a system of controlled circuit protocol, and following agreement between the authorities responsible, the transmission specified in 23.2.4.4.9.3 shall not be made.

23.2.4.4.9.4 CHANNEL-CHECK TRANSMISSIONS AND STATION RADIO IDENTIFICATIONS.

(1) In order to satisfy the requirements of ITU regarding

periodic transmission of the station radio identification, those AFTN stations using radio teletypewriter channels may combine the station radio identification transmission with the channel-check transmission specified in 23.2.4.4.9.3(1). In this case the combined transmission shall be sent as follows:

(a) heading (see 23.2.4.4.2.1(1));

(b) alignment function [<≡];

(c) the procedure signal CH;

(d) alignment function [<≡];

(e) the procedure signal DE followed by one SPACE [→] and the assigned ITU radio call sign;

(f) alignment function [<≡];

(g) end-of-message signal [NNNN];

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

Note.— Application of this format will permit this special transmission to be handled by fully automatic switching centres without the intervention of supervisory personnel.

(2) When multichannel radio teletypewriter circuits are used (e.g. MET and AFTN) the station radio call sign transmission shall be sent on only one channel of the circuit. The channel chosen shall be the one which is the most convenient for this purpose with the identification transmission being sent in conformance with the format used on that channel. When an AFTN channel is chosen the identification transmission shall be combined with the channel- check transmission.

(3) When a teletypewriter circuit is associated with Automatic Error Correction (ARQ) equipment, and following agreement between the authorities responsible, the transmissions specified in 23.2.4.4.9.3 need not be made: however stations employing radio teletypewriter channels on the AFTN for which the station radio

identification is required, shall comply with the provisions of 23.2.4.4.9.3.4.

Note.— The foregoing is not to be interpreted as implying any ICAO requirement necessitating the installation of Automatic Error Correction (ARQ) equipment on international aeronautical fixed circuits

23.2.4.4.10 NORMAL TELETYPEWRITER TRANSMISSION PROCEDURES

23.2.4.4.10.1 MESSAGES

(1) Messages shall be transmitted in accordance with predetermined responsibility for onward relay as agreed between the authorities responsible for the operation of directly connected stations. (see also 23.2.4.4.1.3 and 23.2.4.4.1.5(5).

(2) Arising from the responsibility agreements established under the provisions of 23.2.4.4.10.1(1), each station of the AFTN shall employ and, subject to the provisions of 23.2.4.4.10(3), adhere to a Routing Directory which consists of the Routing List.

(3) 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 23.2.4.4.1.1(9) notification of this action being given to the station that had made the previous transmission.

(4) 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.

(5) 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.

Note.— A method of specifying service address in the optional data field is shown in 23.2.4.4(9) and When a separate address for service messages or inquiries is different from the originator indicator, the modifier SVC shall be used. 23.2.4.4.4(10)

23.2.4.4.10.2 FORM OF TRANSMISSION - TELETYPEWRITER OPERATION.

(1) All transmissions shall comprise in the following order (see Figure 4-2). below

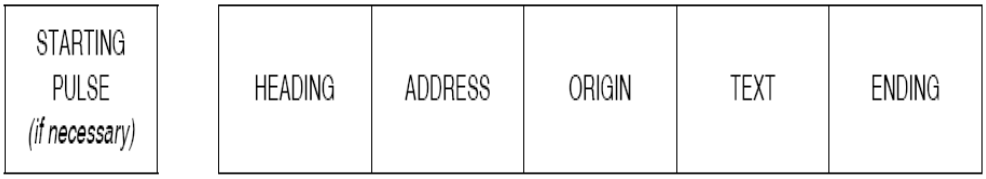


Figure 4-2. Form of transmission — teletypewriter operation

23.2.4.4.10.3 STARTING PULSE.

(1) When the receiving station uses equipment fitted with a time- switch to stop the teletypewriter 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 1.5seconds shall be permitted to elapse before the transmission of the heading.

Note 1.— This is equivalent to the transmission of a LETTER SHIFT [↓] *, followed by a pause (i.e. a continuous MARKING IMPULSE) of at least 1.37 seconds.*

Note 2.— Application of this procedure will allow the receiving equipment to reach synchronization before transmission of the heading is commenced.

23.2.4.4.10.4 MESSAGE FORMAT.

(1) All messages shall be prepared in accordance with the provisions of 23.2.4.4.2 (ITA-2 format) or 23.2.4.4.14 (IA-5 format).

(2) 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 23.3.8.6.3 and 23.3.8.6.4 of Subpart 3 of Part 23.

23.2.4.4.10.5 REPROCESSING PROCEDURES

(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.

(2) When applying the provisions of A message requiring retransmission shall have its previous heading deleted by the station which received such 23.2.4.4.10.5(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 [<≡].

(3) 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) 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.

(5) At a "torn-tape" station the incoming tapes shall be torn at a position in the message-separation signal component (see 23.2.4.4.6(1)and 23.2.4.4.7(1)) so that the preceding end-of message signal remains intact.

(6) Following application of the provisions of 23.2.4.4.10.5(5) 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:

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

(b) 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 23.2.4.4.6(1)(c)).

(7) 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.

23.2.4.4.10.6 ACKNOWLEDGEMENT OF RECEIPT OF MESSAGES

(1) In teletypewriter operation and except as provided in 23.2.4.4.10.6(2), a receiving station shall not transmit

acknowledgement of receipt of incoming messages. In lieu thereof the provisions of 23.2.4.4.1.4.1 shall be applied.

(2) The receipt of distress messages (priority SS - see 23.2.4.4.1(2) shall be individually acknowledged by the AFTN destination station sending a service message (see 23.2.4.4.1.1(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 23.2.4.4.4(7)) and shall have a text comprising:

(a) the procedure signal R;

(b) the origin (see 23.2.4.4.4), without priority alarm, or optional heading information of the message being acknowledged;

(c) the end-of-text signal [↓<≡].

Note.— The following example illustrates the application of 23.24.4.10.1.6.1 procedure:

Heading (see *23.2.4.4.2.1.(1))*
<≡SS→LECBZRZX<≡
↑121322↓→ EGLLYFYX (Priority Alarm) <≡
R→↑121319↓→LECBZRZX↓<≡
Ending (see *23.2.4.4.6)*

(3) 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.

23.2.4.4.11 ACTION ON MUTILATED OR IMPROPERLY FORMATTED MESSAGES DETECTED IN TELETYPEWRITER RELAY STATIONS.

(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 23.2.4.4.1.1(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.

Note 1.— The following example illustrates a typical text of a service message in which the foregoing procedure has been applied in respect of a mutilated message having as its origin "141335 CYULACAX":

SVC→QTA→RPT→↑141335↓→CYULACAX↓<≡

Note 2.— This circumstance of detection of a mutilation may only be possible at "torn-tape" relay stations.

(2) When the provisions of 23.2.4.4.11(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 23.2.4.4.11(3).

(3) Following application of the provisions of ~~When the provisions of~~ 23.2.4.4.11(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:

(a) insert a new heading;

(b) remove the ending of the message (see 23.2.4.4.6(1));

(c) 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 23.2.4.4.6 and 23.2.4.4.7), the LETTER SHIFTS [↓] of the message-separation signal and tape feed.

Note.— The example appearing in Figure 4-3 illustrates the application of this procedure

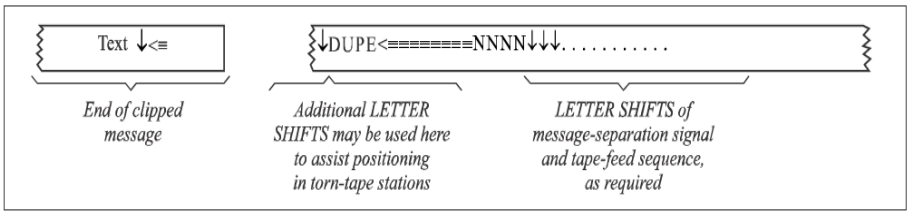


Figure 4-3. Example of application of 23.2.4.4.11(4) 23.2.4.4.11.3 procedure

(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 23.2.4.4.1.1(9)to the previous station rejecting the mutilated transmission and requesting a repetition of the incorrectly received message (or messages).

Note 1. — The following examples illustrate application of the above-mentioned procedure. In example 2) the hyphen (-) separator is understood to mean "through" in plain language

1) *in respect of a single mutilated message:*

SVC→QTA→RPT→ABC↑123↓<≡

2) *in respect of several mutilated messages:*

SVC→QTA→RPT→ABC↑123-126↓<≡

Note 2. — This circumstance of detection of a mutilation may only be possible at "torn-tape" relay stations.

(5) When the provisions of 23.2.4.4.11(5) 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 23.2.4.4.2.1(1) (b) If that station is not in

possession of an unmutilated copy of the original message, it shall take the action prescribed in 23.2.4.4.11(1).

(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.

Note.— This circumstance of detection of a mutilation may only be possible at "torn-tape" relay stations and the action prescribed will be essential where messages are being transmitted to a semi-automatic or fully automatic station.

(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:

(a) cancel the transmission by inserting into the channel the sequence ↓<≡QTA→QTA↓<≡ followed by a complete ending 23.2.4.6);

(b) reassume responsibility for the message;

(c) comply with the provisions if, before retransmission is commenced, a relay station detects that a message has been 23.2.4.4.11(1) or 23.2.4.4.11(5as appropriate.

(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).

Note.— This circumstance of detection of a mutilation or incomplete message may only be possible at "torn-tape" relay stations or at semi-automatic stations using continuous-tape.

(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.

(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:

(a) ↓<≡CHECK≡TEXT≡
NEW→ENDING→ADDED→

(b) its own station identification;

(c) ↓<≡

(d) a proper ending as prescribed in 4.4.6.1.

Note 1.— On tape copy, this insertion will appear as follows:

↓<≡CHECK≡TEXT≡
NEW→ENDING→ADDED→LOWWYFYX↓<≡
≡≡≡≡≡≡≡NNNN↓↓↓ . . .

Note 2.— On page copy, this insertion will appear as follows:

CHECK
TEXT
NEW ENDING ADDED LOWWYFYX
NNNN

Note 3.— The staggered presentation on copy is prescribed to ensure that the attention of the addressee is drawn immediately to the insertion.

Note 4.— The FIGURE SHIFT [ ] *is included to ensure proper functioning where First Line Monitoring Equipment is used, where the presence of the FIGURE SHIFT in the origin is used to cause disconnection of this equipment and where the missing part of the message includes this FIGURE SHIFT.*

Note 5.— This circumstance of detection of a mutilation may only be relevant to fully automatic stations or stations using semi-automatic methods without continuous-tape.

(11) Relay stations applying the procedural provisions of 23.2.4.4.11(10) or 23.2.4.4.11(11) 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.

(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.

(13) The text of this service message shall comprise:

(a) the abbreviation SVC;

(b) the procedure signal QTA;

(c) the procedure signal ADS;

(d) the transmission identification of the message rejected;

(e) the indication CORRUPT;

(f) the end-of-text signal.

Note.— The following example illustrates application of the above-mentioned procedure:

SVC→QTA→ADS→ABC↑123↓→CORRUPT↓<≡

(14) 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.

(15) 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 23.2.4.4.8).

(16) In addition, except as 23.2.4.4.11(19) the station shall send a service message to the previous station requesting correction of the error. The text of this service message shall comprise:

(a) the abbreviation SVC;

(b) the procedure signal ADS;

(c) the transmission identification of the message in error;

(d) an alignment function;

(e) the first address line of the message as received;

(f) an alignment function;

(g) either:

(i) for an invalid addressee indicator: the indication CHECK;

(ii) for an unknown addressee indicator: the indication UNKNOWN;

(h) the invalid or unknown addressee indicator(s);

(i) the end-of-text signal.

Note.— The following examples illustrate the application of the procedure of 23.2.4.4.11.13.1:

a) for an invalid addressee indicator:

SVC→ADS→ABC↑123↓<≡
GG→EGLLACAX→EGPKYTYX→CYAAYFYX→
CYQXAFX<≡CHECK→CYQXAFX↓<≡

b) for an unknown addressee indicator:

SVC→ADS→ABC↑123↓<≡

GG→EGLLACAX→EGEHYTYX→CYAAYFYX→
CYQXACAX<≡UNKNOWN→EGEHYTYX↓<≡

(17) A station receiving a service message as prescribed in 23.2.4.4.11(17) shall, if a correct addressee indicator is available, repeat the message to that addressee only using the stripped address procedure (see 23.2.4.4.8) or, if a correct addressee indicator is not available, act as prescribed in 23.2.4.4.11.13.1.

(18) Where the procedure of 23.2.4.4.11(16) 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:

(a) the abbreviation SVC;

(b) the procedure signal ADS;

(c) the origin of the message in error;

(d) an alignment function;

(e) the first address line of the message as received;

(f) an alignment function;

(g) the indication UNKNOWN;

(h) the unknown addressee indicator(s);

(i) the end-of-text signal.

Note.— The following example illustrates application of the above-mentioned procedure:

SVC→ADS→↑141335↓→CYULACAX<≡
GG→EGLLACAX→EGEHYTYX→CYAAYFYX→
CYQXACAX<≡UNKNOWN→EGEHYTYX↓<≡

(19) 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 23.2.4.4.8).

(20) 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.

(21) The text of this service message shall comprise:

(a) the abbreviation SVC;

(b) the procedure signal QTA;

(c) the procedure signal OGN;

(d) the transmission identification of the message rejected;

(e) the indication CORRUPT;

(f) the end-of-text signal.

Note.— The following example illustrates application of the above-mentioned procedure:

SVC→QTA→OGN→ABC↑123↓→CORRUPT↓<≡

(22) The station receiving a service message as prescribed in 23.2.4.4.11(22) shall reassume responsibility for the referenced message and shall retransmit the message with a correct origin line and a new transmission identification.

Note.— When applying the provisions of 23.2.4.4.11.14, the minimum requirements for processing the origin of AFTN

messages are:

1) the date-time group consisting of six numeric characters;

2) the originator indicator consisting of eight alpha

characters.

(23) 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.

(24) The text of the service message shall comprise:

(a) the abbreviation SVC;

(b) the procedure signal QTA;

(c) the procedure signal OGN;

(d) the transmission identification of the message rejected;

(e) the indicator INCORRECT; and

(f) the end-of-text signal.

Note.— The following ITA-2 example illustrates application of the above-mentioned procedure:

SVC→QTA→OGN→ABC↑123↓→INCORRECT↓<≡

(25) The station receiving a service message as prescribed in 23.2.4.4.11(25) shall resume responsibility for the referenced message and shall retransmit the message with a correct originator indicator and, if applicable, a new transmission identification.

Note.— When applying the provisions of 23.2.4.4.11.15 the relay centre requirement is as a minimum the first character of the originator indicator verified as the first character of the location indicator of the place at which the message is originated.

23.2.4.4.12 CORRECTION OF ERRORS DURING TAPE PREPARATION

(1) Correction of errors during tape preparation Messages for which tapes are prepared at the origin station shall not be allowed to flow into the AFTN with known uncorrected errors.

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

(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) Where the action of 23.2.4.4.12(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.

(5) Where neither the action of 23.2.4.4.12(3) nor the action of 23.2.4.4.12(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 23.2.4.4.5.1(8).

(6) The ending must be typed without error.

23.2.4.4.13 CORRECTION OF ERRORS DURING MESSAGE ORIGINATION IN CASES WHERE THE MESSAGE IS FLOWING INTO THE AFTN DURING PREPARATION.

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

(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 23.2.4.4.6).

(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) 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 23.2.4.4.5.1(8).

(5) In cases where it becomes obvious, during the origination of the text, that the message shall be cancelled, the station shall take the action described in 23.24.4.13(22)

23.2.4.4.14 PREDETERMINED DISTRIBUTION SYSTEM FOR AFTN MESSAGES

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

(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:

(i) 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;

(ii) "N" and "S", as the fifth letter, are reserved for NOTAM and SNOWTAM respectively (see IS: 15.5.3.4.2 of Part 15 of Ghana Civil Aviation (ANS) Directives);

(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.

Note 1.— To avoid conflict with the AFTN start-of-message signal, combinations with ZC or CZ will not be used.

Note 2.— To avoid conflict with the AFTN end-of-message signal, combinations with NN will not be used.

(3) **PANS. –** 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) 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 Distribution Addressee Indicators 23.2.4.4.14(5).

(5) The ANS Provider shall send its list of selected Predetermined 23.2.4.4.14(5) 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.

(6) 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).

23.2.4.4.14 MESSAGE FORMAT - INTERNATIONAL ALPHABET NO.5 (IA-5)

(1) When it has been agreed between the authorities concerned to use International Alphabet No. 5 (IA-5) the format described in 23.2.4.4.14 through 23.2.4.4.15.4 shall be used. It shall be the responsibility of authorities using IA-5 to accommodate adjacent AFTN stations employing ITA-2 code in the format described in 23.2.4.4.2.

(2) All messages, other than those prescribed in 23.2.4.4.1.8 and 23.2.4.4.9.3(1) shall comprise the components specified in 23.2.4.4.15.1 to 23.2.4.4.15.6(4) inclusive.

Note 1.— An illustration of the IA-5 message format is given in Figure 4-4.

*Note 2.— In the subsequent standards relative to message format the following symbols have been used in making reference to the functions assigned to certain signals in IA-5. (*See *Subpart 23.3, Part I, 23.3.8.6.1 and Tables 8-2 and 8-3.)*

Symbol *Signification*

< CARRIAGE RETURN (character position 0/13)
≡ LINE FEED (character position 0/10)
→ SPACE (character position 2/0).

23.2.4.4.15.1 HEADING

(1) The heading shall comprise:

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

(b) transmission identification comprising:

(i) circuit or link identification;

(ii) channel-sequence number;

(c) additional service information (if necessary) comprising:

(i) one SPACE;

(ii) no more than 10 characters.

(2) 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.

(3) Except as provided in 23.2.4.4.15.1(4) 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) 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.

(5) The transmission identification shall be sent over the circuit in the following sequence:

(a) transmitting-terminal letter;

(b) receiving-terminal letter;

(c) channel-identification letter;

(d) channel-sequence number.

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 23.2.4.4.15.1(5) shall be followed immediately by that of 23.2.4.4.15.2.

23.2.4.4.15.2 ADDRESS

(1) The address shall comprise:

(a) alignment function [<≡];

(b) priority indicator;

(c) addressee indicator(s);

(d) alignment function [<≡].

(2) 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 23.2.4.4.1.1.(2))
FF	flight safety messages (see 23.2.4.4.1.1.(3))
GG	meteorological messages (see 23.2.4.4.1.1.(4))
GG	flight regularity messages (see 23.2.4.4.1.1.(5))
GG	aeronautical information services messages (see 23.2.4.4.1.1.(6))
KK	aeronautical administrative messages (see 23.2.4.4.1.1.(7))
as appropriate	service messages (see 23.2.4.4.1.1(9))

(3) The order of priority shall be the same as specified in 23.2.4.4.1.(2).

(4) 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;

(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.

(5) 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 23.2.4.4.15.2(4) 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.

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 given in sequence for each addressee (*Example:*→**EGLLZRZX**→**EGLLYKYX**→**EGLLACAD**)	
		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	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 23.2.4.4.14)

(6) 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.

(7) The complete address shall be restricted to three lines of page printing copy, and, except as provided in 23.2.4.4.15, a separate addressee indicator shall be used for each addressee whether at the same or different locations.

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

(9) 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 23.2.4.4.15.2(8). 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.

23.2.4.4.15.3 ORIGIN

(1) 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).

(2) The filing time shall comprise the 6-digit date-time group indicating the date and time of filing the message for transmission (see 23.2.3.4(2)

(3) 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) Where a message is originated by an organization that has not been allocated an ICAO three-letter designator of the type prescribed in 23.2.4.4.15.(3)(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.

(5) 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.

(6) 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.

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

Note.— Use of the priority alarm will actuate a bell (attention) signal at the receiving teletypewriter station, other than at those fully automatic stations which may provide a similar alarm on receipt of priority indicator SS, thereby alerting supervisory personnel at relay centres and operators at tributary stations, so that immediate attention may be given to the message.

(8) 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.

(9) 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.

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

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

23.2.4.4.15.4 TEXT

(1) The text of messages shall be drafted in accordance with

23.2.4.1.1and shall consist of all data between STX and ETX.

Note — When message texts do not require conversion to the ITA-2 code and format and do not conflict with ICAO message types or formats in the PANS-ATM (Doc 4444), authorities may make full use of the characters available in International Alphabet No. 5 (IA-5).

(2) When an originator's reference is used, it shall appear at the beginning of the text, except as provided in 23.2.4.4.15.4(3) and 23.2.4.4.15.4(4).

(3) 23.2.4.4.15.4(3) comprise the second element of the addressee indicator (see 23.2.4.4.15.2(5) and 23.2.4.4.15.2(6)) 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) 23.2.4.4.15.4(4) *ZZZ* comprise the second element of the originator indicator (see 23.2.4.4.15.3(4) and 23.4.4.15.3.(6)) 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.

(5) When applying the provisions of 23.2.4.4.15.4(3) and 23.2.4.4.15.4(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.

(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.

(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).

(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).

(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.

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

(11) When messages are transmitted only on low-speed circuits, the text of messages entered by the AFTN origin station shall not exceed 1800 characters in length. AFTN messages exceeding 1800 characters shall be entered by the AFTN origin station in the form of separate messages.

Note 1.— Low-speed circuits operate at 300 bits per second or less.

Note 2.— Guidance material for forming separate messages from a single long message is given in Attachment B to Volume II.

Note 3.— The character count includes all printing and non-printing characters in the text from, but not including, the start-of-text signal to, but not including, the first alignment function of the ending.

(12) The transmission on medium- or high-speed circuits of AFTN messages with text exceeding 1 800 characters that have not been entered by the AFTN origin station in the form of separate messages shall be subject to agreement between the authorities concerned and not diminish the performance characteristics of the network or link.

Note 1.— Medium-speed circuits operate at speeds in the range between 300 and 3 000 bits per second. High-speed circuits operate at speeds in excess of 3000 bits per second.

Note 2.— Guidance material for forming separate messages from a single long message is given in Attachment B to Volume II.

Note 3.— The character count includes all printing and non-printing characters in the text from, but not including, the start-of-text signal to, but not including, the first alignment function of the ending.

23.2.4.4.15.5 ENDING

(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).

(2) 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).

(3) When the message does not transit ITA-2 portions of the AFTN, or where authorities 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 authorities concerned.

(4) When messages are transmitted only on low-speed circuits, messages entered by the AFTN origin station shall not exceed 2 100 characters in length.

Note 1.— Low-speed circuits operate at 300 bits per second or less.

Note 2.— The character count includes all printing and non-printing characters in the message from and including the start-of-heading character (SOH) to and including the end-of-text character.

(5) The transmission on medium- or high-speed circuits of AFTN messages exceeding 2 100 characters that have not been entered by the AFTN origin station in the form of separate messages shall be subject to agreement between the authorities concerned and not diminish the performance characteristics of the network or link.

Note 1.— Medium-speed circuits operate at speeds in the range between 300 and 3 000 bits per second. High-speed circuits operate at speeds in excess of 3 000 bits per second.

Note 2.— The character count includes all printing and non-printing characters in the message from and including the start-of-heading character (SOH) to and including the end-of-text character.

(6) Except as provided in 23.2.4.4.15.6 to 23.2.4.4.15.6(4) and 23.2.4.4.15, the procedures of 23.2.4.4.8 and 23.2.4.4.9 to 23.2.4.4.13 shall be used for messages using IA-5 code.

(7) The transmission of message texts that do not require conversion to the IA-2 code and format and with message lines containing more than 69 printable and non-printable characters shall be subject to agreement between the

authorities concerned.

23.2.4.4.15.6 CHANNEL-CHECK TRANSMISSIONS.

(1) In the case where continuous control of channel condition is not provided the following periodic transmissions shall be sent on tele- typewriter circuits:

(a) heading line (see 23.2.4.4.15.1(1));

(b) alignment function SXT;

(c) the procedure signal CH;

(d) alignment function EXT.

(2) 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.

Note. – Application of this procedure provides some measure of assurance that channel continuity is maintained; however, a continuously controlled channel is much more preferable in that data integrity can also be improved.

(3) Where a circuit is unoccupied and uncontrolled, the transmission identified in 23.2.4.4.15.6 shall be sent at H + 00, H + 20, H + 40.

(4) 23.2.4.4.15.6(4) (priority indicator SS, see 23.2.4.4.1(2)) shall be individually acknowledged by the AFTN destination station by sending a service message (see 23.2.4.4.1.1(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 23.2.4.4.15.3(7),and shall have a text comprising:

(a) the procedure signal R;

(b) the origin line (see 23.2.4.4.15.3) without priority alarm, or optional heading information of the message being acknowledged;

(c) the ending (see 23.2.4.4.15.5(1)).

Note.— The following example illustrates the application of the 23.2.4.4.15.6(4) procedures:

Heading (*see* 23.2.4.4.15.1(1))

<≡ SS → LECBZRZX <≡

121322 → EGLLYFYX (Priority Alarm) <≡

S
TR → 121319 → LECBZRZX <≡
X

Ending (*see* 23.2.4.4.15.5(1)).

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

(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.

(2) On channels not employing continuous control the relay station shall employ the following procedures:

(a) 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:

(i) cancel the onward routing responsibility for the message;
(ii) send a service message to the transmitting station requesting a retransmission.

Note.— The following example illustrates a typical text of a

service message in which the foregoing procedure has been applied in respect of a mutilated message:

SVC→QTA→RPT→ABC 123 (ending — see 23.2.4.4.15.5(1))

(3) When the provisions of 23.2.4.4.11(5) 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 23.2.4.4.15.2(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.

Note.— The following example illustrates a typical text of a service message in which the foregoing procedure has been applied in respect of a mutilated message having as its origin "141335 CYULACAX":

SVC→QTA→RPT→141335→CYULACAX
(ending — *see* 23.3.4.4.15.5(1))

(4) 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:

(a)<≡CHECK≡TEXT≡NEW→ENDING→ADDED

(b) its own station identification;

(c)(ending – see 23.2.4.4.15.5(1)).

23.2.4.4.16 TRANSFER OF AFTN MESSAGES OVER CODE AND BYTE INDEPENDENT CIRCUITS AND NETWORKS.

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

(2) Except as provided in 23.2.4.4.16(4) the heading line of the message shall be omitted. The message shall start with an alignment function followed by the address.

(3) The message shall end with a complete ending.

(4) 23.2.4.4.16(4) 23.2.4.4.17.3 ~~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.

(5) When the provisions of 23.2.4.4.16(4) are applied, the data added shall not include either carriage return or line feed characters or any of the combinations listed in 23.2.4.1.1(5).

23.2.4.5 COMMON ICAO DATA INTERCHANGE NETWORK (CIDIN)

Note1-The common ICAO data interchange network (CIDIN), which comprises application entities and communication services for ground-ground message exchange, makes use of protocols based on the International Telegraph and Telephone Consultative Committee (CCITT) X.25 provision to provide code and byte-independent communication facilities.

Note 2-The principal goals of the CIDIN are to improve the AFTN and to support large message transmission and more demanding applications, such as operational meteorological information (OPMET), between two or multiple ground systems.

23.2.4.6 ATS MESSAGE HANDLING SERVICES (ATSMHS)

(1) 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.

Note 1.— The ATS message service comprised in the ATS

message handling service application aims at providing generic message services over the ATN internet communication service (ICS). It may, in turn, be used as a communication system by user-applications communicating over the ATN. This may be achieved, for example, by means of application programme interfaces to the ATS message service.

Note 2.— The detailed specification of the ATS message handling service application is included in the Manual on Detailed Technical Specifications for the Aeronautical Telecommunication Network (ATN) using ISO/OSI Standards and Protocols *(Doc 9880), Part II.*

Note 3.— The ATS message service is provided by the implementation over the ATN internet communication service of the message handling systems specified in ISO/IEC (International Organization for Standardization/International Electrotechnical Commission) 10021 and ITU-T (International Telecommunication Union — Telecommunication Standardization Sector) X.400 and complemented by the additional requirements specified in the Manual on Detailed Technical Specifications for the Aeronautical Telecommunication Network (ATN) using ISO/OSI Standards and Protocols *(Doc 9880), Part II. The two sets of documents, the ISO/IEC MOTIS (Message-Oriented Text Interchange System) International Standards and the ITU-T X.400 Series of Recommendations (1988 or later) are, in principle, aligned with each other. However, there are a small number of differences. In the above-mentioned document, reference is made to the relevant ISO International Standards and International Standardized Profiles (ISP), where applicable. Where necessary, e.g. for reasons of interworking or to point out differences, reference is also made to the relevant X.400 Recommendations.*

Note 4.— The following types of ATN end systems performing ATS message handling services are defined in the Manual on Detailed Technical Specifications for the Aeronautical Telecommunication Network (ATN) using ISO/OSI Standards and Protocols *(Doc 9880), Part II:*

(a) an ATS message server;

(b) an ATS message user agent; and

(c) an AFTN/AMHS gateway (aeronautical fixed telecommunication network/ATS message handling system).

(2) Connections may be established over the internet communications service between any pair constituted of these ATN end systems (see Table 4-1).

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	CIDIN/AMHS Gateway
ATS Message Server	ATS Message User Agent
AFTN/AMHS Gateway	AFTN/AMHS Gateway
CIDIN/AMHS Gateway	CIDIN/AMHS Gateway
CIDIN/AMHS Gateway	AFTN/AMHS Gateway

23.2.4.7 INTER-CENTRE COMMUNICATIONS (ICC)

The inter-centre communications (ICC) applications set shall be used to exchange ATS messages between air traffic services ~~users~~ units over the ATN/IPS ~~internet~~.

Note 1.— The ICC applications set enables the exchange of information in support of the following operational services:

a) flight notification;

b) flight coordination;

c) transfer of control and communications;

d) flight planning;

e) airspace management; and

f) air traffic flow management.

Note 2.— The first of the applications developed for the ICC set is the ATS interfacility data communication (AIDC).

Note 3.— The AIDC application exchanges information between ATS units (ATSUs) for support of critical air traffic control (ATC) functions, such as notification of flights approaching a flight information region (FIR) boundary, coordination of boundary conditions and transfer of control and communications authority.

23.2.5 AERONAUTICAL MOBILE SERVICE - VOICE COMMUNICATIONS

Note 1.— For the purposes of these provisions, the communication procedures applicable to the aeronautical mobile service, as appropriate, also apply to the aeronautical mobile satellite service.

Note 2.— Guidance material for the implementation of the aeronautical mobile satellite service is contained in the Manual on the Aeronautical Mobile Satellite (Route) Service (*Doc 9925*). *Additional guidance for satellite voice communications (SATVOICE) is contained in the* Satellite Voice Operations Manual *(Doc 10038) and the* Performance-based Communication and Surveillance (PBCS) Manual (*Doc 9869*).

23.2.5.1 GENERAL

(1) In all communications the highest standard of discipline shall be observed at all times.

(2) 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.

(3) The transmission of messages, other than those specified in 23.2.5.2, on aeronautical mobile frequencies when the aeronautical fixed services are able to serve the intended purpose, shall be avoided.

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

Note.— Guidance material on human performance can be found in the Human Factors Training Manual *(Doc 9683).*

(5) 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.

(6) 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.

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

Note.— In certain cases when SELCAL is used the procedures respecting the establishment of communications are contained in 23.2.5.7

(8) 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.

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

(10) 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.

23.2.5.2 CATEGORIES OF MESSAGES

(1) 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 signal	***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	—

Note 1.— Messages concerning acts of unlawful interference constitute a case of exceptional circumstances which may preclude the use of recognized communication procedures used to determine message category and priority.

Note 2.— A NOTAM may qualify for any of the categories or priorities c) to f) inclusive. The decision as to which priority will depend on the contents of the NOTAM and its importance to the aircraft concerned.

(2) Distress messages and distress traffic shall be handled in

accordance with the provisions of 23.2.5.8

(3) Urgency messages and urgency traffic, including messages preceded by the medical transports signal, shall be handled in accordance with the provisions of 23.2.5.8

*Note.— The term "medical transports" is defined in the 1949 Geneva Conventions and Additional Protocols (*see *also RR S33 Section III) and refers to "any means of transportation by land, water, or air, whether military or civilian, permanent or temporary, assigned exclusively to medical transportation and under the control of a competent authority of a Party to the conflict".*

(4) Communications relating to direction finding shall be handled in accordance with 23.2.6.

(5) Flight safety messages shall comprise the following:

(a) movement and control messages.

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

(c) meteorological advice of immediate concern to an aircraft in flight or about to depart (individually communicated or for broadcast);

(d) other messages concerning aircraft in flight or about to depart.

(6) Meteorological messages shall comprise meteorological information to or from aircraft, other than those in 23.2.5.2(5)(c).

(7) Flight regularity messages shall comprise the following:

(a) messages regarding the operation or maintenance of facilities essential for the safety or regularity of aircraft operation;

(b) messages concerning the servicing of aircraft;

(c) 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;

(d) messages concerning non-routine landings to be made by the aircraft;

(e) messages concerning aircraft parts and materials urgently required;

(f) messages concerning changes in aircraft operating schedules.

(8) 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.

Note.— The messages at 23.2.5.2(5)b) and 23.2.5.2(7) (a) to (f) typify some of the operational control communications defined in 23.2.1 of this part.

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

(10) 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 23.2.5.2 .

23.2.5.3 CANCELLATION OF MESSAGES

(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.

(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.

(3) The station cancelling a transmission shall be responsible for any further action required.

23.2.5.4 RADIOTELEPHONY PROCEDURES

Note: When Selective Calling (SELCAL) equipment is used certain of the following procedures are superseded by those contained in 23.2.5.7 .

23.2.5.4.1 GENERAL

PANS – When a controller or pilot communicates via voice, the response shall be via voice. Except as provided by 23.2.8.2.12.1, when a controller or pilot communicates via CPDLC, the response shall be via CPDLC.

23.2.5.4.2 LANGUAGE TO BE USED

(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.

(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.

(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.

23.2.5.4.3 WORD SPELLING IN RADIOTELEPHONY.

(1) 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**	'ɑlfa	AL FAH
B	**Bravo**	'bra:'vo	BRAH VOH
C	**Charlie**	'tʃɑ:li *or* 'ʃɑ:li	CHAR LEE *or* SHAR LEE
D	**Delta**	'delt‿ɑ	DELL TAH
E	**Echo**	'eko	ECK OH
F	**Foxtrot**	'fɔkstr‿ɔt	FOKS TROT
G	**Golf**	gɔlf	GOLF
H	**Hotel**	ho:'tel	HO TELL
I	**India**	'indiə‿ɑ	IN DEE AH
J	**Juliett**	'dʒu:liə‿et	JEW LEE ETT
K	**Kilo**	'ki:lo	KEY LOH
L	**Lima**	'li:m‿ɑ	LEE MAH
M	**Mike**	mɔik	MIKE
N	**November**	no'vemb‿ɔ	NO VEM BER
O	**Oscar**	'ɔsk‿ɑ	OSS CAH
P	**Papa**	pɑ'pɑ	PAH PAH
Q	**Quebec**	ke'bek	KEH BECK
R	**Romeo**	'ro:miə‿ɔ	ROW ME OH
S	**Sierra**	si'er‿ɑ	SEE AIR RAH
T	**Tango**	'tɔŋgo	TANG GO
U	**Uniform**	'ju:nifɔ:m *or* 'u:nifɔrm	YOU NEE FORM *or* OO NEE FORM
V	**Victor**	'vikt‿ɔ	VIK TAH
W	**Whiskey**	'wiski	WISS KEY
X	**X-ray**	'eks'rei	ECKS RAY
Y	**Yankee**	'jɔŋki	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

23.2.5.4.4 TRANSMISSION OF NUMBERS IN RADIOTELEPHONY

23.2.5.4.4.1 TRANSMISSION OF NUMBERS

(1) All numbers, except as prescribed in 23.2.5.4.4.1.(2) to 3.2.5.4.4.1.(4), shall be transmitted by pronouncing each digit separately.

*Note.— The following examples illustrate the application of this procedure (*see *23.2.5.4.4.3(1) for pronunciation).*

aircraft call signs	*transmitted as*
CCA 238	Air China **two three eight**
OAL 242	Olympic **two four two**
flight levels	*transmitted as*
FL 180	flight level **one eight zero**
FL 200	flight level **two zero zero**
headings	*transmitted as*
100 degrees	heading **one zero zero**
080 degrees	heading **zero eight zero**
wind direction and speed	*transmitted as*
200 degrees 70 knots	wind **two zero zero** degrees **seven zero** knots
160 degrees 18 knots 30 knots	wind **one six zero** degrees **one eight** knots gusting **three zero knots**
transponder codes	*transmitted as*
2 400	squawk **two four zero zero**

4 203	squawk **four two zero three**

runway	*transmitted as*
27	runway **two seven**
30	runway **three zero**

altimeter setting	*transmitted as*
1 010	QNH **one zero one zero**
1 000	QNH **one zero zero zero**

(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.

*Note.— The following examples illustrate the application of this procedure (*see 23.2.5.2.1.4.3.1 *for pronunciation).*

altitude	*transmitted as*
800	**eight hundred**
3 400	**three thousand four hundred**
12 000	**one two thousand**

cloud height	*transmitted as*
2 200	**two thousand two hundred**
4 300	**four thousand three hundred**

visibility	*transmitted as*

1 000	visibility **one thousand**
700	visibility **seven hundred**
runway visual range	*transmitted as*
600	RVR **six hundred**
1 700	RVR **one thousand seven hundred**

(3) Numbers containing a decimal point shall be transmitted as prescribed in 23.2.5.4.4(1) with the decimal point in appropriate sequence being indicated by the word DECIMAL.

Note 1.— The following examples illustrate the application of this procedure:

Number	*Transmitted as*
100.3	ONE ZERO ZERO DECIMAL THREE
38 143.9	THREE EIGHT ONE FOUR THREE DECIMAL NINE

Note 2.— For identification of VHF frequencies, the number of digits used after the decimal point are determined on the basis of the channel spacing (23.2.5.2.1.7.3.3(3) refers to frequencies separated by 25 kHz, 23.2.5.2.1.7.3.3(4) refers to frequencies separated by 8.33 kHz).

Note 3.— The channelling/frequency pairing relationship for 8.33 kHz and 25 kHz is found in Table 4-1 (bis), *Subpart 4 of Part 23.*

(4) **PANS**-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.

Note.— The following example illustrates the application of this procedure when applying the provisions of 5.2.1.2.2:

Time	*Statement*
0920 *(9:20 A.M.)*	TOO ZE-RO
or	ZE-RO NIN-er TOO ZE-RO
1643 *(4:43 P.M.)*	FOW-er TREE
or	WUN SIX FOW-er TREE

23.2.5.4.4.2 VERIFICATION OF NUMBERS

(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.

23.2.5.4.4.3 PRONUNCIATION OF NUMBERS

(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

Note.— The syllables printed in capital letters in the above list are to be stressed; for example, the two syllables in ZE-RO are given equal emphasis, whereas the first syllable of FOW-er is given primary emphasis

23.2.5.4.4.4 TRANSMITTING TECHNIQUE

(1) **PANS.—** *Each written message shall be read prior to commencement of transmission in order to eliminate unnecessary delays in communications.*

(2) Transmissions shall be conducted concisely in a normal conversational tone.

(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 shall 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

(4) Speech transmitting technique shall be adapted to the prevailing communications conditions.

(5) **PANS.—** Messages accepted for transmission shall 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 shall 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. The abbreviations which constitute the exceptions mentioned in 23.2.5.4.4.4(5) are specifically identified in the abbreviation encode sections of the PANS-ABC (Doc 8400).

Note.— The abbreviations which constitute the exceptions mentioned in 23.2.5.4.4.4(5) are specifically identified in the abbreviation encode sections of the PANS-ABC (Doc 8400).

(6) **PANS.—** *To expedite communication, the use of phonetic spelling shall be dispensed with, if there is no risk of this affecting correct reception and intelligibility of the message.*

(7) **PANS.—** *The transmission of long messages shall 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.*

(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)."
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."
GO AHEAD	"Proceed with your message."
HOW DO YOU READ	"What is the readability of my transmission?" (see 23.2.5.2.1.8.4.)
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 information..."	"Pass me the following
REQUEST obtain..."	"I shall like to know..." or "I wish to
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." *Note.— For normal rate of speech, see 5.2.1.5.3 b).*
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."

23.2.5.4.4.5 COMPOSITION OF MESSAGES

(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 23.2.5.4.5.2.3

(b) text (see 23.2.5.4.4.5(4)

Note.— The following examples illustrate the application of this procedure:

(call) NEW YORK RADIO SWISSAIR ONE ONE ZERO
(text) REQUEST SELCAL CHECK

or

(call) SWISSAIR ONE ONE ZERO NEW YORK RADIO
(text) CONTACT SAN JUAN ON FIVE SIX

(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 23.2.3.3(12) shall be composed as follows:

(3) When originated in an aircraft:

(a) call (see 23.2.5.4.5.2.3

(b) the word FOR;

(c) the name of the organization addressed;

(d) the name of the station of destination;

(e) the text.

(4) The text shall be as short as practicable to convey the necessary information; full use shall be made of ICAO

phraseologies.

Note.— The following example illustrates the application of this procedure:

(call) BOSTON RADIO SWISSAIR ONE TWO EIGHT
(address) FOR SWISSAIR BOSTON
(text) NUMBER ONE ENGINE CHANGE REQUIRED

23.2.5.4.4.6 WHEN ADDRESSED TO AN AIRCRAFT.

(1) When a message, prepared in accordance with 23.2.4.4.2, 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.

(2) When the provisions of 23.2.5.4.4.6

(3) 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).

(4) **PANS.—** 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.

Note.— The abbreviations which constitute the exceptions mentioned in 23.2.5.4.4.6(4) are specifically identified in the abbreviations encode sections of the PANS-ABC (Doc 8400).

23.2.5.4.5 CALLING

23.2.5.4.5.1 RADIOTELEPHONY CALL SIGNS FOR AERONAUTICAL STATIONS

(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.

(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

23.2.5.4.5.2 RADIOTELEPHONY CALL SIGNS FOR AIRCRAFT

Note.— The formation of call signs as specified in ITU Radio Regulations S19 Section III and Section VII.

23.2.5.4.5.2.1 FULL CALL SIGNS

(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.

Note- 1. The name of the aircraft manufacturer or of the aircraft model may be used as a radiotelephony prefix to the Type a) call sign (see Table 5-1).

Note 2.— The telephony designators referred to in Types b) and c) are contained in Doc 8585 — Designators for Aircraft Operating Agencies, Aeronautical Authorities and Services.

Note 3.— Any of the foregoing call signs may be inserted in the corresponding item of the filed flight plan concerning aircraft identification, such as Item 7 in FPL*. Instructions on the completion of the flight plan form are contained in the PANS-ATM (Doc 4444).*

23.2.5.4.5.2.2 ABBREVIATED CALL SIGNS

(1) The aircraft radiotelephony call signs shown in 23.2.5.4.5.2.1(1) , with the exception of Type c), may be abbreviated in the circumstances prescribed in 23.2.5.4.5.2.3.2(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* 23.2.5.4.5.2.1(1) and 23.2.5.4.5.2.2(1))

		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)

** Examples illustrate the application of Note 1 to 23.2.5.4.5.2.1(1)*

23.2.5.4.5.2.3 RADIOTELEPHONY PROCEDURES

(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.

(2) 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.

23.2.5.4.5.2.3.1 ESTABLISHMENT OF RADIOTELEPHONY COMMUNICATIONS

(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.

Table 5-2. Radiotelephony calling procedure

	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 23.2.5.4.3 shall be used.*
Numbers are to be spoken in accordance with 23.2.5.4.4

(2) **PANS.—** *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.*

Note.— No reply is expected to such general calls unless individual stations are subsequently called to acknowledge receipt.

(3) The reply to the above calls shall be in accordance with Table 5-3.

Table 5-3. Radiotelephony reply procedure (See 23.2.5.4.5.2.3.1(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
Invitation to proceed with transmission	GO AHEAD	GO AHEAD	GO AHEAD

* 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 23.2.5.4.3 shall be used. Numbers are to be spoken in accordance with 23.2.5.4.4.

(4) **PANS.—** *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

Note.— The following example illustrates the application of this procedure: (CAIRO station replying)

STATION CALLING CAIRO *(pause)* SAY AGAIN YOUR CALL SIGN

(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.

(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.

Note.— For conditions on use of air-to-air channels see 23.5.4.1.3.2.1 of Subpart 5 of Part 23 and *also 23.2.5.5.1(5) of Subpart 2 of Part 23 of Ghana Civil Aviation (ANS) Directives.*

(7) **PANS -** As the aircraft may be guarding more than one frequency, the initial call shall include the distinctive channel identification “INTERPILOT”.

Note.— The following examples illustrate the application of this calling procedure.

CLIPPER 123 — SABENA 901 — INTERPILOT — DO YOU READ

or

ANY AIRCRAFT VICINITY OF 30 NORTH 160 EAST — JAPANAIR 401 — INTERPILOT — OVER

23.2.5.4.5.2.3.2 SUBSEQUENT RADIOTELEPHONY COMMUNICATIONS

(1) Abbreviated radiotelephony call signs, as prescribed in 23.2.5.4.5.2.2, 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.

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

(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.

23.2.5.2.1.7.3.3 INDICATION OF TRANSMITTING CHANNEL

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

(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.

Note.— The following example illustrates the application of this

procedure: (PAA 325 calling Kingston on 8 871 kHz)

KINGSTON CLIPPER THREE TWO FIVE — ON EIGHT EIGHT

(3) **PANS –** Except as specified in 23.2.5.2.1.7.3.3(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.

Note 1.— The following examples illustrate the application of the procedure in 23.2.5.2.1.7.3.3(3)

Channel	*Transmitted as*
118.000	*ONE ONE EIGHT DECIMAL ZERO*
118.005	*ONE ONE EIGHT DECIMAL ZERO ZERO FIVE*
118.010	*ONE ONE EIGHT DECIMAL ZERO ONE ZERO*
118.025	*ONE ONE EIGHT DECIMAL ZERO TWO FIVE*
118.050	*ONE ONE EIGHT DECIMAL ZERO FIVE ZERO*
118.100	*ONE ONE EIGHT DECIMAL ONE*

Note 2.— Caution must be exercised with respect to the indication of transmitting channels in VHF radiotelephony communications when all six digits of the numerical designator are used in airspace where communication channels are separated by 25 kHz, because on aircraft installations with a channel separation capability of 25 kHz or more, it is only possible to select the first five digits of the numerical designator on the radio management panel.

*Note 3.— The numerical designator corresponds to the channel identification in Table 4-1 (*bis*) of Subpart 5 of Part 23 of Ghana Civil Aviation (ANS) Directives.*

(4) In airspace where all VHF voice communications channels are separated by 25 kHz or more and the use of six digits as in 23.2.5.2.1.7.3.3(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.

Note 1.— The following examples illustrate the application of the procedure in 23.2.5.2.1.7.3.3(4) and the associated settings of the aircraft radio management panel for communication equipment with channel separation capabilities of 25 kHz and 8.33/25 kHz:

Channel Transmitted as	*Radio management panel setting for communication equipment with*	
	25 kHz (5 digits)	***8.33/ 25 kHz (6 digits)***
118.000 ONE ONE EIGHT DECIMAL ZERO	*118.00*	*118.000*
118.025 ONE ONE EIGHT DECIMAL ZERO TWO	*118.02*	*118.025*
118.050 ONE ONE EIGHT DECIMAL ZERO FIVE	*118.05*	*118.050*
118.075 ONE ONE EIGHT DECIMAL ZERO SEVEN	*118.07*	*118.075*
118.100 ONE ONE EIGHT DECIMAL ONE	*118.10*	*118.100*

Note 2.— Caution must be exercised with respect to the indication of transmitting channels in VHF radiotelephony communications when five digits of the numerical designator are used in airspace where aircraft are also operated with channel separation capabilities of 8.33/25 kHz. On aircraft installations with a channel separation capability of 8.33 kHz and more, it is possible to select six digits on the radio management panel. It shall therefore be ensured that the fifth and sixth digits are set to 25 kHz channels (see Note 1).

Note 3.— The numerical designator corresponds to the channel identification in Table 4-1 (bis) of Subpart 5 of Part 23 of Ghana

Civil Aviation (ANS) Directives.

23.2.5.4.6 TEST PROCEDURES

(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.

(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.

(3) **PANS -** The test transmission and reply thereto shall be recorded at the aeronautical station.

(4) **PANS -** 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
5 Perfectly readable

23.2.5.4.7 EXCHANGE OF COMMUNICATIONS

(1) Communications shall be concise and unambiguous, using standard phraseology whenever available.

(2) Abbreviated procedures shall only be used after initial contact

has been established and where no confusion is likely to arise.

(3) ***Acknowledgement of Receipt.*** The receiving operator shall make certain that the message has been received correctly before acknowledging receipt.

Note.— Acknowledgement of receipt is not to be confused with acknowledgement of intercept in radiotelephony network operations.

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

(5) **PANS –** 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.

Note .— The following example illustrates the application of this procedure:

(ATC clearance by network station to an aircraft)

Station:
TWA NINE SIX THREE MADRID

Aircraft:
MADRID TWA NINE SIX THREE

Station:
TWA NINE SIX THREE MADRID — ATC CLEARS TWA NINE SIX THREE TO DESCEND TO NINE
THOUSAND FEET

Aircraft (acknowledging):
CLEARED TO DESCEND TO NINE THOUSAND FEET — TWA NINE SIX THREE

Station (denoting accuracy of readback):
MADRID

(6) When acknowledgement of receipt is transmitted by an aeronautical station:

(a) 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;

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

(7) **PANS –** 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.

(8) **PANS –** 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.

(9) **PANS –** 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.

(10) ***End of Conversation.*** A radiotelephone conversation shall be terminated by the receiving station using its own call sign.

23.2.5.4.8 CORRECTIONS AND REPETITIONS

(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.

(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.

(3) When an operator transmitting a message considers that reception is likely to be difficult, he shall transmit the important elements of the message twice.

(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) 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)".

(6) Specific items shall be requested, as appropriate, such as "SAY AGAIN ALTIMETER", "SAY AGAIN WIND".

(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.

(8) ***"OPERATIONS NORMAL" REPORTS***

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

23.2.5.5 ESTABLISHMENT AND ASSURANCE OF COMMUNICATIONS

23.2.5.5.1 COMMUNICATIONS WATCH OR HOURS OF SERVICE

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

(2) 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.

(3) 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.

(4) Aircraft on flights other than those specified in 23.2.5.5.1(2) and 23.2.5.5.1(3) shall guard the emergency frequency 121.5 MHz to the extent possible.

(5) 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.

(6) Aeronautical stations shall maintain watch as required by the appropriate Authority.

(7) 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.

Note.— See Subpart 23.5.4.1.3.1.1 of Part 23 of Ghana Civil Aviation (ANS) Directives *for provisions related to the utilization of 121.5 MHz at aeronautical stations*

(8) 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.

(9) 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.

(10) 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.

23.2.5.5.2 PRINCIPLES OF NETWORK OPERATION (HF COMMUNICATIONS)

(1) **PANS-**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.

(2) **PANS-**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.

Note 1.— The selection of stations to act as regular stations for a particular route segment will, where necessary, be undertaken by regional or local agreement, after consultation, if necessary, between the States responsible for the network.

Note 2.— In principle, the regular stations will be those serving the locations immediately concerned with flights on that route segment, i.e. points of take-off and landing, appropriate flight information centres or area control centres and, in some cases, additional suitably located stations required to complete the communication coverage or for intercept purposes.

Note 3.— In selecting the regular stations, account will be taken of the propagation characteristics of the frequencies used.

(3) **PANS-**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.

(4) **PANS –** 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;

(c) be responsible for the action required in case of failure of communications (see 23.2.5.5.7.3).

(5) **PANS-**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.

23.2.5.5.3 FREQUENCIES TO BE USED

(1) Aircraft stations shall operate on the appropriate radio frequencies.

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

(3) **PANS –** 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.

(4) An aeronautical station, when designating frequencies in accordance with 23.2.5.5.3(2) or 23.2.5.5.3(3), shall take into account the appropriate propagation data and distance over which communications are required.

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

(6) When, notwithstanding the provisions of 23.2.5.1(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.

23.2.5.5.4 ESTABLISHMENT OF COMMUNICATIONS

(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.

(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.

(3) **PANS –** 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.

(4) **PANS –** 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) **PANS –** The provisions of 23.2.5.5.4(3) and 23.2.5.5.4(4) 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.

Note.— A specific time period may be prescribed by the ATS Provider.

23.2.5.5.5 TRANSFER OF HF COMMUNICATIONS

(1) **PANS-**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.

(2) **PANS-**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.

(3) An aircraft station which has transferred communications

watch from one radio frequency to another shall, when so required by the ATS Provider, inform the aeronautical station concerned that communications watch has been established on the new frequency.

(4) **PANS-**When entering a network after takeoff, an aircraft station shall transmit its take-off time or time over the last check-point, to the appropriate regular station.

(5) **PANS-**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.

(6) **PANS-**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)

23.2.5.5.6 TRANSFER OF VHF COMMUNICATIONS

(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.

(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.

23.2.5.5.7 VOICE COMMUNICATIONS FAILURE

23.2.5.5.7.1 AIR-GROUND

(1) When an aircraft station fails to establish contact with the aeronautical station on the designated frequency, it shall attempt to establish contact on another frequency appropriate to the route. If this attempt fails, the aircraft station shall attempt to establish communication with other aircraft or other aeronautical stations on frequencies appropriate to the route. In addition, an aircraft operating within a network shall monitor the appropriate VHF frequency for calls from nearby aircraft.

(2) If the attempts specified under 23.2.5.5.7.1(1) fail, the aircraft station shall transmit its message twice on the designated frequency(ies), preceded by the phrase "TRANSMITTING BLIND" and, if necessary, include the addressee(s) for which the message is intended.

(3) **PANS-**In network operation, a message which is transmitted blind shall be transmitted twice on both primary and secondary frequencies. Before changing frequency, the aircraft station shall announce the frequency to which it is changing.

23.2.5.5.7.2 RECEIVER FAILURE

(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 frequency 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.

(2) An aircraft which is provided with air traffic control or advisory service shall, in addition to complying with 23.5.2.2.7.1.3.1, transmit information regarding the intention of the pilot-in- command with respect to the continuation of the flight of the aircraft.

(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.

Note.— General rules which are applicable in the event of communications failure are contained in Part 19 of Ghana Civil Aviation (ANS) Directives.

23.2.5.5.7.3 GROUND-TO-AIR

(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;

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

(2) The provisions of 23.2.5.5.7.3(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.

Note.— A specific time period may be prescribed by the ATS Provider.

(3) If the attempts specified in 23.2.5.5.7.3(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.

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

(5) ***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.

23.2.5.6 HF MESSAGE HANDLING

23.2.5.6.1 GENERAL

(1) **PANS-**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.

Note.— Exceptionally, an aircraft may need to communicate with an aeronautical station outside the network appropriate to its particular route segment. This is permissible, provided it can be done without interrupting the continuous watch with the communication network appropriate to the route segment, when such watch is required by the ATS Provider, and provided it does not cause undue interference with the operation of other aeronautical stations.

(2) **PANS –** 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.

Note 1.— Determination of the arrangements for dissemination of air-ground messages without address will be a matter for multilateral or local agreement.

Note 2.— In principle, the number of stations required to intercept are to be kept to a minimum consistent with the operational requirement

(3) **PANS -** Acknowledgement of intercept shall be made immediately after the acknowledgement of receipt by the station to which the message was passed.

(4) **PANS -** 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) **PANS -** 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.

(6) **PANS -** If, in abnormal circumstances, forwarding is necessary using the air-ground channels, the provisions of 23.2.5.5.3(6) shall be observed.

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

(8) **PANS -** 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.

(9) 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:

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

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

(10) **PANS -** The provisions of 23.2.5.6(2)shall also be applied, if practicable, in non-network operation.

(11) 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.

Note.— This does not preclude the transmission by the forwarding aeronautical station, of the original message to the aircraft addressed, if the forwarding station is later able to communicate with that aircraft.

(12) If the aeronautical station to which the message is addressed is unable to dispose of the message in accordance with 23.2.5.6.1(11) the station of origin shall be advised.

(13) 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.

23.2.5.6.2 TRANSMISSION OF ATS MESSAGES TO AIRCRAFT

(1) **PANS-**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.

(2) **PANS-**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.

(3) **PANS-**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.

23.2.5.6.3 RECORDING OF AIR-GROUND COMMUNICATIONS ON TELETYPEWRITER

(1) **PANS-**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:

(i) call sign of the calling station;

(ii) text of the message;

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

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

(v) designation of frequency used;

(vi) 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.

23.2.5.7 SELCAL PROCEDURES

Note.— The procedures contained in 23.2.5.7 are applicable when SELCAL is used and replace certain of the procedures related to calling contained in 23.2.5.4.1.

23.2.5.7.1 GENERAL

(1) **PANS-**With the selective calling system known as SELCAL, the voice calling is replaced by the transmission of coded tones to the aircraft over the radiotelephony channels. A single selective call consists of a combination of four pre-selected audio tones whose transmission requires approximately 2 seconds. The tones are generated in the aeronautical station coder and are received by a decoder connected to the audio output of the airborne receiver. Receipt of the assigned tone code (SELCAL code) activates a cockpit call system in the form of light and/or chime signals.

Note.— Due to the limited number of SELCAL codes, similar code assignments to multiple aircraft may be expected. Therefore, the use of correct radiotelephony (RTF) procedures contained in this Part is emphasized when establishing communications via SELCAL.

(2) **PANS-**SELCAL shall be utilized by suitably equipped stations for ground-to-air selective calling on the en-route HF and VHF radio channels.

(3) **PANS-**On aircraft equipped with SELCAL, the pilot is still able to keep a conventional listening watch if required.

23.2.5.7.2 NOTIFICATION TO AERONAUTICAL STATIONS OF AIRCRAFT SELCAL CODES

(1) **PANS-**It is the responsibility of the aircraft operating agency and the aircraft to ensure that all aeronautical stations, with which the aircraft would normally communicate during a particular flight, know the SELCAL code associated with its radiotelephony call sign.

(2) **PANS-**When practicable, the aircraft operating agency shall disseminate to all aeronautical stations concerned, at

regular intervals, a list of SELCAL codes assigned to its aircraft or flights.

(3) **PANS-**The aircraft shall:

(a) include the SELCAL code in the flight plan submitted to the appropriate air traffic services unit; and

(b) ensure that the HF aeronautical station has the correct SELCAL code information by establishing communications temporarily with the HF aeronautical station while still within VHF coverage.

Note.— Provisions regarding completion of the flight plan are set forth in the PANS-ATM (Doc 4444).

23.2.5.7.3 PRE-FLIGHT CHECK

(1) **PANS-**The aircraft station shall contact the appropriate aeronautical station and request a pre-flight SELCAL check and, if necessary, give its SELCAL code.

(2) **PANS-**When primary and secondary frequencies are assigned, a SELCAL check shall normally be made first on the secondary frequency and then on the primary frequency. The aircraft station would then be ready for continued communication on the primary frequency.

(3) **PANS-**hall the pre-flight check reveal that either the ground or airborne SELCAL installation is inoperative, the aircraft shall maintain a continuous listening watch on its subsequent flight until SELCAL again becomes available.

23.2.5.7.4 ESTABLISHMENT OF COMMUNICATIONS

(1) **PANS-**When an aeronautical station initiates a call by SELCAL, the aircraft replies with its radio call sign, followed by the phrase “GO AHEAD”.

23.2.5.7.5 EN-ROUTE PROCEDURES

(1) **PANS-**Aircraft stations shall ensure that the appropriate aeronautical station(s) are aware that SELCAL watch is being established or maintained.

(2) **PANS-**When so prescribed on the basis of regional air navigation agreements, calls for scheduled reports from aircraft may be initiated by an aeronautical station by means of SELCAL.

(3) **PANS-**Once SELCAL watch has been established by a particular aircraft station, aeronautical stations shall employ SELCAL whenever they require to call aircraft.

(4) **PANS-**In the event the SELCAL signal remains unanswered after two calls on the primary frequency and two calls on the secondary frequency, the aeronautical station shall revert to voice calling.

(5) **PANS-**Stations in a network shall keep each other **immediately** advised when malfunctioning occurs in a SELCAL installation on the ground or in the air. Likewise, the aircraft shall ensure that the aeronautical stations concerned with its flight are immediately made aware of any malfunctioning of its SELCAL installation, and that voice calling is necessary.

(6) **PANS-**All stations shall be advised when the SELCAL installation is again functioning normally.

23.2.5.7.6 SELCAL CODE ASSIGNMENT TO AIRCRAFT

(1) **PANS-**In principle, the SELCAL code in the aircraft shall be associated with the radiotelephony call sign, i.e. where the flight number (service number) is employed in the radio call sign, the SELCAL code in the aircraft shall be listed against the flight number. In all other cases, the SELCAL code in the aircraft shall be listed against the aircraft registration.

Note.— The use of aircraft radio call signs, consisting of the

airline abbreviation followed by the flight service number, is increasing among aircraft operators throughout the world. The SELCAL equipment in aircraft shall, therefore, be of a type which permits a particular code being associated with a particular flight number, i.e. equipment which is capable of adjustment in code combinations. At this stage, however, many aircraft still carry SELCAL equipment of the single code type, and it will not be possible for aircraft with such equipment to satisfy the principle set out above. This shall not militate against use of the flight number type of radio call sign by an aircraft so equipped if it wishes to apply this type of call sign, but it is essential when a single code airborne equipment is used in conjunction with a flight number type radio call sign that the ground stations be advised in connection with each flight of the SELCAL code available in the aircraft.

23.2.5.8 ISTRESS AND URGENCY RADIOTELEPHONY COMMUNICATION PROCEDURES

23.2.5.8.1 GENERAL

Note.— The distress and urgency procedures contained in 23.2.5.8 relate to the use of radiotelephony. The provisions of Article S30 and Appendix S13 of the ITU Radio Regulations are generally applicable, except that S30.9 permits other procedures to be employed where special arrangements between governments exist, and are also applicable to radiotelephony communications between aircraft stations and stations in the maritime mobile service

(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.

(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.

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

(4) 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) 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 23.2.5.8.2.2 and 23.2.5.8.3.2 respectively.

Note.— "Other stations" is intended to refer to any other station which has received the distress or urgency message and has become aware that it has not been acknowledged by the station addressed.

(6) 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.

Note.— 121.5 MHz or alternative available VHF or HF frequencies may be used as appropriate

(7) 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.

23.2.5.8.2 RADIOTELEPHONY DISTRESS COMMUNICATIONS

23.2.5.8.2.1 ACTION BY THE AIRCRAFT IN DISTRESS

(1) In addition to being preceded by the radiotelephony distress signal MAYDAY (see 23.2.5.8(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:

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

(ii) the identification of the aircraft;

(iii) the nature of the distress condition;

(iv) intention of the person in command;

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

Note 1.— The foregoing provisions may be supplemented by the following measures:

(a) the distress message of an aircraft in distress being made on the emergency frequency 121.5 MHz or another aeronautical mobile frequency, if considered necessary or desirable. Not all aeronautical stations maintain a continuous guard on the emergency frequency;

(b) the distress message of an aircraft in distress being broadcast, if time and circumstances make this course preferable;

(c) the aircraft transmitting on the maritime mobile service radiotelephony calling frequencies;

(d) the aircraft using any means at its disposal to attract attention and make known its conditions (including the activation of the appropriate SSR mode and code);

(e) any station taking any means at its disposal to assist an aircraft in distress;

(f) any variation on the elements listed under 23.2.5.8.2.1(1)b, when the transmitting station is not itself in distress, provided that such circumstance is clearly stated in the distress message.

Note 2.— The station addressed will normally be that station communicating with the aircraft or in whose area of responsibility the aircraft is operating.

23.2.5.8.2.2 ACTION BY THE STATION ADDRESSED OR FIRST STATION ACKNOWLEDGING THE DISTRESS MESSAGE

(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:

(i) the ATS unit concerned;

(ii) the aircraft operating agency concerned, or its representative, in accordance with preestablished arrangements;

Note.— The requirement to inform the aircraft operating agency concerned does not have priority over any other action which involves the safety of the flight in distress, or of any other flight in the area, or which might affect the progress of expected flights in the area.

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

23.2.5.8.2.3 IMPOSITION OF SILENCE

(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.

(2) The use of the signals specified in 23.5.8.2.3(1) shall be reserved for the aircraft station in distress and for the station controlling the distress traffic.

23.2.5.8.2.4 ACTION BY ALL OTHER STATIONS

(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.

(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.

23.2.5.8.2.5 TERMINATION OF DISTRESS COMMUNICATIONS AND OF SILENCE

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

(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:

(a) the ATS unit concerned;

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

(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 23.2.5.8.2.5(1), it is authorized to do so by the appropriate authority.

23.2.5.8.3 RADIOTELEPHONY URGENCY COMMUNICATIONS

23.2.5.8.3.1 ACTION BY THE AIRCRAFT REPORTING AN URGENCY CONDITION EXCEPT AS INDICATED IN 23.2.5.8.3.4

(1) In addition to being preceded by the radiotelephony urgency signal PAN PAN (see 23.2.5.8(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:

(i) the name of the station addressed;

(ii) the identification of the aircraft;

(iii) the nature of the urgency condition;

(iv) the intention of the person in command;

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

(vi) any other useful information.

Note 1.— The foregoing provisions of 23.2.5.8.3.1(1) are not intended to prevent an aircraft broadcasting an urgency message, if time and circumstances make this course preferable.

Note 2.— The station addressed will normally be that station communicating with the aircraft or in whose area of responsibility the aircraft is operating.

23.2.5.8.3.2 ACTION BY THE STATION ADDRESSED OR FIRST STATION ACKNOWLEDGING THE URGENCY MESSAGE

(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:

(i) the ATS unit concerned;

(ii) the aircraft operating agency concerned, or its representative, in accordance with preestablished arrangements;

Note.— The requirement to inform the aircraft operating agency concerned does not have priority over any other action which involves the safety of the flight in distress, or of any other flight in the area, or which might affect the progress of expected flights in the area.

(c) if necessary, exercise control of communications.

23.2.5.8.3.3 ACTION BY ALL OTHER STATIONS

(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.

23.2.5.8.3.4 ACTION BY AN AIRCRAFT USED FOR MEDICAL TRANSPORTS

(1) The use of the signal described in 23.2.5.8.3.4(2) shall indicate that the message which follows concerns a protected medical transport pursuant to the 1949 Geneva Conventions and Additional Protocols.

(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;

(e) estimated time en route and of departure and arrival, as appropriate; and

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

23.2.5.8.3.5 ACTION BY THE STATION ADDRESSED OR BY OTHER STATIONS RECEIVING A MEDICAL TRANSPORTS MESSAGE.

(1) The provisions of 23.2.5.8.3.2 and 23.2.5.8.3.3 shall apply as appropriate to stations receiving a medical transports message.

23.2.5.9 COMMUNICATIONS RELATED TO ACTS OF UNLAWFUL INTERFERENCE

(1) 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.

23.2.6 AERONAUTICAL RADIO NAVIGATION SERVICE

23.2.6.1 GENERAL

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

(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.

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

(4) 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 Part 15.

23.2.6.2 DIRECTION FINDING

Introductory Notes

1) Direction-finding stations work either singly or in groups of two or more stations under the direction of a main direction-finding station.

2) A direction-finding station working alone can only determine the direction of an aircraft in relation to itself.

(1) A direction-finding station working alone shall give the following, as requested:

(a) true bearing of the aircraft, using the appropriate phrase;

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

(c) magnetic bearing of the aircraft, using the appropriate phrase;

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

(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.

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

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

(b) 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;

(c) 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.

(4) 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.

(5) 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) 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 shall be repeated, the duration of the transmission required or any special transmission requirement.

(7) 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.

Note.— Certain types of VHF/DF stations require the provision of a modulated signal (voice transmission) in order to take a bearing.

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

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

(a) the appropriate phrase;

(b) bearing or heading in degrees in relation to the direction-finding station, sent as three figures;

(c) class of bearing;

(d) time of observation, if necessary.

(10) 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:

(a) the appropriate phrase;

(b) the position;

(c) class of position;

(d) time of observation.

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

(12) 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.

(13) 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.

(14) 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.

(15) 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.

23.2.7 AERONAUTICAL BROADCASTING SERVICE

23.2.7.1 GENERAL

23.2.7.1.1 BROADCAST MATERIAL

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

23.2.7.1.2 FREQUENCIES AND SCHEDULES

(1) Broadcasts shall be made on specified frequencies and at specified times.

(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.

Note.— This does not prevent an emergency change of frequency when required in circumstances which do not permit the promulgation of a NOTAM at least two weeks in advance of the change.

(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.

(4) 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.

(5) 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.

(6) 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.

23.2.7.1.3 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.

23.2.7.2 RADIOTELEPHONE BROADCAST PROCEDURES

23.2.7.2.1 BROADCAST TECHNIQUE

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

(2) Rate of speech on radiotelephone broadcasts shall not exceed 100 words per minute.

23.2.7.2.2 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).

Note.— The following example illustrates the application of this procedure:

(general call)	*ALL STATIONS*
(the words THIS IS)	*THIS IS*
(station name)	*NEW YORK RADIO*
(time of broadcast)	*TIME, ZERO ZERO FOUR FIVE*

23.2.8 AERONAUTICAL MOBILE SERVICE - DATA LINK COMMUNICATIONS

23.2.8.1 GENERAL

Note 1.— While the provisions of Chapter 8 are based primarily on the use of controller-pilot data link communications (CPDLC), the provisions of 8.1 would apply to other data link applications, where applicable, including surveillance — contract (ADS-C) and data link-flight information services (e.g. D-ATIS, D-VOLMET, etc.).

Note 2.— For the purposes of these provisions, the communication procedures applicable to the aeronautical mobile service, as appropriate, also apply to the aeronautical mobile satellite service.

Note 3.— Guidance material relating to CPDLC, ADS-C and related data link initiation capability (DLIC) can be found in the Global Operational Data Link (GOLD) Manual *(Doc 10037).*

23.2.8.1.1 DATA LINK INITIATION CAPABILITY (DLIC)

23.2.8.1.1.1 GENERAL

(1) **PANS.—** 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.

(2) **PANS.—** The logon address and procedures associated with an ATS unit shall be published in the Ghana Aeronautical Information Publications in accordance with IS:15.5.2.1(2) (Contents of the Aeronautical Information Publication) of Part 15 of Ghana Civil Aviation (ANS) Directives).

Note 1.— A given FIR may have multiple logon addresses; and more than one FIR may share the same logon address.

Note 2.—Guidance on the publication of information concerning the logon address and procedures is contained in the Global Operational Data Link (GOLD) Manual (Doc 10037).

23.2.8.1.1.2 AIRCRAFT INITIATION

(1) **PANS.—** 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.

(2) **PANS.—** Unless otherwise agreed by ATS units concerned, when ATS unit receives a data link initiation request from an aircraft neither within nor approaching its data link service area, the ground system shall send the aircraft a logon response indicating a data link initiation rejection.

Note.— There may be instances where an ATS unit has a flight plan on an aircraft in this condition and may elect to establish a data link connection with the aircraft.

23.2.8.1.1.3 DATA LINK CONNECTION FORWARDING BETWEEN ATS UNITS ~~ATS UNIT FORWARDING~~

PANS.— Where the ATS unit's ground system is capable of forwarding the data link connection, it ~~The ground system initially contacted by the aircraft~~ shall provide to the next ATS unit any relevant updated aircraft information and perform the address forwarding procedure — whether ground-to-ground or air-to-ground —in sufficient time to permit the establishment of data link communications.

23.2.8.1.1.4 FAILURE

(1) **PANS.—** 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.

Note.— When the aircraft's logon request results from responding to a contact request by a transferring ATS unit, then both ATS units will receive the indication.

(2) **PANS.—** The ATS Provider shall establish procedures to resolve, as soon as practicable, data link initiation failures. Procedures shall include, 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 the data link.

(3) **PANS.—** The data link initiation failure procedures shall also include the re-issuance by the ATS unit of the failed message in response to the failure of a single data link initiation response message.

(4) **PANS.—** 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.

23.2.8.1.2 COMPOSITION OF DATA LINK MESSAGES

(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.

(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.

(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.

23.2.8.1.2 COMPOSITION OF DATA LINK MESSAGES

(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 23.2.3.7. 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.

(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	-	(hyphen)
	?	(question mark)
	:	(colon)
	(	(open bracket)
	)	(close bracket)
	.	(full stop, period, or decimal
	,	(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.

(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.

23.2.8.1.3 DISPLAY OF DATA LINK MESSAGES

(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 shall such action be necessary.

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

23.2.8.2 CPDLC PROCEDURES

Note.— The CPDLC message set referred to in this section can be found in the PANS-ATM, Appendix 5.

(1) In all communications the highest standard of discipline shall be observed at all times.

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

Note.— Guidance material on human performance can be found in the Human Factors Training Manual *(Doc 9683) and* Human Factors Guidelines for Air Traffic Management (ATM) Systems *(Doc 9758).*

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

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

(5) 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.

(6) 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.

(7) 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) Unless specified by the ATS Provider, voice read-back of CPDLC messages shall not be required.

23.2.8.2.1 ESTABLISHMENT OF CPDLC

(1) The controller and the pilot shall be informed when CPDLC has been successfully established.

(2) CPDLC shall be established in sufficient time to ensure that the aircraft is communicating with the appropriate ATC Unit

(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.

(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.

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

(6) PANS.— An ATC unit shall only request~~shall only establish~~ CPDLC connection with an aircraft if the ATC unit is the current controlling authority or is expecting to become the next data authority.~~aircraft has no CPDLC link established, or when authorized by the ATC unit currently having CPDLC established with the aircraft.~~

(7)

(8) PANS.— 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 connection ~~initiation~~ of CPDLC shall be permitted.

23.2.8.2.2 EXCHANGE OF OPERATIONAL CPDLC MESSAGES

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

(2) 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.

(3) **PANS.—** Unless otherwise deemed necessary, ~~Except as provided by 23.2.8.2.12.1,~~ when a controller or pilot communicates via CPDLC, the response shall be via CPDLC and when a controller or pilot communicates via voice, the response shall be via voice.

(4) **PANS.—** 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.

Note.— The following procedures may be applied by the controller, in terms of correcting clearances, instructions or information, or by a pilot, in terms of correcting a reply to an uplink message or correcting previously advised requests or information.

(5) **PANS.—** 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 include the phrase: "DISREGARD CPDLC (message type) MESSAGE, and the correct clearance, instruction, information or request, as appropriate.

Note.— It is possible that, at the time the voice communicated clarification is transmitted, the CPDLC message being referred to has not yet reached the recipient, or has reached the recipient but has not been acted upon, or has reached the recipient and has been acted upon.

(6) **PANS.—** When referring to and identifying the CPDLC message to be disregarded, caution shall be exercised in its phrasing so as to avoid any ambiguity with the issuance of the accompanying corrected clearance, instruction, information or request.

Note.— For example, if SAS445, maintaining FL290, had been instructed via CPDLC to climb to FL350, and the controller needs to correct the clearance utilizing voice communications, the following phrase might be used:

SAS445 DISREGARD CPDLC CLIMB CLEARANCE MESSAGE, BREAK, CLIMB TO FL310.

(7) **PANS.—** 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.

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

(8) **PANS.—** The use of long messages or messages with multiple clearance elements, multiple clearance request elements or messages with a combination of clearances and information shall be avoided where possible.

Note.— Guidance material on the development of local operating procedures and CPDLC good operating technique can be found in the Global Operational Data Link (GOLD) Manual (Doc 10037).

(9) CPDLC ground systems and airborne systems shall be capable of using the CPDLC message alert attributes in order to draw attention to higher priority messages.

Note.— Message attributes dictate certain message handling requirements for the CPDLC user receiving a message. Each CPDLC message has two attributes: alert and response attributes. When a message contains multiple message elements, the highest precedence message element attribute type becomes the attribute type for the entire

message.

(10) The alert attribute shall delineate the type of alerting required upon message receipt. Alert types are presented in Table 8-1.

(11) The response attribute shall delineate valid responses for a given message element. Response types are presented in Table 8-2 for uplink messages and Table 8-3 for downlink messages.

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

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

Table 8-2. 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 8-3. 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), MESSAGE NOT SUPPORTED BY THIS ATC UNIT, ERROR	2

(12) **PANS.—** When a multi-element message requires a response, the response shall apply to all message elements.

Note.— For example, a multi-element message containing CLIMB TO FL310 MAINTAIN MACH.84, a WILCO response applies to, and indicates compliance with, both elements of the message.

(13) **PANS.—** 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.

(14) **PANS.—** 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.

(15) **PANS.—** 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.

Note.— A separate CPDLC message (or messages) may subsequently be transmitted to respond to those elements that can be accommodated.

(16) **PANS.—** 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 shall be a single uplink message.

Note.— For example, while messages containing multi-element clearance requests are to be avoided, a multi-element downlink message containing the indicated message elements:

REQUEST CLIMB TO FL350
REQUEST MACH 0.84

could be responded to with

CLIMB TO FL350

REPORT MAINTAINING
CROSS YYG AT OR AFTER 1150
NO SPEED RESTRICTION.

(17) **PANS.—** *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.*

Note.— For example, a multi-element uplink message containing

CONFIRM SQUAWK
WHEN CAN YOU ACCEPT FL410

could be responded to with

SQUAWKING 5525
WE CAN ACCEPT FL410 AT 1636Z

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

(19) The ATS Provider shall select those message elements contained in the PANS-ATM, Appendix 5 that support operations in their airspace. where 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 MESSAGE NOT SUPPORTED BY THIS ATC UNIT.

Note.— Further processing of the received message is not required.

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

Note.— The CPDLC message set contained in the PANS-ATM, Appendix 5 was developed to encompass different air traffic management environments.

(21) Information concerning CPDLC message elements subset

utilized shall be published in the Aeronautical Information Publications (AIPs).

23.2.8.2.3 TRANSFER OF CPDLC

Note.— Details on CPDLC transfer can be found in the Global Operational Data Link (GOLD) Manual (Doc 10037).

(1) **PANS.—** When CPDLC is transferred, the transfer of voice communications and CPDLC shall commence concurrently.

(2) **PANS.—** 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.

(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.

(4) **PANS.—** When~~If the controller needs to transfer~~ the aircraft is transferred between data authorities with ~~out replying to any~~ downlink or uplink message(s) outstanding, the aircraft and ground system shall have the capability to terminate the open ~~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.~~

(5) **PANS.—~~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.~~** The controller shall coordinate with the receiving ATS unit regarding any operationally relevant CPDLC messages that were still open when the CPDLC connection was terminated.

(6) **PANS.—** The transferring or receiving controller shall~~ revert to voice communications to~~ clarify any ambiguity associated with

the message(s) outstanding.

(7) 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.

23.2.8.2.4 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 PANSATM,

23.2.8.2.5 FREE TEXT MESSAGES.

(1) **PANS.—** ~~The use of free text message elements by controllers or pilots shall be avoided.~~ Controllers and pilots shall only compose a free text message element when no appropriate message element is available in the data link system.

Note.— Whilst it is recognized that non-routine and emergency situations may necessitate the use of free text, particularly when voice communication has failed, the avoidance of utilizing free text messages is intended to reduce the possibility of misinterpretation and ambiguity.

(2) When the CPDLC message set contained in the PANS-ATM (Doc 4444) does not provide for specific circumstances, the ATS Provider may determine that it is acceptable to use preformatted free text message elements. In such cases, the ATS Provider, in consultation with operators and other ATS authorities that may be concerned, shall define display format, intended use and attributes for each preformatted free text message element and publish them with relevant procedures in the AIPs.

(3) **PANS.—** Where preformatted free text message elements are used, shall be stored for selection within the aircraft system or ground system to facilitate their use.

Note.— ICAO phraseologies are contained in Chapter 5 of this document and the Procedures for Air Navigation Services — Air Traffic Management (PANS-ATM) (Doc 4444). ICAO abbreviations and codes are contained in the Procedures for Air Navigation Services — ICAO Abbreviations and Codes (PANS-ABC) (Doc 8400)

(4) **PANS.—** When composing a CPDLC message using free text message elements, controllers and pilots shall use ICAO phraseologies, abbreviations and codes, and avoid nonessential words and phrases.

(5) **PANS.—** Controllers shall not compose a CPDLC message solely with free text message elements to issue a clearance; however, free text message elements may be included as part of the CPDLC message.

23.2.8.2.6 EMERGENCIES, HAZARDS AND EQUIPMENT FAILURE PROCEDURES

(1) **PANS.—** *When a CPDLC emergency message is received, the controller shall acknowledge receipt of the message by the most efficient means available.*

(2) 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.

Editorial Note.— Renumber subsequent paragraphs and amend the cross-referenced paragraphs throughout Annex 10, Volume II, accordingly.

23.2.8.2.7 FAILURE OF CPDLC

Note 1.— Action to be taken in the event of a data link initiation failure is covered in 23.2.8.1.1.4.

Note 2.— Action to be taken in the event of the failure of a single CPDLC message is covered in 23.2.8.2.9.

(1) A CPDLC failure shall be detected in a timely manner.

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

(3) **PANS.—**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.

(4) **PANS.—** 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.~~ verified and if needed, retransmitted by the most appropriate means.

(5) **PANS.—** When CPDLC fails but is restored prior to a need to revert to voice communications, all CPDLC messages outstanding shall be verified and if needed, retransmitted by the most appropriate means.~~considered not delivered and the entire dialogue involving the messages outstanding shall be recommenced via CPDLC.~~

23.2.8.2.8 INTENTIONAL SHUTDOWN OF CPDLC

(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.

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

(3) The controller and pilot shall be provided with the capability to terminate a ~~abort~~ CPDLC connection.

23.2.8.2.9 FAILURE OF A SINGLE CPDLC MESSAGE ~~DOWNSTREAM CLEARANCE DELIVERY SERVICE~~

(1) **PANS.—** 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; or,

(b) via CPDLC, reissue the CPDLC message that failed.

23.2.8.2.10 RESUMPTION OF DATA LINK SERVICES ~~ESTABLISHMENT OF DOWNSTREAM CLEARANCE DELIVERY SERVICE~~

23.2.8.2.11

(1) **PANS.—** When data link services are resumed, the controller shall advise, by the most appropriate means, any affected flight crew and instruct them to log on to the appropriate ATS unit. ~~The resumption of the normal use of CPDLC shall be advised by using the following phrase:~~

(2)

23.2.8.2.12 Testing of CPDLC

PANS.— 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.

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