International Civil Aviation Organization

MIDANPIRG Communication Navigation and Surveillance Sub-Group (CNS SG)

Fourth Meeting
(Cairo, Egypt, 25 – 27 September 2011)

Agenda Item 5: Developments in CNS Field

OUTCOME OF MID SURVEILLANCE WORKSHOP AND OTHER SURVEILLANCE ISSUES

(Presented by Secretariat)

SUMMARY

This paper provides the results of the MID surveillance workshop conducted in Saudi Arabia and proposes MID surveillance strategy and time lines for the ADS-B implementation, along with other surveillance issues.

Action by the meeting is at paragraph 3.

REFERENCES

- MIDANPIRG/12 Report
- Summary of the outcome of the MID Surveillance workshop

1. INTRODUCTION

1.1 MIDANPIRG/12 meeting was held in Amman, Jordan 17-21 October, noted that many emerging surveillance technologies had been included in the ICAO provisions and are being implemented worldwide and in the MID Region, some of which are not a straight foreword implementation and require considerable knowledge on systems and procedures for their implementations. Accordingly, the meeting agreed to the following Conclusion:

CONCLUSION 12/45: MID SURVEILLANCE WORKSHOP

That,

a) the ICAO MID Regional Office organizes a workshop with an objective to raise awareness, develop MID Regional Surveillance strategy and road map; and

b) MID States participate in the workshop and provide their future surveillance plans

1.2 MID Surveillance Workshop was successfully hosted by the General Authority of Civil Aviation (GACA) in Jeddah, Saudi Arabia, from 08 to 10 May 2011. The workshop was attended by a total of 68 participants from 6 States and 2 International Organizations. Airbus, Boeing and EUROCONTROL participated as presenters through WebEx, were life online presentation were conducted followed by questions and answers session.

2. DISCUSSION

2.1 The meeting may wish to note that workshop was conducted with an objective to provide States in the Middle East Region, with a better understanding of evolving aeronautical surveillance and the development of new technologies to enhance the situational awareness. The objective also included the development of MID Region Surveillance strategy and the time lines for the ADS-B implementation

2.2 The meeting may further wish to note that the presentations and discussions covered mainly the following topics:

- Evolution of aeronautical surveillance
- Surveillance part of the MID REGION ANP FASID
- Radar Performance and Comparison of aeronautical surveillance Systems.
- User Surveillance Requirements
- MID States activities on surveillance
- Mode S coordination issues
- Multilateration and its use and requirement
- Solution and roadmap of FANS and ADS-B on the airbus family fleet
- SESAR and Nextgen requirement and the new advances on the situational awareness in cockpit
- ADS-B Out & ATSAW Deployment in Europe
- Boeing ADS-B Out and Regulatory Mandates in different Regions

2.3 The workshop discussed in detail Mode S coordination issues including a live demonstration on the MICA application used by EUROPE AND MID, where the participant had good understanding of the different capabilities available in the MICA web tool, the IC allocation cycle along with IC code conflict reporting and resolution screen.

2.4 The workshop was presented with practical examples on the Multilateration and its use and requirement. AIRBUS provided a presentation on the Solution and roadmap of FANS and ADS-B on the airbus family fleet and the equipment being fitted in their airframes. Examples on the EHS mandate in Europe to fulfill the SESAR and Nextgen requirement were highlighted.

2.5 EURCONTROL presented ADS-B Out & ATSAW Deployment in Europe where the rule on the European Commission Single European Sky, Surveillance Performance & Interoperability Implementing (SPI IR) was explained .It was noted that SPI IR mandate supports the use of ADS-B and WAM,. The workshop noted that ADS-B, WAM, ATSAW deployment ongoing under SESAR being the baselines and these will produce Rationalized high performance surveillance system in Europe.

2.6 The workshop received presentation from Boeing which was dedicated to the ADS, and it covered ADS-B Out Regulatory Mandates. Accordingly, the participants had the views of the two major aircraft manufacturers and got better understanding of their plans and the future equipage planning.

2.7 It was noted that the airframe manufacturers will be meeting the various ADS-B mandates in different parts of the world including Australia, Hong Kong, Singapore, other Asia Pacific Regulatory Agencies, Nav Canada, EURCONTROL/ESA draft rule and the USA.

2.8 The meeting may wish to note that manufacturers are in continuous coordination with Air Navigation Service Providers (Canada, Australia, Europe, US) to ensure common airborne requirements global harmonization, the discussions many times engage with airlines, industry partners and the rulemakings around the world.

2.9 The workshop further noted that ICAO is addressing through the ASTAF (Airborne Surveillance Task Force) advanced situational awareness issues, where the mission of the task force is to develop a manual on Airborne Surveillance, covering the implementation of airborne surveillance and the initial applications, implemented by manufacturers over the next 3-5 years along with other related material. The full summary of discussion is at **Appendix A** to this working paper.

2.10 The meeting may wish to note that the workshop developed MID Region Surveillance Strategy as at **Appendix B** to this working paper. Accordingly, the meeting may wish to agree to the following draft conclusion:

Why	Adopt MID Region Surveillance Strategy
What	MID Region Surveillance Strategy
Who	ICAO and MID States
When	MIDANPIRG/13

DRAFT CONCLUSION 4/XX: MID REGION SURVEILLANCE STRATEGY

*That, the MID Region Surveillance strategy be adopted as at **Appendix X** to the Report on agenda item 5*

2.11 The meeting may wish to note that MID Surveillance workshop had developed set of actions as follows:

- ICAO to provide guidance material to standardize and facilitate flight check procedures for ADS-B and Multirateration
- Acknowledge ICAO role and activities to address airborne surveillance applications.
- Acknowledge the need for setting Regional timelines to implement ADS-B out where justified
- States to reply to the survey and confirm their position and support for the core implementation/ coordination team
- States to share the aircraft ADS-B approval data bases

2.12 The meeting may wish to note the benefits of exchanging surveillance data as this will enable greater efficiencies for airlines operating across boundaries by providing increased capacity, reduced workload, and enhance safety. In this regard the meetings recalled that, PANS ATM DOC 4444 para 8.1.5 indicates *States should, to the extent possible, facilitate the sharing of information derived from ATS surveillance systems in order to extend and improve surveillance coverage in adjacent control areas.*

2.13 The meeting may further wish to note that gaps in surveillance coverage for individual States exist at present, causing aircraft to fade from surveillance coverage. In this regard, MIDANPIRG/12 meeting was of the view that a full programme on surveillance data information sharing be carried out by all MID States in order to significantly reduce surveillance gaps.

2.14 MIDNPIRG/12 meeting noted that Bahrain already exchanges ATS surveillance data with Kuwait, and Lebanon with Nicosia. Egypt and Saudi Arabia are in the process of Sharing ATS surveillance data. Accordingly, MIDANPIRG/12 meeting agreed to the revised Regional PFF for the ATS surveillance data exchange and agreed to the following Conclusion:

CONCLUSION 12/46: EXCHANGE OF SURVEILLANCE DATA

That, MID States be encouraged, to share ATS surveillance data in order to improve surveillance coverage in the MID Region, which will enhance safety, efficiency, capacity and could be used as back-up where feasible.

2.15 As a follow-up to the above conclusion ICAO MID Regional office sent State letter AN 7/5.9–11/025 dated 16 February 2011 and the following States provided replies:

- Bahrain implemented the exchange of surveillance data with Kuwait since 2009, Qatar has formally approved the exchange of surveillance data and it is in the process of finalizing the technical aspects of surveillance, Bahrain has made request to Saudi Arabia and UAE to implement the exchange of surveillance data, Bahrain has been providing UAE with the surveillance data since 2003;
- Jordan is not exchanging surveillance data with other States but as part of airspace modernization project surveillance data exchange is considered; and
- Oman is presently seeking approvals for the exchange of surveillance data with other states from appropriate authorities.

2.16 Based on the above, the meeting may wish to continue encouraging the exchange of the surveillance data to enhance safety and efficiency in the ATM field.

2.17 The meeting may wish to recall that MIDANPIRG/10 encouraged States, in collaboration with the airspace users to develop and implement an ADS-B trials programme and MIDANPIRG/11 under conclusion 11/69 agreed on a Regional Strategy for the implementation of ADS-B. The meeting may wish to consider the development of Interface Control Document for the MID region based on the other regions documents as at **Appendix C** to this working paper. In this regard the meeting may wish to consider the conduct of seminar on AIDC for Increased Interoperability, Efficiency and Capacity through Ground-Ground Integration.

2.18 MIDANPIRG/12 supported the development of a harmonized plan for the ADS-B implementation for the MID Region based on the strategy adopted by MIDANPIRG/11. Accordingly, MID Surveillance workshop developed draft Surveillance strategy including time lines for ADS-B out implementation. MIDANPIRG/12 also reiterated MIDANPIRG/11 conclusion 11/69 and considered that the MID Region Strategy for the Implementation of ADS-B as at **Appendix D** to this working paper as applicable.

2.19 The meeting may recall amendment 85 to annex 10, where MIDANPIRG/12 meeting urged MID States to strictly adhere to the 24-bit aircraft addresses allocated to their States as listed in Annex 10, Volume III, Part I, Chapter 9, Table 9-1 (allocation of aircraft addresses to States). Furthermore, the MIDANPIRG/12 meeting encouraged MID States to allocate the 24 bit address to all aircraft registered in their State with the principle that, at any one time, no address shall be assigned to more than one aircraft.

2.20 MIDANPIRG/12 meeting urged MID States to maintain databases for all the 24bit aircraft address allocation pertaining to their States and send the assigned allocations to ICAO MID Regional Office and MID RMA for inclusion in their databases as soon possible. Accordingly, the meeting may wish to agree to the following Draft Conclusion:

Why	To assign 24 bit aircraft address to all
What	Allocation of 24 bit aircraft address
Who	MID States
When	MIDANPIRG/13

DRAFT CONCLUSION 4/X: ALLOCATION OF 24 BIT AIRCRAFT ADDRESS

That, MID States be urged to:

a) allocate 24 bit aircraft address according to Annex 10, Volume III, Part I, Chapter 9, Table 9-1 (allocation of aircraft addresses to States);

b) send the allocation list to ICAO MID Regional Office and MID RMA by 30 March 2012; and

c) provide ICAO MID Regional Office and MID RMA with regular updates to the allocation list.

3. ACTION BY THE MEETING

3.1 The meeting is invited to:

a) note the information in this working paper and its Appendices;

b) endorse Conclusion in para 2.10 and 2.20;

c) agree on further actions for para. 2.11;

d) review and comment on **Appendices C and D** and request CNS/ATM/IC SG to further review; and

e) agree on further steps for radar data exchange and AIDC.

APPENDIX A

INTERNATIONAL CIVIL AVIATION ORGANIZATION

MIDDLE EAST OFFICE

MID SURVEILLANCE WORKSHOP

(JEDDAH, SAUDI ARABIA, 08-10 MAY 2011)

SUMMARY OF DISCUSSIONS

1. INTRODUCTION

1.1 The MID Surveillance Workshop was successfully hosted by the General Authority of Civil Aviation (GACA) in Jeddah, Saudi Arabia, from 08 to 10 May 2011. The workshop was attended by a total of 68 participants from 6 States and 2 International Organizations. Airbus, Boeing and EUROCONTROL participated as presenters through WebEx, were life online presentation were conducted followed by questions and answers session. The list of participants is available in **Appendix A** to this Summary of Discussions. Eng. Mohammed Al-Salmi, Vice President GACA for Air Navigation Services, and Mr. Jehad Faqir, Deputy Regional Director, ICAO MID Region, opened the workshop.

1.2 Mr. R. A. Gulam was the principle facilitator of the workshop, supported by Mr. Vaughn Maiolla, Technical Officer CNS/AIM Section of Air Navigation Bureau, ICAO Headquarters in Montreal, who delivered several presentations providing details on SARPS updates and the evolution of the aeronautical surveillance; he also provided an update on the Australian ADS-B experience.

1.3 The workshop was conducted with an objective to provide States in the Middle East Region, with a better understanding of evolving aeronautical surveillance and the development of new technologies to enhance the situational awareness. The objective also included the development of MID Region Surveillance strategy and the time lines for the ADS-B implementation.

2. DISCUSSIONS

2.1 The three days workshop was divided into nine working sessions; three sessions each day. On the first day of the workshop, participants were provided with basic presentations, which covered the objective of the workshop and the related MIDANPIRG conclusions on MID surveillance Strategy and data sharing to enhance situational awareness in the MID Region.

2.2 The first day presentations also covered the Evolution of aeronautical surveillance, MID REGION ANP FASID, "Surveillance part " and GANIS, Radar Performance and Comparison of aeronautical surveillance Systems. IATA presented the User Surveillance Requirements with regards to sureveillance followed by two presentations from States highlighting their States activities on surveillance, the day was ended by a brain storming session the results of which were discussed the following days and were taken into account while developing the final outcome of the workshop.

2.3 On the second day, the workshop received detailed information on Mode S coordination issues which were thoroughly discussed and a live demonstration on the MICA application used by EUROPE AND MID was performed where the minimum requirement for the IC code allocation was highlighted. The participant also had good understanding of the different capabilities available in the tool, also the IC allocation cycle along with IC code conflict reporting and resolution screen where explained. Practical examples on the Multilateration and its use and requirement were then provided to the participants. The workshop then continued to receive States views, plans and requirements.

2.4 Through WebEx, AIRBUS provided a presentation on the Solution and roadmap of FANS and ADS-B on the airbus family fleet and the equipment being fitted in the airframes..Examples on the EHS mandate in Europe to fulfil the SESAR and Nextgen requirement was also highlighted, the new advances on the situational awareness in cockpit was also provided.

2.5 EURCONTROL presented through WebEx the ADS-B Out & ATSAW Deployment in Europe where the rule on the European Commission Single European Sky, Surveillance Performance & Interoperability Implementing (SPI IR) was explained .It was noted that SPI IR mandate supports the use of ADS-B and WAM,. The workshop noted that ADS-B, WAM, ATSAW deployment ongoing under SESAR being the baselines and these will produce Rationalized high performance surveillance system in Europe.

2.6 On the third day of the workshop, Boeing presented through WebEx an update on the Boeing fleet and the participants had the views of the two major aircraft manufacturers and got better understanding of their plans and the future equipage planning. The presentation was dedicated to the ADS, and it covered ADS-B Out Regulatory Mandates. It was noted that Boeing will be meeting the various ADS-B mandates in Australia, Hong Kong, Singapore, other Asia Pacific Regulatory Agencies, Nav Canada, Eurocontrol/EASA draft rule and the USA.

2.7 The Boeing presentation and the discussions followed the presentation concluded that Boeing supports ADS-B Out and will meet ADS-B Out mandates, and the company is in continuous coordination with Air Navigation Service Providers (Canada, Australia, Europe, US) to ensure common airborne requirements global harmonization, the discussions also highlighted the need to engage with airlines and industry partners in the rulemakings around the world.

2.8 On the Airborne side Mr. Vaughn Maiolla provided further details that ICAO is addressing through the ASTAF (Airborne Surveillance Task Force). The mission of the task force is to develop a manual on Airborne Surveillance, covering the implementation of airborne surveillance and the initial applications, implemented by manufacturers over the next 3-5 years along with other material.

2.9 After receiving further presentations from IATA and updates from States, Mr. Raza Gulam lead the discussions on the development of MID surveillance strategy which was agreed by the participants. Furthermore the workshop agreed on action items that included the conduct of a survey to be addressed by ASTAF, MIDANPIRG subsidiary bodies and ICAO MID regional.

2.10 At the closing session Mr. Hasan Al Ghoraiby, Director CNS/ATM in GACA, requested the establishment of core implementation/coordination team which was support by IATA, the proposal will be circulated along with the survey to MID States and concerned organization for comments and suggestions. Mr. Jehad Faqir, Deputy ICAO Regional Director, MID Region, thanked the participants and their States for allowing such a fruitful workshop, he also thanked Saudi Arabia and the CNS/ATM section in GACA for their valuable support in making the workshop a successful event and asked the States to utilize the knowledge gained in order to correctly address their future investment in the surveillance domain.

3. RECOMMENDATIONS

3.1 As a result of discussions, the workshop developed the following draft MID Region Surveillance Strategy and actions, which are to be addressed by ICAO and States, as appropriate:

SURVEILLANCE STRATEGY:

- Share experience and trial results in new surveillance technologies
- Minimize reliance on position reporting, particularly voice reporting & Primary Radar
- Maximize contiguous coverage and use of ADS-B on major routes/terminal areas
- Make full use of SSR Mode 'S' capabilities, reduce reliance on 4 digit octal code
- Make use of ADS-C when ADS-B, SSR or multilateration not supported
- Encourage Multilateration for surface, terminal & area surveillance
- Improve safety through sharing ATS surveillance data across FIR boundaries
- Broaden scope of cooperation between ANSPs and Stakeholders
- Acknowledge the development of other Regions and should consider incremental introduction of new surveillance technologies
- Increase use of Aircraft Derived Data
- The MID Region ADS-B implementation times line set for 2017

Actions:

- ICAO to provide guidance material to standardize and facilitate flight check procedures for ADS-B and Multirateration
- Acknowledge ICAO role and activities to address airborne surveillance applications.
- Acknowledge the need for setting Regional timelines to implement ADS-B out where justified
- States to reply to the survey and confirm their position and support for the core implementation/ coordination team
- States to share the aircraft ADS-B approval data bases

NAME	TITLE & ADDRESS
STATES **BAHRAIN** Mr. Ali Mohammed Ali Sayed	Civil Aviation Affairs P.O. Box 586 KINGDOM OF BAHRAIN Fax: (973-17) 329 966
EGYPT Mr. Abdel Aziz Ibrahim El Sayed Ahmed	National Air Navigation Services Company (NANSC) Cairo International Airport Road Cairo - EGYPT Fax: (202) 22678882 Tel: (202) 46164736 Mobile: 0020108040765 Email: cap.abedelaziz@gmail.com
Mr. Ashraf Saad El Din Hussein Farag	National Air Navigation Services Company (NANSC) Cairo International Airport Road Cairo - EGYPT Fax: (202) 22678882 Tel: (202) 46164736 Mobile: 0020127564050 Email: ashrafsaad_2006@yahoo.com
Mr. Moustafa Kamel Sadek Dardir	National Air Navigation Services Company (NANSC) Cairo International Airport Road Cairo - EGYPT Fax: (202) 22678882 Tel: (202) 46164736 Mobile: 0106013045 Email: dangerzone13@msn.com

NAME	TITLE & ADDRESS
JORDAN Mr. Ibrahim Mahmoud Faraj	Communication Engineer Civil Aviaiton Regulatory Commission P.O.Box 7547 Amman 11110 JORDAN Fax: (962-6) 488 1534 Tel: (962-6) 4799 142 Email: diana.sabbagh@carc.gov.jo
OMAN Mr. Mohamed Zahir Al-Abri	Chief Radar Supervisor Civil Aviation Affairs Muscat International Airport P.O.Box 1 - Code 111 Muscat, SULTANATE OF OMAN Fax: (968-24) 519 930 Tel: (968-24) 519 261 Mobile: (968) 9941 8726 Email: maabri6@gmail.com
Mr. Said Hussein Biri Al-Balushi	Engineer Civil Aviation Affairs P.O.Box 1394 PC111 Seeb, SULTANATE OF OMAN Fax: 96824519930 Tel: 96824519261 Mobile: (968-99) 386 366 Email: said@caa.gov.om
Mr. Mahad Sailmoon Al Kathiri	Radar Technician Civil Aviation Affairs P.O.Box 868/211 SULTANATE OF OMAN Fax: (968-23) 204 315 Tel: (968-23) 204 333 Mobile: (968-99) 290 060 Email: mahadlkathiri@yahoo.com

NAME	TITLE & ADDRESS
Mr. Said Ahmed Said Al Mashani	Radar Technician Civil Aviation Affairs P.O.Box 868/211 SULTANATE OF OMAN Fax: (968-23) 204 315 Tel: (968-23) 204 333 Mobile: (968-99) 294 452 Email: mmashani@hotmail.com
SAUDI ARABIA Mr. Hasan Al-Ghoraibi	CNS/ATM Planning Director General Authority of Civil Aviation SAUDI ARABIA Fax: (966-2) 6717717 ext 1594 Tel: (966-2) 6717717 ext 1276 Mobile: (996) 555719929 Email: hmg_sa@yahoo.com
Fahad Al-Malki	Planning & Analysis Manager General Authority of Civil Aviation P.O. Box 1116 Makkah 21955 Fax: (966-2) 6717717 ext 1594 Tel: (966-2) 6717717 ext 1161 Mobile: (996) 555544014 Email: fahadmalki@hotmail.com
Ali Hakami	Navigation Specialist General Authority of Civil Aviation SAUDI ARABIA Fax: (966-2) 6717717 ext 1594 Tel: (966-2) 6717717 ext 1593 Mobile: (996) 598402598 Email: yaro123@yahoo.com
Adnan Al-Hindi	Communication Specialist General Authority of Civil Aviation SAUDI ARABIA Fax: (966-2) 6717717 ext 1594 Tel: (966-2) 6717717 ext 1888 Mobile: (996) 599993215 Email: aah258@hotmail.com

NAME	TITLE & ADDRESS
Saad Al-Zahrani	Surveillance System Planning General Authority of Civil Aviation SAUDI ARABIA Fax: (966-2) 6717717 ext 1594 Tel: (966-2) 6717717 ext 1595 Mobile: (996) 555645291 Email: sdbd9@hotmail.com
Rafael Bautista Ramirez	CNS/ATM Planning Department General Authority of Civil Aviation SAUDI ARABIA Fax: (966-2) 6717717 ext 1594 Tel: (966-2) 6717717 ext 1234 Mobile: (996) 563731157 Email: rafael_ramirez22@yahoo.com
Khalid Omar Al-Amri	Sector Manager General Authority of Civil Aviation SAUDI ARABIA Tel: (966-2) 6717717 Mobile: (996) 506650550 Email: kalamri@engineer.com
Osama Al-Balbisi	MPM General Authority of Civil Aviation SAUDI ARABIA Tel: (966-2) 6717717 Mobile: (996) 505373992 Email: oalbalbeesi@gaca.gov.sa
Suleiman Bin Saddeeq	General Authority of Civil Aviation SAUDI ARABIA Tel: (966-2) 6717717 Mobile: (996) 503628354 Email: suleiman_saddeeq@hotmail.com
Abdul Khalig Saeed Al-Ghamdi	Central Workshop Manager General Authority of Civil Aviation SAUDI ARABIA Fax: (966-2) 6719041 Tel: (966-2) 6717717 ext 1777 Mobile: (996) 505628717 Email: akalghamdi@gaca.gov.sa

NAME	TITLE & ADDRESS
Mohammad Abdul Rahman Fallata	MED/FE General Authority of Civil Aviation SAUDI ARABIA Tel: (966-2) 6717717 ext 1329 Mobile: (996) 500046714 Email: gaca_625@yahoo.com
Ahmed Ghormallah Al-Ghamdi	Radar Specialist General Authority of Civil Aviation SAUDI ARABIA Tel: (966-2) 6717717 ext 1341 Mobile: (996) 503671258 Email: aalhomrani2@hotmail.com
Ahmad Mohammed Balbaid	Radar Specialist General Authority of Civil Aviation SAUDI ARABIA Tel: (966-2) 6717717 Mobile: (996) 503367701 Email: farisbal@yahoo.com
Ismail M. N. Shirbeeni	MED/FE General Authority of Civil Aviation SAUDI ARABIA : Tel: (966-2) 6717717 ext 1329 Mobile: (996) 500046714
Ahmed Bargawi	General Authority of Civil Aviation SAUDI ARABIA Tel: (966-2) 6717717 ext 1269 Email: bargawi@yahoo.com
Zaki Al-Amri	Radar Engineer General Authority of Civil Aviation SAUDI ARABIA Fax: (966-2) 6719041 Tel: (966-2) 6717717 ext 1228 Mobile: (996) 504697249 Email: zalamri@yahoo.com
Jamal Faghih	Radar Engineer General Authority of Civil Aviation SAUDI ARABIA Tel: (966-2) 6717717 ext 1232 Mobile: (996) 540006013 Email: jfageh@yahoo.com

NAME	TITLE & ADDRESS
Flavio Qejar Romano	ICAO Junior Advisor General Authority of Civil Aviation SAUDI ARABIA Tel: (966-2) 6717717 ext 1508 Mobile: (996) 551957821 Email: flaviocra@hotmail.com
Aon A. Al-Garni	ATM General Manager General Authority of Civil Aviation SAUDI ARABIA Fax: (966-2) 6402855 Tel: (966-2) 6401005 Mobile: (996) 505772984 Email: aonabdal@yahoo.com
Abdulaziz Al-Ghamdi	ATS Unit Manager General Authority of Civil Aviation SAUDI ARABIA Fax: (966-2) 6717717 ext 1832 Tel: (966-2) 6717717 ext 1830 Mobile: (996) 505629796 Email: aazezgam@hotmail.com
Waleed Madani	General Authority of Civil Aviation SAUDI ARABIA
Hatim Al-Abudi	ATS General Authority of Civil Aviation SAUDI ARABIA Fax: (966-2) 6717717 ext 1832 Tel: (966-2) 6717717 ext 1833 Mobile: (996) 504325373 Email: alabudi@hotmail.com
Saeed Abdullah Al-Ghamdi	Air Traffic Controller General Authority of Civil Aviation SAUDI ARABIA Fax: (966-2) 6717717 ext 1817 Tel: (966-2) 6717717 ext 1815 Mobile: (996) 558839911 Email: sg_acc2007@hotmail.com
Dhafer Nasser Al-Shehri	General Authority of Civil Aviation SAUDI ARABIA Mobile: (996) 505482308 Email: daatc1959@hotmail.com

NAME	TITLE & ADDRESS
Fahad Al-Ghamdi	Air Traffic Controller General Authority of Civil Aviation SAUDI ARABIA Fax: (966-2) 6854021 Tel: (966-2) 6850505 Mobile: (996) 503624810 Email: atcudfahad@hotmail.com
Mohammed Al-Ghanmi	Air Traffic Controller General Authority of Civil Aviation SAUDI ARABIA Fax: (966-2) 6855768 Tel: (966-2) 6855045 Mobile: (996) 504605501 Email: atcghanmi@hotmail.com
Basheer Al-Juhani	Training Officer General Authority of Civil Aviation SAUDI ARABIA Mobile: (996) 594183378 Email: bashjuh@hotmail.com
Youssef Yahya Al-Suleim	Air Traffic Controller General Authority of Civil Aviation SAUDI ARABIA Fax: (966-2) 6854021 Tel: (966-2) 238533 Mobile: (996) 501733061 Email: yalsolaim@hotmail.com
Atif Al-Harthi	General Authority of Civil Aviation SAUDI ARABIA Tel: (966-2) 6854021 Mobile: (996) 598951786 Email: ahatcsa@hotmail.com
Fahd A. Bukhari	Air Traffic Controller General Authority of Civil Aviation SAUDI ARABIA Tel: (966-2) 6855007 Mobile: (996) 505690749 Email: abumutaz1964@hotmail.com
Ali Hamza Al-Khaibari	General Authority of Civil Aviation SAUDI ARABIA Mobile: (996) 598567648 Email: controller15@hotmail.com

NAME	TITLE & ADDRESS
Abdul Rahman Al-Najem	General Authority of Civil Aviation SAUDI ARABIA Fax: (966-2) 6854011 Tel: (966-2) 6855006 Mobile: (996) 590114243 Email: najeem001@hotmail.com
Mahmoud Nass	ATC Supervisor General Authority of Civil Aviation SAUDI ARABIA Fax: (966-2) 6854011 Tel: (966-2) 6855007 Mobile: (996) 561414663 Email: mah5a@yahoo.com
Mohammed Ayesh Hasan	ATC Supervisor General Authority of Civil Aviation SAUDI ARABIA Fax: (966-2) 6854011 Tel: (966-2) 6558348 Mobile: (996) 504680400 Email: m.ayesh@hotmail.com
Ali Saeed Al-Ghamdi	Radar Supervisor General Authority of Civil Aviation SAUDI ARABIA Fax: (966-2) 6855007 Mobile: (996) 555618325 Email: radar_sup@hotmail.com
Hasan Ghazi Al-Niami	ATC Supervisor General Authority of Civil Aviation SAUDI ARABIA Fax: (966-2) 6854011 Tel: (966-2) 6855007 Mobile: (996) 505680025 Email: alsakab@live.com
Abdullah Al-Sayed	Air Traffic Controller General Authority of Civil Aviation SAUDI ARABIA Mobile: (996) 504473605 Email: afr5122000@yahoo.com

NAME	TITLE & ADDRESS
Nayef Al-Rouqi	Air Traffic Controller General Authority of Civil Aviation SAUDI ARABIA Mobile: (996) 555113130 Email: rng_acc@hotmail.com
Saeed Ali Al-Ghamdi	Air Traffic Controller General Authority of Civil Aviation SAUDI ARABIA Fax: (966-3) 8831290 Mobile: (996) 505827416 Email: sgsg11@yahoo.com
Khaleel Maneel Al-Hakami	Training Officer General Authority of Civil Aviation SAUDI ARABIA Fax: (966-3) 8831290 Tel: (966-3) 8831250 Mobile: (996) 500700727 Email: kaleel@w.en
Abdulaziz Al-Mohammad	Operation and Planning Specialist General Authority of Civil Aviation SAUDI ARABIA Fax: (966-2) 6717717 ext 1819 Mobile: (996) 505522447 Email: meshary001@yahoo.com
Ayman Felemban	Quality Manager General Authority of Civil Aviation SAUDI ARABIA Fax: (966-2) 6717717ext 1903 Mobile: (996) 567777698 Email: sqa@gaca.gov.sa
Salem Abdul Samad Al-Jahdli	Director ME Affairs General Authority of Civil Aviation SAUDI ARABIA Mobile: (996) 503356993 Email: salem.jahdli@canso.org
Yasser Abdullah Mousa	Business Planner General Authority of Civil Aviation SAUDI ARABIA Tel: (966-2) 6717717 ext 1167 Mobile: (996) 544558584 Email: mousa_y@yahoo.com

NAME	TITLE & ADDRESS
Abdullah Basodan	Customer Relation General Authority of Civil Aviation SAUDI ARABIA Mobile: (996) 503692591 Email: abdullah_basodan@windowslive.com
Hani Al-Ghamdi	Business Analyst General Authority of Civil Aviation SAUDI ARABIA Mobile: (996) 506364370 Email: hghamdi@gaca.gov.sa
Mohammed Ghazi Mousili	Performance Analyst General Authority of Civil Aviation SAUDI ARABIA Mobile: (996) 555699671 Email: m_mously_sa@hotmail.com
Hameed Hamad Al-Jedaani	General Authority of Civil Aviation SAUDI ARABIA Fax: (966-2) 6405622 Tel: (966-2) 6405000 ext 5517 Mobile: (996) 504671134 Email: hjydanee1@yahoo.com
Turki Ahmed Al-Judibi	Flight Procedure Designer General Authority of Civil Aviation SAUDI ARABIA Mobile: (996) 506659208 Email: turki_aljudibi@yahoo.com
Mohammed Hasan Howsawi	Chief Flight Dispatch Saudi Airlines SAUDI ARABIA Mobile: (996) 504630884
Ahmed Mohammed Al-Zahrani	M90 Capt. Flt & Trng Stds Specialist Saudi Airlines SAUDI ARABIA Tel: (966-2) 6717717 ext Mobile: (996) 500009966 Email: drzama@yahoo.com
Amin Al-Ghamdi	Aircraft Engineer Saudi Airlines SAUDI ARABIA Tel: (966-2) 6717717

NAME	TITLE & ADDRESS
Wajih Al-Amari	Aircraft Engineer Saudi Airlines SAUDI ARABIA Tel: (966-2) 6717717
Ahmed Bafagih	Senior Flight Dispatcher Saudi Airlines SAUDI ARABIA Tel: (966-2) 6867577 Mobile: (996) 504652420 Email: abafagih@saudiairlines.com
Taqreiz Ahmad Khan	Check Flight Engineer @ Specialist Fuel Conservation Saudi Airlines SAUDI ARABIA Fax: (966-2) 6842480 Tel: (966-2) 6842478 Mobile: (996) 509602398 Email: takhan@saudiairlines.com
UNITED ARAB EMIRATES Mr. Waleed Al Hameeri	Director of CNS General Civil Aviation Authority P.O.Box 666 Abu Dhabi UNITED ARAB EMIRATES Fax: (971-2) 559 6872 Tel: (971-2) 559 6861 Mobile: (971-50) 811 9151 Email: waleeds@szc.gcaa.ae
Mr. Ahmed Al Sabiri	ATS Inspector General Civil Aviation Authority P.O.Box 6558 Abu Dhabi UNITED ARAB EMIRATES Fax: (971-2) 4054 406 Tel: (971-2) 405 5219 Mobile: (971-50) 611 9357 Email: aalsabiri@gcaa.ae
ORGANIZATIONS	

NAME	TITLE & ADDRESS
ERA Mr. Simon Arnold	Regional Director ERA 5 Helps Well Road, Hilperton Trowbridge Wiltshire UK BA14 7TE Fax: (44) 7825 299544 Email: sarnold@erabeyondradar.com
IATA Ms. Ruby Sayyed	Assistant Director Safety, Operations and Infrastructure International Air Transport Association (IATA) P.O.Box 940587 Amman 11194 - JORDAN JORDAN Fax: (962-6) 593 9912 Tel: (962-6) 593 9916 Ext 5141 Mobile: (962-79) 944 4252 Email: sayyedr@iata.org

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APPENDIX B

Draft MID Region Surveillance Strategy

SURVEILLANCE STRATEGY:

- Share experience and trial results in new surveillance technologies
- Minimize reliance on position reporting, particularly voice reporting & Primary Radar
- Maximize contiguous coverage and use of ADS-B on major routes/terminal areas
- Make full use of SSR Mode ‘S’ capabilities, reduce reliance on 4 digit octal code
- Make use of ADS-C when ADS-B, SSR or multilateration not supported
- Encourage Multilateration for surface, terminal & area surveillance
- Improve safety through sharing ATS surveillance data across FIR boundaries
- Broaden scope of cooperation between ANSPs and Stakeholders
- Acknowledge the development of other Regions and should consider incremental introduction of new surveillance technologies
- Increase use of Aircraft Derived Data
- The MID Region ADS-B implementation times line set for 2017

\- END -

Middle East
Office

MID ICD 1.0

The Middle East Common Coordination

Interface Control Document

Version 1.0
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RECORD OF AMENDMENTS

Amendments			Corrigenda		
No.	**Date of Amendment**	**Entered by**	**No.**	**Date of Corrigendum**	**Entered by**

TABLE OF CONTENTS

EXECUTIVE SUMMARY

1. The Middle East Air Navigation Plan, which was developed in the context of the regional implementation of the ICAO Global Air Navigation Plan, has, at its core, the need for a communications and data interchange infra-structure that will largely obviate the need for verbal coordination between Area Control Centres.

2. Air Traffic Services Interfacility Data Communications (AIDC), as defined in this document, provides the means by which Middle East automated air traffic management systems will be able to communicate with each other during the notification, coordination and transfer of control phases of Middle East operations. While looking to the future, the message sets and procedures contained herein have been designed to meet today's needs as well as to make the transition to an automatic dependent surveillance based air traffic control system transparent to the coordination process.

3. This document also defines the following:

- Basic communications and support mechanisms required to underpin the coordinated implementation of on-line data interchange throughout the Middle East Region;
- Implementation guidance material;
- Common boundary agreements between all the area control centres concerned;
- MID/AFI/ASIA/EUR Air Traffic Services interface messages; and

4. Finally, in order to ensure stability in the design and implementation of the messages listed herein, a configuration management process has been agreed to which is applicable to all Middle East provider States.

FOREWORD

1. HISTORICAL

1.1 In 1971, Canada and the United Kingdom broke new ground by agreeing to exchange data between Gander and Shanwick Oceanic Area Control Centres (OACs) using On-Line Data-Interchange (OLDI) techniques. Subsequently, a similar arrangement was agreed to between Reykjavik and the Shanwick OAC/ACC. These arrangements improved efficiency between the Air Traffic Services (ATS) units concerned; however, they were not standard nor indeed even compatible. In the long run, to get full benefits from the application of OLDI, regional standardization needed to be achieved.

1.2 Since those early days, the use of OLDI has expanded to many other ICAO Regions and has proven to be an essential element of improving interfacility ATS coordination and it has been determined that automated coordination was an important means to mitigate risk arising because of incorrect coordination between ATS facilities.

1.3 To support the regional activities being carried out ICAO has updated the Procedures for Air Navigation Services – Air Traffic Management (PANS ATM) (Doc 4444), in particular Appendices 3 and 6. Although the term AIDC had originally been used to specify an Aeronautical Telecommunications Network (ATN) based application, it has since evolved to include applications using the Aeronautical Fixed Telecommunications Network (AFTN) such as OLDI. For that reason and to avoid confusion only the term AIDC will be used realising that in the current implementations, it includes OLDI implementations.

1.4 The North Atlantic and the Asia/Pacific Regions have both developed AIDC ICDs. Work is currently being carried out to integrate the two documents to the extent possible to achieve inter regional harmonisation. The AIDC ICD is also being used in other inter regional applications such as Caribbean/North America. Eurocontrol has also developed an OLDI standard for use in parts of the EUR Region. However, because of its limited scope and the specificity of its application, it did not appear to be able to meet the MID Region requirements.

1.5 At its thirteen meeting (xxxx), MIDANPIRG established a Task Force to develop a (TBD)

1.6 On the basis of the above, it was agreed that the new MID Air Navigation Plan should include the following:

a) ground/ground data interchange should be in accordance with the procedures specified in a common interface control document (ICD). The purpose of this document would be to ensure that data interchange between units providing air traffic management (ATM) in the MID Region is harmonized to a common base standard, and that the evolutionary development is co-ordinated and implemented centrally through the MIDANPIRG; and

b) ICAO data interchange standards will be applied, but the common ICD will identify and detail any regional differences considered necessary.

2. ABOUT THE DOCUMENT

2.1 The Common Coordination ICD for the MID Region is divided into the following Parts:

PART I - PURPOSE, POLICY AND UNITS OF MEASUREMENT

This part provides an overall philosophical view of the ICD, general information concerning the units that are used and information on data that is applicable to all ATS units.

PART II - MID ATS COORDINATION MESSAGE

This part describes, in detail, all the messages used to exchange ATS data between MID Area Control Centre's (ACC) Flight Data Processing Systems (FDPS).

PART III - COMMUNICATIONS AND SUPPORT MECHANISMS

This part describes the technical and other requirements needed to support AIDC. It also indicates that a longer term strategy for the transition to the Aeronautical Telecommunications Network (ATN) needs to be developed. A testing support mechanism is also included.

2.2 Appendices

2.2.1 Appendices, which are under configuration management (cf. § 2.1 below), include a list of **error** messages, the logical **connectivity** table, and **implementation** guidance material.

2.3 Attachments

2.3.1 Attachments, which are not subject to configuration management, include a list of common boundary agreements at the interfaces between ATS units concerned as well as messages used to exchange ATS data between those MID States bordering the AFI, EUR and ASIA Regions.

PART I - PURPOSE, POLICY AND UNITS OF MEASUREMENT

1. PURPOSE

1.1 The purpose of the document is to ensure that data interchange between ATS units providing an Air Traffic Service in, and adjacent to, the MID region is harmonised to a common standard and to ensure that evolutionary development is coordinated centrally. It also provides a description of the message types and methods of communication.

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

> the reception and transmission of ATS data and messages required to ensure the integrity of FDPS/FPPS data bases.

1.3 In the interest of global standardisation, 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. Other ICAO planning regions need to harmonise these additional messages as well through their regional ICDs.

2. POLICY

2.1 Changes

This ICD is under configuration control and is administered by the ICAO Middle East Office. Changes to the document shall only be made as a result of agreement by the MIDANPIRG CNS SG. Significant amendments affecting the purpose and policy will need the approval of the MIDANPIRG itself.

2.2 System philosophy

2.2.1 The application of AIDC in the MID Region shall be based on a step-by-step data distribution scheme comprising three phases: **Notification**, **Coordination**, and **Transfer of control**. The capability to revert to verbal coordination and manual (or implicit) transfer of control shall be retained.

- The Advance Boundary Information (ABI) message shall normally be used for notification, subject to bi-lateral agreement.

- For the coordination phase, The Current Flight Plan (CPL) message shall act as the initial cleared profile coordination message and the Coordination (CDN) message shall be used to negotiate changes. Coordination dialogues must be terminated using an Accept (ACP) or a Reject (REJ) message.

- Automated Transfer of Control (TOC) and Acceptance of Control (AOC) procedures shall be supported.

2.2.2 If an evolutionary implementation strategy is required, a subset of the available messages may be used initially. While this set might support only simple cases, this should in fact allow the great majority of flights to be coordinated.

2.2.3 In support of all the above operational phases, application management messages are required to support application level dialogue between ATC computers.

2.2.4 Operators shall continue to file flight plans in accordance with existing procedures and they shall make every effort to ensure that flight plans are disseminated to all the correct addresses.

3. UNITS OF MEASUREMENT

3.1 Time and date

3.1.1 All times shall be expressed in UTC as four digits **rounded to the nearest whole minute**, with midnight expressed as 0000. Subject to bilateral agreement, time can be expressed in 6 digits as hours, minutes and seconds.

3.2 Geographic position information

3.2.1 Geographic position information shall be in accordance with the provisions contained in the Procedures for Air Navigation Services – Air Traffic Management (PANS-ATM, Doc 4444).

3.3 Level and speed information

3.3.1 All level information shall be specified as flight level(s) or altitude(s) expressed in hundreds of feet. Speed information shall be expressed as true airspeed in knots or as a Mach number.

3.4 Functional addresses

3.4.1 A functional address, which refers to a function within an ACC (e.g. an ATC supervisor), may be substituted in the MIS and EMG 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 an aircraft identification.

4. RESTRICTIONS

4.1 Principles

1. The restriction information provided by the controlling center to the downstream center shall be limited to the flight profile at and beyond the Area of Common Interest (ACI) boundary.
2. The cleared level, supplementary crossing data and crossing conditions in field 14 shall be based on the conditions at the ACI boundary.
3. If a fix other than a filed route point is used in the level and/or speed clearance at and beyond the ACI boundary, it shall be part of the appropriate flight profile in field 15.
4. The use of time restrictions shall be bilaterally agreed between MID ATS Providers.

4.2 Field 15 Level and speed restrictions

4.2.1 Route, speed and level information contained in the Route field (ICAO ATS field 15) represents 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. 1). Where a clearance requires a speed/level change to be completed by a route point, then the items will be reversed (Example. 2).

4.2.2 A combination of these two conventions will describe a clearance with a defined starting and completion point (Example. 3).

Example 1: 60N010W/M084F350

Example 2: M084F350/62N020W

Example 3: 60N010W/M084F350/62N020W

4.3 Field 15 time restrictions

4.3.1 There are three types of time restrictions, describing when an aircraft should arrive at a fix. A suffix will be added to the four digit time to denote the restriction type, as follows:

a) AT : ('A', e.g. '1230A') or,

b) AT or BEFORE; ('B', e.g. '1230B') or

c) AT or LATER ('L', e.g. '1230L')

4.3.2 The restriction itself will begin with a slash, i.e., '/', e.g., /1230B, and will appear directly after the fix with which it is associated. For example,

49N050W/1230L

signifies that the aircraft should arrive at 49°N 50°W at or later than 1230Z.

4.3.3 A time restriction at a fix may be used in conjunction with speed/level restrictions as follows:

Example 1: *60N010W*/1230L/M084F350

After 60N010W cleared M084 FL350 and cross 60N010W at or later than 1230Z

Example 2: *M084F350*/62N020W/1230A

Cleared M084 FL350 to be maintaining at or before 62N020W and cross 62N020W at time 1230Z

Example 3: *60N010W*/M084F350/62N020W/1230B

After 60N010W cleared M084 FL350 to be maintaining at or before 62N020W. Cross 62N020W at or before 1230Z

4.4 Field 15 time restrictions related to level and speed

4.4.1 There are three types of time restrictions, describing when an aircraft should commence or terminate a level and/or speed change. A suffix will be added to the four digit time to denote the restriction type, as follows::

a) UNTIL: ("A", e.g. 1230A)

b) AT or BEFORE: ("B", e.g., 1230B); or

a) AT or LATER: ("L", e.g., 1230L).

4.4.2 The restriction itself will begin with a slash, i.e., "/", e.g., /1230B, and will appear directly after the element with which it is associated. For example,

M080F350/1230L

signifies that the aircraft should cruise M080 at F350 at or later than time 1230Z.

4.4.3 A time restriction related to level and speed may be used in conjunction with a fix restriction as follows:

Example 1: *M080F350/1135A/M080F370/1220B 53N030W*

Maintain M080 F350 until 1135Z then cleared M080 F370 to be level at or before 1220Z

Example 2: *M080F330/1135A/M080F370 53N030W*

Maintain M080 F330 until 1135Z then climb to F370

Example 3 *60N010W/M084F350/1230B*

After 60N010W cleared M084 FL350 to be maintaining at or before 1230Z

Example 4: *M083F330/1135L/60N020W*

At 1135Z or later cleared M083 FL330 to be maintaining by 60N020W

Example 5: *M083F330/1135L*

At 1135Z or later cleared M083 F330

5. COORDINATION AND THE FURTHER ROUTE OF FLIGHT

5.1.1 Field 15 describes the route beginning with the route point on or preceding the ACI boundary. It contains the cleared route followed by the remaining route to destination. When a rerouting creates a discontinuity, the route will be terminated at that point and the truncation indicator “T” appended.

5.1.2 Subject to bilateral agreement, Field 15 in CPL messages may always be limited to the cleared route (followed by the truncation indicator).

6. BOUNDARY POSITIONS IN MESSAGES

6.1 The point used in field 14, Estimate Data, will normally be a boundary point but may also be an agreed point close to, rather than on, the FIR boundary.

7. COORDINATION OF AIRCRAFT OCCUPYING BLOCKS OF LEVELS

7.1.1 While the validity of flights occupying blocks of flight levels is recognised by ICAO Doc. 4444 both in its voice phraseology section and in the CPDLC message set, no provision is made for the representation of such blocks in any of the ATS messages described by the document.

7.1.2 In order to ensure compatibility with other regions the following notation will be used in field 14:

Example 1, aircraft occupying a block spanning F310 to F350:

F310F350

Example 2, aircraft at or above F290 climbing towards the block described above:

F310F350F290A

PART II - MID ATS COORDINATION MESSAGES

1. INTRODUCTION

1.1 The following sections describe those messages used by MID ATS systems for AIDC. Message fields will conform to ICAO field definitions (PANS-ATM 4444, Fifteenth Edition), and are referred to by field number. It should be noted that with respect to ATS Field 3, only Field 3 a), message type, shall be used. Information defined in Fields 3 b) and 3 c) is to be conveyed in the Optional Data Fields of the AFTN header as defined in Part III of this ICD. In respect of ATS Field 13, only Field 13 a), the departure aerodrome designator, is required. Field 13 b) is not to be transmitted. All ATS data shall be enclosed between parentheses. Only one ATS message shall be included within a transmission. An overview of all MID core messages and their composition can be found in **Table 2**.

2. MID CORE MESSAGE SET

The set of messages shown in the table below are to be supported by all MID ATS Providers:

Table 1 MID Core Messages

Message Class	Message
Notification	ABI (Advanced Boundary Information)
Co-ordination	CPL (Current Flight Plan)
	MAC (Cancellation)
	CDN (Co-ordination Negotiation)
	ACP (Acceptance)
	REJ (Rejection)
Transfer of Control	TOC (Transfer of Control)
	AOC (Assumption of Control)
General Information	EMG (Emergency)
	MIS (Miscellaneous)
Data link communications	FAN (FANS APPLICATION MESSAGE)
	FCN (FANS COMPLETION NOTIFICATION)
Application Management	ASM (Application Status Monitoring)
	LAM (Logical Acknowledgement)
	LRM (Logical Rejection)

2.1 Notification messages

ABI (ADVANCE BOUNDARY INFORMATION)

Purpose

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. Normally changes to the cleared route of flight will result in the retransmission of an ABI.

Message Format

ATS Field	Description
3a	Message type
7a	Aircraft identification
13a	Departure aerodrome
14abcde	Boundary estimate data
16a	Destination aerodrome
22*	Amendment

***Field 22 will contain the following fields**:

8ab	Flight rules and type of flight
9abc	Number, type of aircraft and wake turbulence category
10ab	Equipment
15abc	Route
18	Other information (as may be contained in the original flight plan received in the sending centre, or as otherwise agreed).

Examples

The first example shows a case of an aircraft containing full route details until destination:

(ABI-IBE6175-LEMD-41N040W/0700F330-KMIA-8/IS-9/B747/H-10/SXW/C-15/M084F350 41N030W 41N040W 41N050W 40N060W 38N065W DANER A699 NUCAR DCT HEATT-18/0)

This example shows an aircraft cleared to F350 but entering the ACI at or above F310. Field 15 is truncated.

(ABI-ICE615-BIKF-62N030W/0700F350F310A-KJFK-8/IS-9/B757/M-10/SXW/C-15/-M080F350 62N030W 60N040W 57N050W OYSTR STEAM T -18/0)

The next example shows field 18 from the original FPL message included in the ABI

(ABI-BAW242-MMMX-42N050W/0623F330-EGLL-8/IS-9/B744/H-10/SIRWXY/C-15/M082F330 42N050W 45N040W 47N030W 49N020W BEDRA UN491 GUNSO UM197 GAPLI UR8 GIBSO-18/EET/KZHU0054 CZQX0546 45N040W0556 EGGX0643 49N020W0732 BEDRA0757 GUNSO0813 EGTT0833 OPR/BAW ORGN/EGLLBAWH RALT/CYQX EIDW REG/GBNLI RMK/TCAS SEL/BPCE DOF/040212)

2.2 Co-ordination messages

CPL (CURRENT FLIGHT PLAN)

Purpose

Used to inform the receiving centre of the clearance issued to a flight. The receiving centre shall signal its acceptance by issuing an ACP, else the coordination dialogue will be continued using a CDN message.

Message Format

ATS Field	Description
3a	Message type
7a	Aircraft identification
8ab	Flight rules and type of flight
9abc	Number and type of aircraft and wake turbulence category
10ab	Navigation equipment
13a	Departure aerodrome
14abcde	Boundary estimate data
15abc	Route
16a	Destination aerodrome
18	Other information (as may be contained in the original flight plan received in the sending centre, or as otherwise agreed).

Examples

The first example shows a simple case of an aircraft in level flight. The route in field 15 is truncated.

(CPL-UAL815-IS
-B777/H-S/C
-LFPG-54N030W/1417F350
-M080F350 54N020W 54N030W 54N040W 52N050W YAY T
-KIAD
-0)

This example shows an aircraft cleared to F350 but entering the ACI at or above F310.

(CPL-ICE615-IS
-B757/H-SWX/C

-BIKF-62N030W/1701F350F310A
-M080F350 62N030W 60N040W 57N050W OYSTR STEAM T
-KJFK
-0)

This example shows the coordination point preceding the boundary as per bilateral agreement and also shows a full route to destination:

(CPL-IBE6123-IS
-B747/H-SXWC/C
-LEMD-41N030W/1325F350
-M084F350 41N030W 41N040W 41N050W 40N060W 38N065W DANER A699 NUCAR DCT HEATT
-KMIA
-0)

This example shows field 18, other information:

(CPL-BAW242-IS
-B744/H-SIRWXY/C
-MMMX-42N050W/0623F330
-EGLL
-M082F330 42N050W 45N040W 47N030W 49N020W BEDRA UN491 GUNSO UM197 GAPLI UR8 GIBSO
-EGLL
-EET/KZHU0054 CZQX0546 45N040W0556 EGGX0643 49N020W0732 BEDRA0757 GUNSO0813 EGTT0833 OPR/BAW ORGN/EGLLBAWH RALT/CYQX EIDW REG/GBNLI RMK/TCAS SEL/BPCE DOF/040212)

MAC (CANCELLATION)

Purpose

Used to indicate to a receiving centre that all notification or coordination information previously received for a flight is no longer relevant to that centre.

Message Format

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

Examples

- (MAC-BCA789-EGKK-KLAX)
- (MAC-ICE234-BIKF-EGPF)

CDN (CO-ORDINATION NEGOTIATION)

Purpose

Used to propose changes to the conditions specified in a previously issued CPL or CDN message. Only one CDN can be active at any given time per flight. The initial coordination dialogue is always terminated by an ACP message. Should the coordination dialogue be re-opened, either centre can indicate that the cleared profile should be left as previously agreed by transmitting an REJ message.

Message Format

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

* Field 22 may only contain fields 14, 15, 16 and 18

Example

(CDN-NWA36-KBOS-EDDF-14/54N030W/0446F370)

ACP (ACCEPTANCE)

Purpose

Used to confirm that the contents of a received CPL or CDN message are accepted.

Message Format

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

Example

(ACP-ACA860-CYMX-EGLL)

REJ (REJECT)

Purpose

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

Message Format

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

Example

(REJ-AAL780-KJFK-EGLL)

2.3 Transfer of control messages

TOC (TRANSFER OF CONTROL)

Purpose

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

Message Format

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

Example

(TOC-TAP451-LPPT-KJFK)

AOC (ASSUMPTION OF CONTROL)

Purpose

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

Message Format

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

Example

(AOC-TAP451-LPPT-KJFK)

2.4 General information messages

EMG (EMERGENCY)

Purpose

Used at the discretion of ATS units when it is considered that the contents require immediate attention. When the message does not refer to a specific flight, a functional address shall be used. The following are some examples of circumstances which would justify the use of an EMG message.

- Reports of emergency calls or emergency locator transmission reports.
- Messages concerning hi-jack or bomb warnings.
- Messages concerning serious illness or disturbance among passengers.
- Sudden alteration in flight profile due to technical or navigational failure.

Message Format

ATS Field	Description
3a	Message type
7a	Aircraft identification or functional address
18	Free Text

Examples

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

MIS (MISCELLANEOUS)

Purpose

Used to transmit information which cannot be formatted to comply with any other message type and for plain language statements. When the message does not refer to a specific flight, a functional address shall be used.

Message Format

ATS Field	Description
3a	Message type
7a	Aircraft identification or functional address
18	Free Text

Examples

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

2.5 Data link communications messages

FANS (FANS APPLICATION MESSAGE)

Purpose

Transmitted by one Air Traffic Services Unit (ATSU) (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 a FANS equipped aircraft.

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

Message Format

ATS Field	Description
3	Message type
7	Aircraft identification
13	Departure aerodrome
16	Destination aerodrome
Text	Application data as described below

Application data field

Application data 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 of elements which are described below. Each element consists of an “identifier” and a value 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).

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 that may use the information within these optional elements. If data is not available for an optional element, that element is not to be included in the FAN message.

Additional information concerning the elements described below is contained in **Appendix C**.

Standard message identifier (SMI)

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.

- Allowable values for the SMI are listed in ARINC 620. Examples of SMIs include “FML”, “FMR”, “FMD”, “FM3” and “AFD”.

  Example

  SMI/FMD

Aircraft identification

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

Aircraft registration

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.

Examples

REG/N12345
REG/9V-ABC

Aircraft Address (ICAO 24 bit code)

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

Example

CODE/ABC123

Aircraft position information

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.

Examples

FPO/23S150E
FPO/0823N11025E

ATS Application and Version Number

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 preceded 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.

The value associated with the FCO identifier consists 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 3 letters are “ATC” (for CPDLC) or “ADS” (for ADS-C), and the possible range of version numbers is 01 to 99.

Examples

FCO/ATC01 FCO/ADS01
FCO/ADS01

The second example illustrates a FAN message with the ADS-C 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 when the aircraft is only entering the ACI.

Examples

(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)

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 data record.

Note 1. If the FAN message contains information for the purpose of the next unit establishing a CPDLC connection, it 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.

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.

FCN (FANS COMPLETION NOTIFICATION)

Purpose

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 CPDLC 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 the failure of a CPDLC Connection request.

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

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.

Message Format

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

Communication Status field

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.

CPDLC Connection Status identifier (CPD)

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.

CPDLC Connection Status		**Meaning**
FCN sent by transferring ATSU	**FCN sent by receiving ATSU**	
0		The CPDLC Connection with the aircraft has been terminated
	0	No CPDLC Connection could be established with the aircraft
	1	The CPDLC Connection Request failed due to the receiving ATSU not being the nominated CPDLC Next Data Authority
	2	A CPDLC Connection has been established with the aircraft

Frequency identifier (FREQ)

This optional element is preceded by the identifier "FREQ", and may be included in an FCN message transmitted by the receiving ATSU to advise of any changes to a previously notified (or a default) frequency. The FREQ/ identifier provides 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.

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.

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

<u>Examples</u>

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. Contact/Monitor voice frequency is 13261

FCN transmitted by transferring ATSU:

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

The CPDLC Connection with QFA43 has been terminated

2.6 Application Management Messages

ASM (APPLICATION STATUS MONITOR)

Purpose

Sent to an adjacent centre to inform it that the transmitting centre's ATC application system is online. Only transmitted when no other application messages have been received within an adaptable time.

Message Format

ATS Field	Description
3a	Message type

Example

(ASM)

LAM (LOGICAL ACKNOWLEDGEMENT MESSAGE)

Purpose

Used to acknowledge successful receipt and processing of a transmitted message. Note that the message identifier and reference identifier are found in the message header, which is defined in Part III.

Message Format

ATS Field	Description
3a	Message type
18	Other information

Example

(LAM)

LRM (LOGICAL REJECTION MESSAGE)

Purpose

Used to reject a message which contains invalid information. Note that the message identifier and reference identifier are found in the message header, which is defined in Part III.

Message Format

ATS Field	Description
3a	Message type
18	Other information

Field 18 will only use the RMK/ sub-field. It will comprise an error code, supporting text and the ICAO field number where applicable.

The following format is used to report errors:

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

A catalogue of error codes and supporting text is contained in **Appendix A**.

<u>Example</u>

(LRM-RMK/27/15/93N070W)

This message denotes an invalid lat/lon in Field 15.)

Table 2. MID Core Messages and their Field Composition.

MESSAGE	MESSAGE ACRONYM	ICAO FIELDS											NON-ICAO FIELD
		3a	7a	8ab	9abc	10ab	13a	14abcde	15abc	16a	18	22	
Advanced Boundary Information	ABI	X	X				X	X		X		X	
Cancellation	MAC	X	X				X			X			
Current Flight Plan	CPL	X	X	X	X	X	X	X	X	X	X		
Current Flight Plan	CDN	X	X				X			X		X	
Acceptance	ACP	X	X				X			X			
Rejection	REJ	X	X				X			X			
Transfer of Control	REJ	X	X				X			X			
Assumption of Control	AOC	X	X				X			X			
Emergency	EMG	X	X								X		
Miscellaneous	MIS	X	X								X		
Application Status Monitoring	ASM	X											
Logical Acknowledgement	LAM	X											
Logical Rejection	LRM	X									X		
FANS Application Message	FAN	X	X				X			X			X
FANS Completion Notification	FCN	X	X				X			X			X

PART III - COMMUNICATIONS AND SUPPORT MECHANISMS

1. INTRODUCTION

1.1 Coordination communications are divided into two areas; one addresses the need for voice communications between ATS units whereas the other addresses the need for data communications. It is anticipated that the continuing implementation of automated data communications between ATS units will result in a reduction in the utilisation of voice communications.

2. MESSAGE HEADERS AND ATS UNIT INDICATORS

2.1 Message Headers

2.1.1 AFTN IA-5 Message Headers, including the use of the Optional Data Field defined in Annex 10, Volume II and herein, will be employed for the exchange of all ATS data in the region. The AFTN priority indicator FF shall normally be used for all data exchanges. The AFTN date time group may be used by administrations to monitor end to end delay performance of the data exchanges.

2.1.2 **Optional Data Field.** The optional data field provides a flexible way to convey information on an end-to-end basis, 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, Volume II in due course. 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.

2.1.3 **Addressing.** The Source and Destination addresses of the AFTN header convey the direction and logical identity of the application processes exchanging OLDI information (data). 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 is the unique character "O" to indicate the oceanic AIDC processing application function. 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 OSI parameters and simplify the transition to the ATN.

2.1.4 **Message/Data Identification Number.** The message/data identification number is a six (6) digit number, taken from a single application pool of available numbers. The identification of the sending and receiving units would use the normal 8-character addresses of the AFTN header.

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

b) 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 on an application process basis in such a way as to guarantee a unique identification number for a period of time as specified in paragraph 2.1.7. For messages/data not requiring confirmation the message/data identification parameter shall not be used.

2.1.5 **Reference Information.** The 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.

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

2.1.7 **Cyclic Redundancy Check (CRC).** The 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. This data item is conveyed as option 5 of the ODF.

2.1.8 **Timers.** 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.

2.1.9 **Accountability Timer.** The 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 is cancelled by the receipt of a valid LAM or LRM response. Retransmissions use the same message/data identification number as the original message/data unit.

2.1.10 **Reuse Timer.** The 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 reset timer A shall be 5 minutes, or as agreed for communicating applications by the concerned administrations. Reuse timer B shall be set for exchanges where a dialogue is involved in the exchange. The range for reset timer B shall be 2 to 90 minutes, in one minute increments. The default value for reset 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.

2.1.11 **System Failure Timer Procedures.** In the event of system failure the accountability and reuse timers will be reset and resume timing upon completion of system recovery.

2.1.12 **Example.** The following examples depict two MID 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. The proposed encoding would have no impact on AFTN switching centres as they ignore this part of the origin line.

FF OEJDZOZO
122145 HECCZOZO 2.000033-4.940412214523-5.A34B-
(CPL-SVA714-EGLL- etc.)

Explanation: Sending Message number 000033 from HECCZOZO to OEJDZOZO at time 940412 214523.
FF HECCZOZO
122147 OEJDZOZO 2.000044-3. HECC 000033-4.940412214703-5.DE6A-
(ACP-SVA714- EGLL OEJD-)

Explanation: Sending message number 000044 from OEJDZOZO to HECCZOZO at 122147 and the data refers to message 000033 sent earlier by HECCZRZO

2.2 ATS Unit Location Indicators

2.2.1 The following ATS unit ICAO location indicators will be used:

Amman	OJAC
Baghdad	ORBB
Bahrain	OBBB
Beirut	OLBB
Cairo	HECC
Damascus	OSDI
Jeddah	OEJD
Kuwait	OKBK
Muscat	OOMM
Sanaa	OYSC
Teheran	OIIX
Tel Aviv	LLTA

2.2.2 The ATS unit organization code for the AIDC application will be ZOZO. This organization code, when used with the ICAO location, forms the full ICAO address.

3. ENGINEERING CONSIDERATIONS

3.1 The future data communications infrastructure should be compatible with the ICAO ATN. The ground-ground logical connectivity table is at **Appendix B**.

3.2 Until the ATN becomes available, the engineering details needed to implement the messages contained in Part II of the ICD will need to be agreed to bilaterally and identified in **Attachment 1**.

4. TEST CONSIDERATIONS

4.1 Many ATC automation systems will be upgraded in the foreseeable future. These systems will have to exchange critical ATC data among themselves, using the messages described in the MID Common Coordination ICD.

4.2 Support for testing will need to be provided. Test messages shall have the same format as existing MID Core messages, but shall be distinguished by special callsigns. A test callsign shall begin with the letter 'Z', followed by the four-letter ICAO ATS Unit location indicator, as defined in Paragraph 2.2.1 above. The last two characters shall be numeric. The following are examples of valid test callsigns:

ZOSDI01

ZOBBB87

ZHECC45

4.3 Testing shall be bi-laterally agreed between MID ATS Providers.

APPENDIX A

ERROR CODES

1. Introduction

1.1 A set of error codes has been developed for those messages contained in the MID Core message set. A list of the codes and error text is contained in the table below.

1.2 Error codes for incorrect message sequences, such as attempting a change in coordination conditions (CDN) while a transfer of control is in progress (TOC) have not yet been developed.

Table A-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 TURBULENCE CATEGORY
15	10	INVALID CNA 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
21	13, 16, 17	EXPECTED TIME DESIGNATOR NOT FOUND
22	13, 16, 17	TIME DESIGNATOR PRESENT WHEN NOT EXPECTED

Error Code	Field Number	Error Text
23	13, 14, 16, 17	INVALID TIME DESIGNATOR
24	13, 14, 16, 17	MISSING TIME DESIGNATOR
25	14	INVALID BOUNDARY POINT DESIGNATOR
26	14, 15	INVALID ENROUTE POINT
27	14, 15	INVALID LAT/LON DESIGNATOR
28	14, 15	INVALID NAVAID 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
49	19	INVALID SUPPLEMENTARY INFORMATION ELEMENT
50	22	INVALID AMENDMENT FIELD DATA
51		INVALID AMENDMENT FIELD DATA
52		MORE THAN ONE FIELD MISSING

Error Code	Field Number	Error Text
53		MESSAGE LOGICALLY TOO LONG
54		SYNTAX ERROR IN FIELD nn
55		INVALID MESSAGE LENGTH
56		MID ERROR
57		INVALID MESSAGE
58		MISSING PARENTHESIS
59		MESSAGE NOT APPLICABLE TO zzzz AAC
60	3	INVALID MESSAGE MNEMONIC (i.e., 3 LETTER IDENTIFIER)
61	Header	INVALID CRC
62-71		RESERVED FOR FUTURE USE
72	ADF (See Note 1)	INVALID IDENTIFIER
73	ADF (See Note 1)	INVALID SMI
74	ADF (See Note 1)	INVALID ACID IN FMH/ IDENTIFIER
75	ADF (See Note 1)	INVALID REGISTRATION IN REG/ IDENTIFIER
76	ADF (See Note 1)	INVALID AIRCRAFT ADDRESS IN CODE/ IDENTIFIER
77	ADF (See Note 1)	INVALID LOCATION IN FPO/ IDENTIFIER
78	ADF (See Note 1)	INVALID DATA LINK APPLICATION IN FCO/ IDENTIFIER
79	ADF (See Note 1)	INVALID OR UNSUPPORTED CPDLC VERSION NUMBER
80	ADF (See Note 1)	INVALID OR UNSUPPORTED ADS-C VERSION NUMBER
81	ADF (See Note 1)	INVALID IDENTIFIER IN FAN MESSAGE
82	CSF (See Note 2)	INVALID CPDLC CONNECTION STATUS
83	CSF (See Note 2)	INVALID FREQUENCY IN FREQ/ IDENTIFIER
84-255		RESERVED FOR FUTURE USE

Note 1. In the FAN message, the “ADF” field number refers to the Application data field

Note 2. In the FCN message, the “CSF” field number refers to the Communication Status field

APPENDIX B

LOGICAL CONNECTIVITY TABLE

	HECC	LLTA	OBBB	OEJD	OIIX	OJAC	OKBK	OLBB	OOMM	ORBB	OSDI	OYSC
HECC												
LLTA												
OBBB												
OEJD												
OIIX												
OJAC												
OKBK												
OLBB												
OOMM												
ORBB												
OSDI												
OYSC												

APPENDIX C

IMPLEMENTATION GUIDANCE MATERIAL

1. INTRODUCTION

1.1 The Middle East (MID) Core Message set supports five Air Traffic Service (ATS)-related functions:

1. Notification
2. Coordination
3. Transfer of Control
4. General (Text) Information Interchange
5. Data link communications
6. Application Management (Data and Communications Integrity Monitoring)

1.2 The MID ICD provides detailed information on the structure of these messages. This appendix contains explanatory material on how the message set as a whole is intended to be used, with particular emphasis on the first three functions. The objective is to provide useful information and guidance to software engineers responsible for implementing the MID Core Message set within an ATC computer system.

2. ASSUMPTIONS

2.1 The following assumptions have been made:

- Only flights totally within MID FIRs are considered.
- The material described below applies only to data transfers between two ATS Units. Though most of it also applies to the general case of Notification, Coordination, and Transfer of Control between more than two ATS Units, certain multi-unit Coordination problems have not yet been solved.
- It must be possible to revert to manual intervention of the Notification, Coordination, and Transfer of Control processes at any time.
- Exceptional conditions, such as loss of communications between two ATS Units, are not addressed.

3. NOTIFICATION/CORDINATION/TRANSFER OF CONTROL

1.2 Flight State Transitions

3.1 Consider an aircraft that is currently within MID FIR A progressing towards the next FIR, FIR B. Each FIR has an Area of Common Interest (ACI), which includes the FIR and border areas just beyond the FIR boundary. The aircraft is several hours from the boundary between the two FIRs. The flight is initially in the ***Pre-notifying*** **or** ***Notifying state***. ATS Unit A, responsible for providing ATS in FIR A, will send an initial ABI message to ATS Unit B. Additional ABI messages are sent to ATS Unit B when mutually agreed upon (between ATS Units A and B) events, such as a change in route, altitude, or boundary crossing time, occur. If the aircraft for some reason, such as a change in route, is no longer expected to penetrate ACI B, ATS Unit A sends a MAC message to ATS Unit B, causing the flight to be cancelled or made dormant from ATS Unit B's perspective.

3.2 ATS Unit A transmits a CPL to ATS Unit B when the aircraft intersects ACI B, or when the aircraft is at a mutually agreed upon predetermined time period (e.g., twenty minutes) or distance (e.g., 60nm) from FIR B's boundary. The flight is now in a ***Negotiating state***. ATS Unit B can accept the conditions specified in the CPL "as is" by transmitting an ACP message to ATS Unit A, or it can propose modifications using the CDN message. Negotiations between the two units are carried out using the CDN until a mutually acceptable flight profile is achieved. This acceptance is signalled by one unit sending an ACP, as before, to the other unit. This establishes the initial coordination conditions. The flight is now in a ***Coordinated state***.

3.3 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. The dialogue is re-opened when one ATS Unit (either A or B) transmits a CDN to the other ATS Unit, 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 ATS Unit can close the dialogue by issuing an ACP or REJ. An ACP closes the dialogue with a new, mutually agreed upon flight profile. An REJ, however, immediately terminates the dialogue with the previously accepted coordination conditions in effect. Any proposed changes are null and void. Note that CDNs are only proposals; no changes are made in the coordination conditions until an ACP is sent. Transmission of an ACP or REJ places the flight back into the *Coordinated state*.

3.4 For a given flight, only one CDN may be active between any pair of centres. Note, however, that coordination between more than two centres (for the same flight) may have a total number of active CDNs greater than one, though each pair of centres is still restricted to a maximum of one active CDN.

3.5 A flight that was coordinated, but will no longer enter a downstream ATS Unit's ACI, can be cancelled. The controlling ATS Unit (i.e. ATS Unit A) transmits a MAC to the affected downstream ATS Unit (e.g. ATS Unit B).

> *Note !: ATS Unit A must coordinate with ATS Unit B all aircraft that enter 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 FIR's airspace. The maintenance of adequate separation between these two aircraft requires coordination between the two ATS units.*

3.6 Transfer of control conditions are supported by two messages: the TOC and AOC. ATS Unit A sends a TOC to ATS Unit B when the aircraft is about to cross the boundary. Alternatively, ATS Unit 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. ATS Unit B responds by transmitting an AOC to ATS Unit A, signalling acceptance of control responsibility. This is the ***Transferring state***.

> *Note: Transfer of Control process will not occur for all flights. Some flights fly near an FIR boundary, requiring coordination, but do not actually enter the FIR.*

3.7 The aircraft has now entered FIR B, and is under the control of ATS Unit B, progressing towards the next FIR, FIR C. The same process described above is repeated between ATS Units B and C.

3.8 No changes to the flight profile may be made while in the border region without mutual agreement between ATS Units A and B. If a flight has entered FIR B, and either ATS Unit A or B desires a change in the coordination conditions, negotiation must take place using CDNs. This negotiation is terminated with either an ACP or REJ.

3.9 Several flight states can be identified from the above description. These states are identified in **Table C-1**.

3.10 A flight state transition diagram is shown in Figure 1. This diagram depicts graphically how the flight transitions from one state to the next. It is seen that the OLDI 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 transition, is given in **Table C-2**.

Table C-1 Flight States

Flight State	Description
Notifying	The aircraft's progress is being monitored by one or more non-controlling ATS Units, in addition to the controlling ATS Unit.
Pre-notifying	A flight which was originally going to enter a downstream ATS Units area of responsibility will no longer do so.
Negotiating	The aircraft is near the ACI and coordination data is being exchange between the controlling ATS Unit and the receiving ATS Unit as part of the initial coordination dialogue.
Coordinated	Coordination of the ACI crossing conditions is completed.
Re-Negotiating	The aircraft is near the ACI and coordination data is being exchange between the controlling ATS Unit and the receiving ATS Unit 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 ATS Unit.
Transferred	Air traffic control responsibility for the aircraft has been transferred to the receiving ATS Unit.
Backward-Coordinating	The aircraft is now under the control of the receiving ATS Unit, but still near the ACI. Changes are being proposed to the coordination conditions while the aircraft is still in the vicinity of the ACI.

4. MESSAGE SEQUENCING

4.1 The preceding section identified the flight states and showed how the aircraft transitions from one state to the next, based on the receipt of OLDI messages by ATS Unit B. In this section, a table of two-message sequences is constructed, as shown in **Table C-3**. These 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, but must be sent in response to any received Notification, Coordination, or Transfer of Control.

4.2 **Table C-4** lists the messages which are valid for each state. The ATS Unit which can transmit the message is also identified.

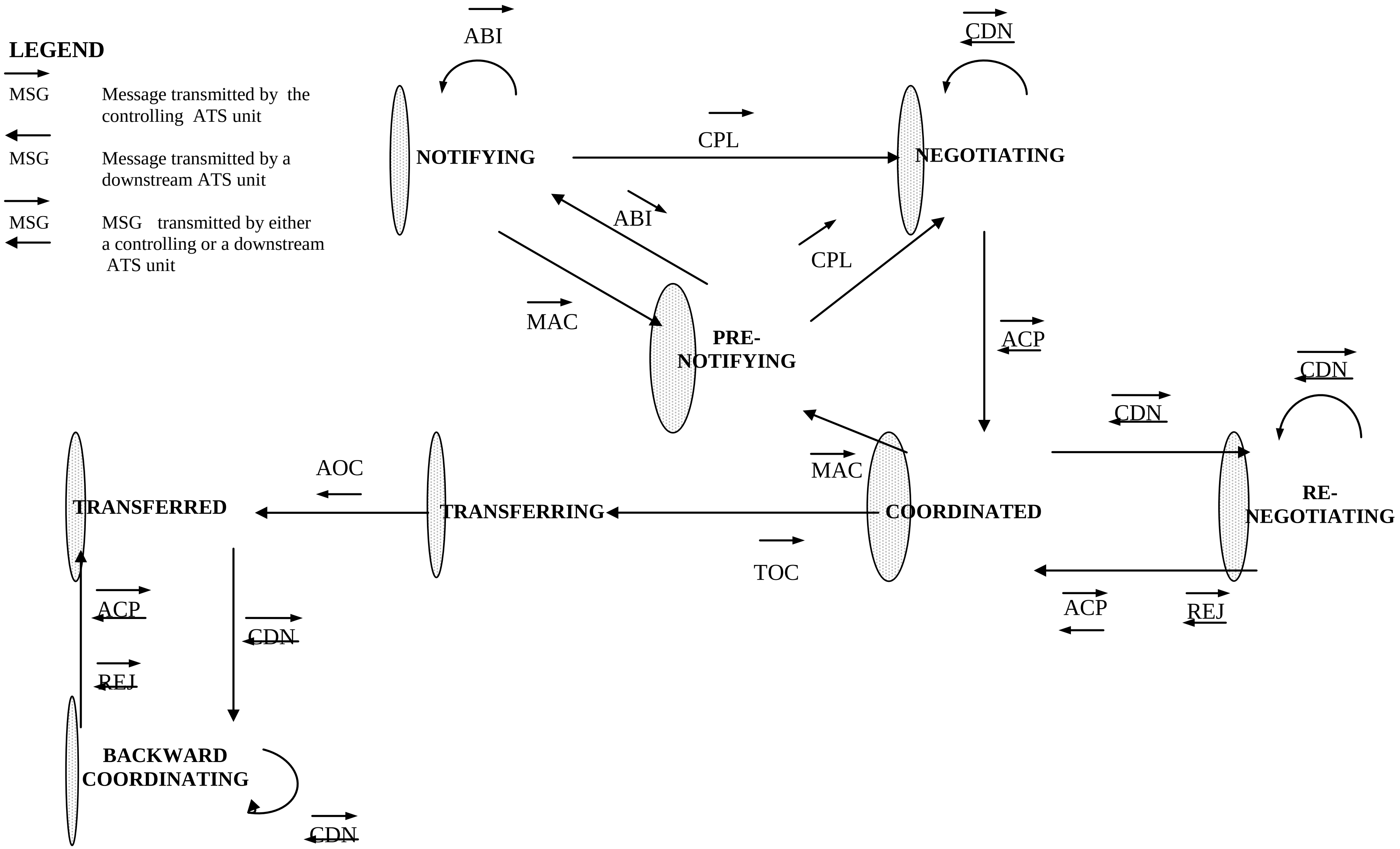


FIGURE C-1 - FLIGHT STATE TRANSITION DIAGRAM

Table C-2 Flight State Transitions

State Transition	Message Trigger	Description
Pre-notifying/Notifying	ABI	An ABI updates the information a downstream ATS Unit 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/Notifying	ABI	An ABI updates the information a downstream ATS Unit 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 ATS Unit'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 ATS Units ACI. A CPL contains the current clearance to landfall.
Pre-notifying Negotiating	CPL	A CPL is used to initiate the Coordination process for an aircraft that will enter the downstream ATS Units ACI. A CPL contains the current clearance to landfall.
Negotiating/Negotiating	CDN	If the downstream ATS Unit 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 ATS Unit signals its acceptance of the coordination conditions using 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 ATS Unit 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/Transferring	TOC	A TOC is sent after Coordination occurs but (usually just) before the boundary is crossed to the accepting ATS Unit. The TOC informs the accepting ATS Unit that it now has control authority for the aircraft.
Coordinated/Pre-notifying	MAC	A flight that was expected to enter a downstream ATS Unit's ACI will no longer do so.

State Transition	Message Trigger	Description
Transferring/Transferred	AOC	The formerly downstream ATS Unit is now the controlling ATS Unit.
Transferred/Backward-Coordinating	CDN	An attempt is made (by either the previous or new controlling ATS Unit) to change the coordination conditions while the aircraft is near the common boundary.
Backward-Coordinating/Backward-Coordination	CDN	Either ATS Unit 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 boundary region.
Backward-Coordinating/Transferred	ACP REJ	Similar to a Re-Negotiation/Coordinated state transition. 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).

Table C-3 Message Sequences

Received Message	Next Valid Message	Comments
Notification Sequences		
ABI	ABI	Update the flight information.
	MAC	The ABI may be Cancelled, indicating that the flight is no longer expected to enter the downstream air space.
	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.
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.
CDN	ACP	The negotiated clearance is acceptable to both ATS Units.
	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.
ACP	CDN	A request for modification of a previously accepted clearance is submitted.
	TOC	The aircraft is at or near the boundary.
	MAC	The coordinated flight may be cancelled, indicating that the flight is no longer expected to enter the downstream ATS unit's ACI.
REJ	CDN	
	TOC	
	MAC	
Transfer of Control Sequences		
TOC	AOC	The aircraft is at or near the boundary.
AOC	CDN	A request for modification of a previously accepted clearance is submitted.

Table C-4 Valid Messages by ATS Unit

Flight State	Message	Sent by
Notifying	ABI	Controlling ATS Unit
Notifying	MAC	Controlling ATS Unit
Notifying	CPL	Controlling ATS Unit
Negotiating	CDN	Either ATS Unit
Negotiating	ACP	Either ATS Unit
Coordinated	CDN	Either ATS Unit
Coordinated	TOC	Controlling ATS Unit
Coordinated	MAC	Controlling ATS Unit
Re-Negotiating	CDN	Either ATS Unit
Re-Negotiating	ACP	Either ATS Unit
Re-Negotiating	REJ	Either ATS Unit
Transferring	AOC	Receiving ATS Unit
Transferred	CDN	Either ATS Unit
Backward-Coordinating	CDN	Either ATS Unit
Backward-Coordinating	ACP	Either ATS Unit
Backward-Coordinating	REJ	Either ATS Unit

5. EXAMPLES

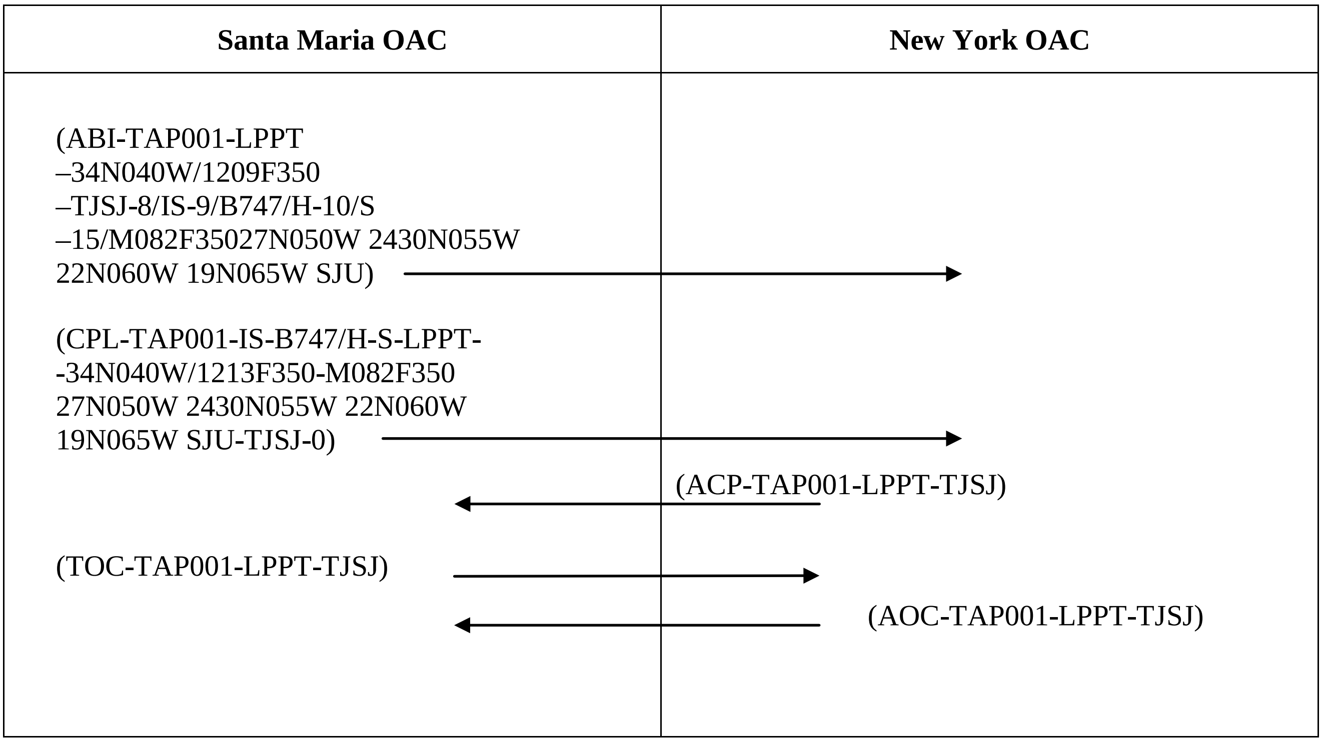
Several examples illustrating the use of the MID Core Message set are presented. No Application Management messages (principally the LAM, but also the LRM and ASM) are shown for clarity, though these messages are almost always sent as an application acknowledgement response to the receipt of a Notification, Coordination, or Transfer of Control message.

5.1 Standard case. (Refer to Example 1).

6.1.1 Santa Maria Oceanic Area Control (OAC) informs New York OAC several hours in advance that flight TAP001 is expected to cross the Santa Maria FIR boundary into the New York FIR at approximately 1209 PM (ABI). The flight will continue on to San Juan, Puerto Rico.

6.1.2 Coordination between Santa Maria OAC and New York OAC occurs approximately twenty minutes before the expected boundary crossing time, which has been revised to 1213 PM (CPL). New York OAC accepts the coordination conditions without modification (ACP).

6.1.3 Santa Maria OAC transfers ATC responsibility near the boundary (TOC). New York OAC accepts ATC responsibility by responding with an AOC.



Example 1 – Standard Case

5.2 Negotiation of coordination condition. (Refer to Example 2).

6.2.1 Santa Maria OAC informs New York OAC several hours in advance that flight TAP001 is expected to cross the Santa Maria FIR boundary into the New York FIR at approximately 1209 PM (ABI). The flight will continue on to San Juan, Puerto Rico.

6.2.2 Coordination between Santa Maria OAC and New York OAC occurs approximately twenty minutes before the expected boundary crossing time, which has been revised to 1213 PM (CPL). New York OAC request a change in the boundary crossing altitude to F390 (CDN), which Santa Maria OAC signals as acceptable (ACP).

6.2.3 Santa Maria OAC transfers ATC responsibility near the boundary (TOC). New York OAC accepts ATC responsibility by responding with an AOC.

Santa Maria OAC	New York OAC
(ABI-TAP001-LPPT –34N040W/1209F350 –TJSJ-8/IS-9/B747/H-10/S –15/M082F35027N050W 2430N055W 22N060W 19N065W SJU) →	
(CPL-TAP001-IS-B747/H-S-LPPT- -34N040W/1213F350-M082F350 27N050W 2430N055W 22N060W 19N065W SJU-TJSJ-0) →	
←	(CDN-TAP001-LPPT-TJSJ –14 / 34N040W/1213F390)
(ACP-TAP001-LPPT-TJSJ) →	
(TOC-TAP001-LPPT-TJSJ) →	
←	(AOC-TAP001-LPPT-TJSJ)

Example 2 – Negotiation of Coordination Conditions

5.3 Re-Negotiation rejected. (Refer to Example 3).

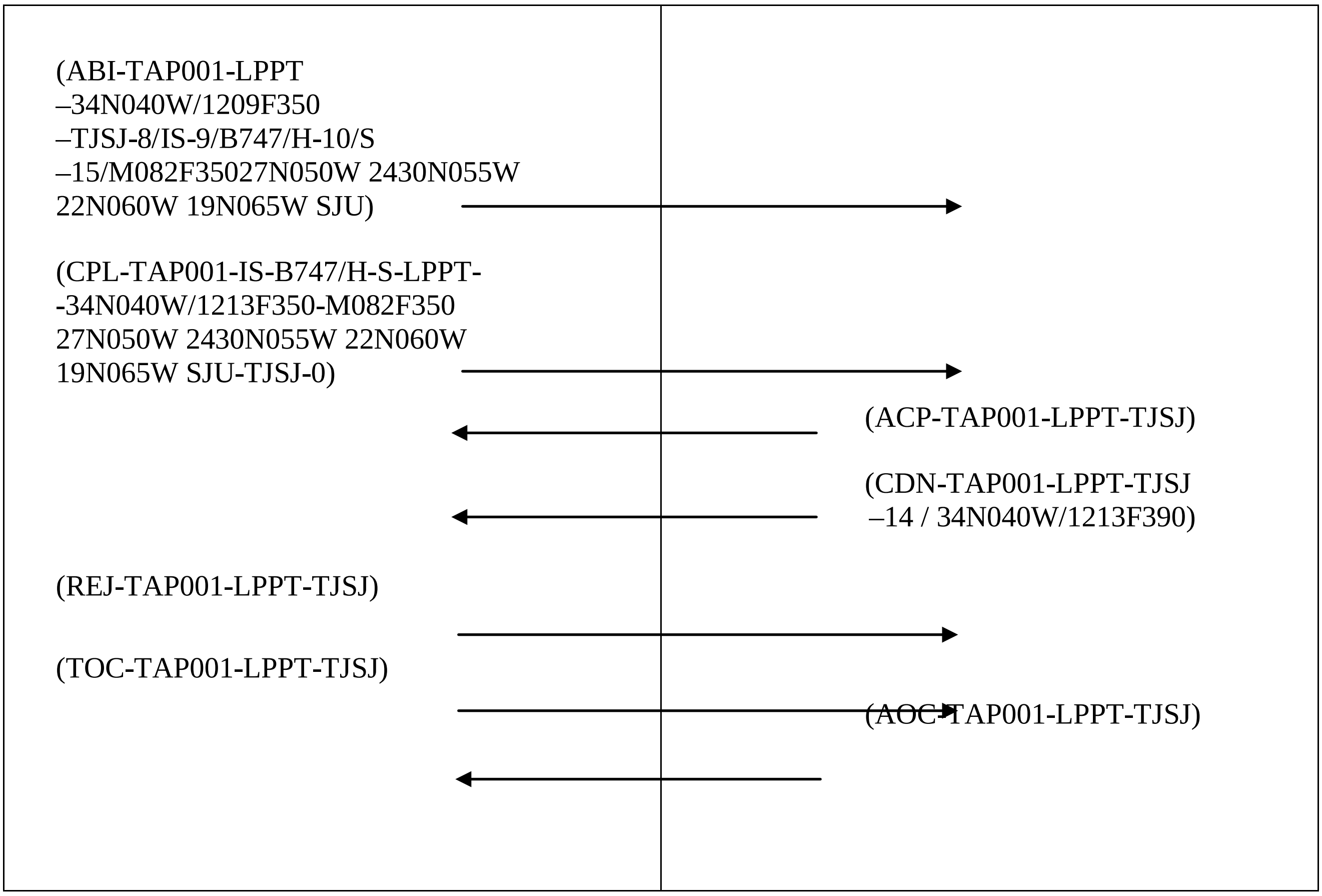
6.3.1 Santa Maria OAC informs New York OAC several hours in advance that flight TAP001 is expected to cross the Santa Maria FIR boundary into the New York FIR at approximately 1209 PM (ABI). The flight will continue on to San Juan, Puerto Rico.

6.3.2 Coordination between Santa Maria OAC and New York OAC occurs approximately twenty minutes before the expected boundary crossing time, which has been revised to 1213 PM (CPL). New York OAC accepts the coordination conditions without modification (ACP).

6.3.3 Some time after the initial Coordination process has been completed, but before the start of the Transfer of Control process, New York OAC attempts to modify the boundary crossing altitude (CDN), due to unexpected traffic in the area. Santa Maria OAC can not accept the proposed change due to conflicting traffic in its FIR, and therefore rejects the proposal (REJ).

6.3.4 Santa Maria OAC transfers ATC responsibility near the boundary (TOC). New York OAC accepts ATC responsibility by responding with an AOC.

Santa Maria OAC	New York OAC



Example 3 – Rejection of Coordination Re-Negotiation Attempt

Data link communications messages

5.3.1 The FANS-1/A datalink connection transfer messages FAN and FCN are supported.

5.3.2 The FAN message may be used to transfer a data link aircraft's logon information from one ATSU to another. Implementation of this message removes the need to utilise 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.

5.3.3 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 Figure D-4). While the second FAN may not be required for address forwarding purposes it does provide the receiving ATSU with a positive indication that another NDA has been sent to the aircraft.

5.3.4 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 of the ground-ground link.

5.3.5 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.

5.3.6 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.

Note. 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.

5.3.7 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 than the QF0924 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

5.3.8 Under certain circumstances (e.g. FMC failure) it is possible for the SMI of 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.

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

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

5.3.10 Any “padding” in the registration in the logon (e.g. preceding periods < . >s) must not 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”.

5.3.11 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.

5.3.12 The FCN message, where used, provides advice to the transferring ATSU that the receiving ATSU has established an (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 the receiving ATSU. FCN messages should only be transmitted when a CPDLC transfer is being effected – i.e. not for transfers involving aircraft that are only ADS-C equipped.

5.3.13 Multiple FCN messages

5.3.13.1 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 below).

Table C-5 FCN Transmission

ATSU transmitting FCN	When an FCN should be sent
Transferring ATSU	On receipt of a Disconnect Request terminating the CPDLC Connection
Receiving ATSU	On receipt of a Connection Confirm, establishing a CPDLC Connection
Receiving ATSU	On receipt of CPDLC downlink #64 [*icaofacilitydesignation*], **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 CPDLC Connection has yet been established, whichever occurs later

5.3.13.2 Procedures 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.

5.3.13.3 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.

5.3.14 Sample flight threads involving FAN and FCN messages

5.3.14.1 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.

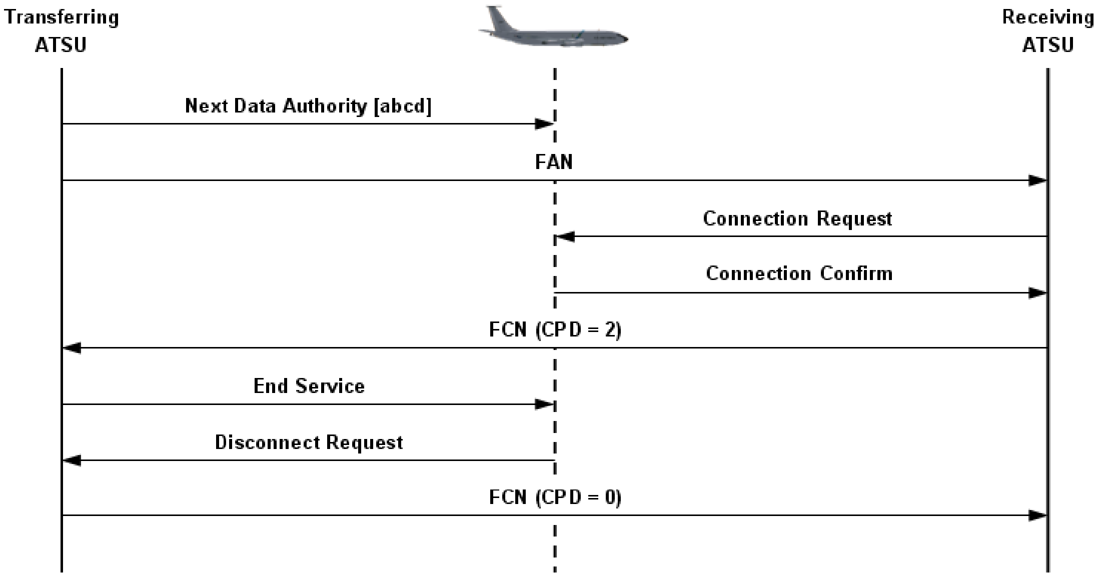


Figure 2. Routine data link Transfer using FAN and FCN messaging

5.3.14.2 Figure 2 shows a routine data link transfer from one ATSU to the next. The first step in the transfer process is the uplinking 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.

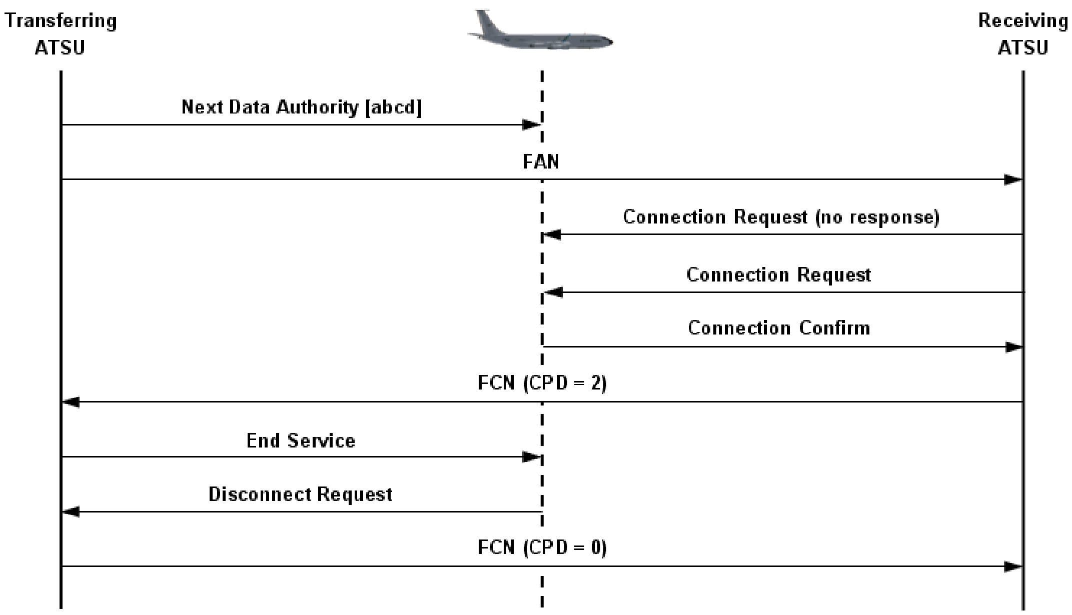


Figure 3. CPDLC Transfer using FAN and FCN messaging – initial Connection Request failed

5.3.14.3 Figure 3 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.

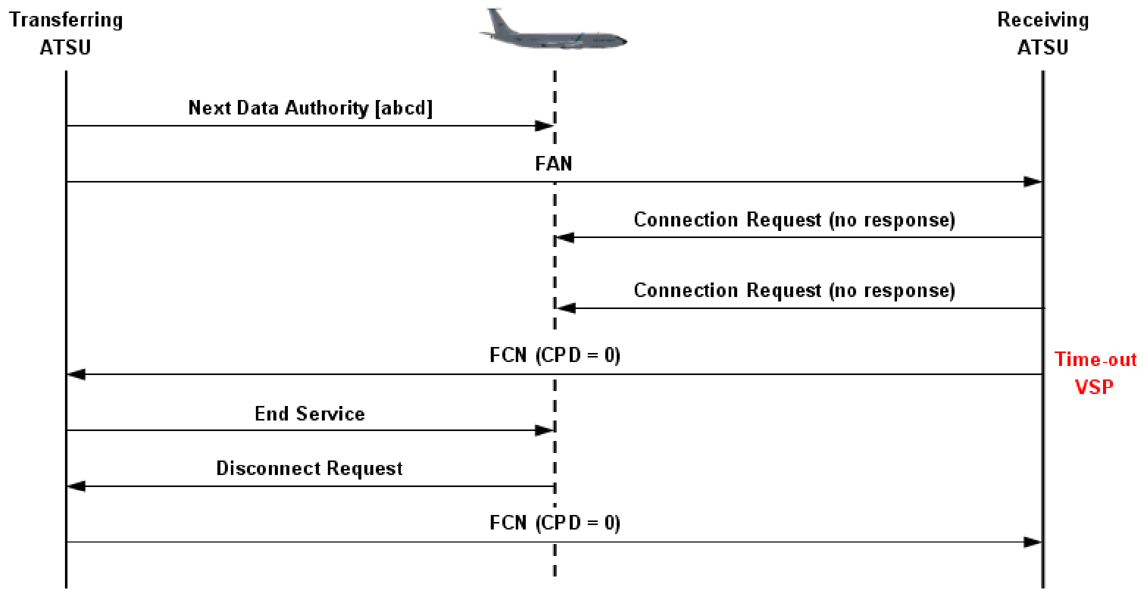


Figure 4. CPDLC Transfer using FAN and FCN messaging – Unable to establish CPDLC Connection

5.3.14.4 Figure 4 shows an attempted data link transfer where there is no response by the avionics to multiple CPDLC Connection requests uplinked 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 event 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.

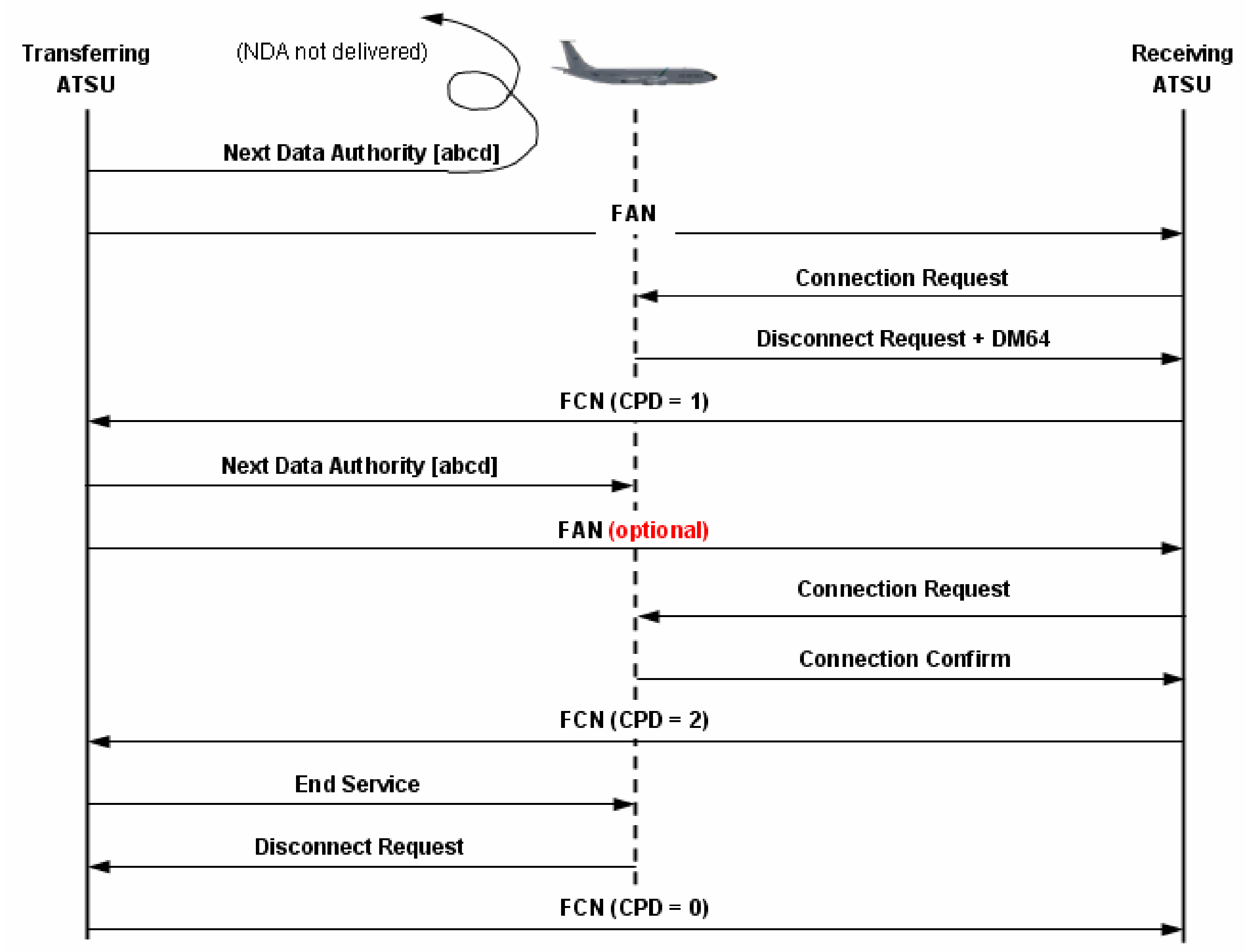


Figure 5. CPDLC Transfer using FAN and FCN messaging – initial NDA not delivered

5.3.14.5 Figure 5 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.

5.4 Standard coordination including FAN/FCN exchange (Refer to example 4).

5.4.1 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).

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

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

5.4.4 The current flight plan message (CPL) is transmitted by Brisbane thirty minutes prior to the boundary estimate. Auckland accepts the proposed coordination conditions by responding with an ACP.

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

5.4.6 Brisbane terminates the CPDLC connection with UAL815, and transmits an FCN to Auckland to advise them that the CPDLC connection has been terminated.

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

Brisbane OAC	Auckland OAC
(ABI-UAL815/-YSSY3200S16300E/0330F290 -KLAX-8/IS-9/B744/H10/SDHIRWJP/CD-15/N0499F310 NOBAR A579 JORDY DCT 3200S16000E 3050S16300E 2800S16500E..)	
(FAN-UAL815-YSSY-KLAX-SMI/FML FMH/UAL815 REG/N123UA FPO/3330S15910E FCO/ATC01 FCO/ADS01)	
	(FCN-UAL815-YSSY-KLAX-CPD/2FREQ/13261)
(CPL-UAL815-IS -B744/H- SDHIRWJP/CD -YSSY-3200S16300E/0330F290 -N0499F310 NOBAR A579 JORDY DCT 3200S16000E 3050S16300E 2800S16500E..)	
	(ACP-UAL815-YSSY-KLAX)
(TOC-UAL815-YSSY-KLAX)	
	(AOC-UAL815-YSSY-KLAX)
(FCN-UAL815-YSSY-KLAX-CPD/0)	

Example 4 – Standard coordination including FAN/FCN exchange

6. Additional information

7.1 **Initialization and termination conditions.** Only material pertaining to flights within MID FIRs is included. Most flights depart from aerodromes outside the region, then transition into the MID. Similarly, most flights transition from a MID FIR into a non-MID FIR. These transitions are not discussed. The required Notification, Coordination, and Transfer of Control processes are dependent on the particular transition.

7.2 **Air/ground events.** Certain air/ground events may be associated with the particular flight states. These include ADS contract establishment and Data Link Transfer. Assume that an aircraft is ADS equipped, and that the current controlling centre is receiving ADS reports. The flight then undergoes a coordination process, leaving it in ***Coordinated state*** with one or more downstream ATS Units. These ATS

Units may now establish separate ADS contracts with the aircraft to monitor its position just before and after entry into a new FIR. The Coordinated state has been linked with a specific A/G event - establish an ADS contract.

7.3 Similarly, Transfer of a Data Link connection may be linked with the Transferred state. Only one ATS Unit has control authority over an aircraft at any given time. This unit would transfer its Data Link connection during the Transfer of Control process.

6.1 General information messages

6.1.1 Two of these messages (MIS and EMG) support the exchange of text information between ATS Units. A communicator (usually a person, but a computer or application process is also permitted) in one ATS Unit can send a free text message to a functional address at another ATS Unit. Typical functional addresses are supervisor positions.

6.2 Application Management messages.

6.2.1 Application acceptance (LAM), application rejection due to errors (LRM), status monitoring (ASM), capabilities are supported.

6.2.2 Every message possessing an associated message identification number (other than an LAM or LRM) must be responded to by the addressee with an (1) LAM if the message was processed and no errors were found by the receiving Air Traffic Control (ATC) application; otherwise an (2) LRM if the message was not accepted due to errors.

6.2.3 The generation of LAM and LRM messages must be triggered at the application level, not at the communications front-end level. This is because LAM and LRM messages indicate that previously received data has been analyzed by the ATC application(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 service, which is responsible for the reliable delivery of data, but not its interpretation.

6.2.4 The ASM message is used to ensure that the ATC application on the other end is alive. This message is sent by ATS Unit A to (adjacent) ATS Unit B if, after a mutually agreed upon time, no communication has been received from ATS Unit B. ATS Unit B responds, if the ATC application is active and functioning, by sending an LAM to ATS Unit A. If ATS Unit A does not receive a response LAM from ATS Unit B within a specified time, local contingency procedures should be executed. These procedure will include reverting to manual telephonic communications if it is determined a communications link is down. True loss of ATC capabilities at ATS Unit B will require a different response.

ATTACHMENT 1

COMMON BOUNDARY AGREEMENTS

1. INTRODUCTION

1.1 Due to the individual nature of operations in the vicinity of ACC boundaries some divergence from the common ICD are required. These differences and other procedures are defined in the following sections. The long term aim should be to adopt the contents of Parts 1,2 and 3 of the ICD with only variable system parameters.

2. INTERFACES

2.1 Name of Interface (A N)

General

ATTACHMENT 2

RELATIONSHIP TO ICAO AIDC MESSAGES

The Core messages were used as the initial basis for the ICAO ATS Interfacility Data Communications (AIDC) message set developed by the ICAO ADS Panel. Therefore, the Core message set now forms a proper subset of the AIDC message set. The AIDC message has been in Appendix 6 of the PANS ATM (4444).

The AIDC message set can be tailored to satisfy regional requirements. Datalink provides three means for achieving regional adaptation of the AIDC messages:

a) Regions select an AIDC subset that will support their regional operational procedures;

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

  i) the optional component must always be used;

  ii) the optional component must never be used;

  iii) the optional component is truly optional;

c) 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.

Using the regional tailoring procedures stated above, the MID Core messages are related to a subset of the AIDC messages as shown in **Table 1**.

The encoding rules employed within the MID Region will remain for the foreseeable future the ICAO ATS field and message-based, character-oriented rules as currently defined in the MID Interface Control Document (ICD) and ICAO PANS-ATM (Doc 4444). The message structure will remain as described in Part II, Section 2 of the MID ICD. Therefore, no changes to existing MID messaging practices as described in the MID ICD are envisioned at this time.

Table 1. MID Core / AIDC Relationship.

AIDC Message	MID Core Message	AIDC Mandatory Data Field	AIDC Optional Data Field	AIDC Optional Data Field Usage
Notify	ABI	FlightID Departure Aerodrome Destination Aerodrome Estimate	FlightRules	Always Used
			Equipment	Always Used
			Route	Always Used
			OtherInformation	Optional
CoordinateInitial	CPL	FlightID Departure Aerodrome Destination Aerodrome Estimate	FlightRules	Always Used
			Equipment	Always Used
			Route	Always Used
			OtherInformation	Optional
CoordinateNegotiate	CDN	FlightID Departure Aerodrome Destination Aerodrome Estimate	Route	Optional
CoordinateAccept	ACP	FlightID Departure Aerodrome Destination Aerodrome	N/A	
CoordinateReject	REJ	FlightID Departure Aerodrome Destination Aerodrome	N/A	

CoordinateCancel	MAC	FlightID Departure Aerodrome Destination Aerodrome	Estimate	Never Used
			OtherInformation	Never Used
TransferProposal	TOC	FlightID	Departure	Always Used
			Destination	Always Used
			ExecData	Never Used
TransferAssume	AOC	FlightID	Departure	Always Used
			Destination	Always Used
FreetextEmergency	EMG	FlightID/Functional- Address OtherInformation	N/A	
FreetextGeneral	MIS	FlightID/Functional- Address OtherInformation	N/A	
AppStatus	ASM	N/A	N/A	
AppAccept	LAM	N/A	N/A	
AppError	LRM	MessageType ComponentType ErrorCode	ErrorData	Optional

ATTACHMENT 3

MID/AFI/ASIA/EUR ATS INTERFACE MESSAGES

1. INTRODUCTION

The following section describes those messages used by MID ATS systems for AIDC between MID provider States adjacent to the AFI, ASIA or EUR Regions.

2. REGIONAL INTERFACE MESSAGE GROUP

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

REGIONAL INTERFACE MESSAGES	
Flight Planning	
Co-ordination	

2.1 Flight Planning Messages

Message

Purpose

Message Format

ATS Field	**Description**

Example

Special conditions

2.2 Co-ordination messages

Message

Purpose

Message Format

ATS Field	Description

Example

Special conditions

LIST OF ACRONYMS

ACC	Area Control Centre
ACI	Area of Common Interest
ADS	Automatic Dependent Surveillance
AFTN	Aeronautical Fixed Telecommunications Network
AIDC	ATS Interfacility Data Communications
ATC	Air Traffic Control
ATFM	Air Traffic Flow Management
ATM	Air Traffic Management
ATN	Aeronautical Telecommunications Network
ATS	Air Traffic Services
CPDLC	Controller Pilot Data Link Communications
FDPS	Flight Data Processing System
FIC	Flight Information Centre
IA5	International Alphabet 5
ICD	Interface Control Document
MIDANPIRG	Middle East Planning and Implementation Regional Group
MID ID	Middle East Implementation Document
AAC	Area Control Centre
OLDI	On-Line Data-Interchange
UTC	Universal Coordinated Time
WGS/84	World Geodetic System 1984

– END –

MID REGION STRATEGY FOR THE IMPLEMENTATION OF AUTOMATIC DEPENDENT SURVEILLANCE-BROADCAST (ADS-B)

Considering:

a) the ICAO strategic objectives;
b) the ICAO Business Plan;
c) the Global Air Traffic Management Operational Concept;
d) the revised Global Air Navigation Plan and associated GPIs;
e) the outcome of the 11th Air Navigation Conference; and

Recognizing that:

i) the implementation of data-link surveillance technologies is an evolutionary process, but which has significant potential for safety and cost-effectiveness; and
ii) implementation of ADS-B is in support of various Global Plan Initiatives;

The MID Region strategy for the implementation of ADS-B is detailed below:

A) the MID Region ADS-B implementation plan should:

1) be evolutionary and consistent with the Global Air Navigation Plan taking into consideration associated MID Region priorities;

2) when cost/benefit models warrant it, prioritize implementation in areas where there is no radar coverage surveillance, followed by areas where implementation would otherwise bring capacity and operational efficiencies;

3) ensure that implementation of ADS-B is harmonized, compatible and interoperable with respect to operational procedures, supporting data link and ATM applications;

4) identify sub-regional areas where the implementation of ADS-B would result in a positive cost/benefit in the near term, while taking into account overall Regional developments and implementation of ADS-B in adjacent homogeneous ATM areas;

5) be implemented following successful trial programmes with regards to safety and operational feasibility, taking into account studies and implementation experiences from other ICAO Regions; and

6) be implemented in close collaboration with users.

7) The proportions of equipped aircrafts are also critical for the ADS-B deployment, for which it is required to periodically provide, at least, the following information: number of equipped aircrafts operating in the concern airspace, number and name of the airlines that have equipped aircrafts for ADS-B, type of equipped aircrafts, categorization of the accuracy/integrity data available in the aircrafts.

8) The ADS-B deployment should be associated at early stages in coordination with the States/Regional/International Organizations responsible for the control of

adjacent areas, and the correspondent ICAO Regional Office, establishing a plan in the potential areas of ADS-B data sharing, aimed at a coordinated, harmonious and interoperable implementation.

9) Each State/Regional/International Organization should investigate and report their own Administration's policy in respect to the ADS-B data sharing with their neighbours and from cooperative goals.

10) The ADS-B data sharing plan should be based selecting centres by pairs and analyzing the benefits and formulating proposals for the ADS-B use for each pair of centre/city with the purpose to improve the surveillance capacity.

11) Likewise, it is necessary to consider implementing surveillance solutions for surface movement control by the implementation of ADS-B.

12) The implementation would be in conformity with the SARPs, ICAO guidelines and the MIDANPIRG conclusions.

B) The implementation would require aircraft equipped with avionics compliant with either:

i) Version 0 ES as specified in Annex 10, volume IV, Chapter 3, paragraph 3.1.2.8.6 (up to and including amendment 83 to annex 10) and chapter 2 of draft technical Provisions for Mode S services and extended Squitter (ICAO Doc 9871) to be used till atleast 2020, or

ii) Version 1 ES as specified in chapter 3 draft Technical Provisions for Node S Services and Extended Squitter (ICAO Doc 9871) Equivalent to DO260A.

C) Implementation should be monitored to ensure collaborative development and alignment with the MID Region projects and relevant elements of the GPIs.

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