International Civil Aviation Organization

SPECIAL IMPLMENTATION PROJECT (SIP) ON ATS INTER-FACILITY DATA COMMUNICATION IMPLEMENTATION SEMINAR

Bangkok, Thailand, 12-13 October 2010

Agenda Item 3: Review version 3 of the Asia/Pacific ICD for AIDC

STATUS OF HARMONIZATION PROCESS BETWEEN ASIA PACIFIC AND NORTH ATLANTIC REGION ON THE AIR TRAFFIC SERVICE INTER-FACILITY DATA COMMUNICATIONS (AIDC) INTERFACE CONTROL DOCUMENT (ICD)

(Presented by the United States of America)

SUMMARY

The purpose of this paper is to provide information on the process to consolidate the Interface Control Document (ICD) for the North Atlantic and Asia/Pacific Regions, to provide for harmonized Air Traffic Service Inter-facility Data Communications (AIDC).

1. INTRODUCTION

1.1 At the thirty-fourth meeting of the NAT Implementation Management Group, (NAT IMG/34), held from 5-8 May 2009, the Implementation Management Group (IMG) recalled that both the NAT and Asia/Pacific (APAC) Regions had identified the safety benefits of accelerating AIDC implementation in order to reduce air traffic control (ATC) to ATC coordination errors.

1.2 Subsequently, at the first meeting of the NAT Communications, Navigation and Surveillance Group (NAT CNSG/1), held from 28 September to 2 October 2009, the Group noted that the IMG agreed to add the task on harmonization of the NAT and APAC ICDs to the work program of the NAT CNSG. The Group confirmed the areas identified by the IMG in paragraphs 1.1 a)-1.1 c) as their work program. The NAT CNSG Secretary agreed to coordinate with the APAC to determine ways and means to address the foregoing task.

1.3 At the twentieth meeting of the Asia/Pacific Air Navigation Planning and Implementation Regional Group (APANPIRG/20), held from 7-11 September 2009 in Bangkok, Thailand, the meeting recognized the benefits that would accrue from a common Global Oceanic and Remote ICD, and supports the work being undertaken by the United States to coordinate a global Interface Control Document for AFTN AIDC and invites the Asia/Pacific Regional Office to act as the regional point of contact for this work.

2. DISCUSSION

2.1 At the forty-sixth meeting of the NAT Systems Planning Group (NAT SPG/46), the group was presented with the follow up actions undertaken by the NAT IMG in response to NAT SPG Conclusion 45/25 c) whereby the NAT IMG was tasked to direct its contributory groups to assist in the development of a harmonised multi-regional AIDC ICD.

2.2 In this regard the NAT SPG agreed that the task of harmonising the NAT and APAC AIDC ICDs should be advanced in accordance with the following principles:

a) The United States should continue the effort by drafting a consolidated ICD with thorough bi-directional tracking of content;

b) Since the ICD would apply to oceanic regions only a title of the future document should be "Pan Regional ICD for Oceanic AIDC";

c) The content of the initial consolidated ICD should be confined to the existing substance of the NAT and APAC ICDs. Otherwise review would be unnecessarily complicated;

d) The above should be accomplished as quickly as practicable, and the NAT and APAC ICDs should be frozen in the interim; and

e) Once the NAT and APAC PIRGs have endorsed the resulting ICD, a new round of drafting and review could begin to incorporate any desired new substance, as part of the ongoing inter-regional maintenance of the document.

2.3 The NAT SPG also agreed that this work would be progressed in the framework of the NAT IMG and that a group of experts would be identified to review the draft consolidated NAT/APAC AIDC ICD. The Rapporteur of the NAT CNSG would coordinate this activity with the APAC Region. The work would be conducted via electronic means of communication as far as possible. A progress report would be provided to the next meeting of the NAT IMG where a decision would be taken regarding further steps.

2.4 Utilizing the existing draft *Global Interface Control Document (ICD) for ATS Interfacility Data Communications (AIDC)*, the United States reformatted the document to reflect the NAT SPG suggestions. A copy of the coordination draft *Pan Regional Interface Control Document for ATS Interfacility Data Communications (PAN ICD), v 0.3,* is at **Attachment A**.

2.5 The following is a list of the issues that have been taken in consideration for the development of a work program to amalgamate the ICDs for the NAT and APAC Regions:

a) Formation of an Ad Hoc Working Group (WG);

b) Including material from each of the regional documents taking into account lessons learned, global implications and guidance on more recent initiatives;

c) Recognizing the priority for full AIDC implementation in the NAT Region by 15 November 2012, the changes necessitated by Amendment 1 to Doc 4444, 15th Edition, will need to be addressed and incorporated into the work on harmonisation of the ICDs;

d) Method of distribution for review;

e) Change control mechanism; and,

f) Coordination with ICAO Regional Offices to determine the tasks necessary for the NAT SPG and APANPIRG to conclude on endorsing the Global ICD.

2.6 The PAN ICD Ad Hoc Working Group Distribution List is shown at **Attachment B**.

3. CONCLUSION

3.1 The meeting is invited to note the information presented in this paper and at the Attachments.

Attachment A: Coordination Draft PAN ICD
Attachment B: PAN ICD Ad Hoc Working Group Distribution List

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Attachment A to SIP AIDC – IP/6

Pan Regional Interface Control Document for Oceanic ATS Interfacility Data Communications (PAN ICD)

Coordination Draft
Version 0.3 — 31 August 2010

Sponsored by the North Atlantic Systems Planning Group (NAT SPG) and
Asia/Pacific Air Navigation Planning and Implementation Regional Group (APANPIRG)

Amendments to the PAN ICD

The following table will be used to track updates to the PAN ICD by the Ad Hoc Working Group. This document contains procedures material from the *Asia/Pacific Regional ICD for AIDC* and the *North Atlantic Common Coordination ICD*. The working method was to port material from both documents with differences between the two original documents highlighted as follows:

Procedures material from the Asia/Pacific Regional ICD for AIDC is highlighted in green.

Procedures material from the North Atlantic Common Coordination ICD is highlighted in blue.

Amendment	Source	Subject(s)	Date
0.1		Not used	
0.2	Pre-PAN ICD	Annotated outline incorporated into document structure	May 2010
0.3	PAN ICD	The draft document at this stage is focused on populating the outline with relevant material. Document style, formatting, and presentation of material are still to be considered.	31-Aug-10

AMENDMENTS

The issue of amendments is announced by the ICAO Regional Offices concerned, which holders of this publication should consult. The space below is provided to keep a record of such amendments.

RECORD OF AMENDMENTS AND CORRIGENDA

No.	Date Applicable	Date Entered	Entered By	Description of Change

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Appendix A Templates for Bilateral Letter of Agreement on AIDC

1. Historical background

1.1 The *Pan Regional Interface Control Document* (PAN ICD) for Oceanic ATS Interfacility Data Communications (AIDC) is the result of the progressive evolution of the *Asia/Pacific Regional ICD for AIDC*, issued by the ICAO Asia/Pacific Regional Office on behalf of the Asia Pacific Air Navigation Planning and Implementation Regional Group (APANPIRG), and the *North Atlantic Common Coordination ICD*, published by the ICAO European and North Atlantic Office, on behalf of the North Atlantic Systems Planning Group (NAT SPG).

1.2 Each of the two founding documents provided guidance on a regional basis. However, in recognition of the need to provide globally harmonized guidance, the PAN ICD became effective on [date].

1.3 This edition provides for a consolidation of the founding documents which includes material from each of the regional documents taking into account lessons learned, global implications and guidance on more recent initiatives.

2. Scope and Purpose

2.1 The purpose of the ICD is to ensure that data interchange between units equipped with automated air traffic services (ATS) systems used for air traffic management (ATM) is to a common base standard, and that the evolutionary development is coordinated and implemented globally. Therefore, the PAN ICD was developed to preserve the common base standard set out in the Automatic Dependent Surveillance (ADS) Panel Guidance Material, while allowing for regional differences as required.

2.2 There is a great need for a communications and data interchange infrastructure to significantly reduce the need for verbal coordination between Oceanic and Domestic Area Control Centres. AIDC standards, as defined in this document, provide a harmonised means for data interchange between ATS units during the notification, coordination, and transfer of control phases of operations.

2.3 The message sets and procedures described in the ICD have been designed for use with the existing Aeronautical Fixed Telecommunications Network (AFTN) and the future Aeronautical Telecommunication Network (ATN). In the interest of global standardisation, ICAO agreed methods and messages were used wherever possible. Where ICAO methods and messages do not meet requirements, new messages were identified using existing ICAO field definitions to the extent possible. Specifically, the ICD defines the following:

a) Basic communications and support required to coordinate implementation of AIDC;

b) Common boundary agreements between all the area/oceanic control centres concerned;

c) Implementation guidance material; and,

d) Relationship to the ICAO Operational Data Link Panel (OPLINKP) AIDC message set and NAT/Europe ATS interface messages.

2.4 The ICD also describes a configuration management process which will ensure stability in the design and implementation of the messages described herein. This process as well as the Pan Regional ICD should be adopted by all participating States.

3. Implementation

The implementation of procedures is the responsibility of Contracting States; they are applied in actual operations only after, and in so far as, States have enforced them. However, with a view to facilitating their processing towards implementation by States, this material has been prepared in language which will permit direct use by air traffic services personnel and others associated with the provision of air traffic services to international air navigation.

4. Promulgation of information

Information relating to the establishment and withdrawal of and changes to facilities, services and procedures affecting aircraft operations should be notified and take effect in accordance with Annex 15 — Aeronautical Information Services .

5. Changes to the document

5.1 This document is maintained as a regional document in coordination with all ICAO planning and implementation regional groups (PIRGs) providing data link services within their region. Each participating PIRG establishes a mechanism for submitting and administering change proposals.

5.2 Change proposals (CPs) can be submitted by any stakeholder. The stakeholder should submit a Change Proposal to their ICAO regional office (see Chapter 8, *Common Boundary Agreements*). The ICAO regional office will coordinate the change proposal within its own region, other regions, and ICAO HQ, to determine the acceptability of the change proposal. Once the ICAO regional office has completed coordination and the participating PIRGs accept the change proposal, the change is concluded by each of the PIRGs.

Amendments to the PAN ICD

Amendment	Source(s)	Subject(s)	Approved applicable
1st Edition ([date])	Asia/Pacific Air Navigation Planning and Implementation	*Pan Regional ICD* (PAN ICD)	Applicable within participating

Regional Group (APANPIRG/20 – 2009) North Atlantic Systems Planning Group (NAT SPG/46 – 2010)	Regions on [date].

Pan Regional Interface Control Document for Oceanic ATS Interfacility Data Communications

Chapter 1. List of Acronyms

When the following acronym are used in the present document they have the following meanings.

Acronym

ABI. Advance Boundary Information (AIDC message)

ACARS. Aircraft Communication Addressing and Reporting System.

ACC. Area Control Centre

ACI. Area of Common Interest

ACP. Acceptance (AIDC message)

ADS. Automatic Dependent Surveillance

ADS-B. Automatic Dependent Surveillance – Broadcast

ADS-C. Automatic Dependent Surveillance – Contract

AFN. ATS Facilities Notification

AFTN. Aeronautical Fixed Telecommunications Network

AIDC. ATS Inter facility Data Communications

AOC. Airline Operational Control (also stands for Assumption of Control)

AMHS. ATS Message Handling System

APANPIRG. Asia Pacific Air Navigation Planning and Implementation Regional Group

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(PAN ICD)

Acronym

ARINC. Aeronautical Radio Inc.

ARTCC. Air Route Traffic Control Center

ASIA/PAC. Asia/Pacific

ASM. Application Status Monitor (AIDC message)

ATC. Air Traffic Control

ATSC. Air Traffic Service Center

ATM. Air Traffic Management

ATMOC. Air Traffic Management Operations Center

ATN. Aeronautical Telecommunications Network

ATS. Air Traffic Services

ATSU. Air Traffic Service Unit

C-ATSU. Controlling ATSU

CDN. Coordination (AIDC message)

CHG. ICAO Modification Message

CPDLC. Controller Pilot Data Link Communications

CPL. Current Flight Plan (AIDC message)

Pan Regional Interface Control Document for Oceanic ATS Interfacility Data Communications

Acronym

CRC. Cyclic Redundancy Check

D-ATSU. Downstream ATSU

DIA. Coordination Dialogue

EMG. Emergency (AIDC message)

EST. Coordination Estimate (AIDC message)

ETX. End of Text

FAN. FANS Application Message (AIDC message)

FANS. (also FANS-1/A) Future Air Navigation System

FCN. FANS Completion Notification (AIDC message)

FCO. Facilites Notification Contact

FI. Flight Identifier

FIR. Flight Identification Region

FMC. Flight Management Computer

FMD. Flight Management Computer (Selected)

FMH. Facilities Notification Message Header

FML. Flight Management Computer (Left)

FMR. Flight Management Computer (Right)

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(PAN ICD)

Acronym

FPL. Filed Flight Plan

FN CAD. Contact Advisory

FPO. Facilities Notification Current Position

GOLD. Global Operational Data Link Document

IA-5. International Alphabet 5

ICAO. International Civil Aviation Organization

ICD. Interface Control Document

IGM. Implementation Guidance Material

IMI. Imbedded Message Identifier

LAM. Logical Acknowledgement Message (AIDC message)

LOA. Letter of Agreement

LRM. Logical Rejection Message (AIDC message)

MAC. Coordination Cancellation (AIDC message)

MIS. Miscellaneous (AIDC message)

MTI. Message Type Identifier

NAT. North Atlantic

Acronym

NDA. Next Data Authority (CPDLC message); or Next Data Authority (Next unit that will communicate with the aircraft using CPDLC)

OAC. Oceanic Area Control Centre

OCS. Oceanic Control System

ODF. Optional Data Field

OLDI. On-Line Data Interchange

OPLINKP. Operational Data Link Panel

OSI. Open System Inter-connection

PAC. Pre-activation (AIDC message)

PANS-ATM. Procedures for Air Navigation Services – Air Traffic Management

REJ. Rejection (AIDC message)

R-ATSU. Receiving ATSU

RNP. Required Navigation Performance

SARPs. Standards and Recommended Practices

SITA. Societe Internationale de Telecommunciations Aeronautiques

SMI. Standard Message Identifier

SOH. Start of Header

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(PAN ICD)

Acronym

STX. Start of Text

TCP. Transfer of Control Point

TDM. Track Definition Message (AIDC message)

TEI. Text Element Identifier

TOC. Transfer of Control (AIDC message)

TRU. Track Update (AIDC message)

UTC. Universal Coordinated Time

VSP. Variable System Parameter

Chapter 2. Purpose, Policy and Units of Measurement

2.1 Purpose

2.11 The purpose of this document is to ensure that data interchange between ATSUs providing air traffic services is harmonized to a common standard and to ensure that evolutionary development is encouraged and coordinated centrally. It also provides a description of the message types and methods of communication.

2.12 In the context of this document, the definition of AIDC is as follows:

2.12.1 The AIDC application supports information exchanges between ATC application processes within automated ATS systems located at different ATSUs; and,

2.12.2 In the interest of global standardization, ICAO agreed methods and messages are used wherever possible. Where ICAO methods and messages do not meet requirements, new messages were identified using existing ICAO field definitions to the extent possible.

2.13 This document specifies the facilities and messages to be used for the exchange of notificiation, coordination, transfer and related data between automated ATS systems.

2.14 The messages defined in this document are used during the active phase of flight. Though outside the scope of the AIDC application, the Emergency, Flight Planning and Supplementary Message Categories as defined in ICAO *Procedures for Air Navigation Services – Air Traffic Management* (PANS-ATM) Appendix 3 will continue to be used to perform functions not provided by the AIDC application.

2.15 In particular, the Flight Planning function is required and will be required in the future to support operations. The ICAO messages FPL (Filed Flight Plan), CHG (Modification), DLA (Delay), DEP (Departure), ARR (Arrival), CNL (Cancel) and RQP (Request Flight Plan) will be used to support this function.

2.2 Policy

2.21 The application of AIDC shall be based on a step-by-step data distribution scheme comprising three (3) phases: NOTIFICATION, COORDINATION and TRANSFER OF CONTROL. In

support of all the operational phases, application management messages are required to support application level dialogue between automated ATS systems.

2.22 A functional address, which refers to a function within an OAC/ACC (e.g., an ATC watch supervisor), may be susbstituted in certain messages for the aircraft identification found in Field 7. Where such an address is used, it is preceded by an oblique stroke (/) to differentiate it from aircraft identification.

2.23 The capability to revert to manual coordination shall be retained.

2.24 Flight plans shall continue to be filed in accordance with existing procedures.

2.3 Units of Measurement

2.31 In general the AIDC ICD messages support different units of measurement. Bilateral agreements should determine the units to be transmitted.

2.32 Data conventions shall be in accordance with PANS-ATM Appendix 3, with the following exceptions for level and speed information applying to Field 14 only.

2.32.1 Block level information

2.32.1.1 In certain circumstances, a vertical range of levels may be transmitted. Where a vertical range of levels is used, it shall be specified as a lower level followed by the upper level.

Example 1: MINNY/2125F320F340
The aircraft is operating in a block of levels between F320 and F340 (inclusive).

2.32.1.2 When transmitting a level restriction, only a single level may be included within the restriction.

Example 2: ELMER/0244F310F350F290A
The aircraft is cleared to operate in a block of levels between F310 and F350 and will cross ELMER at or above F290.

2.32.1.3 The coordination of a vertical range of levels by AIDC should only be made following bilateral agreement.

2.32.2 Speed and Mach Number Technique Information

2.32.2.1 The boundary estimate may contain additional clearance information describing a Mach Number that has been assigned to an aircraft. This information shall contain a single character providing advice as to whether an aircraft will be maintaining the notified Mach Number or less (L), the notified Mach Number or greater (G), or exactly the notified Mach Number (E); and the notified Mach Number.

Example 1: BUGGS/0349F350F370/GM085
The in a block of levels between F350 and F370 (inclusive) maintaining M0.85 or greater. aircraft is operating

Example 2: PLUTO/0215F310/EM076
The aircraft is maintaining M0.76

2.32.2.2 The absence of speed information in the boundary estimate data of an AIDC message indicates that the previously assigned speed has been cancelled.

Example 3: SPEDY/1237F310F330B/LM083
The aircraft is cleared to F310 and will cross SPEDY at or below F330, maintaining M0.83 or less; subsequently followed by:

Example 4: SPEDY/1238F310
The aircraft will no longer be on descent at SPEDY, and has resumed normal speed (and one minute later than previously coordinated)

2.32.2.3 The format described for the notification and coordination of Mach Number in this section applies to Field 14 – boundary estimate data – only. It may be transmitted in any AIDC message containing Field 14.

2.32.2.4 The coordination of Mach Numbers by AIDC should only be made following bilateral agreement.

2.32.3 Offset and Weather Deviation Information

2.32.3.1 The boundary estimate may contain additional clearance information describing an offset or weather deviation that has been issued to an aircraft. This information shall contain:

2.32.3.1.1 a single character providing advice as to whether the clearance is an offset (O) or a weather deviation (W);

2.32.3.1.2 an off track distance associated with this clearance; and,

2.32.3.1.3 a direction, indicating left (L), right (R) or either side of track (E).

Example 1: GOOFY/2330F310/GM084/O30R
The aircraft is offsetting 30NM right of track, maintaining M0.84 or greater.

Example 2: DAFFY/0215F310F350/W25E
The aircraft is operating in a block of levels between F310 and F350 (inclusive) deviating up to 25NM either side of track.

2.32.3.2 The absence of offset or weather deviation data in the boundary estimate data of an AIDC message indicates that the off track clearance no longer applies.

Example 3: MICKY/1519F330/W15R
The aircraft is deviating up to 15NM right of track subsequently followed by:

Example 4: MICKY/1520F330
The aircraft is back on track (and one minute later than previously coordinated).

2.32.3.3 The off-track clearance format described in this section applies to Field 14 – boundary estimate data – only. It may be transmitted in any AIDC message containing Field 14.

2.32.3.4 When an aircraft is offsetting or deviating, the coordination point shall be the coordination point based on the nominal route rather than the offset route.

2.32.3.5 When coordinating an Offset, the direction "E" (either side of track) shall not be used.

2.32.3.6 The coordination of offsets and weather deviations by AIDC should only be made following bilateral agreement.

2.4 Restriction Formats

2.41 Level and speed restrictions.

2.41.1 Use of restrictions is not mandatory. If they are used, the following convention shall be used.

2.41.2 Route, speed and level information contained in the Route field (ICAO ATS Field 15) represent the current cleared profile. Where a clearance requires a speed/level change subsequent to a route point, then the ICAO convention of route point followed by an oblique stroke and the new speed/level will be used:

Example: 60N010W/M084F350

2.41.3 Where a clearance requires a speed/level change to be completed by a route point, then the items will be reversed:

Example: M084F350/62N020W

2.41.4 A combination of these two conventions will describe a clearance with a defined starting and completion point:

Example: 60N010W/M084F350/62N020W

2.42 Time restrictions.

2.42.1 There are three types of time restrictions describing when an aircraft should arrive at a fix:

AT/ (UNTIL);

AT OR BEFORE; or,

AT OR LATER.

2.42.2 A suffix will be added to the four digit time to denote the restriction type, as follows:

AT: 'A', e.g. 1230A;

AT OR BEFORE: 'B', e.g., 1230B; or,

AT OR LATER: 'L', e.g., 1230L.

2.42.3 The restriction itself will begin with a slash (/), e.g., /1230B, and will appear after the fix with which it is associated. For example, 49N050W/1230L signifies that the aircraft should arrive at 49N 50W at or later than 12:30 P.M.

2.42.4 A time restriction may be used in conjunction with speed/level restrictions as follows:

60N010W/M084F350/1230L
M084F350/62N020W/1230A
60N010W/M084F350/62N020W/1230B

2.42.5 Time restrictions may only appear in the Route field (Field 15).

2.42.6 The use of time restrictions shall be bilaterally agreed between ATS providers.

2.43 Coordination and the further route of flight.

2.43.1 Field 15 shall include subfields 15a, 15b and 15c. It shall describe the cleared route, beginning with the last route point preceding the coordination point. It will contain the full cleared route of flight to destination as filed by the aircraft in its FPL or CHG. In order to avoid route discontinuity, if a change in filed route has been given by ATC, a clearance to rejoin its filed route shall be given. If the cleared route of flight is not known completely to destination, the truncation indicator shall appear after the last known cleared route point.

2.44 Field 3 requirements.

2.44.1 All messages shall use Field 3a only.

2.44.2 Fields 3b and 3c are not used since, for AIDC, these reference numbers are included in ODF, option 3 (See Chapter 3, *Communications and Support Mechanisms*, para 3.22.5).

2.5 Boundary Positions in Messages

2.51 Where a message requires the inclusion of a boundary position and the flight plan does not contain that position, then the previous route point shall be substituted as the boundary position.

Chapter 3. Communications and Support Mechanisms

3.1 Introduction

3.11 Coordination communications are divided into two areas: one addresses the need for voice communications between ATSUs, whereas the other addresses the need for data communications. It is anticipated that the continuing implementation of automated data communications between ATSUs will result in a reduction in the utilization of voice communications.

3.12 Existing wide-area networks (e.g. X.25 packet-switched network) may be used if the speed, capacity, and security characteristics are verified as adequate to support the interface.

3.13 In cases where speed, capacity, and/or security require it, a direct line interface may be used between facilities.

3.14 The IA-5 character set shall be used for all application message content. Certain characters have special meanings and must only be used as indicated below:

Open parenthesis "(”and close parenthesis ")" shall be used only to begin and terminate the application message; and,

A single hyphen "-" shall be used only as a field separator and shall not be used within any field.

3.2 Message Headers, Timers and ATSU Indicators

3.21 Message headers.

3.21.1 The AFTN IA-5 Message Header, including the use of the Optional Data Field defined in ICAO Annex 10, Vol II and herein, will be employed for the exchange of all ATS data. The AFTN priority indicator FF shall normally be used for all data exchanges.

3.21.2 Optional data field. Provides a flexible way to convey information from end-to-end, undisturbed by the communication processes along the path. Since the information is optional it is necessary to specify a unique number and ending for each defined use. Option 1 has already been allocated for additional addressing use, and will be found in ICAO Annex 10, Vol II. Option numbers 2 and 3 have been defined for computer applications to convey message/data unit identification and

message/data unit reference information, respectively, and are adopted in this ICD. Other options can be defined and added as the need arises. The proposed encoding would have no impact on AFTN switching centers as they ignore this part of the origin line.

3.21.3 Addressing. The Source and Destination addresses of the AFTN header convey the direction and logical identity of the application processes exchanging AIDC data information. The application process must be aware of the AFTN addresses that are used for this function. The first four characters form the location, while the next three characters specify an office/agency or a processor at the given location. The eighth character of the address indicates the end system application and details of the naming assignment are contained in Chapter 6, *ATM Application Naming Conventions*. This approach allows up to 26 multiple applications to be co-hosted in the same processor, each having its own unique address. This implementation will make the addressing consistent with Open System Inter-connection (OSI) parameters and simplify the transition to the ATN.

3.21.4 Message/data identification number. The message/data identification number is a six digit number, taken from a single application pool of available numbers. The identification of the sending and receiving units would use the normal eight character addresses of the AFTN header.

3.21.4.1 The message/data identification number is encoded and conveyed in the AFTN message header Optional Data Field (ODF), option 2. The AFTN implementation provides functionality consistent with the OSI primitive/parameter structure.

3.21.4.2 A message/data identification number will be assigned to each message/data unit requiring confirmation of receipt by the initiating processor. This number will be assigned by the application process basis in such a way as to guarantee a unique identification number for a period of time as specified in paragraph 2.12 below. For messages/data not requiring confirmation the message/data identification parameter shall not be used.

3.21.5 Message/data reference information is a way of linking a message/data unit to a previously sent message. This function is encoded and conveyed in the AFTN ODF, option 3. This implementation would make the linking information consistent with the abstract OSI protocol primitive/parameter structure. The reference information consists of the message/data identification number of the previously sent message/data unit being referenced. As the previous message being referenced could have been originated by either processor, the location indicator of the message source shall be used as a prefix to the reference number.

3.21.6 Time stamp is expressed as 12 digits in year, month, day, hours, minutes, and seconds (YYMMDDHHMMSS). The precision of the time stamp will support computation of transmission delays. This data item is conveyed as option 4 of the ODF.

3.21.7 Cyclic Redundancy Check (CRC) is a four digit hexadecimal number that is used to ensure end-to-end message integrity. The CRC employed is the CRC-CCITT. The CRC is computed over the message text, from the beginning left parenthesis to the closing right parenthesis, inclusive. Non printable characters such as line feeds and carriage returns shall be excluded from the CRC calculation. This data item is conveyed as option 5 of the ODF.

3.22 Timers.

3.22.1 In order to guarantee the uniqueness of the message/data identification number, and yet allow for the efficient reuse of the numbers in the pool, two timers are required for each message/data unit requiring confirmation: accountability and reuse.

3.22.2 Accountability timer determines the maximum period of time for the responding application to confirm receipt of a given message/data unit. The default value for this timer nominally shall be three minutes. If there is no valid response from the responding application, the initiating processor shall retransmit the message/data unit and reset the timer, or initiate local recovery procedures. When local procedures allow retransmission, a maximum value, such as three, must be determined before local recovery procedures are initiated. The accountability timer shall be cancelled by the receipt of any message with the appropriate message/data reference identifier, which will typically be a LAM or LRM. Retransmissions use the same message/data identification number as the original message/data unit.

3.22.3 Reuse timer function employs two timers that determine the minimum period of time during which a message/data identification number is guaranteed to be unique. Reuse timer A shall be set for exchanges not involving dialogues between processors. The range for reuse timer A shall be from 1 to 30 minutes, in one minute increments. The default value for reuse timer A shall be 5 minutes, or as agreed by the concerned ATSUs. Reuse timer B shall be set for exchanges where a dialogue is involved in the exchange. The range for reuse timer B shall be 2 to 90 minutes, in one minute increments. The default value for reuse timer B shall be 10 minutes, or as agreed for communicating applications by the concerned administrations. A given message/data identification number can be reused when an ACP, AOC, or REJ response message is received or the reuse timer has expired.

3.22.4 In the event of system failure, the accountability and reuse timers will be reset and resume timing upon completion of system recovery.

3.22.5 The following examples depict two Core Messages encoded in accordance with the previous procedures. The second message is a reference to the first message. SOH, STX, message ending and ETX characters are omitted for clarity, as are the alignment functions.

FF NFFFZOZO
122145 KZOAZOZO 2.000033-4.940412214523-5.A34B
(CPL-UAL714-IS-B747/H-S/C-KLAX-05S179W/2220F370-M082F370(route data) -YSSY-0)

Explanation: Sending an initial coordination message (number 000033 from Oakland Air Route Traffic Control Center (KZOAZOZO) to Nadi ACC (NFFFZOZO) at time 940412 214523.

FF KZOAZOZO
122147 NFFFZOZO 2.000044-3.KZOA000033-4.940412214703-5.DE6A
(ACP-UAL714-KLAX-YSSY)

Explanation: Nadi ACC (NFFFZOZO) accepts the proposed coordination condition received from Oakland Air Route Traffic Control Center (KZOAZOZO) by sending message number 000044 from NFFFZOZO to KZOAZOZO at 940412214703. The message refers to message 000033 sent earlier by KZOAZOZO

3.22.6 ICAO location indicators must be used by automated ATSUs in AIDC messages.

3.3 Engineering considerations

3.31 Future communications.

3.31.1 The future data communications infrastructure should be compatible with the ICAO ATN. Until the ATN becomes available, the engineering details needed to implement the exchange of messages contained in Chapter 4, *ATS Coordination Messages*, will need to be agreed to bilaterally and identified in Chapter 7, *Implementation Guidance Material*.

3.32 ATN transition support.

3.32.1 The AFTN will provide the underlying communications network and services in the near-term. Communication services provided by the ground element of the ATN will be eventually employed by the AIDC application.

3.32.2 When the ATS Message Handling System (AMHS) is implemented, the exchanges of AFTN messages on ATN can be accomplished using the AFTN/AMHS gateway function of the AMHS application. This mechanism can be used to exchange the AFTN AIDC messages provided that the connection has been tested to meet the recommended performance criteria in Chapter 7, *Implementation Guidance Material*.

3.33 Performance Criteria.

3.33.1 If AIDC messages are not transmitted and received in a timely manner between automation systems, aircraft can potentially cross boundaries without coordination or transfer of control responsibility taking place. The benefits of AIDC are reduced if link speeds and transit times are inadequate.

3.33.2 In order to effectively use the AIDC application for the interchange of ATC coordination data, performance requirements need to be specified. These specified performance requirements need to be agreed to by neighboring states implementing AIDC. Recommended performance figures are specified in Chapter 7, *Implementation Guidance Material*.

3.34 Response time.

3.34.1 For flight planning messages, controllers require indication of an unsuccessful message transmission within 60 seconds of the message being sent. Therefore, the response time from the time a message is sent until an LAM (or LRM) is received shall be under 60 seconds at least 99% of the time under normal operations. A faster response time is desirable, and will result in operations that are more efficient.

3.34.2 For messages involving transfer of control and surveillance data (e.g. RTI, RTA, and RTU) the data must be transmitted in time for the receiving system to display the track position with acceptable accuracy. Communication across the interface shall be less than 6 seconds.

3.35 Availability/Reliability

3.35.1 The hardware and software resources required for providing service should be developed such that the inherent reliability will support interface availability which is at least equal to the end systems of that interface.

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3.36 Capacity and growth.

3.36.1 Before implementing this interface between two ATSUs, an analysis of the traffic expected between the centers shall be performed and the proposed communications links verified for appropriate capacity. Traffic estimates should consider current and future expected traffic levels.

3.36.2 For initial planning purposes the following estimates of message size and messages per flight are provided in Table 3-1.

Table 3-1. Expected Message Rates and Sizes

Message	Avg. per Flight	Avg. Size	Comments
Messages per near-border departure flight:			
FPL	1	240	
CHG	0.5	160	Assumed 1 of 2 flights amended after coordination, before departure.
EST	1	120	
MOD	0.5	120	Assumed 1 of 2 flights amended after coordination.
Messages per non near-border departure flight:			
CPL	1	250	
MOD	0.5	120	Assumed 1 of 2 flights amended after coordination.
Messages per every flight:			
CNL	0.01	100	Assumed 1 in 100 flight plans are cancelled.
RTI	1	150	
RTU	5	140	Assumed 1 RTU every 6 seconds for 30 seconds.
RTA	1	110	
MIS	0.1	130	

Message	Avg. per Flight	Avg. Size	Comments
Responses (not per flight):			
LAM/RLA	Sum of all above except RTU	80	
LRM		100	

Note: The average message size includes an estimated 50 bytes of communications header added to each application message. Average message size estimates are based on a combination of specification analysis, and review of sample data. In particular the route, other information, and nav/comm equipment elements were estimated based on approximately 200 FPLs filed in Houston Center in 1998.

3.36.3 The hardware and software developed for the interfaces shall be capable of asynchronously exchanging the messages defined in Part II, section 3, simultaneously with up to _____ automated system.

3.37 Recording of AIDC data.

3.37.1 The contents and time stamps of all AIDC messages shall be recorded in both end systems in accordance with the current requirements for ATS messages.

3.37.2 Facilities shall be available for the retrieval and display of the recorded data.

3.38 Associated automation functionality.

3.38.1 Each ATS service provider participating in this interface must have a supporting automation system. The supporting automation shall:

a) Error check all inbound messages for proper format and logical consistency;

b) Ensure only messages from authorized senders are accepted and processed;

c) As required, alert the responsible controller(s) of flight data that has been received; and,

d) Notify the responsible personnel when any message sent is rejected or not acknowledged within a variable system parameter (VSP) period of time.

3.39 Failure and recovery solutions.

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3.39.1 Automation systems may have different failure avoidance and failure recovery mechanisms. Each participating system shall have the following characteristics:

a) If the recovery process preserves the current message number in the sequence with each facility, no notification is necessary.

b) If the recovery process requires reset of the sequence number to 000, a means of notifying the receiving facility that the message numbers have been reset is required. This may be procedural rather than automated.

c) The recovery process shall not automatically re-send any CPL for which an LAM had been received. This is relevant if the system was able to recover state information about which flight plans have been coordinated, and did not need to reset the message sequence numbers.

3.40 Data requirements.

3.40.1 Certain data must be defined and maintained to support all features of the interface. Depending on the data, it should be coordinated on a National, Regional, or Local (facility) basis. Data requirements are identified in Table 3-2 below.

Table 3-2. Summary of Data Definitions Needed to Support the Interface

Field	Data	Purpose	Source	Coordination
03	Facility Identifiers	Identify the sending/receiving facility.	ICAO Doc. 7910 (first four characters) and local definition (second four characters)	Local
07	Functional Address	Agree on functional addresses to be used in MIS messages.	Local Data	Local
09	Aircraft Type exceptions	Identify aircraft type designators and wake turbulence categories that are not listed in ICAO Doc. 8643.	***FAA, NAV CANADA, SENEAM publications***	***National***

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Field	Data	Purpose	Source	Coordination
10	Equipment Codes	Identify ATS-specified equipment qualifiers that are not specified in ICAO Doc. 4444.	***FAA, NAV CANADA, SENEAM publications***	***National***
14	Boundary Point	Identify the coordination fixes to be sent for each airway.	Local Data	Local
15	Adapted Routes and Fixes	Identify airway and fix information that is adapted by both systems.	Local Data	Local
18	Requirements for other data to be included	Identify any requirements for data that must be included in Field 18.	***FAA, NAV CANADA, SENEAM publications***	National

3.41 Security considerations.

3.41.1 Privacy.

3.41.1.1 This ICD does not define mechanisms that guarantee privacy. It should be assumed that any data sent over this interface may be seen by unintended third parties either through interception of the message or through disclosure at the receiving facility.

3.41.1.2 Any communications requiring privacy must be identified and appropriate communications and procedures defined.

3.41.2 Authentication.

3.41.2.1 Each system shall authenticate that messages received are from the source that is identified in Field 03.

3.41.3 Access control.

3.41.3.1 Each system participating in the interface shall implement eligibility checks to ensure that the source of the message is eligible to send the message type and is the appropriate authority for the referenced flight.

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3.42 Test considerations.

3.42.1 Before an automated flight data interface becomes operational between any two facilities, the following set of tests shall be completed:

a) Off-line tests using development or test (i.e. non-operational) systems. These may include both test systems at non-operational facilities, and operational systems that are in an offline mode.

b) Tests using the operational systems in operational mode in which manual coordination verifies each flight data message sent.

c) For diagnostic purposes, each side of the interface should be able to isolate the source of interface problems.

Chapter 4. ATS Coordination Messages

4.1 Introduction

4.11 The following sections describe those messages used by the ATS systems for OLDI. These core messages are a selection from the AIDC message set developed by the ICAO OPLINKP panel. Unless otherwise indicated in this document, message fields will conform to ICAO field definitions in PANS-ATM, and are referred to by field number. All ATS data shall be enclosed between parentheses. Only one ATS message shall be included within a transmission. An overview of core messages and their composition can be found in Table 4-4, *AIDC Messages and their Field Composition*.

4.12 Coordination and the further route of flight.

4.12.1 Field 15 shall include subfields 15a, 15b, and 15c. It shall describe the cleared route, beginning with the last significant route point preceding the coordination point. It will contain all known cleared route information. As a minimum, it shall contain the first route significant point in the adjacent ATSUs airspace. If the cleared route of flight is not known completely to destination, the truncation indicator shall appear after the last known cleared significant route point. For example:

M083F340 SALAG B333 PUGEL/M083F360 T
M083F300 DCT FICKY B200 TATAS T

Note: In accordance with PANS-ATM Doc 4444 the truncation indicator shall only follow a significant point or significant point/Cruising Speed and Cruising level in Field 15 and shall not follow an ATS Route designator.

Note: ATSUs should be aware of the risks associated with simply deleting an unknown waypoint or route without using correct truncation procedures. Deletion of a waypoint or route will result in erroneous route information being transmitted to downstream ATSUs.

4.13 Field 3 requirements.

4.13.1 All messages shall use field 3a only.

4.13.2 Fields 3b and 3c are not used since, for AIDC, these reference numbers are included in the ODF, option 3. See Part 2, paragraph 2.4.5.

4.14 Field 7 requirements.

4.14.1 Where Field 7 is required to be present in a message, Field 7a (Aircraft Identification) shall be mandatory. Fields 7b (SSR Mode) and 7c (SSR Code) are optional but shall always be present where the information is available and applicable.

4.2 Message group

4.21 The core messages shown in Table 4-1 below are to be supported by all ATS provides using automated data interchange.

4.22 Optional messages may be supported by ATS providers. Such messages will be detailed in bi-lateral agreements.

Table 4-1. AIDC Messages

Core	Opt	Message Class	Message
X		Notification	ABI (Advance Boundary Information)
X		Coordination	CPL (Current Flight Plan)
X			EST (Coordination Estimate)
X			MAC (Coordination Cancellation)
	X		PAC (Pre-activation)
X			CDN (Coordination)
X			ACP (Acceptance)
X			REJ (Rejection)
	X		TRU (Track Update)
X		Transfer of Control	TOC (Transfer of Control)
X			AOC (Assumption of Control)
X		General Information	EMG (Emergency)
X			MIS (Miscellaneous)
			NAT (Organized Tracks)
	X		TDM (Track Definition Message)
X		Application Management	LAM (Logical Acknowledgement Message)

X			LRM (Logical Rejection Message)
	X		ASM (Application Status Monitor)
	X		FAN (FANS Application Message)
	X		FCN (FANS Completion Notification)
	X	Surveillance Data Transfer	TRU (Surveillance General
	X		ADS (Surveillance ADS)

4.3 Notification messages

4.31 ABI (Advance Boundary Information).

4.31.1 Purpose.

4.31.1.1 Used to give advance information on flights and shall be transmitted at a bilaterally agreed time or position (Variable System Parameter) before the common boundary. Changes to a previously transmitted ABI shall be communicated by means of another ABI. Changes to the cleared route of flight will result in the retransmission of an ABI.

4.31.2 Message format.

ATS FIELD	Description
3	Message type
7	Aircraft identification
13	Departure aerodrome
14	Boundary estimate time
16	Destination aerodrome
22	Amendment

Field 22 shall contain as a minimum the following fields:

9	Number, type of aircraft and wake turbulence category
15	Route (see Chapter 4, *ATS Coordination Messages*, paragraph 4.12.1)

Field 22 may also optionally include any or all of the following fields:

8	Flight rules
10	Equipment
18	Other information. Note that this field shall contain information as received by the sending centre or a subset thereof as agreed between the parties

Subject to bilateral agreement, the following field may also be included in Field 22:

Text	Amended Destination

4.31.3 Amended Destination is a free text field that may be used in the ABI message to notify an amend destination aerodrome. The field consists of a identifier ("DEST") followed by a delimiter "/" character, followed by the name or the location of the new destination. When used, the Amended destination field is the last field with Field 22.

Example(s)

a) (ABI-THA179-EGLL-15N0090E/0700F330-VTBD-8/IS-9/B747/H-10/S/C-15/14N093W 13N097W YAY T-18/0)

b) (ABI-QFA43-YSSY-ESKEL/0300F330-NZAA-8/IS-9/B747/H-10/SIDHJRW/CD-15/SYL521 ESKEL TANEN WN-DEST/NZWN)

The second example shows an ABI following a diversion from the original destination (NZAA) to a new destination (NZWN)

4.31.4 More information concerning the usage of the Amended Destination field is contained in Chapter 7, *Implementation Guidance Material*.

4.4 Coordination messages

4.4.1 CPL (Current Flight Plan)

4.4.1.1 Purpose.

4.4.1.1.1 Used to initiate initial coordination dialogue between automated ATS systems for a specific flight.

4.4.1.2 Message format.

ATS	Description
3	Message type
7	Aircraft identification
8	Flight rules
9	Aircraft type
10	Navigation equipment
13	Departure aerodrome
14	Boundary estimate data
15	Route (see Chapter 4, *ATS Coordination Messages*, paragraph 4.12.1)
16	Destination aerodrome
18	Other information

Example

(CPL-QFA811-IS-B767/H-S/C-WSSS-20N070E/1417F350-M080F350 30N060E 40N090E YAY T-EGLL-0)

4.4.2 EST (COORDINATION ESTIMATE)

4.4.2.1 Purpose.

4.4.2.1.1 Used to inform the receiving centre of the crossing conditions for a flight and to indicate that the conditions are in compliance with agreements between the two parties. An ACP message shall be transmitted to complete the coordination process. The only valid response to an EST is an ACP.

4.4.2.2 Message Format

ATS	Description
3	Message type
7	Aircraft identification
13	Departure aerodrome
14	Boundary estimate data
16	Destination aerodrome

Example

(EST-QFA811/A2277-WSSS-20N070E/1417F350-YAYT)

4.4.3 PAC (PREACTIVATION)

4.4.3.1 Purpose.

4.4.3.1.1 Used to inform the receiving centre of the crossing conditions for a flight which has not yet departed and to indicate that the conditions are in compliance with agreements between the two parties. Normally it is only used when the departure point is close to the FIR boundary and preflight coordination is required.

Note: On receipt of a PAC message and ACP message is required to be transmitted to complete the coordination process. The only valid response to a PAC is an ACP.

4.4.3.2 Message Format

ATS Field	Description
3	Message type
7	Aircraft identification
13	Departure aerodrome
14	Bondary estimate data
16	Destination aerodrome
22	Amendment (optional field)
Field 22 may optionally include any or all of the following fields	
8	Flight rules
9	Number, type of aircraft and wake turbulence category
10	Equipment
15	Route (see Chapter 4, *ATS Coordination Messages*, paragraph 4.12.1)
18	Other information. Note that this field shall contain information as received by the sending centre or a subset thereof as agreed between the parties.

Example

(PAC-QFA811/A2277-WSSS-20N070E/1417F250-YAYT-10/S/C)

4.4.4 MAC (COORDINATION CANCELLATION)

4.4.4.1 Purpose.

4.4.4.1.1 Used to indicate a receiving centre that all notification and/or coordination received for a flight is no longer relevant to that centre. This message is not to be considered as a CNL message.

4.4.4.2 Message Format

3	Message type
7	Aircraft identification
13	Departure aerodrome
16	Destination aerodrome
22*	Amendment (optional field)

*Field 22 may contain the following fields:

14	Boundary Estimate Data
18	Other information

Field 14 may be transmitted containing the boundary estimate data previously transmitted. It may be used if required, to correctly identify the flight concerned by the MAC, when appropriate. If a MAC is transmitted as a result of a diversion to a new destination (i.e. such that the receiving ATSU is no longer affected by the flight), Field 16 – Destination aerodrome – should contain the destination contained in the original Notification and/or coordination messages.

4.4.5 CDN (COORDINATION NEGOTIATION)

4.4.5.1 Purpose.

4.4.5.1.1 Used to propose changes to the coordination conditions agreed to in a previously transmitted CPL, EST, PAC, or CDN message. Only one CDN dialogue can be active per flight at any given time between the same two ATSU's (refer Chapter 7, *Implementation Guidance Material*). The initial coordination dialogue is always terminated by an ACP message; otherwise a unit receiving a CDN can indicate that the coordination conditions should be left

as previously agreed by transmitting an REJ message. CDN dialogues should be closed prior to the Transfer of Control occurring. ATSUs should ensure that appropriate procedures are defined n bilateral Letters of Agreement for dealing with CDN messages containing a number of revisions (eg a revised estimate and level). There may be occasions when the receiving ATSU can accept one of the amendments but not the other.

4.4.5.2 Message Format.

ATS Field	Description
3	Message type
7	Aircraft identification
13	Departure aerodrome
16	Destination aerodrome
22*	Amendment

* Under normal circumstances, Field 22 may only contain fields 14, 15, and 18. Subject to bilateral agreement, the following fields may also be included in Field 22.

10	Equipment
Text	Amended Destination

4.4.5.3 Amended Destination is a free text field that may be used in the CDN message to propose the coordination of a new destination aerodrome. The field consists of an identifier (“DEST”) followed by a “/” character, followed by the name or location of the destination. When used, the Amended destination field is the last field within Field 22.

Example

a. (CDN-NWA36-NFFN-RJTT-14/20N150E/0446F370)
b. (CDN-QFA1-YSSY-WSSS-10/SDGHIJRYZ/SD)
c. *CDN/MOD can NOT be approved

4.4.5.4 Refer to Chapter 7, *Implementation Guidance Material*, for the methodology in proposing a diversion to a new destination.

4.4.6 ACP (ACCEPTANCE)

4.4.6.1 Purpose.

4.4.6.1.1 Used to confirm that the contents of a received CPL, CDN, EST or PAC message are accepted. ACP messages may be generated automatically or manually.

4.4.6.2 Message Format.

ATS Field	Description
3	Message type
7	Aircraft identification
13	Departure aerodrome
16	Destination aerodrome

Example

(ACP-ACA860-NZAA-KSFO)

4.4.7 REJ (REJECTION)

4.4.7.1 Purpose.

4.4.7.1.1 Used to reject a clearance proposed by a CDN to a previously coordinated flight and terminate the coordination dialogue. The clearance remains as was previously agreed.

4.4.7.2 Message Format.

ATS Field	Description
3	Message type
7	Aircraft Identification
13	Departure Aerodrome
16	Destination Aerodrome

Example

(REJ-AAL780-KSFO-RJAA)

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4.4.8 TRU (TRACK UPDATE)

4.4.8.1 Purpose.

4.4.8.1.1 Used to permit the coordination of amendments to previously agreed coordination conditions where prior coordination of the changes is not required. Because there is no operational response to the TRU message, use of this message must be in strict accordance with bilateral agreements between ATSUs concerned.

4.4.8.2 Message Format.

ATS Field	Description
3	Message type
7	Aircraft Identification
13	Departure Aerodrome
16	Destination Aerodrome
Text	Track Data

4.4.8.3 Track data is a free text field used in the TRU message to permit the transfer of updated clearance information from one ATSU to another. This field contains a number of elements which are described below. Each element consist of an "identifier" and a value which are separated by a "/" character.

4.4.8.4 All of the elements within the Track data field are optional, and multiple elements may be included, separated by a single <space> character. Track data will contain at least one element. When multiple elements are to be transmitted in a single TRU message, the order of the elements within the Track data field is the order in which they are listed below. Unused elements are not included in the Track data field.

4.4.8.5 Heading (HDG)

4.4.8.5.1 This optional element is preceded by the identifier 'CFL' and contains the amended level that the aircraft has been assigned. Block levels in accordance with Part I, Paragraph 4.2 are also supported.

Example

HDG/080

4.4.8.6 Cleared Flight Level (CFL)

4.4.8.6.1 This optional element is preceded by the identifier ‘CFL’ and contains the amended level that the aircraft has been assigned. Block levels in accordance with Part I, Paragraph 4.2 are also supported.

Example

CFL/F330
CFL/F310F330

4.4.8.7 Speed (SPD)

4.4.8.7.1 This optional element is preceded by the identifier ‘SPD’ and contains details of the speed (Mach Number or Indicated airspeed) that the aircraft has bee assigned.

Mach numbers are expressed as “M” followed by 3 numeric giving the true Mach Number or to the nearest .01 Mach.

Indicated airspeeds are expressed as “I” followed by 4 numeric giving the Indicated Airspeed in knots.

4.4.8.7.2 To cancel an assigned speed that had been previously coordinated, the SPD identifier is followed by a “/” character, followed by a zero (0).

Example

SPD/M084
SPD/I0250
SPD/0

4.4.8.8 Direct to (DCT)

4.4.8.8.1 This optional element is preceded by the identifier “DCT” and contains the position that the aircraft has been cleared directly to.

Example

DCT/MICKY
DCT/30S160E

4.4.8.9 Off Track deviation (OTD)

4.4.8.9.1 This optional element is preceded by the identifier 'OTD' and contains the details of any off track clearance that has been issued to the aircraft. The format of the off track deviation is as described in Part I paragraph 4.4.1 (a,b,c).

a single character providing advice as to whether the clearance is an offset (O) or a weather deviation (W); and

an off track distance associated with this clearance:

a direction, indicating left (L) or right ® or, in the case of weather deviation, either side of track (E); and

when including Offset information in and AIDC message, the direction "E" (either side of track) shall be used

4.4.8.9.2 To cancel a previously coordinated off track deviation, the OTD identifier is followed by a "/" character, followed by a zero (0).

Example

OTD/W20R
OTD/O30L
OTD/0

4.4.9 Depending on automation, the receiving ATSU may automatically update their flight plan data, or simply display the message to the responsible controller.

Example

(TRU-UAL73-NTAA-KLAX-CFL/F280 OTD/W20R)
(TRU0-QFA43-YSSY-NZAA-HDG/115 CFL/F270)

4.5 Transfer of control messages

4.5.1 TOC (TRANSFER OF CONTROL)

4.5.1.1 Purpose.

4.5.1.1.1 Used to offer the receiving centre executive control of a flight

4.5.1.2 Message Format

ATS Field	Description
3	Message type
7	Aircraft identification
13	Departure aerodrome
16	Destination aerodrome

Example

(TOC-TAP451/A2217-YMML-NZCH)

4.5.2 AOC (ASSUMPTION OF CONTROL)

4.5.2.1 Purpose.

4.5.2.1.1 Sent in response to a TOC to indicate acceptance of executive control of a flight.

4.5.2.2 Message Format.

ATS Field	Description
3	Message type
7	Aircraft identification
13	Departure aerodrome
16	Destination aerodrome

Example

(AOC-TAP451/A2217-NFFF-PHNL)

4.6 General information messages

4.6.1 EMG (EMERGENCY)

4.6.1.1 Purpose.

4.6.1.1.1 Used at the discretion of ATSUs when it is considered that the contents require immediate attention. Normally the information would be presended directly to the controller responsible for the flight or to the controller expecting to receive responsibility for the flight. When the message does not refer to a specific flight, a functional address shall be used and the information presented to the appropriate ATS position. Where such an address is used it is preceded by an oblique stroke (/) to differentiate it from an aircraft identification. The following are some examples of circumstances which could justify the use of an EMG message.

a) Reports of emergency calls or emergency locator transmission reports.

b) Messages concerning hi-jack or bomb warnings.

c) Messages concerning serious illness or disturbance among passengers.

d) Sudden alteration in flight profile due to technical or navigational failure.

e) Communications failure.

4.6.1.2 Message format.

ATS Field	Description
3	Message type
7	Aircraft identification
18	Other information

Example

(EMG-UAL123-RMK/Free Text)
(EMG-/ASUP-RMK/Free Text)

4.6.2 MIS (MISCELLANEOUS)

4.6.2.1 Purpose.

4.6.2.1.1 Used to transmit operational information which cannot be formatted to comply with and other message type and for plain language statements. Normally the information would be presented directly to the controller responsible for the flight or to the controller expecting to

receive responsibility for the flight. When the message does not refer to a specific flight, a functional address shall be used and the information presented to the appropriate ATS position. Where such an address is used it is preceded by an oblique stroke (/) to differentiate it from an aircraft's identification.

4.6.2.2 Message format.

ATS Field	Description
3	Message type
7	Aircraft identification
18	Other information

Examples

(MIS-NWA456-RMK/Free Text)
(MIS-/ASUP-RMK/Free Text)

4.6.3 TDM (TRACK DEFINITION MESSAGE)

4.6.3.1 Purpose.

4.6.3.1.1 Used to distribute track information to affected Area Control Centres (ACCs) and Airline Operational Control Centres (AOCs) for flight planning. The message contains track definition and activity time periods.

4.6.3.2 Message Format.

1. Message Identifier. The message begins with a "(TDM" and ends with ")". Fields within the message are separated by a space (i.e. " ").

2. Track Name. The track name consists of two fields. The first field is always TRK. The second field is the track identifier. The track identifier consists of 1 to 4 alphanumeric characters.

3. General Information. Contains:

a. Date and time the track was generated and message number tor that particular track in YYMMDDHHMMNN format where NN represents the message number. The initial TDM date/time message number group will like: 941006134501. Message numbers 02 and 99

indicate TDM amendments or e revision. Note that zero padding may be required to provide the correct number of digits.

b. Track status – Blank field for initial message or “AMDT” for amendment.

4. Activity Time Interval. This field consists of two date/time pairs, separated by a blank character, in the following format: YYMMDDHHMM YYMMDDHHMM.

The first date/time pair represents the track activation, while the second is the track termination date/time.

Example: 9410070300 9410071500.

This example represents an activation date/time of October 7, 1994, at 0300 UTC and a termination date/time of October 7, 1994 at 1500 UTC.

5. Track Waypoint. This field contains the set of waypoints defining the track from the ingress fix to the egress fix. Waypoints are represented as latitude/longitude or named en route points. Waypoints are separated from each other by a blank space. Note that zero padding may be required. For example:

60N150W 60N160W, or NORMUL NUMMI, or FINGS 5405N13430W, etc.

6. Optional Fields

a. Level: This optional field will not be used in the Pacific operations since levels are published in separate documents, eg Pacific Ocean Supplements. However, the field will be retained for possible future use. If used in the future, track levels lists may be specified for the east and westbound directions of flight and a track levels list would contain the complete list of levels available on the track for the specified direction of flight. The levels would apply to all waypoints in the track waypoint list.

b. Connecting routes (RTS): The RTS field is an optional field not normally used by automated ATS systems. When used, it is located after the waypoint list (before the remarks field) and begins with the keyword “RTS/” at the beginning of a line. Each line of the RTS field contains a single connecting route (to the ingress fix or from the egress fix).

7. Remarks: The Remarks subfield is a free text field text field that can contain additional comments. If there are no remarks a zero (0) is inserted as the only text. The remarks subfield begins with “RMK/”.

Examples

The following TDM describes a route connecting Honolulu and Japan and would look similar to:

(TDM TRK A 940413124001
9404131900 9404140800
LILIA 27N170W 29N180E 31N170E 32N160E MASON
RTS/PHNL KEOLA2 LILIA
MASON OTR 15 MOLT OTR 16 SUNNS OTR20 LIBRA RJAA RMK/0)

The following TDM Revision describes a revision to the TDM shown above.

(TDM TRK A 940413131502 AMDT
9404131900 9404140800
LILIA 27N170W 29N180E 30N170E 32N160E MASON
RTS/PHNL KEOLA2 LILIA
MASON OTR15 SMOLT OTR16 SUNNS OTR20 LIBRA RJAA RMK/0)

In the example given above, the message number (as delineated by the last two digits of the message generation date/time group) indicates it as the second ("2") message for the track. This is followed by "AMDT" to signify the previous message has been amended.

4.6.4 NAT (ORGANIZED TRACK STRUCTURE)

4.6.4.1 Purpose.

4.6.4.1.1 Used to publish the organized track structure and the levels available. The message may be divided into several parts to enable it to be transmitted.

4.6.4.2 Message Format.

ATS Field	Description
3	Message type

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Text Structured text

4.6.4.3 Structured Text Format.

4.6.4.3.1 It is required to adhere strictly to the syntax described hereafter in order to facilitate automated processing of NAT messages.

4.6.4.3.2 In the examples below, text between angle brackets should be understood to represent characters by their ASCII name. E.g. <sp> stands for 'space character', <cr> for 'carriage return>, <lf> for 'line feed', and any combination <crlf> is the same as <cr><lf>. No control character shall be inserted in the message text unless specified as in the examples below. This restriction of course applies to <cr> and <lf> as well as any other control character.

4.6.4.3.3 It shall be noted that NAT Track messages shall otherwise follow current AFTN syntax requirements as expressed in ICAO Annex 10, Chapter 11, 1995, e.g. that the alignment function with the message text, header and trailer is composed of a single <cr> followed by a single <lf>. However modern systems shall also be able to process the older alignment function composed of a double <cr> followed by a single <lf> as if it were a single <cr> followed by a single <lf> for backward compatibility reasons and to facilitate transition.

4.6.4.3.4 Characters in **bold underlined** in Message Text (syntax) column are to be replaced or dealt with as explained in the Description column.

4.6.4.3.5 The structured text is first composed of a NAT message header, as follows:

Id	Message Text (syntax)	Description (semantics)
1	(NAT-**a**/**b**<sp> TRACKS<sp>	**a** designates the part number in the **b** parts of the NAT message (**a** and **b** are one decimal digit)
2	FLS<sp>**nnn**/**mmm** <sp>INCLUSIVE	**nnn** and **mmm** designating the minimum and maximum concerned flight levels in hundreds of feet (three decimal digits)
3	<crlf>	
4	**month**<sp>**d1/h1m1**Z <sp>TO<sp>	Validity time with: **month**: for the month of validity full month name in letters
	month<sp>**d2/h2m2**Z	**d1/h1m1**: beginning time of validity

		d2/h2m2: ending time of validity(day/hour minute, 2 digits each, no space, leading zero required if number is less than 10)
5	<crlf>	
6	PART<sp>**a** <sp>OF<SP> b<sp> PART**S**-	**a** and **b** textual numbers (ONE, TWO, THREE, FOUR) or one digit. Both numbers shall represent the same digits as referred to in item Id 1 above. Terminal character **S** may be omitted if **b** is ONE.
7	<crlf><crlf>	

4.6.4.3.6 Following the NAT message header is a repeat of the following structure for each North Atlantic Track part of the message. If the resulting NAT message text is longer than 1800 characters, it must be separated into as many parts as necessary. Separation must happen between individual North Atlantic Track descriptions, not with an individual description.

Id	Message Text (syntax)	Description (semantics)
8	**L**	letter designating the name of the NAT track. One of: ABCDEFGHIJKLM for Westbound tracks. The most northerly Track of the day is designated as NAT Track Alpha, the adjacent Track to the south as NAT Track Bravo, etc, NPQRSTUVWXYZ for Eastbound tracks The most southerly Track of the day is designated as NAT Track Zulu, the adjacent Track to the north as NAT Track Yankee, etc, Tracks must be defined in sequence starting at any letter in the appropriate set, each following track using the immediately following letter in that set, e.g. UVWXYZ or ABCDE etc.

		The first track in the message shall be the most northerly one and each subsequent track shall be the next one towards the south.
	9 <sp>	
	10 **list of points**	Each point, separated by a space, is either significant points (named points from the published ICAO list of fixes) or a LAT/LONG given in degrees and minutes. At present only whole degrees are used. Acceptable LAT/LONG syntaxes are:
1.	xx/yy	
2.	xxmm/yy	
3.	xx/yymm	
4.	xxmm/yymm	
		Where xx is the north latitude, yy the west longitude, and mm the minutes part of the latitude or longitude.
2.	<cr>	
	3. EAST LVLS<sp>**List of allowed levels**	list the allowed flight levels for eastbound flights. This list can contain NIL if there is no allowed level or a list of numbers (3 decimal digits) for each allowed level separated by a space.
4.	<crlf>	
5.	West LVLS<sp>**List of allowed levels**	list the allowed flight levels for westbound flight. This list can contain NIL if there is no allowed level or a list of numbers (3 decimal digits) for each allowed level separated by a space.
6.	<crlf>	
	7. EUR<sp>RTS<sp>	(optional field)
	WEST<sp>**XXX** <sp> VIA<sp>**RP**	Note that the indentation does not indicated the presence of space characters, it is a presentation mechanism to highlight two variant syntaxes for this field.
	OR	

	EUR<sp>RTS<sp> WEST<sp> NIL	Description of European links to the tracks, this description will be given separately for Eastbound and/or Westbound flights. **XXX** designating the Irish/UK route structure linked to the NAT track. **RP** designating the point recommended to be over flown by westbound flights for joining the NAT track. The text "VIA<sp>**RP**" is optional. There is no European link.
8.	<crlf>	
9.	NAR<sp>**list** OR	(optional) Description of North American links to the tracks list
10.	-	
11.	<crlf><crlf>	

And to terminate the NAT message is composed of a trailer

Id	Message Text (syntax)	Description (semantics)
12.	<crlf>	
13.	REMARKS<crlf>**text** <crlf>	This field is optional and can only be present in the last part of a multipart NAT message, or in the unique part in case of a mono-part NAT message. The remark text must contain the Track Message Identifier (TMI). It is recommended to consistently place the TMI in the first remark. The syntax for the TMI is as follows: Any text may precede the keywords that identify the TMI.

		The TMI is recognised as the first occurrence of the string (without the quotes) "TMI<sp>IS<sp>**xxx"** is the TMI and "**a**" the optional track message revision letter. To facilitate automated processing, this string shall be followed by a space character before any subsequent remark text is inserted in the track message. The TMI shall be the Julian calendar day in the year – i.e. starting at one (001) on the first of January or each year, 002 for second of January etc.
23	END<sp>OF<sp>PART <sp>**a**<sp>OF<sp>**b** <sp>PART**S**)	**a** and **b** textual numbers (ONE, TWO, THREE, FOUR) or one decimal digit. Both numbers must be the same as in field 6 above.

Terminal character

4.6.4.3.7 Example of westbound message set.

```
 (NAT-1/3 TRACKS FLS 310/390 INCLUSIVE
JULY 01/1130Z TO JULY 01/1800Z
PART ON OF THREE PARTS-

A 57/10 59/20 61/30 62/40 62/50 61/60 RODBO
EAST LVLS NIL
WEST LVLS 320 340 360 380
EUR RTS WEST NIL
NAR N498C N4996C N484C-

B 56/10 58/20 60/30 61/40 60/50 59/60 LAKES
EAST LVLS NIL
WEST LVLS 310 330 350 370 390
EUR RTS WEST 2
NAR N434C N428C N424E N416C

C 55/10 57/20 59/30 60/40 59/50 PRAWN YDP
EAST LVLS NIL
WEST LVLS 310 32 330 340 350 360 370 380 390
EUR RTS WEST NIL
```

```
NAR N322B N326B N328C N336H N346A N348C N352C N356C N362B-

D MASIT 56/20 58/30 59/40 58/50 PORGY HO
EAST LVL NIL
WEST LVLS 310 320 330 340 350 360 370 380 390
EUR RTS WEST DEVOL
NAR N284B N292C N294C N298H N302C N304E N306C N308E N312A-

E 54/15 55/20 57/30 57/40 56/50 SCROD VALIE
EAST LVLS NIL
WEST LVLS 310 320 330 340 350 360 370 380 390
EUR RTS WEST BURAK
NAR N240C N248C N250E N252E N254A N256A N258A N260A-

END OF PART ONE OF THREE PARTS


(NAT-2/3 TRACKS FLS 310.390 INCLUSIVE
JULY 01/1130Z TO JULY 01/1800Z
PART TWO OF THREE PARTS

F 53/15 54/20 56/30 56/40 55/50 OYSTR STEAM
EAST LVLS NIL
WEST LVLS 310 320 330 340 350 360 370 380 390
EUR RTS WEST GUNSO
NAR NIL-

END OF PART TWO OF THREE PARTS)


(NAT-3/3 TRACKS FLS 310/390 INCLUSIVE
JULY 01/1130Z TO JULY 01/1800Z
PART THREE OF THREE PARTS-

BANAL 43/20 44/30 44/40 43/50 JEBBY CARAC
EAST LVLS NIL
WEST LVLS 310 350 370
EUR RTS WEST DIRMA
```

```
NAR N36E N44B-

REMARKS
1. TMI IS 182 AND OPERATORS ARE REMINDED TO INCLUDE THE TMI NUMBER
AS PART OF THE OCEANIC CLEARANCE READ BACK.
2. OPERATORS ATTENTION IS DRAWN TO CZUL NOTAM A2152/01
3. OPERATORS ATTENTION IS DRAWN TO UK NOTAMS A1098/01 AND G0120/01
4. MNPS AIRSPACE EXTENDS FROM FL285 TO FL420. OPERATORS ARE
REMINDED THAT SPECIFIC MNPS APPROVAL IS REQUIRED TO FLY IN THIS
AIRSPACE. IN ADDITION, RVSM APPROVAL IS REQUIRED TO FLY BETWEEN
FL310 AND FL390 INCLUSIVE.
5. EIGHTY PERCENT OR GROSS NAVIGATION ERRORS RESULT FROM POOR
COCKPIT PROCEDURES. ALWAYS CARRY OUT PROPER WAY POINT CHECKS.-
END OF PART THREE OR THREE PARTS)
```

4.6.4.3.8 Example of eastbound message set.

```
(NAT-1/1 TRACKS FLS 310/390 INCLUSIVE
JULY 01/0100Z TO JULY 01/0800Z
PART ONE OF ONE PART-

V YAY 53/50 54/40 55/30 56/20 56/10 MAC
EAST LVLS 310 320 330 340 350 360 370 380 390
WEST LVLS NIL
NAR N125A N129B-

W DOTTY 52/50 53/40 54/30 55/20 55/10 TADEX
EAST LVLS 310 320 330 340 350 360 370 380 390
WEST LVLS NIL
EUR RTS WEST NIL
NAR N109E N113B-

X CYMON 51/50 52/40 53/30 54/20 54/15 BABAN
EAST LVLS 310 320 330 340 350 360 370 380 390
WEST LVLS NIL
EUR RTS WEST NIL
NAR N93B N97B-

Y YQX 50/50 51/40 52/30 53/20 53/15 BURAK
```

```
EAST LVLS 310 320 330 340 350 360 370 380 390
WEST LVLS NIL
EUR RTS WEST NIL
NAR 77B N83B-

Z VIXUN 49/50 50/40 51/30 52/20 52/15 DOLIP
EAST LVLS 310 320 330 340 350 360 370 380 390
WEST LVLS NIL
EUR RTS WEST NIL
NAR 61B N67B-

REMARKS:
1. TMI IS 182 AND OPERATORS ARE REMINDED TO INCLUDE THE TMI NUMBER
AS PART OF THE OCEANIC CLEARANCE READ BACK.
2. CLEARANCE DELIVERY FREQUENCY ASSIGNMENTS FOR AIRCRAFT OPERATING
FROM MOATT OT BOBTU INCLUSIVE: MOATT – SCROD 128.7 OYSTR – DOTTY
135.45 CYMON – YQX 135.05 VIXUN – COLOR 128.45 BANCS AND SOUTH
119.42
3. PLEASE REFER TO INTERNATIONAL NOTAMS CZUL A2152/01
4. MNPS AIRSPACE EXTENDS FROM FL285 TO FL420. OPERATORS ARE
REMINDED THAT SPECIFIC MNPS APPROVAL IS REQUIRED TO FLY IN THIS
AIRSPACE. IN ADDITION, RVSM APPROVAL IS REQUIRED TO FLY WITHIN THE
NAT REGIONS BETWEEN FL310 AND FL390 INCLUSIVE.
5. 80 PERCENT OF GROSS NAVIGATIONAL ERRORS RESULT FROM POOR
COCKPIT PROCEDURES. ALWAYS CARRY OUT PROPER WAYPOINT CHECKS.
6. REPORT NEXT WAYPOINT DEVIATIONS OF 3 MINUTES OR MORE TO ATC.
7. EASTBOUND UK FLIGHT PLANNING RESTRICTIONS IN FORCE. SEE NOTAMS
A1098/01.
END OF PART ONE OF ONE PART)
```

4.7 Application management messages

4.7.1 LAM (LOGICAL ACKNOWLEDGEMENT MESSAGE)

4.7.1.1 Purpose.

4.7.1.1.1 Sent for each message (except for another LAM or LRM) that has bee received, processed, found free of errors and, where relevant, is available for presentation to a control position.

Non-receipt of a LAM may require local action. The message identifier and reference identifier are found in the message header which is defined in Part II.

4.7.1.2 Message Format.

ATS Field	Description
3	Message type

Example
(LAM)

4.7.2 LRM (LOGICAL REJECTION MESSAGE)

4.7.2.1 Purpose.

4.7.2.1.1 Used to reject a message which contains invalid information. The message identifier and reference identifier are found in the message header, which is defined in Part II of this document. The LRM will identify the first field found that contains invalid information if this field information is available.

4.7.2.2 Message Format.

ATS Field	Description
3	Message type
18	Other Information

4.7.2.3 Field 18 will only use the RMK/ sub-field. It will comprise an error code, supporting text and the field number in which the error occurred (where applicable).

4.7.2.4 The following format is used n the RM/ sub-field of the LRM to report errors:

<error code>/<field number>/<invalid text>

4.7.2.5 The <error code> shall contain the appropriate error code number from Chapter 5, *Error Code*, Table 5-1. The error code is described using up to three numeric characters without leading zeros. When multiple errors are detected in an AIDC message, only a single LRM should be generated in response. This LRM would usually contain the error code of the first error detected.

4.7.2.6 The <field number> will contain the field number corresponding to the error code extracted from Table 5-1, *Error Codes*. Where multiple field numbers are assigned to an error code, only the first field number containing the error will be sent. Where no field number is referenced in Table 5-1, *Error Codes*, and the field number sub-field will be empty. The field number can be described using up to six alphanumeric characters.

> **Note:** Some ATSUs may not support non-numeric field numbers (e.g. "HEADER"). Whilst this is acceptable in order to preserve backwards compatibility with existing systems, the preferred implementation is for any non-numeric field numbers for Table 5-1 to be supported within the LRM.

4.7.2.7 The <invalid text> field will contain the error text corresponding to the error code extracted from Table 5-1 (not including any of 'explanatory text' that may have been included in Table 5-1). If the specific error can be identified, it may optionally be appended to the Table 5-1 error text. The invalid text field can contain up to 256 characters.

> **Note:** Some ATSUs may not include the error text from Table 5-1, *Error Codes*, in the <invalid text> field of transmitted LRMs. Whilst this is acceptable in order to preserve backwards compatibility with existing systems, the preferred option is the LRM <invalid text> field to at least contain the error text from Table 5-1, *Error Codes*.

4.7.2.8 The following shows a number of LRM examples. Where more than one LRM format is shown, the format of the first one is the preferred option.

(LRM-RMK/1HEADER/INVALID SENDING UNIT)

OR

(LRM-RMK/1/INVALID SENDING UNIT)
(See Note following paragraph 2.7.2.6)

(LRM-RMK/17/16/INVALID AERODROME DESIGNATOR)

OR

(LRM-RMK/17/16)
(See Note following paragraph 2.7.2.7

(LRM-RMK/57//INVALID MESSAGE LENGTH)

(LRM-RMK/27/15/INVALID LAT/LON 130S165E)
The actual error "130S165E" may be optionally appended to the error text from Table 5-1, *Error Codes*

4.7.3 ASM (APPLICATION STATUS MONITOR)

4.7.3.1 Purpose.

4.7.3.1.1 Sent to an adjacent centre to confirm that the adjacent centre's ATC application system is online. It is transmitted when no other application messages have received within an adaptable time. The periodic interval between transmissions of this message should be determined based on the needs of the operation environment. Typical values may be between 5 and 30 minutes.

4.7.3.2 Message Format.

ATS Field	Description
3	Message type

Example
(ASM)

4.7.4 FAN (FANS APPLICATION MESSAGE)

4.7.4.1 Purpose.

4.7.4.1.1 Transmitted by on ATSAU (generally the controlling ATSU) to another ATSU (generally the receiving ATSU) to provide the required information necessary to establish CPDLC and/or ADS-C connections with FANS equipped aircraft.

4.7.4.2 Message Format.

ATS Field	Description
3	Message type
7	Aircraft identification
13	Departure aerodrome
16	Destination aerodrome

Text Application data as described below

4.7.4.3 Receipt or transmission of a FAN message does not change the coordination state of the flight.

4.7.4.4 Application data field is a free text field used in the FAN message to permit the transfer of FANS logon information from one ATSU to another. This field contains a number f elements which are separated by a "/" character. The abbreviation used for the identifier corresponds to the associated ICAO abbreviation (where one exists)/ otherwise the three character MTI (Message Type Identifier) contained in the logon is used (refer to ARINC 622 for a listing of various MTIs)

4.7.4.5 The order of the elements within the FAN message is the order that they are listed below, with consecutive elements being separated by a single <space> character. Although some elements within the Application data field may be "optional", they should be included if the corresponding data is available (i.e. if the ATSU transmitting the FAN message has received this information either from a logon or a FAN message). This is for the benefit of downstream ATSUs what may use the information within these optional elements. If data is not available for an optional element is not to be included in the FAN message.

4.7.4.6 Additional information concerning the elements described below is contained in Chapter 7, *Implementation Guidance Material.*

4.7.4.7 Standard message identifier (SMI)

4.7.4.7.1 This mandatory element is preceded by the identifier 'SMI', and contains information relating to the address to which uplink messages are routed to in the avionics. The value of the SMI sent in the FAN message is the downlink SMI as it was received in either the most recently received logon or FAN message.

4.7.4.7.2 Allowable values for the SMI are listed in ARINC 620. Example or SMI include "FML", "FMR", "FMD", FM3" and "AFD".

Example

SMI/FMD

4.7.4.8 Aircraft identification

4.7.4.8.1 This mandatory element is preceded by the identifier 'FMH' and contains the aircraft identification as it was received in either the most recently received logon or FAN message.

Example

FMH/MAS123

4.7.4.9 Aircraft registration

4.7.4.9.1 This mandatory element is preceded by the identifier ‘REG’ and contains the registration details of the aircraft – including the hyphen if applicable – as it was received in either the most recently received logon or FAN message.

Example

REG/N12345
REG/9V-ABC

4.7.4.10 Aircraft Address (ICAO 24 bit code)

4.7.4.10.1 This optional element is preceded by the identifier ‘CODE’ and contains the six character hexadecimal translation or the 24 bit aircraft address as it was received in either the most recently received logon or FAN message.

Example

CODE/ABC123

4.7.4.11 Aircraft position information

4.7.4.11.1 This optional element is preceded by the identifier ‘FPO’ and contains the position of the aircraft as determined by the ATSU at the time of transmission of the FAN message, if this information is available. The position of the aircraft is expressed as a latitude/longitude in either dd[NS]ddd[EW] or ddmm[NS]dddmm[EW] format.

Example

FPO/23S150E
FPO/0823N11025E

4.7.4.12 ATS Application and Version Number

4.7.4.12.1 There will usually be multiple elements associated with the ATS Application and Version number (i.e. CPDLC and ADS-C). Occurrences of this element are receded by the identifier ‘FCO’ which describes the ATS data link application(s) available in the avionics, as they

were received in a logon or a previously received FAN message. The Fan message must include at least one ATS data link application – a separate identifier is used for each available application. These elements may be transmitted in any order.

4.7.4.12.2 The values associated with FCO identifier consist of three letters to describe the application name immediately followed by (i.e. with no intervening spaces) two numeric characters to represent the associated version number. Possible values for the three letters are "ATC" (for CPDLC) or "ADS" (for ADS-C), and the possible range of version numbers is 01 to 99.

Example

FCO/ATC01 FCO/ADS01
FCO/ADS01

4.7.4.12.3 The second example illustrates a FAN message with ADS application only. This may be either because the aircraft is not CPDLC equipped, or because the FAN is being used with an adjacent ATSU to enable monitoring using ADS-C by that ATSU with the aircraft is only entering the ACI.

Example

(FAN-QFA43-YSSY-NZAA-SMI/AFD FMH/QFA43 REG/VH-OJA FPO/34S158E FCO/ATC01 FCO/ADS01)

FAN-ANZ123-NZAA-KLAX-SMI/FML FMH/ANZ123 REG/ZK-NJP FCO/ADS01

(FAN-SIA221-WSSS-YSSY-SMI/FMD FMH/SIA221 REG/9M-MRP CODE/A254B3 FPO/1214S11223E FCO/ATC01 FCO/ADS01)

4.7.4.12.4 ATSUs should ensure that at least two of the ACID, REG, or CODE fields are used to ensure that the logon information contained in the FAN message is associated with the correct flight date record.

Note 1. If the FAN message contains information for the purpose of the next unit establishing a CPDLC connection, is should not be sent until after an appropriate CPDLC Next Data Authority message (NDA) has been transmitted to the aircraft, allowing a reasonable time for delivery of the NDA message.

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Note 2. Where an aircraft enters an adjacent ATSU's ACI but does not actually enter the ATSU's airspace and a FAN message is sent to the adjacent ATSU to enable monitoring using ADS-C then the FCO identifier for the CPDLC application should not be included.

4.7.5 FCN (FANS COMPLETION NOTIFICATION)

4.7.5.1 Purpose.

4.7.5.1.1 The FCN may be transmitted by either the transferring or receiving ATSU to provide information concerning the CPDLC Connection status of the aircraft. It is transmitted by the transferring ATSU when their CPDL C Connection with the aircraft is terminated, providing notification to the receiving ATSU that they are the CPDLC Current Data Authority. It may also be transmitted by the receiving ATSU to provide notification of the establishment of a CPDLC Connection or a failure of a CPDLC Connection request.

4.7.5.2 Receipt or transmission of an FCN message does not change the coordination state of the flight.

4.7.5.3 An FCN transmitted by the receiving ATSU may also (optionally) include contact/monitor frequency information to be issued to the aircraft by the transferring ATSU.

4.7.5.4 Message Format.

ATS fields	Description
3	Message type
7	Aircraft identification
13	Departure aerodrome
16	Destination aerodrome
Text	Communication Status as described below

4.7.5.5 Communication Status field.

4.7.5.5.1 Communication Status is a free text field used in the FCN message to permit the transfer of CPDLC connection status and (optionally) frequency information from one ATSU to another. This field may contain a number of elements which are described below. Each element consists of an "identifier" and a value which are separated by a "/" character. Separate elements are separated by a single < space> character.

4.7.5.6 CPDLC Connection Status identifier (CPD)

4.7.5.6.1 This mandatory element is preceded by the identifier “CPD” and contains a single Integer value which is used to provide information concerning an aircraft’s CPDLC Connection status. The value to be included in the CPDLC Connection Status field is determined from the following table.

Table 4-2. CPDLC Connection Status

CPDLC Connection Status		Meaning
0		The CPDLC Connection with the aircraft has bee terminated
	0	No CPDLC Connection could be established with the aircraft
	1	The CPDL C Connection Request failed due to the receiving ATSU not being the nominated CPDLC Next Data Authority
	2	A CPDL C Connection has been established with the aircraft

4.7.5.7 Frequency identifier (FREQ)

4.7.5.7.1 This optional element is preceded by the identifier “FREQ” and may be included inan FCN message transmitted by the receiving ATSU to advise of any changes to a previously notified (or a default) frequency. The FREQ/ identifier provide advice to the transferring ATSU of the voice frequency to be transmitted to the aircraft in the CPDLC Contact/Monitor instruction. If no frequency information is to be transmitted this element should not be included in the FCN message.

4.7.5.7.2 When transmitted in the FCN message, the frequency variable does not contain units, spaces or leading zeroes. It may be up to 7 characters in length, containing integers or a decimal point selected from the frequency range below.

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Table 4-3. Frequency Identifier

	Range	Units
HF	2850 to 28000	kHz
VHF	117.975 to 137.000	MHz
UHF	225.000 to 399.975	MHz

Example

FCN transmitted by receiving ATSU:

(FCN-SIA221-YSSY-WSSS-CPD/0)
The CPDLC Connection request for SIA221 failed

(FCN-ANZ15-KLAX-NZAA-CPD/2 FREQ/13261)
The CPDLC Connection request for ANZ15 was successful. Contac/Monitor voice frequency is 13261

FCN transmitted by transferring ATSU:

(FCN-QFA43-YSSY-NZAA-CPD/0)

The CPDLC Connection was QFA43 has been transmitted

4.8 Surveillance data transfer service messages

4.8.1 ADS (SURVEILLANCE ADS-C)

4.8.1.1 Purpose.

4.8.1.1.1 Used to transfer information contained in an ADS-C report from on ATSU to another.

4.8.1.2 Message Format.

ATS Field	Description
3	Message type
7	Aircraft identification
13	Departure aerodrome
16	Destination aerodrome
Text	ADS-C Data

4.8.1.3 ADS-C data field.

4.8.1.3.1 ADS-C data is a free text field used in the ADS message to permit the transfer of information contained in an ADS-C report from one ATSU to another. The data field consists of a identifier ("ADS") followed by a delimiter "/" character, followed by a text string containing specific text extracted from the encoded ACARS ADS-C report received from the aircraft.

4.8.1.3.2 The data field may also be used to indicate that no further ADS messages will be sent

4.8.1.3.3 To the receiving ATSU for the flight. To indicate this state the ADS identifier is followed by a delimiter "/" character, followed by a "0" (zero). The trigger would be the bilateral agreement (e.g. an ADS-C report has been received that places the aircraft outside the ACI and the predicted route group indicates that the aircraft will not re-enter the ACI).

4.8.1.3.4 The specific text to be included in the AIDC ADS message is described in Chapter 7 – *Implementation Guidance Material*.

Example

(ADS-ANZ90-RJAA-NZAA-ADS/.ZK-KC030007FF946B6FC044B9D0DFC013B80DA88FC0A64F9E4438B4AC8F000E34D0EDC00010140F3E86)

(ADS-ANZ90-RJAA-NZAA-ADS/0)

Table 4-4. NAT/APAC AIDC Messages and their Field Composition

CORE	OPT	MESSAGE	MESSAGE ACRONYM	ICAO FIELDS											NON-ICAO FIELDS
				3	7	8	9	10	13	14	15	16	18	22	
X		Advance Boundary Information	ABI	X	X				X	X		X		X 8,9,10,15,18,Text	
X		Current Flight Plan	CPL	X	X	X	X	X	X	X	X	X	X		
X		Coordination Estimate	EST	X	X				X	X		X			
X		Coodination Cancellation	MAC	X	X				X			X		X 14,18	
	X	PreActivation	PAC	X	X				X	X		X		X 8,9,10,15,18	
X		Coordination	CDN	X	X				X			X		X 10,14,15,18,Text	

X		Acceptance	ACP	X	X				X			X			
X		Rejection	REJ	X	X				X			X			
	X	Track Update	TRU	X	X				X			X			X
X		Transfer of Control	TOC	X	X				X			X			
X		Assumption of Control	AOC	X	X				X			X			

CORE	OPT	MESSAGE	MESSAGE ACRONYM	ICAO FIELDS											NON-ICAO FIELDS
X		Emergency	EMG	X	X				X				X		
X		Miscellaneous	MIS	X	X								X		
	X	Track Definition Message	TDM	X											X
X		Logical Acknowledgement message	LAM	X											

X		Logical Rejection Message	LRM	X									X		
	X	Application Status Monitor	ASM	X											
	X	FANS Application Message	FAN	X	X				X			X			X
	X	FANS Completion Notification	FCN	X	X				X			X			X
		Organized Tracks	NAT	X											X
	X	Surveillance ADS-C	ADS	X	X				X			X			X

Chapter 5. Error Code

5.1 Introduction

5.11 A set of error codes has been developed for those messages contained in the AIDC message set. A list of the codes, associated field number and error text is contained in the table below. This information is for the inclusion in any Logical Rejection Message transmitted in response to the reception of an AIDC message containing an error.

Table 5-1. Error Codes

Error Code	Field Number	Error Text
1	HEADER	INVALID SENDING UNIT (e.g. AFTN Address)
2	HEADER	INVALID RECEIVING UNIT (e.g. AFTN Address)
3	HEADER	INVALID TIME STAMP
4	HEADER	INVALID MESSAGE ID
5	HEADER	INVALID REFERENCE ID
6	7	INVALID ACID
7	7	DUPLICATE ACID
8	7	UNKNOWN FUNCTIONAL ADDRESS
9	7	INVALID SSR MODE
10	7	INVALID SSR CODE
11	8	INVALID FLIGHT RULES
12	8	INVALID FLIGHT TYPE
13	9	INVALID AIRCRAFT MODEL

14	9	INVALID WAKE TURBELENCE CATEGORY
15	10	INVALID CNS EQUIPMENT DESIGNATOR
16	10	INVALID SSR EQUIPMENT DESIGNATOR
17	13,16,17	INVALID AERODROME DESIGNATOR
18	13	INVALID DEPARTURE AERODROME
19	16	INVALID DESTINATION AERODROME
20	17	INVALID ARRIVAL AERODROME
Error	13,16,17	EXPECTED TIME DESIGNATOR NOT FOUND
22	13,16,17	TIME DESIGNATOR PRESENT WHEN NOT EXPECTED
23	13,14,16,17	INVALID TIME DESIGNATOR
Error Code	**Field Number**	**Error Text**
24	13,14,16,17	MISSING TIME DESIGNATOR
25	14	INVALID BOUNDARY POINT DESIGNATOR
26	14,15	INVALID EN ROUTE POINT
27	14,15	INVALID LAT/LON DESIGNATOR
28	14,15	INVALID NAVID FIX
29	14,15	INVALID LEVEL DESIGNATOR
30	14,15	MISSING LEVEL DESIGNATOR
31	14	INVALID SUPPLEMENTARY CROSSING DATA
32	14	INVALID SUPPLEMENTARY CROSSING LEVEL
33	14	MISSING SUPPLEMENTARY CROSSING LEVEL
34	14	INVALID CROSSING CONDITION

35	14	MISSING CROSSING CONDITION
36	15	INVALID SPEED/LEVEL DESIGNATOR
37	15	MISSING SPEED/LEVEL DESIGNATOR
38	15	INVALID SPEED DESIGNATOR
39	15	MISSING SPEED DESIGNATOR
40	15	INVALID ROUTE ELEMENT DESIGNATOR
41	15	INVALID ATS ROUTE/SIGNIFICANT POINT DESIGNATOR
42	15	INVALID ATS ROUTE DESIGNATOR
43	15	INVALID SIGNIFICANT POINT DESIGNATOR
44	15	FLIGHT RULES INDICATOR DOES NOT FOLLOW SIGNIFICANT POINT
45	15	ADDITIONAL DATA FOLLOWS TRUNCATION INDICATOR
46	15	INCORRECT CRUISE CLIMB FORMAT
47	15	CONFLICTING DIRECTION
48	18	INVALID OTHER INFORMATION ELEMENT
Error	19	INVALIDE SUPPLEMENTARY INFORMATION ELEMENT
50	22	INVALID AMENDMENT FIELD DATA
51		MISSING FIELD nn (See Note 1)
Error Code	**Field Number**	**Error Text**
52		MORE THAN ONE FIELD MISSING
53		MESSAGE LOGICALLY TOO LONG

54		SYNTAX ERROR IN FIELD nn (See Note 1)
55		INVALID MESSAGE LENGTH
56		NAT ERRORS/TDM ERROR
57		INVALID MESSAGE
58		MISSING PARENTHESIS
59		MESSAGE NOT APPLICABLE TO zzz OAC
60		
61		
62		
63		
64		
65		
66		
67		
68		
69		
70		
71		
72	ADF (See Note 2)	INVALID IDENTIFIER
73	ADF (See Note 2)	INVALID SMI
74	ADF (See Note 2)	INVALID ACID IN FMH/IDENTIFIER
75	ADF (See Note 2)	INVALID REGISTRATION IN REG/IDENTIFIER

76	ADF (See Note 2)	INVALID IAR CRAFT ADDRESS IN CODE/IDENTIFIER
77	ADF (See Note 2)	INVALID LOCATION IN FPO/IDENTIFIER
78	ADF (See Note 2)	INVALID DATA LINK APPLICATION FCO/IDENTIFIER
79	ADF (See Note 2)	INVALID OR UNSUPPORTED CPDLC VERSION NUMBER
80	ADF (See Note 2)	INVALID OR UNSUPPORTED ADS-C VERSION NUMBER
81	ADF (See Note 2)	INVALID IDENTIFIER IN FAN MESSAGE
Error Code	**Field Number**	**Error Text**
82	CSF (See Note 3)	INVALID CPDLC CONNECTION STATUS
83	CSF (See Note 3)	INVALID FREQUENCY IN FREQ/IDENTIFIER
84	ADF (See Note 4)	INVALID IDENTIFIER IN ADS MESSAGE
85	ADF (See Note 4)	INVALID DATA IN ADS MESSAGE **Note.** This error message refers to the encoded ADS-C data (e.g. if it contains non-hexadecimal characters), rather than whether the contents of the decoded ADS-C report itself are valid
86	TDF (See Note 5)	INVALID IDENTIFIER IN TRU MESSAGE
87	TDF (See Note 5)	INVALID HEADING IN HDG/IDENTIFIER
88	TDF (See Note 5)	INVALID POSITION IN DCT/IDENTIFIER
89	TDF (See Note 5)	INVALID OFF TRACK DEVIATION IN OTD/IDENTIFIER
90	TDF (See Note 5)	INVALID FLIGHT LEVE IN CFL/IDENTIFIER
91	TDF (See Note 5)	INVALID SPEED IN SPD/IDENTIFIER

92-256	14,15	RESERVED FOR FUTURE USE

5.12 The intention is that in error codes 51, 54, 59, and 65 that lower case text (e.g. “nn”, or “xxx”) is replaced by the applicable value win this information is available.

5.13 It is not intended that any amplifying text contained in parenthesis “(i.e., AFTN Address)” within the error text column be transmitted in any LRM.

5.14 In the FAN message, the “ADF” field number refers to the Application data field.

5.15 In the FCN message, the “CSF” field number refers to the Communication Status field.

5.16 In the ADS message, the “ADF” field refers to the ADS-C data field.

5.17 In the TRU message, the “TDF” field refers to the Track data field.

5.18 ERROR CODES 66-91 are ASIA/PACIFIC Regional ICD.

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Chapter 6. ATM Application Naming Conventions

6.1 Introduction

6.11 Eight character AFTN addresses will be used by the AIDC application to identify automated ATS end-systems. The first four characters identify the ATS unit location, while the last four characters identify an organization, end-system, or application process at the given location.

6.12 The table below describes a proposed naming convention, developed by the ATN Panel for identifying ATM end-systems and applications. The last (eighth) character of the end-system's or application's AFTN address should be selected in accordance with the table.

Table 6-1. CPDLC Connection Status

8th character	ATM ground system application process
A	Air space management
B	Unassigned
C	Unassigned
D	Dynamic track generation
E	Unassigned
F	Flight data processing (processor routes to appropriate control sector based on internal configuration information).
G	Reserved for State use
H	Reserved for State use
I	Reserved for State use
J	Reserved for State use
K	Reserved for State use

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L	Reserved for State use
M	OPMET data bank
N	AIS data bank
O	Oceanic data processing
P	Unassigned
Q	Unassigned
R	Radar data processing (processor routes to appropriate control sector based on internal configuration information).
S	System management
T	Air traffic flow management
8th character	**ATM ground system application process**
U	Unassigned
V	Unassigned
W	Unassigned
X	Default value
Y	Service function
Z	Unassigned

Chapter 7. Implementation Guidance Material

7.1 Introduction

7.11 The AIDC Message set described in Chapter 4, *ATS Coordination Messages*, supports six ATS-related functions.

1. Notification;
2. Coordination;
3. Transfer of Control;
4. General (Text) Information Interchange;
5. Surveillance Data Transfer; and
6. Application Management.

7.12 This chapter contains Implementation Guidance Material (IGM) of an explanatory nature. Information on how the message set as a whole is intended to be used is provided, with particular emphasis on the first three functions. The objective is to provide useful information and guidance to software engineers responsible for implementing the AIDC Message set within an automated ATS system.

7.13 Although outside the scope of the ICD, flight Planning messages play an important role within the region, and will continue to so in the future.

7.2 Preliminaries

7.21 Assumptions.

7.21.1 The following assumptions have been made:

7.21.1.1 The IGM applies only to those portions of a flight operating within the NAT/APAC Regions;

7.21.1.2 The material described below applies only to data transfers between two automated ATS systems. Though most of it also applies to the general case of Notification and Coordination between more than two automated ATS systems, certain multi-ATSU Coordination problems have not yet been solved;

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7.21.1.3 It must be possible to revert ot manual intervention of the Notification, Coordination, and Transfer of Control processes at any time;

7.21.1.4 Exceptional conditions, such as loss of communications between two ATSUs are not addressed and are subject to local procedures and,

7.21.1.5 An ATSU's Area of Common Interest (ACI) is defined as the airspace for which the ATSU is responsible, i.e., an FIR, and surrounding border regions just outside the FIR. These surrounding border regions are usually determined by the required separation minima.

7.22 AFTN message header.

7.22.1 Every message transmitted shall contain an AFTN header, as specified in Part II of the NAT/APAC ICD. This header shall contain the optional AFTN data fields described in Part II of the NAT/APAC ICD.

7.22.2 Message identifier numbers (AFTN optional data field 2) shall be sequential. Receipt of an out of sequence message shall result in a warning being issued.

7.22.3 A check for duplicate message identifier numbers shall be made. In general, since 1,000,000 numbers are available, no duplicates should be present.

7.22.4 Message identifier numbers shall begin at 0, proceed through 999,999, and then rollover to 0. The same sequence shall be repeated when necessary.

7.22.5 Each unique ATSU-to-ATSU interface shall select message identifier numbers from its own pool of numbers. Each pool shall encompass the entire possible range, i.e., include all numbers from 0 to 999,999.

7.23 Response messages.

7.23.1 Application response.

7.23.1.1 Every NAT/APAC AIDC message received by an ATSU, except a LAM or LRM, shall be responded to with a LAM or LRM. While no LAM is generated for a valid LRM, an ATSU may choose to respond to an invalid LRM with a LRM. Such a response is termed an Application Response, and is generated automatically by the automation system. A LAM shall be transmitted when the receiving automation system found the received message to be syntactically correct and the message data was accepted for further processing or presentation. Otherwise, a LRM message shall be transmitted.

7.23.1.2 The time out value T_{alarm} associated with an application response shall be 180 seconds, corresponding to the nominal value associated with the accountability timer described in Part II, Section 2.2.2.

7.23.1.3 Failure to receive an expected application response (i.e. a LAM or LRM) within T_r seconds ($\leq T_{alarm}$) shall result in a re-transmission (up to a maximum number N_r) of the original message, using the same information contained in optional data fields 2 and 3 found in the original message header. The timeout timer T_r shall be reset upon re-transmission. Failure to receive an application response within T_{alarm} seconds from the original transmission of the message shall result in a warning being issued.

7.23.1.4 The transmission of a LAM or LRM shall be triggered by the ATC application process, not the communications process. This is because an application response indicates that the received message was examined by the ATC application process(s), not just the communications functions. Note the distinction between an ATC application process, which implements a critical ATC function such as Coordination or Transfer of Control and a communications process which is responsible for the reliable deliver of data, but not data interpretation. This approach conforms to the OSI Reference Model.

7.23.1.5 Receipt of a LRM shall cause the receiving ATSU to take a corrective action before re-transmitting the message. This action may be automatic, as in a CRC error being indicated, or manual as in an incorrect route element format. Once this action has been taken, the message shall be re-transmitted with a new message identifier number.

7.23.2 Operational response.

7.23.2.1 Several NAT/APAC AIDC messages require a response, in addition to the normal application response by another AIDC message. Such a response is termed an Operational Response. Table 7-1 below indicates the required response to a received message. NAT/APAC AIDC messages not listed in Table 7-1 have no operational response.

Table 7-1, Required Operational Response

Received	Required Operational Response

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Message	
CPL	**ACP or CDN**
EST	**ACP**
PAC	**ACP**
CDN	**ACP, CDN, or REJ**
TOC	**AOC**

7.23.2.2 A REJ is not available in an Initial Coordination Dialogue initiated by a CPL, EST or PAC. A REJ is only available in a CDN dialogue.

7.23.2.3 Failure to receive a response within an adapted operational response timeout period T_{op} shall result in a warning being issued.

7.23.2.4 The value of T_{op} is dependent on whether manual processing is required to generate the operational response. In general, T_{op} should be less than 600 seconds when a manual action is required to trigger the operational response.

7.23.2.5 An operational response shall employ the AFTN header optional data field 3 to reference the original message being responded to. A coordination dialogue which is initiated by one message and contains a sequence of message exchanges until terminated by an ACP or REJ shall always reference the original message which triggered the dialogue. For example, one ATSU may initiate a coordination dialogue by transmitting a CPL message to an adjacent ATSU. A sequence of CDN messages may ensue terminated by an ACP message. The CDN and ACP messages would all reference the original CPL message. After completion of the initial coordination dialogue in the preceding example one ATSU my initiate another coordination dialogue by transmitting a CDN message. A sequence of CDN messages may ensue terminated by an ACP message. Messages in this new coordination dialogue would reference the first CDN message in the dialogue.

7.24 Application management.

7.24.1 The ASM message is used to confirm that the ATC application on the other end is on-line. This message is sent by ATSU A to (adjacent) ATSU B if, after a mutually agreed time, no communication has been received from ATSU B. ATSU B responds, if the ATC application is active and functioning, by sending a LAM to ATSU A. If ATSU A does not receive a response LAM from ATSU B within a specified time, local contingency procedures should be executed. This message would normally be sent automatically, but may be sent manually for testing purposes.

7.24.2 The FAN message may be used to transfer a data link aircraft's logon information from one ATSU to another. Implementation of this message obviates the need to utilize the five step "Address Forwarding" process (initiated by the FN_CAD) that was developed for the initial implementation of FANS. The message contains all the information that is required to establish ADS-C and/or CPDLC connections with the aircraft. In the event that only an ADS-C connection will be required, the transferring ATSU should include ADS-C information only. If a FAN message is transmitted containing ADS-C information only, there should be no expectation of receiving an FCN (see below) response. If a FAN message is received containing ADS-C application information only, there should be no attempt to establish a CPDLC connection.

7.24.2.1 Normally, one FAN message would be sent for each data link transfer per flight. However, when a FCN is received with a communication status field value of (1) indicating the receiving ATSU is not the Next Data Authority the transferring ATSU should send another NDA message to the aircraft and another FAN message to the receiving ATSU to indicate that the NDA has been sent (refer to Figure D-4). While the second FAN may not ve required for address forwarding purposes it does provide the receiving ATSU with a positive indication that another NDA has been sent to the aircraft.

7.24.2.2 ATSUs implementing the FAN message should consider retaining existing Address Forwarding functionality to be used as a contingency for data link transfers in the event of failure or the ground-ground link.

7.24.2.3 Similarly to Address Forwarding, the FAN message should be sent at a time parameter prior to the boundary with the next ATSU. This parameter should be in accordance with guidance outlined in the FANS Operations Manual (FOM). Functionality for the transmission of a FAN message manually by the ATS officer should also be implemented.

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7.24.2.4 Information concerning the identity of the aircraft i.e. aircraft identification, aircraft address and registration) contained in the Application data field must not be extracted from the flight plan – it must be information that was contained in either the most recently received logon or FAN message.

7.24.2.4.1 This requirement only applies to the aircraft identification within the Application data field of the FAN message. The aircraft identification (i.e. ATS Field 7) at the beginning of the FAN message is the identification of the aircraft from the ATS flight plan.

7.24.2.5 When extracting the identity of the aircraft from the logon, the information required is the aircraft identification within the CRC protected portion of the logon – not the flight identifier (FI) that is contained in Line 4 of the ACARS logon message. In the example below, the aircraft identification is **QFA924** rather that the QFA924 contained in Line 4 of the ACARS message.

QU BNECAYA
.QXSXMXS 010019
AFD
FI QF0924/AN VH-EBA
DT QXT POR1 010019 J59A
- AFN/FMH**QFA924**, . VH-EBA,, 001902/FPOS33373E150484,0/FCOADS,
01/FCOATC,,01292B

7.24.2.6 Under certain circumstances (e.g. FMC failure) it is possible for the SMI or an aircraft to change in flight, which will require a new logon from the aircraft to permit data link services to continue. To ensure that the next ATSU has up to date information, the SMI transmitted in any FAN message should be the SMI from the most recently received logon or FAN message.

7.24.2.7 A hyphen with the registration that was a contained in either the logon or any previously received FAN message must also be included in REG element of any transmitted FAN message. Without this hyphen, data link message transmitted by the ATSU may not be delivered to the aircraft.

7.24.2.7.1 ATSUs implementing the FAN message must be aware of the possible existence of the hyphen within the registration and that it does not signify a “new field” as is the case with other AIDC messages.

7.24.2.8 Any “padding” in the registration contained in the logon (e.g. preceding periods <.>s) must <u>not</u> be included in the FAN message. In the sample ACARS message above, the registration to be included in the FAN message would be “VH-EBA”, not “.VH-EBA”.

7.24.2.9 Some ATSUs may utilise the aircraft position which is an optional field that may be contained in the logon. If the aircraft position information element is to be included in any transmitted FAN message, there is little purpose in simply relaying the aircraft position from the original logon – the calculated position of the aircraft should be used instead.

7.24.2.10 The FCN message, where used, provides advice to the transferring ATSU that the receiving ATSU has established a (inactive) CPDLC connection with an aircraft. The transmission of an FCN message is triggered by an event such as the termination of a CPDLC Connection by the transferring ATSU, or the establishment of (or failure to establish) a CPDLC Connection by their receiving ATSU. FCN messages should only be transmitted when a CPDLC transfer is being affected – i.e. not for transfers involving aircraft that are only ADS-C equipped.

7.24.2.11 Multiple FCN messages.

7.24.2.11.1 The general philosophy for use of the FCN is that only a single FCN message is transmitted by each ATSU for each flight. Under normal conditions, changes in CPDLC status after transmission of an FCN should not result in the transmission of another FCN (an exception to this is when a Connection request fails due to the receiving unit not being the nominated next data authority – see Table 7-2 below).

Table 7-2. FCN Transmission

ATSU transmitting FCN	When an FCN should not be sent
Transferring ATSU	
Receiving ATSU	On receipt of a Connection Confirm, establishing a CPDLC Connection
Receiving ATSU	On receipt of CPDLC downlink #64 [icao facility designation], **Note.** This provides advice to the transferring ATSU to uplink an appropriate Next Data Authority message to the aircraft. And subsequently; On establishment of a CPDLC Connection
Receiving ATSU	Following initial failure of a CPDLC Connection request or a time

	parameter prior to the FIR boundary, if no CPDL C Connection has yet been established, whichever occurs later

7.24.2.11.2 Procedure following a change to CPDLC Connectivity following the transmission of an FCN message should be described in local procedures (e.g. voice coordination), rather than by transmission of another FCN message.

7.24.2.11.3 Procedures for the notification of changes to the voice frequency after the transmission of an FCN message should be described in local procedures rather than via the transmission of another FCN message.

7.24.3 Sample flight threads involving FAN and FCN messages

7.24.3.1 The following diagrams show typical flight threads involving the FAN and FCN messages. Relevant uplink and downlink messages between the aircraft and the ATSU are also shown.

Figure 7-1. Routine data link Transfer using FAN and FCN messaging

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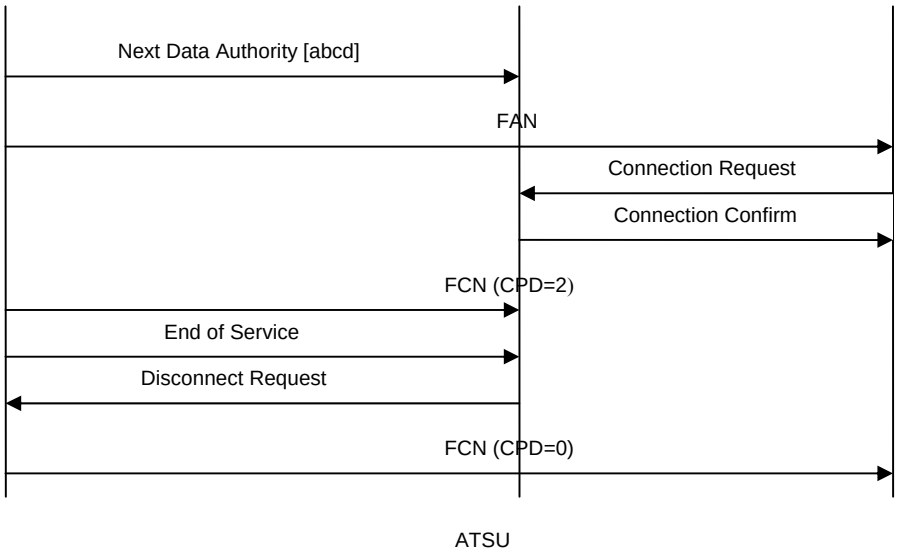

7.24.3.2Figure 7-1 shows a routine data link transfer from one ATSU to the next. The first step in the transfer process is the up linking of a CPDLC Next Data Authority message to the aircraft advising the avionics of the next centre that will be communicating with the aircraft via CPDLC. A FAN message is then sent to the next ATSU to provide them with the aircraft's logon information. The receiving ATSU then successfully establishes a CPDLC connection with the aircraft and transmits a 'successful' FCN (CPD = 2) back to the transferring ATSU. On termination of the CPDLC connection, the transferring ATSU transmits an FCN (CPD = 0) to the receiving ATSU.

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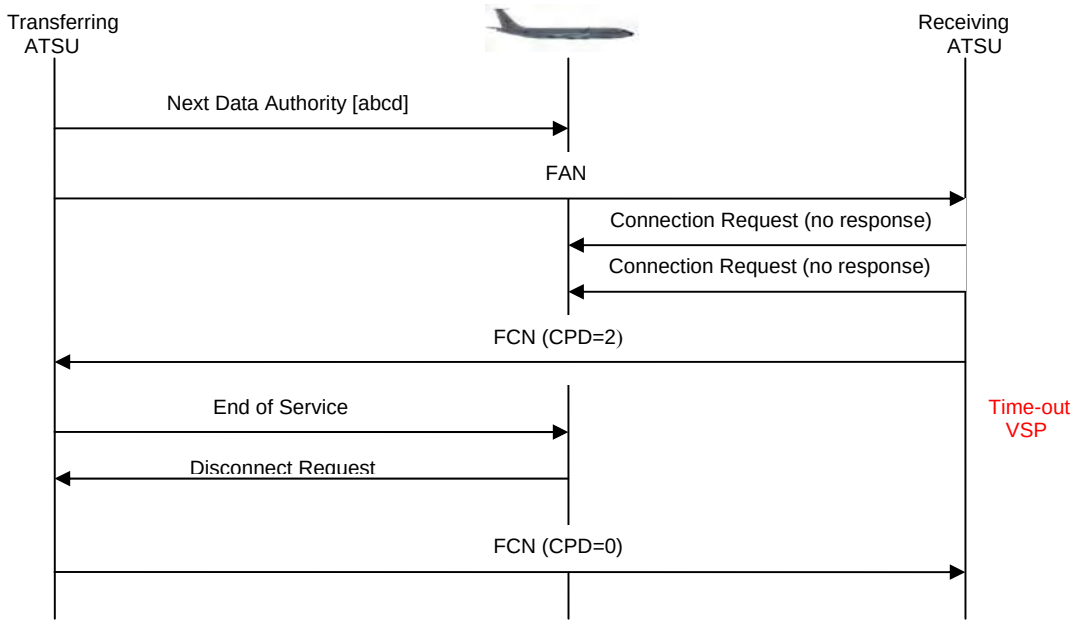
Figure 7-2. CPDLC Transfer using FAN and FCN messaging – Unable to establish CPDLC Connection



7.24.3.3Figure 7-2 shows a data link transfer where there is no response by the avionics to the initial Connection Request uplinked by the receiving ATSU. A subsequent Connection Request is uplinked to the aircraft which is successful. Because the CPDLC connection is finally established prior to the 'time out' VSP before the FIR boundary, a successful FCN (CPD=2) is transmitted to

the transferring ATSU. On termination of the CPDLC connection, the transferring ATSU transmits an FCN (CPD=0) to the receiving ATSU.

Figure 7-3. CPDLC Transfer using FAN and FCN messaging – Unable to establish CPDLC Connection

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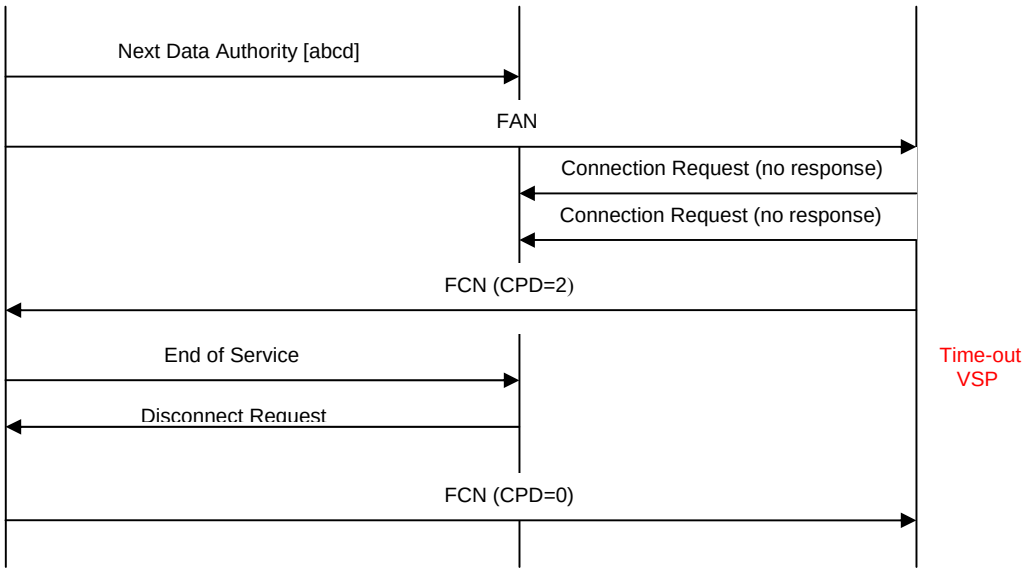

7.24.3.4Figure 7-3 shows an attempted data link transfer where there is no response by the avionics to multiple CPDLC connection request by the receiving ATSU before the 'time out' VSP prior to the FIR boundary. An unsuccessful FCN (CPD=0) is transmitted to the transferring ATSU. Letters of Agreement should describe the procedures to be followed in the even that the receiving ATSU establishes a CPDLC connection after this FCN has been transmitted. Even though the receiving ATSU has advised of their inability to establish a CPDLC connection, the transferring ATSU still transmits an FCN (CPD=0) when their CPDLC connection with the aircraft is terminated.

Figure 7-4. CPDLC Transfer using FAN and FCN messaging – initial NDA not delivered

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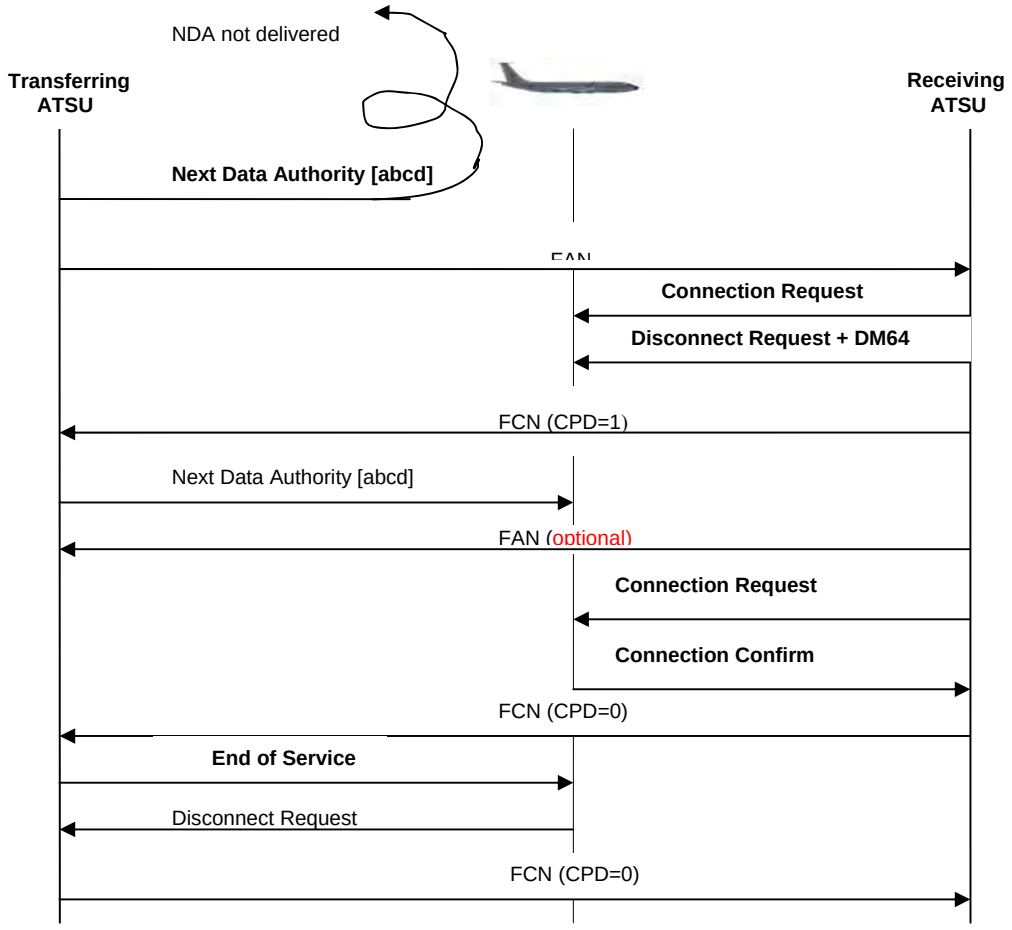

7.24.3.5Figure 7-4 shows a data link transfer in which the original Next Data Authority message uplinked by the transferring ATSU is not delivered to the aircraft. An FCN (CPD=1) is transmitted by the receiving ATSU advising of the failure of their CPDLC Connection request. Another Next Data

Authority message is uplinked to the aircraft. The transferring ATSU may send another FAN message after which the receiving ATSU successfully establishes a CPDLC connection. Because this occurs before the time out VSP prior to the FIR boundary, a successful FCN (CPD=2) is transmitted back to the transferring ATSU. On termination of the CPDLC connection, the transferring ATSU transmits an FCN (CPD=0) to the receiving ATSU.

7.3 Phases of flight

7.31 From an ATSU's perspective, a flight is considered to progress through several phases. The IGM is principally concerned with three phases: Notification, Coordination, and Transfer of Control.

7.32 Notification phase.

7.32.1 An ATSU receives information during the Notification phase on a flight which will at some future time enter its ACI.

7.32.2 Notification dialogue. ABI messages shall be used to transfer notification information. The sending ATSU transmits an ABI to the downstream ATSUs (D-ATSUs) (including the next Receiving ATSU – the R-ATSU) with which it must coordinate the flight. The ATSU is responsible for determining which D-ATSUs must be notified.

7.32.3 Re-Route Notification. All D-ATSUs to the destination aerodrome shall be notified when a re-route has been made. Re-route dissemination shall be performed as a minimum capability on a stepwise (i.e. from one D-ATSU to the next D-ATSU) basis. In stepwise dissemination, an ATSU receiving an ABI is responsible for passing it on to any other affected D-ATSUs at the appropriate time.

7.32.4 Route to Destination. The above procedure requires the C-ATSU to acquire the complete route to destination. Initially, this information is found in the route field of the Filed Flight Plan (FPL). As re-routes occur, the filed route must be updated by the C-ATSU, and transmitted to D-ATSUs. In cases where this is not possible, the route field shall be terminated after the last known significant point with the ICAO truncation indicator, which is the letter "T".

7.32.4.1 In accordance with PANS-ATM Doc 4444, the truncation indicator shall only follow a significant point or significant point/Cruising Speed and Cruising Level in Field 15 and shall not follow an ATS route designator.

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7.32.5 Re-route to new destination. The procedures described below apply when the notification and coordination of amended destinations has been included in bilateral agreements.

7.32.5.1 If an amendment to the destination aerodrome occurs **prior to** the transmission of the first ABI to an adjacent ATSU:

Field 16 shall contain the original destination of the aircraft; and,

The Amended destination field shall contain the new destination of the aircraft.

7.32.5.2 Subsequent AIDC messages shall contain the new destination in Field 16, without reference to an amended destination.

7.32.5.3 If an amendment to the destination aerodrome occurs **after** the transmission of the first ABI to an adjacent ATSU, but before coordination has occurred, a new ABI shall be transmitted.

Field 16 shall contain the original destination of the aircraft; and,

Amended destination field shall contain the new destination of the aircraft.

7.32.5.4 Subsequent AIDC messages shall contain the new destination in Field 16, without reference to an amended destination.

7.32.5.5 The format of the Amended destination field shall be one of the options described below:

ICAO four-letter location indicator; or

Name of the destination aerodrome, for aerodromes listed in Aeronautical Information Publications; or

Latitude/Longitude in the format dd[NS]ddd[EW] or ddmm [NS]dddmm[EW]; or

Bearing and distance from a significant point, using the following format:

The identification of the significant point, followed by

The bearing from the significantly point in the form of 3 figures giving degrees magnetic, followed by

The distance from the significant point in the form of 3 figures expressing nautical miles.

7.32.6 Notification Cancellation. A notification can be cancelled using MAC message. Receipt of a MAC by an ATSU means that any notification data previously received for the flight is no longer relevant. Filed flight plan information (and any modifications) shall continue to be held, in accordance with local ATSU procedures.

7.33 Coordination phase.

7.33.1 Coordination between adjacent ATSUs occurs when the flight approaches a shared FIR boundary. An initial coordination dialogue can be automatically initiated a parameter time or distance from the boundary, as documented within bi-lateral agreement, or it can also be manually initiated. There are several types of coordination dialogues which occur, depending on where the aircraft is and what previous dialogues have occurred.

7.33.2 Initial Coordination Dialogue. This coordination dialogue (or Abbreviated Initial Coordination dialogue) is always required to be successfully completed before later coordination dialogues are initiated. The C-ATSU transmits a CPL to the R-ATSU. The R-ATSU then responds with either an ACP, which signifies acceptance of the coordination conditions contained within the CPL, or a CDN which proposes a modification to the conditions contained in the CPL. If a CDN is the R-ATSU's response to the CPL, a sequence of CDNs may be exchanged between the two ATSUs. This dialogue is eventually terminated by the ATSU which last received a CDN transmitting an ACP to the other ATSU. Transmission of an ACP indicates that coordination conditions are mutually acceptable and an initial coordination has been achieved.

7.33.3 Abbreviated Initial Coordination Dialogue. An Abbreviated Initial Coordination dialogue may be used in place of an Initial Coordination Dialogue when it is known *apriori* (e.g., by letters or agreement) that a flight's coordination data is mutually acceptable to both the C-ATSU and R-ATSU, accurate route information is available at the R-ATSU (e.g., form either an ABI or FPL message), and both ATSUs have agreed to permit the use of this dialogue. The C-ATSU transmits an EST or PAC to the R-ATSU. The R-ATSU then responds with an ACP, which signifies acceptance of the coordination conditions (i.e., boundary crossing data) contained within the EST or PAC. Either this dialogue or a full (i.e., CPL-based) Initial Coordination dialogue shall be successfully completed before any later coordination dialogues are initiated. Note that negotiation via CDNs is not permitted within this dialogue.

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7.33.3.1PAC is only used when coordination is required before departure. This normally only occurs when the FIR boundary is close to the departure airport. Pac signals to the R-ATSU that the departure is imminent as well as initiating coordination.

7.33.4 Re-Negotiating Dialogue. This is an optional dialogue used to propose new coordination conditions after the initial dialogue has been completed. Either ATSU may initiate this dialogue by transmitting a CDN (in contrast to a CPL in the Initial Coordination Dialogue) to the other ATSU. The dialogue then proceeds with an exchange of additional CDNs as necessary. Either ATSU may terminate the dialogue in one of two ways: (1) with an ACP indication that the coordination proposal contained in the latest CDN is acceptable; or (2) with an REJ indicating that the previously agreed upon coordination conditions remain in effect.

7.33.5 Active CDN. For a given flight, only on DCN may be active between any pair of ATSUs. Note, however that coordination between more than two ATSUs (for the same flight) may have a total number of active CDNs greater than one, thought each pair of ATSUs is still restricted to a maximum of one active CDN per flight. In the exceptional (rare) case where a C-ATSU and D-ATSU both simultaneously transmit CDNs, the C-ATSU shall transmit a REJ to the D-ATSU cancelling the S-ATSU's CDN.

7.33.6 CDNs Are Proposals. Note that CDNs are only proposals; no changes are made in a flight's profile until an ACP is sent and acknowledged.

7.33.6.1To ensure interoperability between ATSUs when using a CDN to propose a diversion to an alternative destination, the following procedures shall be used:

7.33.6.1.1 The mandatory Field 16 shall contain the original (i.e., the "current") destination aerodrome. The Amended Destination text field shall contain the amended destination.

7.33.6.1.2 The format of the Amended destination field shall be one of the options described below:

ICAO four-letter location indicator; or

Name of the destination aerodrome, for aerodromes listed in Aeronautical Information Publications; or

Latitude/longitude in the format dd[NS]ddd{EW] or ddmm[NS]ddmm[EW]; or

Bearing and distance from a significant point using the following format:

The identification of the significant point followed by

The bearing from the significant point in the form of 3 figures giving degrees magnetic followed by

The distance from the significant point in the form of 3 figures expressing nautical miles.

7.33.6.1.3 The mandatory Field 16 contained in the operational response (ACP, REJ, CDN) to a CDN that proposes an amended destination shall contain the original (i.e. the "current") destination aerodrome.

7.33.6.1.4 Due to the complexities involved with maintaining multiple profiles for "current destination" vs. "amended destination" ATSus should consider prohibiting (via bilateral agreement) an operational response of CDN in any coordination renegotiation dialogues that contain an amended destination.

7.33.6.1.5 Provided that the proposed amendment is agreed to, all subsequent AIDC messages concerning this aircraft shall contain the new destination in the mandatory Field 16.

7.33.7 Cleared Flight Profile Update. The cleared flight profile (which is used for control purposes) shall only be updated after successful completion of a coordination dialogue, i.e., an ACP has been sent and acknowledged. This will require temporarily storing a proposed flight profile undergoing coordination separate from the cleared flight profile. The cleared profile shall then be updated using the newly coordinated profile upon successful completion of the coordination dialogue.

7.33.8 Automatic update of coordination conditions. When included in bilateral agreements between ATSUs, changes to previously agreed coordination conditions may be coordinated by way of a TRU message. The intent of this message is to allow amendments to certain elements of an aircraft's clearance to be coordinated to an adjacent ATSU. In contrast to the CDN, there is not operational response to a TRU message – this message is used when there is agreement to what amendments can be made to an aircraft's clearance by the controlling ATSU after initial coordination has occurred without prior coordination.

7.33.8.1 Whilst a number of the element that may be coordinated by TRU message may be more suited to an environment associated with an ATS Surveillance system (e.g. Heading, Direct to, etc), other elements may be applicable in *any* ATS environment (e.g. Cleared Flight Level, Off track deviation, Speed, etc).

7.33.8.2 The TRU message makes use of the Track data field to provide updated clearance information to an adjacent ATSU. Track data may be used to update assigned heading, assigned level, off track clearance, assigned speed, or 'direct to' information.

7.33.8.3 When using the DEC/[position] element in the TRU message, [position] would normally be located on the flight planned route of the aircraft. Local procedures should specify the actions to be taken in the event that [position] is not on the flight planned route.

7.33.8.4 For the purpose of the TRU message, the format [position] is one of the following:

From 2 to 5 characters being coded designator assigned to an en-route point or aerodrome; or

ddmm[NS]dddmm[EW]; or

dd[NS]ddd[EW]; or

2 or 3 characters being the coded identification of a navigation aid followed by 3 decimal numeric giving the bearing from the point in degrees magnetic followed by a 3 decimal numeric giving the distance from the point in nautical mile.

7.33.9 Coordination Cancellation. Coordination can be cancelled using a MAC message. Receipt of a MAC by an ATSU means that any coordination (or notification) data previously received for that flight is no longer relevant. Filed flight plan information (and any modification) shall continue to be held in accordance with local ATSU procedures.

7.33.10 Coordination and the ACI. ATSU A may need to coordinate with or provide information to ATSU B on all aircraft that ACI B, even if they do not enter FIR B. Consider the case of aircraft A in FIR A and aircraft B in FIR B, both flying near the FIR A – FIR B boundary, but never penetrating the other's FIR airspace. The maintenance of adequate separation between these two aircraft may require coordination between or the provision of information to adjoining ATSUs.

7.34 Transfer of control phase.

7.34.1 Transfer Dialogue. This phase occurs when the C-ATSU is ready to relinquish control of the flight to the R-ATSU normally just before the FIR boundary crossing. The C-ATSU transfers a TOC message to the R-ATSU which responds with an AOC message. The R-ATSU then becomes the C-ATSU once an application response for the AOC has been received.

7.34.2 Transfer of Control and the ACI. Note that the Transfer of Control process will not occur for all flights. Some flights fly near an FIR boundary, and may require coordination or the provision of other information, but do not actually enter the FIR.

7.4 Flight state transitions

7.41 Notifying states.

7.41.1 Consider an aircraft that is currently within an NAT/APAC FIR – FIR A – controlled by ATSU A (i.e. the C-ATSU) progressing towards the next FIR, FIR B (i.e. the R-ATSU). The aircraft is several hours from the boundary between the two FIRs. The flight is initially in a Pre-Notifying state from ATSU B's perspective. ATSU B usually will have previously received a Filed Flight Plan (an FPL message) possibly with later amendments (as contained in CHG messages). ATSU A will employ a Notification dialogue to transfer information to ATSU B. (This transfer occurs either a system parameter time (e.g. 60 minutes), or distance prior to the flight crossing the FIR A – FIR B boundary.) This places the flight in a Notifying state ATSU B's perspective. Additional Notification dialogues may be invoked by ATSU A as needed to inform ATSU B of flight changes. If the aircraft for some reason, such a change in route is no longer expected to penetrate ACI B, ATSU A sends a MAC message to ATSU B causing the flight to be placed back in Pre-Notifying state from ATSU B's perspective.

7.42 Initial coordination states.

7.42.1 An Initial Coordination Dialogue is employed to effect the initial coordination. ATSU A transmits a CPL to ATSU B when the aircraft is at a mutually agreed upon predetermined time (e.g. thirty minutes) or distance from the FIR A – FIR B boundary. The flight is now in Negotiating state from both ATSU A's and ATSU B's perspectives. ATSU B can accept the conditions specified in the CPL "as is" by transmitting an ACP message to ATSU A, or it can propose modifications using the CDN message. Negotiations between the two ATSUs are carried out using the CDN until a mutually acceptable flight profile is achieved. This acceptance is signalled by one ATSU sending an ACP as before to the other ATSU. This establishes the initial coordination conditions. The flight is now in a coordinated state from both ATSU's perspective.

7.42.2 For an Abbreviated Initial Coordination, ATSU A transmits an EST to ATSU B when the aircraft is at a mutually agreed upon predetermined time (e.g. thirty minutes) or distance from FIR A – FIR B boundary. The flight is now in a Coordinating state. ATSU B responds with an ACP which

places the flight in a coordinated state. This sequence of messages corresponds to an Abbreviated Initial Coordination Dialogue.

7.43 Re-negotiation states.

7.43.1 The initial coordination is typically the final coordination. However, in certain situations it may be desirable, or necessary to re-open the coordination dialogue after initial coordination has been completed. A Re-Negotiation dialogue is employed to effect profile changes. The dialogue is re-opened when one ATSU (either A or B) transmits a CDN to the other ATSU causing the flight to be in a Re-Negotiating state. The dialogue proceeds as above using CDN messages until either an ACP or REJ is sent. Either ATSU can close the dialogue by issuing an ACP or REJ. An ACP closes the dialogue with a new mutually agreed upon flight profile. A REJ however, immediately terminates the dialogue with the previously accepted coordination conditions remaining in effect. Any proposed changes are null and void. Transmission of an ACP or REJ places the flight back into the coordinated state.

7.44 Transfer states.

7.44.1 Transfer of control is supported by the Transfer dialogue. ATSU A sends a TOC to ATSU B when the aircraft is about to cross the boundary. Alternatively, ATSU A can send a TOC when it is ready to relinquish control even if the aircraft will remain in FIR A airspace several minutes before entering FIR B. The flight is now in a Transferring state from both ATSU A's and ATSU B's perspectives. ATSU B responds by transmitting an AOC to ATSU A signalling acceptance of control responsibility. The flight is now in a Transferred state from ATSU A's perspective.

7.45 Backward re-negotiating state.

7.45.1 A flight's profile may occasionally require changes after Transfer of Control have been completed, but the aircraft is still within ATSU A's ACI. A Re-Negotiating dialogue is employed to effect profile changes after transfer has been completed. This places the flight in a Backward Re-Negotiating State from both ATSU's perspectives. Completion of this dialogue returns the aircraft to the Transferred state.

7.45.2 Several flight states are identified in the above discussion. These states are listed in Table 7-3.

7.45.3 A flight state transition diagram is shown in Figure 7-5. This diagram depicts graphically how the flight transitions from one state to the next. It can be seen that the NAT/APAC AIDC messages

act as triggers forcing the necessary state transitions. A description of the allowable flight state transitions along with the message event that triggers the transitions is given in Table 7-4.

Table 7-3. Flight States

Flight State	Description
Pre-Notifying	Flight plan information may have been received. Any previously received notification and coordination information for the given flight cancelled by a MAC is no longer relevant.
Notifying	The aircraft's progress is being monitored by one or more non-controlling ATSUs in addition to the controlling ATSU.
Negotiating	Coordination data is being exchange between the controlling ATSU and the receiving ATSU as part of the initial coordination dialogue.
Coordinating	Abbreviated coordination data has been sent to the receiving ATSU
Coordinated	Coordination of the boundary crossing conditions is completed
Re-Negotiating	Coordination data is being exchanged between the controlling ATSU and the receiving ATSU as part of a later coordination dialogue.
Transferring	Air traffic control responsibility for the aircraft is in the process of being transferred to the receiving ATSU.
Transferred	Air traffic control responsibility for the aircraft has been transferred to the receiving ATSU.
Backward Re-Negotiating	The aircraft is now under the control of the receiving ATSU, but still near the boundary. Changes are being proposed to the coordination conditions while the aircraft is still in the vicinity of the boundary.

Figure 7-5. Flight State Transition Diagram

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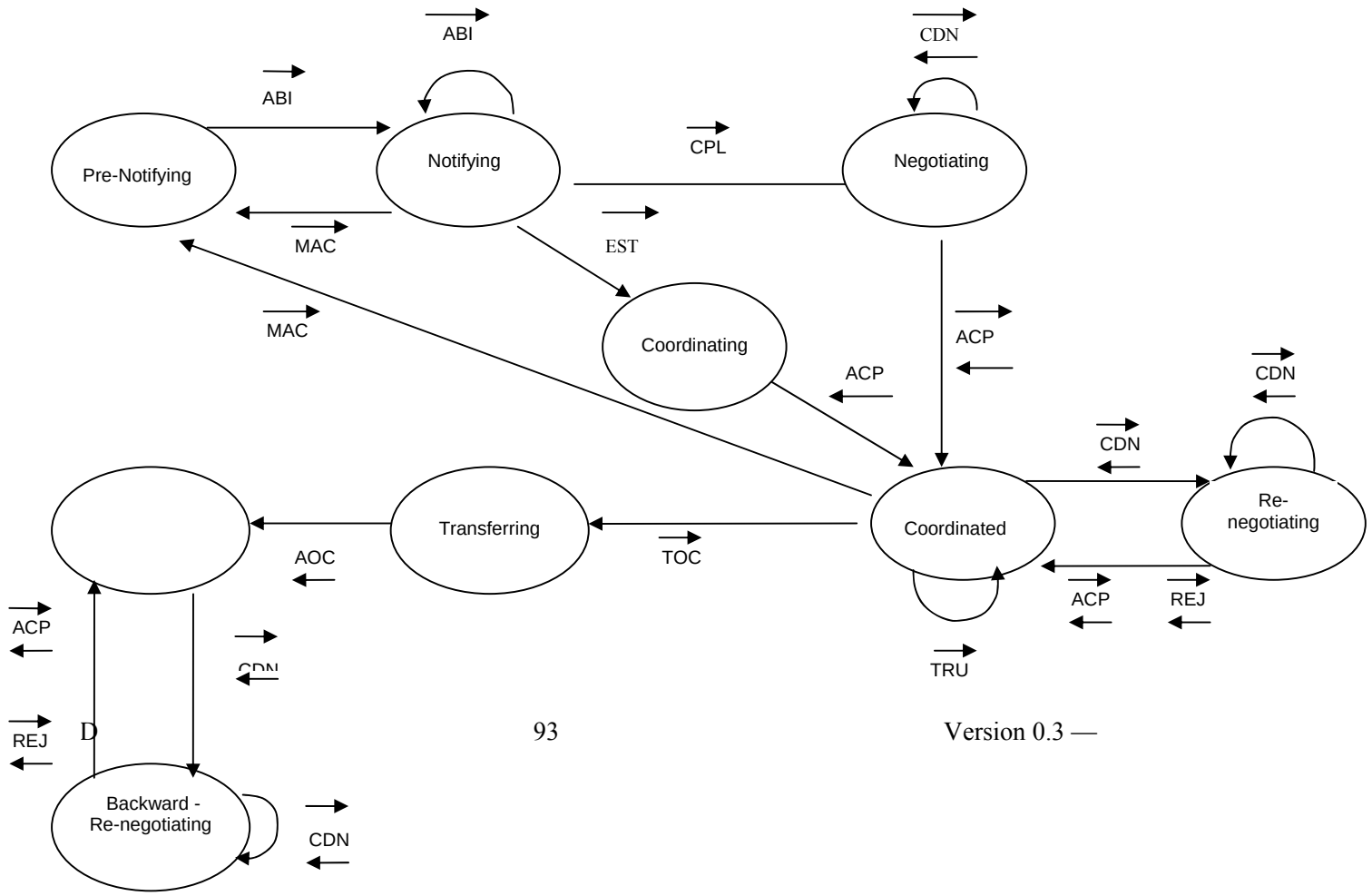

Table 7-4. Flight State Transitions

State Transition	Message Trigger	Description
Pre-Notifying/ Notifying	ABI	An initial ABI begins the Notification phase.
Notifying/ Notifying	ABI	An ABI updates the information a downstream ATSU maintains on a flight that is expected to enter its ACI at some future time. This data can be sent hours in advance of the actual entry.
Notifying/ Pre-Notifying	MAC	A flight that was expected to enter a downstream ATSU's ACI will no longer do so.
Notifying/ Negotiating	CPL	A CPL is used to initiate the coordination process for an aircraft that will enter the downstream ATSU's ACI. A CPL contains the current clearance to destination.
Notifying/ Coordinating	EST	An EST is used to initiate an Abbreviated Coordination process for an aircraft that will enter the downstream ATSU's ACI.
Notifying/ Coordinating	PAC	A PAC is used to initiate an Abbreviated Coordination process for an aircraft not yet airborne that will enter the downstream ATSU's ACI.
Notifying/ Negotiating	CDN	If the downstream ATSu does not like the current clearance (and boundary crossing conditions), a Negotiation process is carried out using CDNs.
Negotiating/ Coordinated	ACP	The negotiation process is terminated when one ATSU signals its acceptance of the coordination conditions using ACP.
Negotiating/ Coordinated	ACP	The Abbreviated Coordination dialogue is terminated by the receiving ATSU transmitting an ACP.
Coordinated/ Re-Negotiating	CDN	The coordination dialogue can be re-opened at any time after the initial coordination and before the initiation of the transfer of control procedure

Re-Negotiating/ Re-Negotiating	CDN	Either ATSU may attempt to change the previously agreed upon coordination conditions any time after the initial coordination dialogue has been completed.
Re-Negotiating/ Coordinated	ACP REJ	An ACP terminates a re-negotiation dialogue with a new mutually agreed upon profile in effect. An REJ immediately terminates the dialogue with the coordination conditions remaining as previously agreed (which is usually, but not necessarily the initial coordination conditions).
Coordinated/ Coordinated	TRU	A TRU may be sent by the controlling ATSU after the initial coordination dialogue has been completed to update previously agreed coordination conditions.

State Transition	**Message Trigger**	**Description**
Coordinated/ Transferring	TOC	A TOC is sent after coordination occurs bur (usually just) before the boundary is crossed to the accepting ATSU. The TOC informs the accepting ATSU that it now has control authority for the aircraft
Coordinated/ Pre-Notifying	MAC	A flight that was expected to enter a downstream ATSU's ACI will no longer do so.
Transferring/ Transferred	AOC	The formerly downstream ATSU is now the controlling ATSU.
Transferred/ Backward-Re-Negotiating	CDN	An attempt is made (by either the previous or new controlling ATSU) to change the coordination conditions while the aircraft is near the common boundary
Backward-Re-Negotiating/ Backward-	CDN	Either ATSU may attempt to change the previously agreed upon coordination conditions any time after transfer of control has been completed, but while the aircraft remains in the common

Re-Negotiating		boundary region.
State Transition	**Message Trigger**	**Description**
Backward-Re-Negotiating/ Transferred	ACP REJ	Similar to a Re-Negotiation/Coordinated state transmission. An ACP terminates a backward coordination dialogue with a new mutually agreed upon profile in effect. An REJ immediately terminates the dialogue with the coordination conditions remaining as previously agreed (which is usually, but not necessarily the initial coordination conditions).

7.5 Message sequence

7.51 The preceding section identified the flight states and showed how the aircraft transitions form on state to the next based on the receipt of NAT/APAC AIDC messages by ATSU B. In this section, a table of two-message sequences is constructed as shown in Table 7-5. The sequences identify the allowable messages (the next message column) that may correctly follow a given, just received message (the first column). Application Management Messages LAM and LRM are not shown.

Table 7-5. Message Sequences

Received Message	Next Valid Messge	Comments
Notification Sequences		
ABI	ABI	Update the flight information.
	MAC	Indicates that the flight is no longer expected to enter the downstream ATSU's ACI
	CPL	Receipt of the ABI signals the beginning of the notification phase for a particular flight. Coordination will take place when the aircraft is within a parameter distance/time of the boundary.
	EST	Receipt of the ABI signals the beginning of the notification phase for a particular flight. Coordination will take place when the aircraft is within a parameter distance/time of the boundary.
Coordination Sequences		
CPL	ACP	The aircraft's current clearance is acceptable.
	CDN	The aircraft's current clearance is not acceptable to the receiving airspace and must be modified.
EST	ACP	The boundary crossing conditions are in accordance with the agreement that exists between the two ATSUs.
PAC	ACP	The boundary crossing conditions are in accordance with the agreement that exists between the two ATSUs.
CDN	ACP	The negotiated clearance is acceptable to both ATSUs.
	CDN	The proposed clearance modification is not acceptable to one of the airspaces and a new proposal is submitted.
	REJ	The last clearance agreed to by both airspaces must be honoured.
TRU	CDN	The proposed clearance modification is not acceptable to one of the airspaces and a new proposal is submitted.

	TOC	The aircraft is at or near the boundary.
	TRU	Notification of an amendment to the previously accepted clearance.
	MAC	Indicates that the flight is no longer expected to enter the downstream ATSU's ACI
ACP	CDN	A request for modification or a previously accepted clearance is submitted.
	TRU	Notification of an amendment to the previously accepted clearance.
	TOC	The aircraft is at or near the boundary.
	MAC	Indicates that the flight is no longer expected to enter the downstream ATSU's ACI.
Received Message	**Next Valid Messge**	**Comments**
Transfer of Control Sequence		
TOC	AOC	The aircraft is at or near the boundary.
AOC	CDN	A request for modification of a previously accepted clearance is submitted.

7.52 Table 7-6 lists the AIDC messages which are valid for each state. The ATSU which can transmit the message is also identified.

Table 7-6. Valid Messages by ATSU

Flight State	Message	Sent by
Notifying	ABI	Controlling ATSU
Notifying	MAC	Controlling ATSU

Notifying	CPL	Controlling ATSU
Notifying	EST	Controlling ATSU
Notifying	PAC	Controlling ATSU
Negotiating	CDN	Either ATSU
Negotiating	ACP	Either ATSU
Coordinated	ACP	Receiving ATSU
Coordinated	CDN	Either ATSU
Coordinated	TRU	Controlling ATSU
Coordinated	TOC	Controlling ATSU
Coordinated	MAC	Controlling ATSU
Re-Negotiating	CDN	Either ATSU
Re-Negotiating	ACP	Either ATSU
Re-Negotiating	REJ	Either ATSU
Transferring	AOC	Receiving ATSU
Transferring	CDN	Either ATSU
Backward-Re-Negotiating	CDN	Either ATSU
Backward-Re-Negotiating	ACP	Either ATSU
Backward-Re-Negotiating	REJ	Either ATSU

7.6 Other messages

7.61 The previous sections have discussed the use of Notification, Coordination, Transfer of Control, and Application Management messages. There are two remaining message subgroups in the NAT/APAC AIDC messages: (1) General Information messages; and (2) Surveillance Data

Transfer messages. All messages within these two subgroups require an application response; no operational response is defined.

7.62 General information messages.

7.62.1 EMG and MIS Messages. These messages support the exchange of text information between ATSUs. A communicator (usually a person, but a computer or application process is also permitted) in one ATSU can send a free text message to a functional address at another ATSU. Typical functional addresses could be an area supervisor or an ATC sector. If further EMG or MIS messages are transmitted in response to a previously received EMG or MIS, the later messages shall include the original message identifier within field 3 of the AFTN header. The EMG shall have an AFTN emergency priority (SS).

7.62.2 Track Definition Message. The TD is generated and disseminated to all affected ATSUs. It is also sent to Airline Operational Control (AOC) Centres where it is used for flight planning purposes. This message contains in a structure text format, the track definition and the time when it is active.

7.63 Surveillance data transfer messages.

7.63.1 The ADS message is used to transfer data contained within an ADS-C report including optional ADS-C groups to an adjacent ATSU.

7.63.2 The ADS message contains a text field – the ADS-C data field which contains information from the ADS-C report in its original hexadecimal format. The ADS-C data field consists of the text that immediately follows the “ADS” IMI (but excluding the 4 character CRC) within the application data portion of the ADS-C report.

7.63.3 The following example shows an encoded ACARS ADS-C report – as it would be received by an ATSU – as well as an example of what information from this report would be transferred into the corresponding ADS-C data field. The ATSU receiving the AIDC ADS message simply decodes the ADS-C data field and extracts the data that is required by the ATSU.

ACARS ADS-C report	QU BNECAYA .QXSXMXS 011505 PAR FI NZ0090/AN ZK-OKC DT QXT POR1 011505 F59A - ADS.ZK- OKC0300007FF946B6F6DC8FC044B9D0DFC013B80DA88F COA64F9E4438B4AC8FC000EweD0EDC00010140F3E8660F3
ADS-C data field	ADS/.ZK- OKC0300007FF946B6F6DC8FC044B9D0DFC013B80DA88FC0A64F9 E4438B4AC8FC000E34D0EDC00010140F3E86

Note. Because it is part of the 7 character registration field the leading "." must be retained in front of the registration (".ZK-OKC"). The 4 character CRC ("60F3") at the end of the ACARS message is not included in the ADS-C data field.

7.63.4 The types of ADS-C reports (i.e. periodic or event) transmitted by the AIDC ADS message shall be in accordance with bilateral agreements. When implementing the AIDC ADS message, ATSUs should consider the effect of relaying numerous ADS-C periodic reports via ground-ground links (e.g. AFTN) when a high periodic reporting rate is in effect.

7.63.5 The types of ADS-C reports (i.e. periodic or event) transmitted by the AIDC ADS message shall be in accordance with bilateral agreements. When implementing the AIDC ADS message, ATSUs should consider the effect of relaying numerous ADS-C periodic reports via ground-ground links (e.g. AFTN) when a high periodic reporting rate is in effect.

7.63.5.1 The AIDC ADS message is used to transfer ADS-C information only. Other messaging protocols exist for the transfer of ADS-B information.

7.63.5.2 While the AIDC ADS message may be used to transfer ADS-C information, this data may also be transferred using ACARS ground-ground network by re-addressing the received ADS-C message to the other ATSU. States should agree on the method to be used on a bilateral basis.

Example: Brisbane ATSU (BNECAYA) receives an ADS-C downlink via the ACARS network from its Data link Service Provider SITA (QXSXMXS)

QU BNECAYA
.QXSXMXS 011505
PAR
FI NZ0090/AN ZK-OKC
DT QXT POR1 011505 F59A
- ADS.ZK-
OKC0300FF946B6F6DC8FC044B9D0DFC013B80DA88FC0A64F9E4438B4AC8FC00
0E34D0EDC00010140F3EE8660F3

Brisbane re-addresses the downlink and forwards to Auckland via the ACARS ground-ground network:

QU AKLCBYA
.BNECAYA 011505
PAR
FI NZ0090/AN ZK-OKC
DT QXT POR1 011505 F59A
- ADS.ZK-
OKC0300FF946B6F6DC8FC044B9D0DFC013B80DA88FC0A64F9E4438B4AC8FC00
0E34D0EDC00010140F3EE8660F3

7.7 Examples

7.71 Standard coordination.

7.71.1 Brisbane transmits a notification message (ABI) to Auckland forty five minutes prior to the time that QFA108 is expected to cross the FIR boundary (1209). The destination of the flight is Christchurch.

7.71.2 The abbreviated coordination message (EST) is transmitted by Brisbane thirty minutes prior to the boundary estimated (which is now 1213). Auckland accepts the proposed coordination conditions by responding with an ACP.

7.71.3 Brisbane transfers ATC responsibility approaching the FIR boundary by transmitting a TOC.

7.71.4 The timing of the transmission of these messages is defined in bilateral agreements between the two units.

Example 1. Standard coordination

Brisbane	***Auckland***
(ABI-QFA108-YBBN-33S163E/1209F350 -NZCH-8/IS-9/B744/H-10/SDHIWRJ -15/M084F350 35S164E 36S165E…)	
(EST-QFA108-YBBN-33S163E/1213F350-NZCH)	
	(ACP-QFA108-YBBN-NZCH)
(TOC-QFA108-YBBN-NZCH)	
	(AOC-QFA108-YBBN-NZCH)

7.72 Negotiation of coordination conditions.

7.72.1 Santa Maria transmits a notification message (ABI) to Auckland forty five minutes prior to the time that TAP001 is expected to cross the FIR boundary (1209). The destination of the flight is San Juan.

7.72.2 The coordination message (CPL) is transmitted by Santa Maria thirty minutes prior to the boundary estimate (which is now 1213).

7.72.3 New York responds with a negotiation message (CDN) requesting a change in the boundary crossing altitude to F390. Santa Maria responds with an ACP indicating that the revised altitude is acceptable.

7.72.4 Santa Maria transfers ATC responsibility approaching the FIR boundary by transmitting a TOC. New York accepts ATC responsibility by responding with an AOC.

7.72.5 The timing of the transmission of these messages is defined in bilateral agreements between the two units.

Example 2. Negotiation of Coordination Conditions

Santa Maria	***New York***
(ABI-TAP001-LPPT-34N040W/1209F350-TJSJ-8/IS-9/B744/H-10/S-15/M082F350	

27N050W 2430N055W 22N060W 19N065W SJU)	
(CPL-TAP001-IS-B744/H-S-LPPT -34N040W/1213F350-M082F350 27N050W 2430N055W 22N060W 19N065W SJU- TSJ-0)	
	(CDN-TAP001-LPPT-TJSJ -14/34N040W/1213F390)
(ACP-TAP001-LPPT-TJSJ)	
(TOC-TAP001-LPPT-TJSJ)	
	(AOC-TAP001/LPPT-TJSJ)

7.73 Re-negotiation rejected.

7.73.1 Brisbane transmits a notification message (ABI) to Auckland forty five minutes prior to the time that QFA108 is expected to cross the FIR boundary (1209). The destination of the flight is Christchurch.

7.73.2 The coordination message (CPL) is transmitted to Brisbane thirty minutes prior to the boundary estimate (which is now 1213). Auckland accepts the proposed coordination conditions without modification by responding with and ACP.

7.73.3 Some time after the initial coordination process has been completed, but before the start of the Transfer of Control process, Auckland requests an amendment to the boundary crossing altitude by transmitting a negotiation message (CDN). Brisbane cannot accept the proposed change due to conflicting traffic in its FIR and therefore rejects the request (REJ).

7.73.4 Brisbane transfers ATC responsibility approaching the FIR boundary by transmitting a TOC. Auckland accepts ATC responsibility by responding with an AOC.

7.73.5 The timing of the transmission of these messages is defined in bilateral agreements between the two units.

Example 3. Rejection of Renegotiated Coordination

Brisbane	***Auckland***
(ABI-QFA108-YBBN-33S163E/1209F350	

-NZCH-8/IS-9/B744/H-10/SDHIWRJ -15/M084F350 35S164E 36S165E….)	
(CPL-QFA108-IS-B744/H-SDHIWRJ-YBBN -33S163E/1213F350-M084F350 35S164E 36S165E NZCH -0.)	
	(ACP-QFA108-YBBN-NZCH)
	(CDN-QFA108-YBBN-NZCH -14/33S163E/1213F390)
(REJ-QFA108-YBBN-NZCH)	
(TOC-QFA108-YBBN-NZCH)	
	(AOC-QFA108-YBBN-NZCH)
(REJ-QFA108-YBBN-NZCH)	
(TOC-QFA108-YBBN-NZCH)	
	(AOC-QFA108-YBBN-NZCH)

7.74 Abbreviated coordination.

7.74.1 Several minutes before AAA842's departure time (e.g. at taxi time), coordination between Bali and Brisbane is effected by Bali transmitting message (PAC). This message alerts Brisbane that the flight is pending and indicates a boundary estimate of 1213 at f290. Brisbane accepts the coordination conditions without modification by responding with an ACP.

7.74.2 On departure, the aircraft's actual estimate differs from that coordinated by more than the value specified in bilateral agreements. The new estimate is coordinated to Brisbane by Bali transmitting a CDN message to Brisbane. Brisbane accepts this revised estimate by responding with an ACP message.

7.74.3 Bali transfer ATC responsibility approaching the FIR boundary by transmitting a TOC. Brisbane accepts ATC responsibility by responding with an AOC.

7.74.4 The timing of the transmission of these messages is defined in bilateral agreements between the two units.

Example 4. Abbreviated coordination

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Bali	***Brisbane***
(PAC-AAA842/A4534-IS-B737/M-WRRR--OGAMI/1213F290-YPPH…)	
	(ACP-AAA842/A4534-WRRR-YPPH)
(CDN-AAA842/4534-WRRR-YPPH-14/OGAMI/1219F290)	
	(ACP-AAA842/A4534-WRRR-YPPH)
(TOC-AAA842/A4534-WRRR-YPPH-14/OGAMI/1219F290)	
	(AOC-AAA842/A4534-WRRR-YPPH)

7.75 Multiple modifications + AIDC cancellation.

7.75.1 Brisbane transmits a notification message (ABI) to Auckland forty five minutes prior to the time that QFA11 is expected to cross the FIR boundary (1105). The destination of the flight is Los Angeles.

7.75.2 Prior to transmitting the coordination message, a modification to the cleared flight level is made resulting in the transmission of another notification message. This ABI contains the latest boundary information of the aircraft showing that the current boundary estimate is now 1107.

7.75.3 The abbreviated coordination message (EST) is transmitted by Brisbane thirty minutes prior to the boundary estimate (which is now 1108). Auckland accepts the proposed coordination conditions by responding with an ACP.

7.75.4 Due tow weather QFA11 requests and is issued an amended route clearance that will now no longer affect Auckland. To advise of the cancellation of any previously transmitted AIDC messages, a MAC message is transmitted to Auckland.

7.75.5 The timing of the transmission of these messages is defined in bilateral agreements between the two units.

Example 5. Multiple notifications + AIDC cancellation

Brisbane	***Auckland***
(ABI-QFA56-YBBN-33S163E/1209F350-NZCH-8/IS-9/B744/H-10/SDHIWRJ-15/M084F350 35S164E 36S165E….)	
(CPL-QFA56-IS-B744/H-SDHIWRJ-YBBN -33S163E/1213F350-M084F350 35S164E 36S165E NZCH -0.)	
	(CDN-QFA56-YBBN-NZCH -14/33S163E/1213F390)
(ACP-QFA56-YBBN-NZCH)	
(TOC-QFA56-YBBN-NZCH)	
	(AOC-QFA56-YBBN-NZCH)

7.76 Multiple negotiations.

7.76.1 Brisbane transmits a notification message (ABI) to Auckland forty five minutes prior to the time that QFA108 is expected to cross the FIR boundary (1209). The destination of the flight is Christchurch.

7.76.2 The abbreviated coordination message (EST) is transmitted by Brisbane thirty minutes prior to the boundary estimate (which is now 1213). Auckland accepts the proposed coordination conditions by responding with an ACP.

7.76.3 QFA108 requests F370. The bilateral Letter of Agreement between Brisbane and Auckland requires that prior coordination is required before issuing a change of level after initial coordination. Brisbane transmits a negotiation message (CDN) proposing the change of level to F370. This level is not available in Auckland's airspace, but an alternative level is available. Auckland therefore responds with a negotiation message proposing F360. Brisbane responds with an ACP indicating that this level is acceptable to Brisbane (and QFA108).

7.76.4 Brisbane transfers ATC responsibility approaching the FIR boundary by transmitting a TOC. Auckland accepts ATC responsibility by responding with an AOC.

7.76.5 The timing of the transmission of these messages is defined in bilateral agreements between the two units.

7.76.5.1 Complex re-negotiations may be more easily solved by voice communication.

Example 6. Multiple negotiations

Brisbane	***Auckland***
(ABI-QFA108-YBBN-33S163E/1209F350 -NZCH-8/IS-9/B744/H-10/SDHIWRJ -15/M084F350 35S164E 36S165E….)	
(EST-QFA108-YBBN-33S163E/1213F350-NZCH)	
	(ACP-QFA108-YBBN-NZCH)

(CDN-QFA108-YBBN-NZCH -14/33S163E/1213F370)	
	(CDN-QFA108-YBBN-NZCH -14/33S163E/1213F360)
(ACP-QFA108-YBBN-NZCH)	
(TOC-QFA108-YBBN-NZCH)	
	(ACO-QFA108-YBBN-NZCH)

7.77 Standard coordination with proposed amended destination.

7.77.1 Brisbane transmits a notification message (ABI) to Auckland forty five minutes prior to the time that ANZ136 is expected to cross the FIR boundary (1400). The destination of the flight is Christchurch.

7.77.2 The abbreviated coordination message (EST) is transmitted by Brisbane thirty minutes prior to the boundary estimate (which is now 1401). Auckland accepts the proposed coordination conditions by responding with an ACP.

7.77.3 ANZ136 requests a deviation to Auckland (NZAA). Brisbane transmits a Coordination message (CDN) to Auckland proposing changes to the previously agreed coordination conditions (route and boundary estimate) as well as the new destination. Auckland accepts the proposed revision(s) by the transmission of an ACP. All subsequent AIDC messages for ANZ136 contain “NZAA” as the destination aerodrome.

7.77.4 Brisbane transfers ATC responsibility approaching the FIR boundary by transmitting a TOC. Auckland accepts ATC responsibility by responding with an AOC.

7.77.5 The timing of the transmission of these messages is defined in bilateral agreements between the two units.

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Example 7. Coordination of amended destination

Brisbane	***Auckland***
(ABI-QFA108-YBBN-RUNOD/1400F350 -NZCH-8/IS-9/A320/M-10/SDHIWRJ -15/M084F350 SCOTT Y32 LOKET L503 LALAP DCT...)	
(EST-ANZ136-YBBN-33S163E/1401F350-NZCH)	
	(ACP-ANZ136-YBBN-NZAA)
(CDN-ANZ136-YBBN-NZCH -14/ESKEL/1357F350-15/ SCOTT Y32 LOKET WOOLY ESKEL L521 AA-DEST/NZAA)	
	(ACP-ANZ136-YBBN-NZAA)
(TOC-ANZ136-YBBN-NZAA)	
	(AOC-ANZ136-YBBN-NZAA)

7.78 Standard coordination including FAN/FCN exchange.

7.78.1 Brisbane transmits a notification message (ABI) to Auckland forty five minutes prior to the time that UAL815 is expected to cross the FIR boundary (0330).

7.78.2 The abbreviated coordination message (EST) is transmitted by Brisbane thirty minutes prior to the boundary estimate. Auckland accepts the proposed coordination conditions by responding with an ACP.

7.78.3 Brisbane transmits a FAN message to Auckland providing the logon information that Auckland requires to establish a CPDLC connection as well as ADS contracts.

7.78.4 When a CPDLC connection is established, Auckland transmits a FCN to Brisbane containing the appropriate frequency for the aircraft to monitor.

7.78.5 Brisbane transfers ATC responsibility approaching the FIR boundary by transmitting a TOC. Auckland accepts ATC responsibility by responding with an AOC.

7.78.6 Brisbane terminates the CPDL connection with UAL815 and transmits a FCN to Auckland to advise them that the CPDLC connection has been terminated.

7.78.7 The timing of the transmission of these messages is defined in bilateral agreements between the two units.

Example 8. Standard coordination including FAN and FCN exchanges

Brisbane	***Auckland***
(ABI-UAL815/-YSSY- 3200S16300E/0330F290 -KLAX-8/IS-9/B744/H- NOBAR A579 JORDY DCT 3200S16000E 3050S16300E 2800S16500E…)	
(EST-UAL815-YSSY-33S163E/0330F290-KLAX	
	(ACP-UAL815-YSSY-KLAX)

(FAN-UAL815-YSSY-KLAX-SMI/FML FMH/UAL815 REG/N123UA FPO/3330S15910E FCO/ATC01 FCO/ADS01)	
	(FCN-UAL815-YSSY-KLAX-CPD/2-FREQ/13261)
(TOC-UAL815-YSSY-KLAXz)	
	(AOC-UAL815-YSSY-KLAX)
(FCN-UAL815-YSSY-KLAX-CPD/0)	

7.79 Standard coordination with TRU update.

7.79.1 An abbreviated coordination message (EST) is transmitted by Melbourne as soon as UAE412 departs Sydney. Brisbane accepts the proposed coordination conditions by responding with an ACP.

7.79.2 The Sydney Departure controller assigns the aircraft a heading of 100 degrees magnetic and issues instructions to maintain FL200. A TRU is transmitted to update the Brisbane controller's flight details.

7.79.3 Melbourne transfers ATC responsibility approaching the FIR boundary by transmitting a TOC. Brisbane accepts ATC responsibility by responding with an ACP.

Example 9. Coordination of amended clearances via TRU

Brisbane	***Auckland***
(EST-UAE412-YSSY-EVONN/0130F280-NZAA)	
	(ACP-UAE412-YSSY-NZAA)
(TRU-UAE412-YSSY-NZAA-HDG/100 CFL/F200)	
(TOC-UAE412-YSSY-NZAA)	(AOC-UAE412-YSSY-NZAA)

7.8 Notes

7.81 The IGM concerns communications between two ATSUs within the NAT/APAC Regions. Inter-centre communications within one country, and communications with ATSUs outside the NAT/APAC regions, though important to an ATC system's design and implementation are not part of the scope of this material.

7.82 The NAT message is generated once every twelve hours and disseminated to all ATS Units in the NAT. It is also sent to AOC centres where it is used for flight planning purposes. This message contains, in a standard text format, the NAT track definitions and the time when they are active.

Chapter 8. Common Boundary Agreements

8.1 Introduction

8.11 Due to the individual nature of operations in the vicinity of OCA boundaries, some divergence from the common ICD is required. These differences and other procedures are defined in the following sections. The long term aim should be to adopt the contents of Chapter 2, *Purpose, Policy & Units of Measurement*, and Chapter 3, *Communications & Support Mechanisms*, of the ICD with only variable system parameters.

8.2 Interfaces

8.21 Reykjavik/Shanwick Interface.

8.21.1 General.

8.21.1.1 On-line message transfer will be effected by discrete links, but may eventually be superseded by the AFTN subject to the latter satisfying the required standards as to integrity and response.

8.21.1.2 All messages listed in Chapter 3, para 3.2, *Message Headers, Timers and ATSU Indicators*, except RPT and TAM, will contain Data Transfer Numbers consisting of a two letter directional indicator followed by a three digit serial number. The direction indicators will be 'RO' for Reykjavik to Shanwick and 'OR' for Shanwick to Reykjavik.

8.21.1.3 A TAM will be sent by each unit for every message received with ATS Field 3 syntactically correct. If a TAM is not received within 3 minutes of a message being transmitted, the message will be repeated. If, after a further 1 ½ minutes a TAM still has not been received, the message will be repeated for a second time. If, 1 ½ minutes later a TAM still has not been received, notification will be output locally for manual intervention.

8.21.1.4 The systems must be capable of altering the time intervals mentioned if required. The adaptable parameters from the time of the initial transmission being:

1st repeat	-	1 to 4 minutes
2nd repeat	-	1 ½ to 6 minutes
Local notification	-	2 to 8 minutes

8.21.1.5 The automatic acknowledgement and repeat of messages should be able to be suppressed.

8.21.2 Notification of Organized Track Structure and elapsed times.

8.21.2.1 The NAT messages will be transmitted by Shanwick for the day track structure, with tracks designated ‘A’ to ‘M’ inclusive (except ‘I’).

8.21.2.2 Tables of elapsed times (ETAFs) for tracks infringing the Reykjavik OCA will be transmitted on the discrete line as a MIS message. See Chapter 4, *ATS Coordination Messages*, for the layout of this message. For each requested track, the output will contain the estimate elapsed times for each segment of the track in both directions at speeds of Mach 0.80, 0.82 and 0.84 for each flight level declared available for the track.

8.21.3 Clearance messages.

8.21.3.1 Automatic Data Transfer (ADT) will be affected for all flights in both directions which cross, fly along or touch 61N between 10W and 30W inclusive. Initially ADT may be restricted to eastbound flights from Reykjavik to Shanwick, and westbound flights from Shanwick to Reykjavik with full implementation at a later date. Data transfer for these flights will be in the form of CLR messages.

8.21.3.2 Transmission of the CLR message in either direction will take place 60 minutes (adaptable) before 61N or not.

8.21.3.3 The first route point stated in a CLR will be the route point prior to 61N and may be a lat/long or a fix identifier in UK domestic airspace or Icelandic airspace. For flights operating wholly on an organised track, the remainder of the route will be specified by the appropriate track designator (e.g. NATA). For random flights, details of the cleared route to landfall will be transmitted, but OAC FDPS currently does not hold route details beyond 70N and/or 80W.

8.21.3.4 Once CLR has been transmitted, no further CLRs will be issued for the same flight while the original flight plan remains valid.

8.21.3.5 The flight level stated in the CLR will be the final level known to the originating system at the time of ADT.

8.21.4 Repeat messages.

8.21.4.1 RPT messages will be sent manually by the receiving centre when missing serial numbers are detected, or when a message received containing a serial number is found to contain text errors.

OAC FDPS is capable of actioning an RPT request for messages up to 6 hours proceeding the time of input of the RPT message.

8.21.5 Cancellation messages.

8.21.5.1 A CNL message will be generated only when a flight plan is cancelled subsequent to a CLR being sent.

8.21.6 Miscellaneous messages.

8.21.6.1 The MIS message will be used to transmit plain language statements or queries between the two centres, and also the transmission of organised track elapsed times.

8.21.7 System of line failures.

8.21.7.1 Basic communication facilities between the two centres will be available in the even of system failures. The actions to be taken will be defined in the current version of the Letter of Agreement between Shanwick and Reykjavik ACC.

8.22 Gander/Shanwick interface.

8.22.1 General.

8.22.1.1 On-line message transfer is currently affected by discrete links which may eventually be superseded by the AFTN/CIDIN subject to the later satisfying the required standards as to integrity and response.

8.22.1.2 All messages listed in Part 2 – Paragraph 2 – except RPT and TAM contain Data Transfer Numbers consisting of a two letter directional indicator followed by a three digit serial number. The direction indicators are ‘GO’ for Gander to Shanwick and ‘OG’ for Shanwick to Gander.

8.22.1.3 A TAM is sent by each unit for every message received with ATS Field 3 syntactically correct. If a TAM is not received within three minutes of a message being transmitted, the message will be repeated. If, after a further 1 ½ minutes a TAM still has not been received, the message will be repeated for a second time. If, 1 ½ minutes later a TAM still has not been received, notification will be output locally for manual intervention.

8.22.1.4 The system must be capable of altering the time intervals mentioned if required – the variable system parameters (from the time of the initial transmission) being:

First repeat - 1 to 4 minutes

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Second repeat	-	1 ½ to 6 minutes
Local notification	-	2 to 8 minutes

8.22.1.5The automatic repetition of messages may be terminated by agreement.

8.22.2 Notification of Organized Track Structure and elapsed times.

8.22.2.1The NAT message is transmitted by Shanwick for the day structure and by Gander for the night structure.

8.22.2.2The tracks stored by either centre shall be activated, altered or deleted – depending on operational requirements – by appropriate local action.

8.22.2.3Day tracks are designated ‘A’ to ‘M’ inclusive (except ‘I’) and Night tracks ‘N’ to ‘Z’ (except ‘O’).

8.22.2.4When requested, tables of elapsed times (ETAFs) will be transmitted on the discrete lines as a MIS message by the centre responsible for the establishment of the track structure.

8.22.2.5ETAFs can be output for Organised and Contingency Tracks and will consist of the established elapsed times for each segment of the track for flights in both directions at speeds of Mach 0.80, 0.82 and 0.84 for each Flight Level declared available on the track.

8.22.2.6Contingency tracks will be designated by two numeric commencing at ‘01’.

8.22.3 Clearance messages.

8.22.3.1Automatic Data Transfer (ADT) will be affected for flights in both directions which cross 30W between 45 and 61N inclusive at FL060 (adaptable) or above. Data transfer for these flights will be in the form of CLR messages.

8.22.3.2Transmission of the CLR message in either direction will take place 60 minutes (adaptable) before 30W.

8.22.3.3Each system will action the content of any CLR message received, either by processing in accordance with local procedures, or by intimation of text failure to a local position.

8.22.3.4For flights operating wholly on Organised Tracks, the first position stated in the CLR will be 20W or 40W as dictated by the direction of flight with the route being specified by the appropriate track designator (e.g. NATB). In the case of Random flights, full route details from or

after 20W or 40W will be transmitted. Both systems will be capable of transmitting the entire Oceanic route if this becomes an operational requirement.

8.22.3.5 Once a CLR has been transmitted, no further CLRs will be issued for the same flight while the original flight plan remains valid.

8.22.3.6 In order to work towards compatibility of the application of "deemed" separation standards, each unit should be aware of the special separations incorporated in each others conflict algorithm.

8.22.3.7 The flight level stated in the CLR will be the final cleared level known to the originating system at the time of ADT.

8.22.4 Repeat message.

8.22.4.1 RPT messages will be sent manually by the receiving centre when missing serial numbers are detected, or when a message received containing a serial number is found to contain text errors. The RPT message will be input manually and actioned by the computer at the centre to which it was sent.

8.22.4.2 Each computer is capable of actioning a RPT request for any or all of the 64 messages immediately preceding the latest message issued. The message repeated will be an exact copy of the message originally issued under the Data Transfer Number quoted in the RPT.

8.22.5 Cancellation messages.

8.22.5.1 A CNL message will be generated when re-routing necessitates the cancellation of a previously sent CLR message. This will occur when the flight's route will now no longer traverse airspace as defined in paragraph 3.3.1.

8.23 Gander/Reykjavik interface.

8.23.1 Gander is responsible for the boundary. The interface is currently manual.

8.24 Gander/New York interface.

8.24.1 The interface is currently manual, however, development and testing is ongoing of an automated AIDC interface.

8.25 New York/Santa Maria interface.

8.25.1 The interface is affected through AFTN and comprises only Initial Coordination Messages (CPL and ACP) and the appropriated Application Management Messages (LAM, LRM and ASM). Notification and Negotiation Phases will be implemented at a later date.

8.25.2 The concept of operation, message content and communication mechanisms of the above messages was adopted in accordance with Parts I, and II of the ICD, except:

a) No restrictions are in use.

b) CPL sent from New York contains full route until destination.

8.25.3 The ACP message is triggered manually by the controller and closes the dialogue automatically. Verbal coordination is still required for counter-proposals (Negotiation) and upon the following:

a) Crossing conditions and/or restrictions at the boundary including blocking levels.

b) Any profile change from a previously coordinated and accepted profile.

c) At the LAM time out warning after sending a CPL or an ACP.

d) When receiving an LRM in response to a CPL or an ACP.

8.26 Gander/Santa Maria interface.

8.26.1 The interface is currently manual.

8.27 Shanwick/Santa Maria interface.

8.27.1 The interface is currently manual.

8.28 Bodø/Reykjavik interface.

8.28.1 The interface is currently manual.

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Chapter 9. Relationship to ICAO AIDS Messages

9.1 Introduction

9.11 The AIDC message set can be tailored to satisfy regional requirements. The OPLINKP documentation defining the AIDC data link application provides three means for achieving regional adaptation of the AIDC messages:

9.11.1 Regions select an AIDC subset that will support their regional operational procedures.

9.11.2 The selected messages are tailored by mandating the usage of optional components into one of three classes:

a) The optional component that must always be used;

b) The optional component that must never be used; and,

c) The optional component is truly optional.

9.11.3 For interim, pre-ATN implementations, encoding rules may be specified by a region. The most frequently used encoding rules today employ ICAO ATS fields and messages. The default encoding rules are the ISO Packed Encoding rules.

9.11.4 Using the regional tailoring procedure stated above, the NAT/APAC Core messages are related to a subset of the AIDC messages and are shown in Table 9-1.

9.11.5 The encoding rules employed within the NAT/APAC will remain for the foreseeable future as the ICAO ATS field and message-based, character-oriented rules currently defined in the NAT/APAC AIDC Interface Control Document (ICD) (ICAO PANS-ATM Doc 4444).

Table 9-1 NAT/APAC AIDC/ICAO AIDC Relationship

ICAO AIDC message	NAT/APAC AIDC message	ICAO AIDC message	NAT/APAC AIDC message	ICAO AIDC message	NAT/APAC AIDC message
		Mandatory fields		Optional fields	
Notify	ABI	Aircraft identification Departure Aerodrome Destination Aerodrome Boundary estimate data	Aircraft identification SSR Mode and Code (where applicable) Departure Aerodrome Destination Aerodrome Boundary estimate data Number of aircraft Aircraft type Wake turbulence category Route	Flight rules Type of flight Number of aircraft (if more than one in the flight) Aircraft type Wake turbulence category CNS equipment Route Amended destination Code (SSR) Other information	Flight rules Equipment Other information Amended destination
Coordinate Initial	CPL	Aircraft identification Departure Aerodrome Destination Aerodrome Boundary estimate data	Aircraft identification SSR Mode and Code (where applicable) Departure Aerodrome Destination Aerodrome Boundary estimate data Number of aircraft Aircraft type Wake turbulence category	Flight rules Type of flight Number of aircraft (if more than one in the flight) Aircraft type Wake turbulence category CNS equipment Route Amended destination	

			Route Other information	Code (SSR) Other information	

ICAO AIDC message	NAT/APAC AIDC message	ICAO AIDC message	NAT/APAC AIDC message	ICAO AIDC message	NAT/APAC AIDC message
		Mandatory fields		**Optional fields**	
Coordinate Initial	EST	Aircraft identification Departure Aerodrome Destination Aerodrome Boundary estimate data	Aircraft identification SSR Mode and Code (where applicable) Departure Aerodrome Destination Aerodrome Boundary estimate data	Flight rules Type of flight Number of aircraft (if more than one in the flight) Aircraft type Wake turbulence category CNS equipment Route Amended destination Code (SSR) Other information	

Coordinate Initial	PAC	Aircraft identification Departure Aerodrome Destination Aerodrome Boundary estimate data	Aircraft identification SSR Mode and Code (where applicable) Departure Aerodrome Destination Aerodrome Boundary estimate data	Flight rules Type of flight Number of aircraft (if more than one in the flight) Aircraft type Wake turbulence category CNS equipment Route Amended destination Code (SSR) Other information	Flight rules Number of aircraft Aircraft type Wake turbulence category Equipment Route Other information
Coordinate Negotiate	CDN	Aircraft identification Departure Aerodrome Destination Aerodrome Boundary estimate data	Aircraft identification SSR Mode and Code (where applicable) Departure Aerodrome Destination Aerodrome	Flight rules Type of flight Number of aircraft (if more than one in the flight) Aircraft type Wake turbulence category CNS equipment Route Amended destination Code (SSR) Other information	Equipment Boundary estimate data Route Other information Amended destination
ICAO AIDC message	**NAT/APAC AIDC message**	**ICAO AIDC message**	**NAT/APAC AIDC message**	**ICAO AIDC message**	**NAT/APAC AIDC message**
		Mandatory fields		**Optional fields**	

Coordinate Accept	ACP		Aircraft identification SSR Mode and Code (where applicable) Departure Aerodrome Destination Aerodrome Boundary estimate data	Aircraft identification Departure aerodrome Destination aerodrome	
Coordinate Reject	REJ		Aircraft identification SSR Mode and Code (where applicable) Departure Aerodrome Destination Aerodrome	Aircraft identification Departure aerodrome Destination aerodrome	
Coordinate Standby	N/A			Aircraft identification Departure aerodrome Destination aerodrome	
Coordinate Cancel	MAC	Aircraft identification Departure aerodrome Destination aerodrome	Aircraft identification SSR Mode and Code (where applicable) Departure Aerodrome Destination Aerodrome	Fix Reason for cancellation	Boundary Estimate Data Other Information
Coordinate Update	TRU	Aircraft identification Departure aerodrome Destination aerodrome	Aircraft identification SSR Mode and Code (where applicable) Departure Aerodrome Destination Aerodrome	Flight rules Type of flight Number of aircraft (if more than one in the flight) Aircraft type Wake turbulence category CNS equipment Route	

				Amended destination Code (SSR) Other information	
Transfer Initiate	N/A	Aircraft identification Executive Data (if available		Track Data	
ICAO AIDC message	**NAT/APAC AIDC message**	**ICAO AIDC message**	**NAT/APAC AIDC message**	**ICAO AIDC message**	**NAT/APAC AIDC message**
		Mandatory fields		**Optional fields**	
Transfer Conditions Proposal		Aircraft identification Executive data (if available		Track Data	
Transfer Condition Accept	N/A	Aircraft identification		Frequency	
Transfer Communication Request	N/A	Aircraft identification		Frequency	
Transfer Communication	N/A	Aircraft identification Executive data and/or Release indication (if available)		Frequency Track	
Transfer Communication Assume	N/A	Aircraft identification			

Transfer Control	TOC	Aircraft identification	Aircraft identification SSR Mode and Code (where applicable) Departure Aerodrome Destination Aerodrome	Departure Aerodrome Destination Aerodrome Executive data	
Transfer Control Assume	AOC	Aircraft identification	Aircraft identification SSR Mode and Code (where applicable) Departure Aerodrome Destination Aerodrome	Departure Aerodrome Destination Aerodrome	
General Point	N/A	Aircraft identification Departure aerodrome Destination aerodrome		Sector designator (sending) Sector designator (receiving) Flight rules Type of flight Number of aircraft (if more than one in flight) Aircraft type Wake turbulence category CNS equipment Route Track data Code (SSR) Other information	
ICAO AIDC message	**NAT/APAC AIDC message**	**ICAO AIDC message**	**NAT/APAC AIDC message**	**ICAO AIDC message**	**NAT/APAC AIDC message**
		Mandatory fields		**Optional fields**	
General Executive Data	N/A	Aircraft identification		Executive data Frequency	

Free Text Emergency	EMG	Facility designation or Aircraft identification Free text	Functional address or Aircraft identification SSR Mode and Code (where applicable) Other information		
Free Text General	MIS	Facility designation or Aircraft identification Free text	Functional address or Aircraft identification SSR Mode and Code (where applicable) Other information		
Application Accept	LAM				
Application Reject	LRM	Error code	Other information	Error data	
N/A	ASM				
N/A	FAN		Aircraft identification SSR Mode and Code (where applicable) Departure aerodrome Destination aerodrome Application data		
N/A	FCN		Aircraft identification SSR Mode and Code (where applicable) Departure aerodrome Destination aerodrome Communication status		

N/A	ADS		Aircraft identification SSR Mode and Code (where applicable) Departure aerodrome Destination aerodrome ADS-C data		

Chapter 10. Interim Operational Support

10.1 Introduction

10.11 This ICD describes the end-state messages to be used within the NAT/APAC region to ensure interoperability between automated ATS systems. However, during the transition to this end state architecture, current operations must be documented and supported. This chapter is the repository of messages not found in other ICD sections which will be used to support current operations during the interim transition period.

10.12 Each interim message will be described in a separate paragraph. Those ATS Providers employing an interim message contained in this chapter shall document this usage in the appropriated bilateral agreements.

10.2 Interim messages

10.21 Estimate message.

10.21.1 The Estimate message is contained within the Core Message set. However, its use has been constrained to those situations in which a flight will cross an FIR boundary in accordance with existing letters of agreement.

10.21.2 An EST message may be used in any situation in which a CPL is permitted. The EST is in actuality an abbreviated CPL contingent upon prior receipt of route and ancillary information. This information could be provided by an FPL or ABI message.

10.21.3 Those ATS Provider States employing an EST in the more general manner during the interim transition period shall document this usage in the appropriate bi-lateral agreements.

10.21.4 The EST message format shall be as described in the Core Message set.

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Chapter 11. NAT/EUR ATS Interface Messages

11.1 Introduction

11.11 The following section describes those messages used by NAT ATS systems for On-Line Data Interchange between NAT provider States adjacent to the European Region.

11.2 Regional interface message group

11.21 This group describes several messages used by ATS Providers in interface with European domestic systems.

REGIONAL INTERFACE MESSAGES	
Flight Planning	DLA (Delay
Co-ordination	ACT (Activation)
	DEP (Departure)
	ACT (ACTIVATE) – Preswick/Shannon
	OCM (Oceanic Clearance)

11.22 Flight planning message.

11.22.1 DLA (Delay).

11.22.1.1 Purpose.

11.22.1.1.1 Used to indicate a delay in a flight's departure time.

11.22.1.2 Message format.

ATS Format Description

3	Message type, DTSN
7	Aircraft identification
13	Departure aerodrome and time
16	Destination aerodrome

Example

(DLAS/0456-EIN105-EINN1400-KJFK)

11.23 Coordination message.

11.23.1 ACT (Activation).

11.23.1.1 Purpose.

11.23.1.1.1 Used to activate a flight in the receiving system. The ACT provides the latest information on a flight and is normally sent subsequent to an ABI.

11.23.1.2 Message format.

ATS Format	Description
3	Message type, DTSN
7	Aircraft identification
13	Departure aerodrome
14	Boundary estimate data
16	Destination aerodrome
22	Amendment

Field 22 will contain Field 9 to specify aircraft type and field 15 to permit transmission of the next reporting point after the boundary crossing.

Example

(ACTO/P487-BAW179-KJFK-ETIKI/0703F370
-EGLL-9/B743 15/QPR)

11.23.2 DEP (Departure)

11.23.2.1 Purpose.

11.23.2.1.1 Used to indicate a flight's actual departure time.

11.23.2.2 Message format.

ATS Format	Description
3	Message type, DTSN
7	Aircraft identification
13	Departure aerodrome and time
16	Destination aerodrome

Example

(DEPS/0476-EIN105-EINN1300-KJFK)

11.23.3 ACT (Activate Message Shanwick to Shannon).

11.23.3.1 Purpose.

11.23.3.1.1 Used to inform the receiving centre of boundary estimates for flights transiting or infringing the Shanwick/Shannon common boundary including flights transiting NOTA.

11.23.3.2 Message format.

ATS fields: 3, 7, 9, 13, 14, 15, 16

Message Content:

Field Type	***Contents of Field***	***Example***

Start of ATS DATA *(open bracket)*			
3	Message Type and DTSN	Message type "ACT" followed by "O/S" followed by three numeric in the range 000 to 999	(ACT/S010
Start of Field *(single hyphen)*			
7	Flight Callsign	Between three and seven alphanumeric characters	-BAW250
Oblique stroke			
	SSR Mode and Code	"A" followed by four "1" numeric characters	/A1111
Start of Field *(single hyphen)*			
13	Departure Airfield	Four alphanumeric characters being the ICAO location indicator	-KJFK
Start of Field *(single hyphen)*			
14	Boundary Point	Up to five alphanumeric characters *or* Geographical coordinates	-MALOT 5330N01500W
Oblique stroke			
	Boundary Estimate and Flight Level	Two numeric in the range 00 to 23 followed by two numeric in the range 00 to 59 then followed by 3 numeric	/0700F330
Start of Field *(single hyphen)*			
16	Destination Airfield	Four alphanumeric characters being the ICAO location indicator	-EGLL
Start of Field *(single hyphen)*			
9	Aircraft Type	The field ident "9/" followed directly by either: a) Between two and four characters d defining the aircraft type as per I ICAO Doc 8543 [Reference 5] *or* b) As a) above preceded by one or two numeric giving the number of aircraft in	-9/GLF2, -9/C12 or 9/B762 -9/02F16

		he flight	
Oblique stroke			
Wake Turbulence Category		H – Heavy M – Medium L – Light Note: If the WTC is unknown, Shanwick will default to sending /H	/H /M /L

Field Type		***Contents of Field***	***Example***
Start of Field *(single hyphen)* ***[only if field 15 present]***			
15	Next Route Point (optional field)	The field ident "15/" followed directly by on of the following: a) Two numeric followed by "N" followed by three numeric followed by "W" b) Four numeric followed by "N" followed by five numeric followed by "W" c) Up to five alphanumeric characters	 -15/15N012W 15/5240N01406W -15/DOLIP
End of ATS Data *(close bracket)*			)

Examples:

(ACTO/S575-BAW250/A1111-KJFK-MALOT/0700F330-EGLL-9/B762/H-15/DOLIP)

11.23.4 OCM (OCEANIC CLEARANCE MESSAGE).

11.23.4.1 Purpose.

11.23.4.1.1 Used to inform Shannon ACC of Oceanic Clearances issued by Shanwick to any flight entering Shanwick OCA from Shannon FIR/UIR or SOTA including flights transiting the NOTA.

11.23.4.2 Message format.

ATS fields 3, 7, 9, 13, 14, 15, 16, 22 (optional)

Message Content:

Field Type		***Contents of Field***	***Example***
Start of ATS Data (*open bracket)*			
3	Message Type and DTSN	"OCM" followed by "O/S" followed by three numeric in the range of 000 to 999	(OCMO/S539)
Start of Field *(single hyphen)*			
7	Flight Callsign	Between three and seven alphanumeric characters	-IBE416A
Start of Field *(single hyphen)*			
9	Aircraft Type	a) Between two and four characters defining the aircraft type as per ICAO Doc 8643 [Reference 5] *or* b) As a) above preceded by one or two numeric giving the number of aircraft in the flight	-GLF2, -C12 or -B762 -02F16
Start of Field *(single hyphen)*			
13	Departure Airfield	Four alphanumeric characters being the ICAO indicator	-EGLL

Field Type		***Contents of Field***	***Example***
Start of Field *(single hyphen)*			
15	Aircraft Speed	a) "M" followed by three numeric giving the Mach Number	-M079

		or b) Four numeric giving the True Airspeed in knots (not to stated standard)	-0410
	Flight Level	"F" followed by three numeric	F310
	Space		
	Boundary Coordinate	Up to five alphabetic characters *or* *Geographical coordinates*	LIMRI 5310N01500W
	Oblique Stroke		
	Boundary Estimate	Two numeric in the range of 00 to 23 followed by two numeric in the range of 00 to 59	/1357
Field Type		***Contents of Field***	***Example***
	Subsequent Oceanic Route	The text "NAT" followed by one or two alphabetic characters or A random route defined as geographical coordinates and/or named points separated by <sp> in the format: a) Two numeric followed by "N" followed by three numeric followed by "W" b) four numeric followed by "N" followed by five numeric followed by "W" c) Between two and five alphabetic characters	NATG 49N020W 4832N02814W BANCS
	Start of Field *(single hyphen)*		
16	Destination Airfield	Four alphabetic characters being the ICAO indicator	-KJFK

Field Type		***Contents of Field***	***Example***
Start of Field *(single hyphen)* ***[only if Field 22 present]***			
22	Other information (operational field)	The text "ATC/<sp>" and one or more of the following fields in any order each separated by a <sp> NBT (i.e. not before time)<sp>time<sp>ATC restriction point* NLT (i.e. not later than)<sp>time<sp> ATC restriction point* EPC (i.e. entry point change) INT (i.e. interval)<sp>callsign<sp>+<sp> interval in minutes LCHG (i.e. level change) RTD (i.e. return to domestic) and/or RECLEARANCE <sp> one numeric in the range of 1 to 7	ATC/ NBT 1357 49N_10W NLT 1357 49N_10W EPC INT BBB213 + 10 LCHG RTD RECLEARANCE 2

		*ATC restriction point takes one of the following formats: a) Up to five alphabetic characters or b) Two numeric followed by “N” and underscore followed by two numeric followed by “W”	
End of ATS Data (*close bracket)*			**)**

Example

(OCMO/S400-ELY027-B743-EGLL-M084/F330 LIMRI/1348 NATG-KJFK)

(OCMO/S475-DAL85-B762-LFMN-M082F330 LIMRI/1335 53N020W 54N030W 54N040W 53N050W YAY-KJFK-ATC/INT VIR015 + 08 RECLEARANCE 1)

(OCMO/S478-UAL919-B744-EGLL-M085F350 MASIT/1356 NATG-KIAD-ATC/NBT 1356 MASIT INT DAL49 + 16)

(OCMO/S919-DLH408-A343-EDDL-M083F370 DOGAL/1441 NATE-KJFK-ATC/ EPC INT WIN111 +10)

(OCMO/S928-OAL881-B762-LGAV-M080F350 SOMAX/1451 51N020W 52N030W 52N040W 50N050W YQK-KJFK-ATC/ LCHG NBT 1451 SOMAX)

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Appendix A Templates for Bilateral Letter of Agreement on AIDC

At an organizational level, the implementation of AIDC to enable data transfers between automated ATS systems is accomplished under the authority and strict operational terms of a bilateral letter of agreement or memorandum of understanding on AIDC arrangements that must be established between the two ATSUs involved. Depending on the particular circumstances, the legally less sophisticated Memorandum of Understanding (MOU) format could be used for the initial implementation of AIDC until the more formalized Letter of Agreement (LOA) is put in place. The choice of legal instrument will be a decision made by the two ATSUs as they prepare the formal agreement to enable AIDC data transfer between States.

In order to provide guidance in the structure and content of bilateral arrangements, templates have been included in this appendix to assist States in preparing suitable memorandums of understandings/letters of agreement on AIDC arrangements. The templates are based upon documentation developed by Airways New Zealand in implementation evolving AIDC arrangements between Auckland Oceanic and all neighbouring States over a period of approximately 10 years commencing from the mid 1990's. Three templates are included:

Template 1 provides a generic example of a basic Letter of Agreement

Template 2 is an example of an actual Letter of Agreement between Auckland Oceanic (New Zealand) and Brisbane ATS Centre (Australia); and

Template 3 is an example of an actual Memorandum of Understanding between Auckland Oceanic (New Zealand) and Nadi ATM Operations Centre (Fiji).

The templates are intended as guidance material only. It is important to note that although changes in the AIDC arrangements applicable to Auckland Oceanic will occur over time, Templates 2 and 3 will NOT be routinely updated. Accordingly, as the circumstances for each bilateral implementation will differ, appropriate adjustments should be made to the content of the templates to ensure that the resulting MOW or LOA is fit for the purpose intended.

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Template 1

Generic Letter of Agreement

AIDC Procedures

1. The format of AIDC messages (*List messages used e.g. ABI, PAC, CDN, CPL, ACP, REJ, MAC, LAM and LRM)* are as defined by the Asia/Pacific/North Atlantic Regional AIDC Interface Control Document (ICD) as amended from time to time, unless described otherwise in this LOA.
2. List messages not supported (*e.g. "EST, TOC, AOC* messages are not supported").
3. Acceptance of CPL or CDN message is approval of the flight's profile and requires no further voice communication (i.e. Non-Standard Altitudes, Block Altitudes, and Deviations).
4. (*Describe other procedures applicable to the use of AIDC for this LOA. Some examples are listed below)*
    a. *Example only. If there is any doubt with regard to the final coordination data, voice coordination shall be used for confirmation.*
    b. *Example only. Receipt of a MAC message much not be interpreted as meaning that the flight plan has been cancelled. Voice coordination must be conducted by the transferring controller to confirm the status of the flight.*
    c. *Example only. Each facility shall advise the other facility of any known equipment outage that affects AIDC. In the event of AIDC outage, voice communication procedures will apply.*
    d. *Example only. Truncation. Where route amendment outside the FIR is unavoidable.*
        i. *Terminate the route details at the farthest possible flight plan significant point of the flight and enter "T" immediately following this.*
        ii. *Without amending the originally received details, every effort is to be made to truncate the route at a minimum of one significant point beyond the adjacent FIR to provide an entry track in that FIR.*

AIDC Messages

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(For each message used describe when it will be sent by each ATSU under the parameter column and use the Notes column to describe other applicable information for the message use by each ATSU. The data below provides an example of the type of information that could be incorporated.)

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Messages	Parameter	Notes
ABI	***ATSU1*:** Sends ABI approx. 80 minutes prior to boundary (73 min prior to the 50 nm expanded sector boundary). ***ATSU2:*** Sends ABI approx. 87 minutes prior to boundary (80 min prior to the 50 nm expanded sector boundary). (*Note: An updated ABI will not be sent once a CPL has been sent.)*	***ATSU1 : ATSU2*** *Updated aBI's will be sent automatically if there is any change to profile. ABI is sent automatically and is transparent to the controller. ABI automatically updates the receiving unit's flight data record.*
CPL	***ATSU1 : ATSU2*** *Send CPL messages approx 37 minutes prior to the boundary (30 minutes prior to the 50 nm expanded sector boundary).*	***ATSU1 : ATSU2*** *CPL messages should be sent by the transferring controller in sufficient time to allow the completion of coordination at least 30 minutes prior to the boundary or 30 minutes prior to the aircraft passing within 50nmof the FIR boundary for information transfers.*
CDN	***ATSU1 : ATSU2*** *CDN messages are sent by either the transferring or receiving facility to propose a change once the coordination process has been completed, i.e., CPL sent and ACP received. CDN's must contain all applicable profile restrictions (e.g. weather deviations, speed assignment, block altitude). If the use of a CDN does not support this requirement, then verbal coordination is required.*	***ATSU1 : ATSU2*** *The APS will display a flashing "DIA" until receipt of ACP. If ACPJ not received within ten (10) minutes, controller is alerted with a message to the queue.* *CDN messages are not normally used for coordination of reroutes; however, with the receiving facilities approval a CDN may be used to coordinate a reroute on a critical status aircraft such as in an emergency.*
PAC	***ATSU1 : ATSU2*** *PAC messages will normally be sent when the time criteria from the*	***ATSU1 : ATSU2*** *Will respond to a PAC message with an ACP. PAC messages shall be verbally verified with*

	departure point to the boundary is less than that stipulated in the CPL.	*receiving facility.*
ACP	***ATSU1 : ATSU2***	***ATSU1 : ATSU2*** *The APS will display a flashing "DIA" until receipt of ACP. If ACP not received within ten (10) minutes, controller is alerted with a message to the queue.*

Messages	Parameter	Notes
TOC	***ATSU1 : ATSU2*** *Not supported. Implicit hand in/off.*	***ATSU1 : ATSU2***
AOC	***ATSU1 : ATSU2*** *Not supported. Implicit hand in/off.*	
MAC	***ATSU1 : ATSU2*** *MAC messages are sent when a change to the route makes the other facility no longer the "next" responsible unit.*	***ATSU1 : ATSU2*** *Receipt of a MAC message must not be interpreted as meaning that the flight plan has been cancelled. Voice coordination must be conducted by the transferring controller to confirm the status of the flight.*
REJ	***ATSU1 : ATSU2*** *REJ messages are sent in reply to a CDN message when the request change is unacceptable*	***ATSU1 : ATSU2*** *REJ messages are sent only as a response to a CDN message.*

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Template 2

***Example*: Auckland Oceanic – Brisbane ATS Centre**

Coordination – General

Transfer of Control Point	The Transfer of Control Point (TCP) shall be either on receipt of an Acceptance of Control (AOC) to a Transfer of Control (TOC) or the common FIR boundary, whichever occurs first. The TCP shall also be the point of acceptance of primary guard. All ATS units shall coordinate an estimate for the FIR boundary at least thirty (30) minutes prior to the boundary. Such coordination constitutes an offer of transfer of responsibility. After the estimate for the FIR boundary has been sent, units shall coordinate any revised estimate that varies by 3 minutes or more.
Communication Systems	Use of communications systems coordination between adjacent units shall be in the following order of priority: a. ATS Interfacility Data Communication (AIDC) b. AIDC messages and procedures are specified in the following sections; c. ATS direct speech circuits; d. International telephone system; e. Any other means of communication available.
AIDC Messages	AIDC message format will be in accordance with the Asia/Pacific/North Atlantic Regional Interface Control Document (ICD), as amended from time to time, unless described otherwise in the LOA.

Successful coordination via AIDC occurs on receipt of an ACP message in response to an EST message.

Each centre shall advise the other of any known equipment outage that affects AIDC.

AIDC Message Parameters

The following table details the AIDC parameters and message to be used.

Message	Parameter	Notes
ABI	EUROCAT: 5-60 minutes prior to COP (Note: An updated ABI will not be sent once an EST has been sent) OCS: 40 minutes prior 50nm expanded boundary	ABI is sent automatically and is transparent to controller. ABI automatically updates flight plan.
EST	EUROCAT: 40 minutes prior to COP OCS: 40 minutes prior 50mn expanded boundary	Any changes to EST level or estimate conditions as detailed in LOA to be notified by voice after initial coordination completed. See notes below on voice procedures. EST is required to track generation in EUROCAT.
ACP	EUROCAT: Sends automatic ACP on receipt of EST	EUROCAT: If ACP not received within 4 minutes the sending controller is alerted. Sending controller will initiate voice coordination if ACP is not received within 4 minutes of sending EST. Receiving controller will initiate voice

	OCE: Sends automatic ACP on receipt of EST	coordination if proposed EST conditions are not acceptable. OCS: If ACP is not receive within 5 minutes the sending controller is alerted. Sending controller will not initiate voice coordination if ACP is not received within 5 minutes of sending EST. Receiving controller will initiate voice coordination if proposed EST conditions are not acceptable.
TOC	EUROCAT: Sent automatically 5 minutes prior to boundary OCS: Sent automatically 2 minutes prior to boundary	
AOC	EUROCAT: Sent automatically on controller acceptance of a TOC OCS: Sent automatically on receipt of a TOC	

Coordination – General, Continued

AIDC Message (continued)
Parameters

Message	Parameter	Notes
CDN	EUROCAT: Manually by the controller when required	• Responses to the CDN shall be ACP or REJ only – there will be no CDN negotiations. • CDN messages will be sent by Brisbane only to revise coordination on eastbound flights. • CDN messages may be used to coordinate changes to estimate or assigned altitude only. • Only on CDN dialogue may be open per aircraft at any time. • Not to be used if the aircraft will not be maintaining the assigned altitude 10 minutes prior to the TCP.
MAC	As per ICD	
LRM	As per ICD. Controller alerted on receipt	
LAM	As per ICD. Controller alerted on non-receipt	

Amendment to Flight Data Record Route amendment – routes/waypoints may be added/deleted as long as they do not change the original intent or integrity of the flight plan information.

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Truncation – where route amendment outside the FIR unavoidable:

a. Terminate the route details at the farthest possible 'flight planned' point of the flight outside the FIR and enter "T" immediately following this.
b. If insufficient 'flight planned' point exist outside the FIR for truncation, insert the first 'defined' point in the adjoining FIR and enter "T" immediately following this.
c. The minimum acceptable truncation point must be at least the first point in the adjoining FIR.
d. Every effort is to be made to truncate the route at a minimum of one point beyond the adjacent international FIR to provide an entry track in to that FIR.

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Coordination – General, Continued

Address Forwarding And Next Data Authority

Brisbane ATSC and Auckland OAC shall send automatic Next Data Authority (NDA) and Address Forwarding (CAD) for data link aircraft as per the following table:

Brisbane ATSC	Auto NDA sent 22 minutes prior to the FIR boundary Auto CAD sent 20 minutes prior to the FIR boundary
Auckland OAC	Auto NDA sent 40 minutes prior to the FIR boundary Auto CAD sent 35 minutes prior to the FIR boundary

---

Voice Coordination

Voice coordination is not required when AIDC messaging has been successful to offer and accepts transfer of control.

However, the receiving controller will initiate voice coordination if the proposed AIDC EST conditions are not acceptable.

If AIDC messaging is not to be sent following voice coordination, it shall be stated as part of the voice coordination by use of the phrase "AIDC messaging will not be sent". A read back is required.

Voice Coordination is required for aircraft operating under any of the following conditions:

- block level clearance;
- weather deviations;
- offset track; or
- Mach Number technique.

Read backs shall comprise all elements of the voice coordination passed by the transferring controller. Read back by the receiving unit confirms acceptance of the offer of transfer of control subject to any other conditions negotiated.

Hemstitch Flights

A hemstitch flight is any flight that will remain within the New Zealand FIR for less time than the NDA VSP (40 minutes) prior to the flight entering the Brisbane FIR.

Auckland AOC shall voice coordinate any hemstitch flight.

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Near Boundary ATS units shall relay significant details of any flight which is, or intends **Operations** operating within fifty nautical miles (50NM0 of the common FIR boundary.

HF Frequencies Brisbane ATC and Auckland ATC shall update each other as to the current voice backup frequency for use by ATC data link equipped aircraft.

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Template 3

Example: Auckland Oceanic – Nadi ATM Operations Centre

Memorandum of Understanding
Between
Airways New Zealand Limited
And
Nadi ATM Operations Centre

Subject **Air Traffic Services Inter-facility Data Communications (AIDC) Coordination Procedures**

Validity Period This Memorandum of Understanding shall be effective from 0506300300 UTC and may be cancelled by either party with written notice.

Signatories The following signatories have ratified this Agreement:

Authority	**Signature**	**Date**
(Name of Officer) Oceanic Business Unit Manager Airways New Zealand		
(Name of Officer) Manager, Operations Strategic Air Services Limited Fiji		
(Name of Officer) Chairman, ATM Projects Committee, Airports Fiji Limited		

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Fiji		

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Memorandum of Understanding, Continued

Purpose	To establish procedures to permit AIDC messages for coordination purposes to be transmitted by Auckland Oceanic and received by Nadi Air Traffic Management Operations Centre (ATMOC).
Scope	This MOU between Auckland and Nadi is supplementary to the procedures contained in the Airways Corporation of New Zealand Limited and Airport Fiji Limited LOA, dated 25 November 2004. Revision to this MOU shall be made only with the concurrence of all parties.
Procedures	The format of AIDC messages (ABI, EST, PAC, CDN, CPL, ACP, REJ, TOC, AOC, MAC, LAM and LRM) are defined by the Asia/Pacific/North Atlantic Regional AIDC Interface Control Document (ICD) version 2.0. The optional formats for the coordination of block levels, weather deviations and Mach Number Technique have not been implemented.

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Each facility shall advise the other facility of any known equipment outage that will affect AIDC. In the even of AIDC outage, voice coordination procedures will apply.

The following table details the messaging parameters and additional information for each message.

Message	Parameter	Notes
ABI Non Hem-stitching flights	**Auckland:** Sends ABI 48 minutes prior to boundary (Note: An updated ABI will no be sent once an EST has been sent)	Updated ABIs will be sent automatically if there is any change to profile. ABI is sent automatically and is transparent to the controller. ABI automatically updates the receiving units flight data record
EST (general) Non Hem-stitching flights	**Auckland:** Sends EST 38 minutes prior to boundary	EST is sent automatically and automatically coordinates the receiving unit's flight data record. Any change to the EST (level or estimate) conditions as detailed in LOA are to be notified by voice after the initial coordination completed. See section below on voice procedures
ABI & EST Hem-stitch flights	**Auckland:** Sends ABI & EST messages for flights that re-enter the Nadi FIR as soon as the aircraft enters NZZO FIR	In these cases the ABI and EST are sent automatically
PAC	**Auckland:** Voice coordination will take place in those situations when a PAC is sent	

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Memorandum of Understanding, Continued

Message	Parameter	Notes
ACP	**Auckland:** Sent automatically	**Auckland:** The APS will display a flashing "DIA"

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	on receipt of EST **Nadi:** Sent automatically on receipt of EST or PAC	until receipt of ACP. If ACP not received within ten (10) minutes, controller is alerted with a message to the queue
TOC	**Auckland:** Sent automatically 2 minutes prior to boundary	This proposes a hand-off to the receiving unit
AOC	**Auckland:** Sent automatically on receipt of TOC **Nadi:** Sent automatically on	This completes the hand-off proposal
MAC	**Auckland:** Sent manually when a change to the route makes Nadi no longer the "next" responsible unit	Receipt of a MAC message should not be interpreted as meaning that the flight plan has been cancelled. Voice coordination should be conducted by the receiving controller to confirm the status of the flight

Procedures, Continued

Block levels, offsets, and weather deviations, or Mach Number Techniques are not included in the current version of AIDC messaging. Voice coordination shall be conducted for aircraft operating under these circumstances.

If there is any doubt with regard to the final coordination conditions, voice coordination shall be used for confirmation.

Truncation – Where route amendment outside the FIR is unavoidable:

- Terminate the route details at the farthest possible 'flight planned' point of the flight and enter "T" immediately following this.
- Without amending the originally received details, every effort is to be made to truncate the route a minimum of one point beyond the adjacent FIR to provide an entry track in to that FIR

For any reason where changes to this MOU are advisable the requesting unit shall propose the pertinent revision. The revision should be emailed of faxed to the appropriate Manager for action. The Manager or the designated deputies shall agree by email or telephone, followed by a confirming fax message signed by all parties.

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Formal exchange of signed copies of the amended MOW shall take place as soon as practicable thereafter.

Hemstitch Flights

A Hemstitch flight is any flight that vacates FIR 1 and transits FIR 2 before re-entering FIR 1.

When a hemstitching flight vacates FIR 1 and then re-enter FIR 2 30 minutes or less later, the re-entry coordination is considered to have been completed when coordination for the initial entry is completed and further coordination is only required if the aircraft requests:

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Memorandum of Understanding, Continued

- A weather deviation, or
- A level change, or
- Any change to the EST time is received or
- If there is any doubt that the receiving FIR has the correct boundary information

AIDC messages (ABI and EST) will still be sent by Auckland, but only when the aircraft flight state becomes active control. For hem stitching flights this will usually be when the aircraft enters the NZZO FIR, therefore these messages will normally be sent at less that 30 minutes prior to the TCP.

Voice Coordination

The following is provided as a summary of occasions when voice coordination is required:

- In the event of an AIDC outage;
- Aircraft operating under any of the following conditions:
  - Block level clearance;
  - Unfulfilled time constraints;
  - Weather deviations;
  - Offset track; or

- Mach Number technique
- Any change to the EST (level or time) conditions;
- On receipt of a warning that an ACP has not been received;
- On receipt of a MAC message;
- If there is any doubt with regard to the final coordination conditions;
- If the receiving controller can not accept the aircraft at the coordinated level

Notwithstanding the above, voice coordination shall take place for any flight that departs an airfield within the NZZO FIR and enters the NFFF FIR within 30 mins after departure.

For aircraft on fixed routes this specifically applies to:

- Aircraft departing Norfolk and entering the Nadi FIR via UBDAK or OSVAR/
- Aircraft departing Fua'amotu and entering the Nadi FIR via APASI;
- Aircraft departing Faleolo and entering the Nadi FIR via OVLAD or KETOT

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Memorandum of Understanding, Continued

Auckland OCA will obtain the appropriate level approval for these flights and will pass Nadi an "Estimate" based on the aircrafts probed profile at the same time as obtaining the level approval.

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A PAC message will also be sent containing the time at the TCP and the climbing condition.
Time revisions will only be passed when the "Estimated" time changes by more than 2 minutes from that previously passed.
Level changes to that previously coordinated and/or off track request shall be verbally coordinated in the usual manner.

Notification of Descent Restrictions by Nadi

Auckland OCS controllers may issue descent to aircraft entering the NZZO FIR from the NFFF FIR and landing at Norfolk, Tonga or Samoa without requesting descent restrictions from Nadi provided descent is commenced after the aircraft has passed the following positions. Should Nadi have any restrictions for descent, they will advise Auckland at least 10 mins prior to these positions:

For aircraft entering NZZO FIR via:

- UPDAK descent to commence after NOGOL
- OSVAR descent to commence after OSVAR minus 10 mins
- APASI descent to commence after ASAPI
- All other occasions, descent to commence after the aircraft has crossed the FIR boundary.

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