INTERNATIONAL CIVIL AVIATION ORGANIZATION

ASIA AND PACIFIC OFFICE

REPORT OF THE

FOURTH ATN TRANSITION TASK FORCE MEETING

Mumbai, India, 8-12 April 2002

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1. Opening of the Meeting

1.1 The Fourth Meeting of the ATN Transition Task Force was held in Mumbai, India from 8 to 12 April 2002. The meeting was hosted by the Airports Authority of India.

1.2 Mr. S.K. Saraswati, General Manager Communication of the Airports Authority of India welcomed all the participants and the guests.

1.3 Mr. Craig Head, Chairman of the Task Force, in his opening address, outlined activities of the Task Force and its achievements. He stated that the initial planning work had been completed and implementation is expected to take place within the target date set in the plan.

1.4 On behalf of Mr. L. B. Shah, ICAO Regional Director, Mr. K.P. Rimal, Regional Officer CNS of the ICAO ASIA/PAC Regional Office expressed gratitude and appreciation to the Airports Authority of India for hosting the meeting and for the excellent arrangement made for the meeting. He highlighted the main events that took place in the ATN field since the last meeting and outlined the objective of the meeting.

1.5 Mr. V.K.Kalra, Regional Executive Director of Airports Authority of India, Western Region welcomed the participants on behalf of the Chairman of the Airports Authority of India. He expressed his pleasure in hosting this meeting in Mumbai.

1.6 Mr A.K. Mishra, Executive Director, Communications of the Airports Authority of India thanked ICAO for holding the meeting in Mumbai. He expressed his thanks to all the participants and guests for attending this event. He also thanked the local Secretariat for all the arrangements made for the meeting.

2. Attendance

2.1 The meeting was attended by 55 participants from Australia, Bhutan, Brunei Darussalam, China, Hong Kong China, Fiji, India, Indonesia, Japan, Nepal, New Zealand, Philippines, Republic of Korea, Russian Federation, Sri Lanka, Thailand, United States of America, Vietnam and IATA, IFALPA and SITA. A list of participants is at Attachment 1.

3. Officers and Secretariat

3.1 Mr. Craig Head, Manager Data Networks of Airservices Australia, Chairman of the Task Force, presided over the meeting.

3.2 Mr. K.P. Rimal, Regional Officer, CNS was the Secretary of the meeting who was assisted by Mr. Li Peng, Regional Officer, CNS of the ICAO Asia and Pacific Regional Office.

4. Agenda

4.1 The Agenda adopted by the meeting was as follows:

Agenda Item 1: Review of work carried out by Working Group B

Agenda Item 2: Develop ATN Interface Control Documents

Agenda Item 3: Review ATN technical documents and transition issues.

Agenda Item 4: Review the Subject/Tasks List of the ATN Transition Task Force

Agenda Item 5: Review status of implementation of AFTN plan and evaluate circuit capacity.

Agenda Item6: Review Table CNS 1A – AFTN plan and Chart CNS-1.

Agenda Item 7: Review Table and Chart for the ground-to-ground part of the CNS FASID - ATN Routers.

Agenda Item 8: Update Table and Chart for the ground-to-ground part of the CNS FASID – AMHS.

Agenda Item: 9: Review Regional Procedures contained in Part IV-CNS of ASIA/PAC Basic ANP/FASID and develop materials on ATN for inclusion in the ANP/FASID.

Agenda Item 10: Any other business

5. Organization, Working Arrangements and Language

5.1 The Task Force met as a single body. The working language was English inclusive of all documentation and this Report. Lists of Working Papers and Information Papers presented at the meeting are at Attachment 2.

5.2 The participants visited the ATS/COM facilities at Mumbai International Airport.

List of Draft Decisions, Decisions and Draft Conclusions

Reference No.	Title	Page
	Draft Decisions	
4/6	Revision of the Subject/Tasks List of the ATN Transition Task Force	7
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Agenda Item 1: Review of work carried out by Working Group B

1.1 The meeting reviewed the highlights of all the works carried out by the Working Group B of the ATN Transition Task Force (ATNTTF) since the third meeting of the Task Force held in Singapore in March 2001.

1.2 It was noted that the Working Group B met twice during 2001. During the August 2001 meeting, the Working Group B discussed a number of topics on the various documents that were to be developed. Tasks were then assigned to various experts to prepare a first draft of the documents. The meeting of the Working Group B held in Chiang Mai in December 2001 in conjunction with the ATN Seminar dealt with the detail discussions on the various documents that were required to be presented at the fourth meeting of the Task Force. The documents developed and presented were as follows:

-The AMHS ICD; and
-The ATN Router ICD

1.3 It was recognized that the remaining technical documents would require further development before the documents were ready for review by the Task Force.

1.4 The Working Group B was also tasked to determine if Fiji should be included as a Backbone BIS router site. This issue was discussed and accepted that the establishment of the BBIS router site would improve the network connection to the United States. However, it was also highlighted that the region is identifying too many backbone router sites and that a rationalization of those backbone sites may need to occur when considering the air ground aspects of the ATN for the region.

1.5 Two future meetings of the Working Group B were proposed during 2002 to continue with the research and development of the remaining technical documents. It was proposed that the meetings would be scheduled during August and November 2002.

1.6 The meeting reviewed a new document called the ATN Documentation Tree that provides an index and hierarchy on relevant ATN documents that are available to assist States in their ATN planning and implementation programmes. The meeting agreed that this document would be of value and recommended that this document, shown in Appendix A, be considered for inclusion in the Second Edition of the ATN Planning and Technical Document. It was also agreed that the Technical Documents should be published in loose leaf to enable incorporation of future amendments in the document. In view of the following the meeting formulated the following draft conclusion.

Draft Conclusion: 4/1- ATN Documentation Tree

That,

a) the ATN Technical Document be published in a loose-leaf form to include future amendments to the Document; and

b) the ATN Documentation Tree provided in Appendix A be adopted and included in the ATN Planning Document.

Agenda Item 2: Develop ATN Interface Control Documents

2.1 It was noted that the Working Group B of the ATN Transition Task Force had reviewed the document in detail during its third and fourth meetings held in August and December 2001. The meeting reviewed the AMHS ICD and noted the changes made by the Working Group B. The meeting agreed to recommend adoption of the AMHS ICD contained in Appendix B and publish it as Issue 1. In view of the above, the meeting formulated the following draft conclusion:

Draft Conclusion 4/2 - ASIA/PAC Interface Control Document (ICD) for ATS Message Handling System (AMHS)

That, the ASIA/PAC ICD for AMHS provided in Appendix B be adopted and published as Issue 1.

2.2 It was noted that the Router ICD was reviewed by the 5th meeting of the Working Group B held in Mumbai on 7 April 2002. The ICD was then presented to the meeting. The meeting reviewed the document and recognized that further work would be required to finalize the document for adoption.

2.3 It was further noted that significant progress has been made to complete the Router ICD. However, it was recognized that the Working Group B had not collectively met and performed a detailed review of each "ATN Protocol Requirement List" item in the document. In addition, it was noted that given the Doc 9705 requirements are intended to cover a wide variety of configurations, there might be requirements that are not necessary in the specific routing architecture defined for the ASIA/PAC region. Accordingly, it was recommended that a detailed review meeting should be conducted with select members of Working Group B before the Router ICD is forwarded to the Task Force as a completed item.

Agenda Item 3: Review ATN technical documents and transition issues

3.1 A number of working papers and information papers were presented under this Agenda Item. The main topics included material on ATN Routing Policy, Performance, Security, AMHS routing policy and Network Management.

3.2 With regard to the Routing Policy Document, it was noted that the requirements were considered to be essentially complete, in particular, in support of ground-ground routing policy. However, based on issues raised and discussed, it was recognized that the air-ground routing policy needed further examination. It was agreed that diagrams in the current version of the document should be presented in a generic fashion since the actual configuration was subject to change. It was also agreed that an Appendix be developed which would provide examples with diagrams for both the ground-ground case and the air-ground case. It was further agreed that this document should also be subject to a detailed review by select members of the Working Group B in conjunction with the Router ICD review.

3.3 In view of the foregoing, it was agreed that the Router ICD and the policy documents should be referred to the Working Group B for further review and reached the following decision.

Decision 4/3 - Review of the Router ICD and Routing Policy Document

That, the Working Group B further review the Router ICD and Routing Policy and finalize the documents for review and adoption by the 5th meeting of the Task Force in 2003.

3.4 The Message Transfer Agents (MTA) Routing Plan was presented for review. This was the first draft of the plan for the interconnection of ATN AMHS MTA within the Region. The plan was still under development and would be expanded to include information on MTA routing definitions and MTA routing architecture. The plan should also include information on MTA security as it applies to routing. It was agreed that the plan should be finalized and submitted by the expert from the United States at the next Working Group B meeting.

3.5 The meeting was informed of the issues associated with performance of the ATN and identified a number of operational functions that would need to have performance values agreed to by the ATS community before any further technical requirement for performance can be developed. In this regard it was noted that attempt would be made by the member from Japan to have the WP/17 presented for comments to the ATS/AIS/SAR Sub Group meeting to be held in Bangkok from 24 to 28 June 2002. It was also agreed that IFALPA representative would forward a copy of the WP/17 to the concerned IFALPA group for comments and provide the resulting comments to the ICAO Secretariat.

3.6 It was felt that the information contained in WP/17 would need further review to ascertain how far it can proceed in producing a document that can provide guidance in this area until the ATS community reviews these issues and come up with recommended figures. In this regard, the meeting agreed that the paper with the comments from the ATS/AIS/SAR Sub Group should be presented to the Sixth CNS/MET Sub Group meeting to be held from 15 to 19 July 2002.

3.7 An Information Paper on Security was presented which provided an overview and introduction to ATN security services, the current status of ATN security and general considerations for implementation of ATN security in the ASIA/PAC Region. Of particular interest in this paper was that whether or not the target date of completion of this task in 2003 specified in the Subject/Tasks List of the Task Force could be met since there seemed to be a dependency on the ATN Panel Work on security. In the ensuing discussion, it was determined that in the 2003 time frame high level guidance relative to issues on transitioning to security could be provided. However, further work on such items as the regional security architecture and development of security policy (including Public Key Infrastructure (PKI) policy) for the ASIA/PAC region would follow corresponding work carried out by the ATN Panel Working Groups.

3.8 The concept of using Policy Based Network Management (PBNM) was presented. The major emphasis was on the identification of the need for strong and concise ATN policy. The need for the development of a clear and concise concept of operation, further development of system management guidelines, and the establishment of service level agreements, were identified.

3.9 It was recognized that documentation to be developed must support the ATN as an enterprise rather than disjointed element management. It was noted that the need exists to manage ATN as an enterprise regardless of employment of PBNM applications. The task is daunting when considering the heterogeneous nature of the network.

3.10 A checklist for implementation of ATN ground-to-ground network was presented with a view to assist States in the implementation of their ground/ground network infrastructure. It was agreed that this information would be of value. It was, therefore, agreed to adopt the checklist and propose its circulation to States for their use. In view of this, the meeting formulated the draft conclusion as follows:

Draft Conclusion 4/4 - Checklist for Implementation of Ground to Ground ATN Infrastructure

That, the Checklist provided in Appendix C be adopted and circulated to States to assist in implementation of the Ground-to-Ground ATN infrastructure.

3.11 Hong Kong, China presented an update on their ATN trial programme with Japan, Australia and Thailand. It was informed that during their trials a number of problems were highlighted in the area of interoperability between systems and interpretation of the SARPs.

3.12 The meeting discussed the best method of resolving such difficulties in the future. It was agreed that the best course of action would be for States to provide the required information to the Secretary of the ATN Transition Task Force at the ICAO Asia and Pacific Office or to the ATN Panel Secretary, for advice. Alternatively, members of the Working Group B could be approached directly. If the problem is deemed to be an issue for consideration by the ATN Panel then one of the members of the Working Group B who is also a Panel member would forward the information on to the appropriate Rapporteur of the ATN Panel Working Groups for review.

3.13 The Secretariat advised the meeting that the ATN Regional Planning Documents were forwarded to States in the ASIA/PAC and adjacent regions on 20 February 2002 in accordance with Conclusion 12/13 and 12/14 of the APANPIRG. The ATN Regional Planning Documents included:

- ASIA/PAC Regional ATN Transition Plan
- ASIA/PAC Routing Architecture Plan
- ASIA/PAC ATN Network Service Access Point Addressing Plan
- ASIA/PAC ATN NSAP Address Registration Form
- ASIA/PAC ATS Message Handling System Naming Plan

3.14 The United States presented a paper, which highlighted activities since the last round of ATN Panel Working Group meetings in Hawaii, USA in March 2001. Of particular interest to this meeting was information that the Third Edition of DOC 9705 - ***Manual of Technical Provisions for the ATN*** had been prepared and posted in the ICAO website.

3.15 It was noted that the ICAO is currently looking into publishing this document in CD-ROM form only in view of the large size of the document.

3.16 It was also noted that the 33rd session of the ICAO Assembly adopted an updated consolidated statement addressing continuing policy and associated practices related to air navigation. The policy states that SARPS and PANS should be drafted in clear, simple and concise language, consisting mainly of broad, mature and stable provisions specifying system-level, functional and performance requirements. The meeting took note of the policy and applied it to the extent possible in the development of regional technical documents.

3.17 Fiji provided an update on their modernization programme with a number of systems being upgraded or replaced and indicated possible leasing arrangements being negotiated for ATN routers. Fiji also confirmed their readiness in taking responsibility as an ATN Backbone BIS as considered by Working Group B.

3.18 New Zealand advised the meeting that they are in the process of establishing a new ATS direct speech circuit and AFTN circuit between New Zealand and the USA due to changes in the FIR boundaries between the two States. The service will be ready by September 2002. New Zealand also indicated willingness to be considered as an ATN Backbone BIS under the ATN Transition Plan for the ASIA/PAC Region.

3.19 The meeting expressed concern that too many Backbone BISs were being requested and that a study should take place based on information from AFTN traffic loads between Australia, Fiji, New Zealand and the USA to assist if any further Backbones should be added between centers in the South Pacific and the USA. The information will be assessed by the Working Group B for consideration and to report back to the Task Force with its deliberations at its 5th meeting in 2003. It was agreed that States concerned would collect required statistics and provide the information for review by the Working Group B.

3.20 The meeting was advised by the Secretariat that at the CNS/ATM IC/SG/9 meeting held in Bangkok in March 2002 it was proposed that in order to simplify the formalities, any future ATN trials should be coordinated through the ATN Transition Task Force. The meeting took note of the view expressed.

3.21 Japan presented a paper regarding the possible use of the Internet Protocol (IP) stack in the ATN environment. The paper explained the differences between pure ATN networks, pure IP networks and the use of IP as an ATN subnetwork using capsulation. The meeting was advised that the Third Joint Working Group meeting of the ATN Panel had issued a draft position statement on the use of IP as a subnetwork for ATN, and that WGB of the ATNP will develop an IP SNDCF to enable the transport of ATN packets over IP subnetworks.

3.22 The Regional CNS/ATM Implementation Matrix prepared in accordance with Conclusion 11/37 of APANPIRG was presented to the meeting for review and update the ATN related information. The meeting also noted the Matrix was reviewed by the CNS/ATM IC/SG/9. The meeting reviewed and updated the information on ATN. The updated Matrix is provided in Appendix D.

Agenda Item 4: Review the Subject/Tasks List of the ATN Transition Task Force

4.1 The meeting reviewed the Terms of Reference (TOR) of the Task Force. It did not recognize the need to propose any change to the TOR. The meeting carried out a thorough review of the Subject/Tasks List taking into account ATN related subject contained in the Key Priorities for CNS/ATM Implementation in the ASIA/PAC region approved by APANPIRG/12 meeting. The target date of completion of actions for Tasks No.5 and 6 were revised.

4.2 The meeting identified the need to undertake, as a matter of urgency, an additional Task for the development of technical guidance material relating the use of public Internet to support AFTN with particular emphasis on security. In addition, it was proposed to undertake a task of developing guidance material for Internet Protocol (IP) as a sub-network of ATN in accordance with the work performed by the ATN Panel. The meeting agreed that the proposed tasks be added as No. 7 and No. 8 Tasks respectively, in the Subject/Tasks List. The meeting assigned these new tasks to its Working Group B and reached the following decision:

Decision 4/5 – Assignment of Additional Tasks

That, the Working Group B of the Task Force undertake the Task No. 7 and No. 8 listed in Subject/Tasks List of the ATN Transition Task Force contained in Appendix E.

4.3 The meeting updated the Subject/Tasks List in light of the above and formulated the following draft decision:

Draft Decision 4/6 - Revision of the Subject/Tasks List of the ATN Transition Task Force

That, the updated Subject/Tasks List of the ATN Transition Task Force provided in the Appendix E be adopted.

Agenda Item 5: Review status of implementation of AFTN plan and evaluate circuit capacity

5.1 The meeting reviewed the AFTN circuit loading statistics presented by Japan and USA. The meeting also reviewed AFTN circuit performance of those circuits, which were required to be closely monitored or upgraded. Accordingly, the meeting developed the following draft conclusion:

Draft Conclusion 4/7 - Need to monitor AFTN circuit performance

That, States concerned closely monitor performance of the following AFTN circuits and coordinate upgrading the circuit capacity within the target date established in the AFTN Plan.

1. Brunei/Singapore
2. Colombo/Male
3. Colombo/Singapore
4. Hong Kong/Ho Chi Minh
5. Mumbai/Colombo
6. Mumbai/Nairobi
7. Kuala Lumpur/Chennai
8. Tokyo/Singapore
9. Tokyo/Moscow

5.2 The meeting was informed that a COM Coordination meeting is being held to thoroughly discuss the issues inhibiting timely upgrading some of the circuits in the Bay of Bengal area. Need for early implementation of the AFTN circuit between Beijing and Yangon is also expected to be discussed at the meeting.

5.3 The meeting noted that Mumbai/Paro circuit would be implemented upon commissioning of the new AFTN switch at Paro in 2002.

5.4 Based on the loading statistics provided by Japan for January 2002, the loading on the Tokyo/Singapore AFTN circuit was found to be on the higher side. The circuit is, therefore, planned to be upgraded by the end of this year. It was also noted that a trial for upgrading of the circuit was planned for April 2002.

5.5 Regarding the loading of the Tokyo/ Moscow AFTN circuit, Japan informed the meeting that the peak hour circuit occupancy had reached as high as 60 percent. It was informed that Japan will give positive consideration to upgrade the signaling speed of the circuit. It was further noted that the loading on the Tokyo/Khavarovsk circuit was only 3 percent of the circuit capacity. It was therefore agreed that both States would coordinate the appropriate technical solution to upgrade the Tokyo/Moscow circuit from 200 bauds to 2400 bps by the end of 2003. It was suggested that pending upgrading of the circuit, States concerned should give due consideration to sharing the load between the Tokyo/Moscow and Tokyo/Khavarovsk AFTN circuits.

5.6 The meeting was informed that the Brunei/Singapore circuit would be upgraded to 2400 bps using X.25 protocol in October 2002.

5.7 The United States presented AFTN circuit loading statistics for AFTN circuits between USA and Australia, Fiji and Japan for two days on March 13 and 14, 2002. The loading conditions were well within the specified limits.

Inter-regional AFTN entry/exit point

5.8. The meeting was informed that the Thirteenth African Planning and Implementation Regional Group (APIRG/13) Meeting in its Conclusion 13/9 had proposed to change in the AFI-ASIA/PAC entry/exit point from Mauritius to Johannesburg. The meeting reviewed the request for designation of correspondent location for the entry/exit point in the ASIA/PAC Region. Recognizing that Brisbane is one of two entry/exit points between AFI and the ASIA/PAC Region linking Mauritius in AFI region, Australia agreed to further investigate and study the requirement and agreed to present the findings to the CNS/MET Sub Group meeting to be held in July 2002.

5.9 New Zealand informed the meeting that based on the proposal for amendment of the ICAO ASIA/PAC Air Navigation Plan APAC 98/8 which was approved by the ICAO Council on 27 November 2001, there is a requirement of AFTN connection between Tonga and New Zealand. The meeting agreed to incorporate this requirement in the AFTN Plan as proposed by New Zealand. New Zealand informed the meeting of the plan to establish a new ATS direct speech circuit between Auckland and Oakland and a 2400 bps data channel would be used for the AFTN circuit.

5.10 Fiji informed the meeting that since the last ATN Transition Task Force meeting held in Singapore, several new CNS/ATM systems including the new AFTN system were implemented. A new multiplexer - Net Promina ATM MUX and 64 Kbps link will be installed and commissioned around June/July 2002 between USA and Fiji to replace the current ACT Multiplexer and the 9.6 K link. The new link will also cater for the meteorological information requirements and ATN trials between the two States.

5.11 Vietnam informed the meeting that reliable VSAT and INTELSAT links have been used to support AFTN and ATS direct speech circuits with adjacent States. It is required to reflect the requirement of the Hanoi/Vientiane AFTN circuit which was implemented using VSAT link with signalling speed of 9600 bps in lieu of the requirement for the Ho Chi Minh/Vientiane circuit.

5.12 In view of the several AFTN communication centers involved in relaying of AFTN messages between Hanoi and adjacent ACCs in China causing transit delays, Vietnam proposed to establish a new direct AFTN circuit between Hanoi and Guangzhou. This would also satisfy the printed communications requirements between Hanoi and Sanya, Nanning and Kunming. China agreed to study Vietnam's proposal for the establishment of the AFTN circuit between Guangzhou and Hanoi.

5.13 It was agreed to upgrade the Ho Chi Minh/Hong Kong AFTN circuit to 2400 bps from 300 bauds by September 2002.

AFTN Routing Directory

5.14 The meeting reviewed the 23rd Edition of ASIA/PAC AFTN Routing Directory, which became applicable on the 1 December 2001. The updated status of AFTN circuits provided at the meeting would be reflected both in Tables, as well as in Chart in the next edition of the Directory.

Delivery of AFTN Traffic over the public Internet

5.15 The meeting was informed that Australia has a number of neighboring small Island States for which the use of dedicated AFTN facilities are either not available or are uneconomical to operate and maintain such services. Current alternative method to provide AFTN traffic to these countries have been via the use of manual faxing or telephone. Replacement with dedicated digital connections required leasing bandwidth far in excess of requirements made many of these services uneconomical to provide the standard AFTN service.

5.16 The system implemented in Australia consists of a software application, which operates on a standard PC under Windows NT. The application interfaces to the AFTN switch physically at V24 level providing further isolation from hacking and operates utilizing standard AFTN procedures. Security of the system is maintained by the use of firewalls and encryption. Access for data input is via a Web page utilizing a URL, which is not published and incorporates SSL encryption. Using this screen requires access to a user logon/password. The current international users of the system are: Honiara (Solomon Is) since March 2001; East Timor since February 2002; Diego Garcia since November 2001; Nauru on trials since February 2002. A number of domestic users such as airlines within Australia are using the service. Australia provided details on the use of the public Internet for AFTN connectivity using a gateway (AGATE) designed and built by Airservices Australia to interface to the AFTN. The purpose of the AGATE is to provide an alternative communications medium for AFTN connectivity to sites of low traffic requirements. The system provides for email delivery of traffic to users and provides a WEB based tool for input. The system may be accessed from anywhere in the world that has an Internet Service Provider connection and entered into an arrangement with Airservices Australia for AGATE access. This gateway could also be implemented as an attachment to any AFTN switch enhancing its connectivity.

5.17 The meeting recognized public Internet is a practical and economical feasible vehicle for distributing aeronautical information and is increasingly considered to be a fundamental communication tool that may be used to help support the dissemination of AFTN messages. However, concerns on the security and reliability, data integrity and timeliness aspects were raised. The representative from IFALPA and some other participants and the Secretariat expressed the view that without adequate protection against security risk it would not be advisable to use this option as an interim solution.

5.18 United States informed the meeting that exchange of AFTN messages will not be permitted with those stations which use such kind of public service communication means. In some States, security and certification processes were required before introduction of such kind of public service for operational use. New Zealand informed that in certain cases Internet with necessary security protection is used as an alternative means to deliver AFTN messages.

5.19 The meeting therefore concluded that further study and discussion for using public internet and developing some policies as guidance to the States were required. The meeting also agreed to study the mater further and develop guidelines for the use of public internet to support low speed AFTN and agreed to add this Task in the Tasks List of the Task Force.

5.20 IATA suggested that as the ATN was a totally X.25 network, that the Task Force encourages States that are establishing any new AFTN circuits in the Region during 2002 – 2005 be only with the X.25 protocol

Agenda Item 6: Review Table CNS 1A – AFTN plan and Chart CNS-1

6.1 The AFTN plan was reviewed and updated. The updated plan is provided in Appendix F. The Chart CNS 1 was also reviewed by the meeting and consequential changes were made in the Chart.

6.2 The main highlights of the AFTN improvements made during the year 2001 and early 2002 were as follows:

6.2.1 Circuits:

- Guangzhou/Sanya 2400 bps circuit was established and became operational on 9 August 2001;
- Hong Kong/Sanya 2400 bps circuit was established and operational on 9 August 2001;
- Hong Kong/Manila circuit was upgraded from dual 75 baud to 300 baud on 21 December 2001;
- Singapore/Manila circuits were upgraded from one of the dual 75-baud circuits to 300 baud on 30 October 2001 with the other 75 baud circuit as backup;
- Singapore/Jakarta circuit was upgraded to 2400 bps on 10 October 2001.
- Christchurch./Papeete circuit was upgraded to 2400 bps from 300 baud in November 2001.
- Brisbane/Singapore circuit was upgraded to 2400 bps from 600 baud in February 2002.

6.2.2 Station

An Unified Message Switching System (UMSS) was commissioned at the new Nadi ATM Centre, Fiji in August 2001

Agenda Item 7: Review Table and Chart for the ground-to-ground part of the CNS FASID - ATN Routers

7.1 The meeting noted that ASIA/PAC Regional ATN Transition Plan was adopted by APANPIRG/12 in its Conclusion 12/14.

7.2 It was noted that an amendment proposal will be processed to include the ASIA/PAC ATN Router Plan, Table CNS 1B in the ASIA/PAC FASID in accordance with established procedure. Table CNS1B was reviewed and necessary changes were made to incorporate editorial corrections. It was considered appropriate to include Chart CNS-2 in the amendment proposal together with the Table.

Agenda Item 8: Update Table and Chart for the ground-to-ground part of the CNS FASID – AMHS

8.1 The meeting noted that the existing sampleTables and Charts for the Ground-to-Ground part of the ATN for ATS MHS Routing Plan and AIDC Routing Plan were expected to be completed by the end of 2002 as identified in the Subject/Tasks list of the ATN Transition Task Force.

8.2 The CNS Tables contained in Part IV of the FASID particularly, Table CNS 1C – AMHS Routing Plan and Table CNS 1D – ATS Inter-facility Data Communications (AIDC) Routing Plan were presented to the meeting. It was agreed to complete the Table CNS IC- AMHS to the extent possible and include it in Appendix G to this report so that States concerned would have a chance to review it and provide necessary input to complete the document by the time of CNS/MET SG/6 meeting for appropriate action.

8.3 With regard to the Table CNS 1D-AIDC Routing Plan it was agreed to refer this matter to the Working Group B for review and for completion of details for presentation at the Fifth meeting of the Task Force in 2003. In view of the foregoing, the meeting formulated the decision as follows:

Decision 4/8- Review of Table CNS 1D-AIDC Routing Plan

That, the Working Group B review and complete the Table CNS 1D- AIDC Router Plan to the extent possible, and present it to the Fifth Meeting of the Task Force in 2003.

Agenda Item 9: Review Regional Procedures contained in Part IV-CNS of ASIA/PAC Basic ANP/FASID and develop materials on ATN for inclusion in the ANP/FASID

9.1 The meeting noted that the ANP/FASID Review Working Group Meeting was held in Mumbai on 7 April 2002. The meeting was attended by 21 participants form Australia, China, Hong Kong China, India, Japan, Thailand and the United States. The Working Group reviewed the draft proposal presented by the Secretariat and comments provided by Japan.

9.2 The draft proposal was revised to incorporate changes proposed by the Working Group and was presented to the meeting. The meeting endorsed the proposed changes to be incorporated into Part IV of the Basic ANP and the introduction Part of the Part IV of FASID which are provided in Appendix H and Appendix I to this report, respectively. Accordingly, the meeting formulated the following draft Conclusion.

Draft Conclusion 4/9- ATN related procedures for Basic ANP and FASID

That, the amendments proposed to the regional procedures contained in the Part IV-CNS of the ASIA/PAC Basic ANP and FASID relating to ATN materials provided in Appendix H and Appendix I, respectively be adopted and incorporated in the respective documents in accordance with the established procedure.

Agenda Item 10: Any other business

10.1 The meeting was informed that as a follow-up to the Council decisions, a matrix was prepared to compile the status of implementation of the CNS/ATM systems in all the ICAO Regions. The purpose of the matrix was to provide a snapshot view of the status for comparative analysis of regional developments in air navigation systems and related fields. The meeting noted the information contained in the matrix with interest.

10.2 It was further noted that the presentation of a matrix-based data on the regional developments in air navigation systems will be an ongoing annual exercise. It was expected that the APANPIRG and its Sub-Groups would closely monitor development in all the regions as it would also facilitate inter-regional co-ordination.

10.3 IATA reminded States that by the time of this report receives appropriate approval, the time remaining for implementation, as agreed in 2000 and again in 2001, would be only 30 months for implementation of the ATN ground-to-ground infrastructure. The Secretariat also emphasized the need to take actions by States to ensure implementation within the established target date.

10.4 SITA provided information on a number of CNS/ATN developments are being undertaken with regard to air-ground communications. Current air-ground applications are based on FANS architecture using Satellite and VHF ACARS subnetworks. SITA is in the process of upgrading all VHF ACARS remote ground stations to comply with ICAO VHF datalink. The new SITA VHF Ground System (VGS) will have three operating modes:

10.4.1 Plain Old ACARS (POA) allowing for the support of existing airline applications and ACARS avionics. This service will continue to be supported on existing ACARS frequencies.

10.4.2 ACARS Over AVLC (Aviation VHF Link Control) where aircraft use the AEEC 618 protocol over the ICAO VDL standard AVLC link providing 31.5-kilobit per second capacity. This AOA architecture is very similar to the "ACARS over SATCOM " architecture used over the ICAO AMSS standard air-ground link. Aircraft using VDL AOA will obtain increased capacity over the VHF link but will only be able exchange the messages in the same ACARS formats used over the existing VHF analogue link.

10.4.3 ICAO VDL Mode 2 suitable for ATN based air-ground applications. This service will be fully ICAO SARPs compliant.

Next Meeting

10.5 The meeting appreciated the offer made by China to host the Fifth Meeting of the Task Force in Shanghai in March/April 2003. The exact date will be provided at the CNS/MET Sub-Group Meeting to be held in Bangkok from 15 to 19 July 2002.

10.6 The meeting also appreciated the offer made by Indonesia to host the Sixth Meeting of the Task Force in Indonesia in 2004.The date and venue of the Meeting will be advised at the Fifth Meeting of the Task Force.

Meeting Documents

10.7 The documents of this meeting including presentations are posted on the ICAO web site. The address is as follows: http://www.icao.int/apac/

Appendix A

INTERNATIONAL CIVIL AVIATION ORGANISATION

ASIA PACIFIC OFFICE

ATN DOCUMENTATION TREE

April 2002

Version 1.0

Published by the ICAO Asia and the Pacific Regional Office Bangkok

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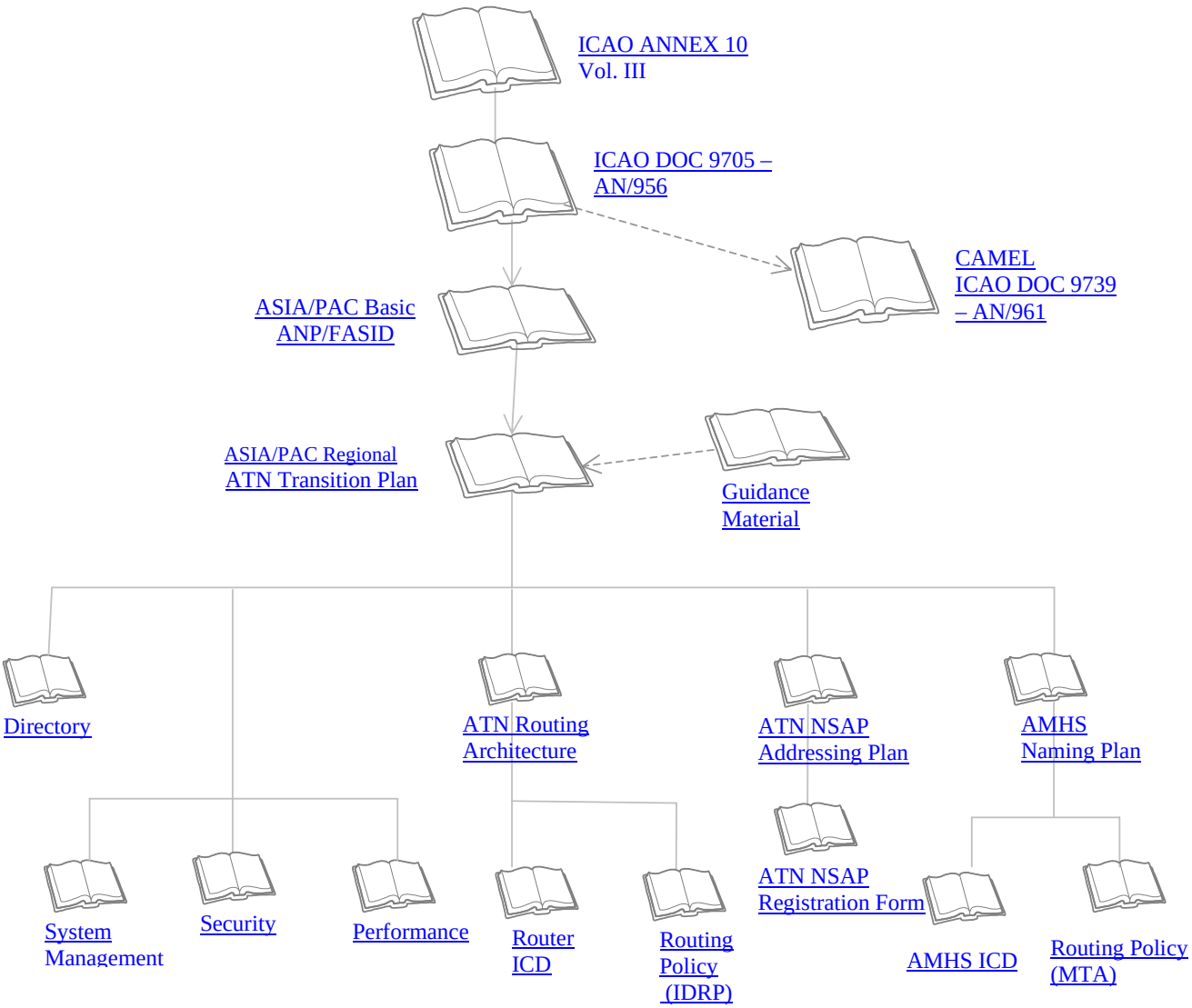
1 Scope

This document has been developed to serve as index and hierarchy of all documentations associated with the ATN in the Asia Pacific Region. A hierarchical representation of the relationships between the various documents is presented in section 2 “Documentation Tree”, with associated document descriptions located in section 3 “Documentation Profiles”.

2 Documentation Tree



3 Documentation Profiles

3.1 ICAO Annex10 Vol. III

Title:

International Standards and Recommended Practices, Aeronautical Telecommunications, Annex 10 Volume III.

Latest Version: March 2001

Purpose:

This ICAO document defines the Standards and Recommended Practices (SARPs) for the Aeronautical Telecommunications Network (ATN).

Contents:

Subjects covered by the document:

- Part I – Digital Data communication Systems.
  - Chapter 1 – Definitions.
  - Chapter 3 – Aeronautical Telecommunication Network.
  - Chapter 4 – Aeronautical Mobile-Satellite Service.
  - Chapter 6 – VHF Air-Ground Digital Link (VDL).
  - Chapter 8 – AFTN.
- Part II – Voice Communication Systems.
  - Chapter 2 – Aeronautical Mobile Service.
  - Chapter 4 – Aeronautical Speech Circuits.
  - Chapter 5 – Emergency Locator Transmitter (ELT) for search and rescue.

3.2 Manual of Technical Provisions for the Aeronautical Telecommunication Network - ICAO DOC 9705 – AN/956

Title:

Manual of Technical Provisions for the Aeronautical Telecommunication Network (ATN).

Latest Version: 3rd Edition

Purpose:

This ICAO manual contains detailed technical information and serves to further elaborate on the ATN standards as defined in Chapter 3 of Annex 10, Volume III, Part I.

Contents:

Subjects covered by the document:

- Sub-Volume I – Introduction and System Level Requirements.
- Sub-Volume II – Air-Ground Applications.
- Sub-Volume III – Ground-Ground Applications.
- Sub-Volume IV – Upper Layer Communications Services (ULCS).
- Sub-Volume V – Internet Communications Services (ICS).
- Sub-Volume VI – ATN Systems Management Provisions.
- Sub-Volume VII – ATN Directory Service.
- Sub-Volume VIII – ATN Security Service.
- Sub-Volume IX – ATN Identifier Registration.

3.3 Comprehensive Aeronautical Telecommunications Network Manual (CAMEL) - ICAO DOC 9739 – AN/961

Title:

Comprehensive Aeronautical Telecommunications Network (ATN) Manual.

Latest Version: 1st Edition - 2000

Purpose:

This document provides guidance material in support of the ATN SARPS as defined in Annex 10, Vol. III and Doc. 9705.

Contents:

Subjects covered by the document:

- Components, functionality and concepts of the ATN.
- ATN Internet lower layer routing protocols.
- ATN Upper layer application protocols.
- ATN subnetworks and corresponding SNDCF's layers.
- Air-ground applications, ADS, CPDLC, CM, FIS.
- Ground-Ground applications ATSMHS, AIDC.

3.4 Routing Policy (IDRP)

To be developed.

3.5 Routing Policy (MTA)

To be developed.

3.6 Directory

To be developed.

3.7 System Management

To be developed.

3.8 Performance

To be developed.

3.9 Security

To be developed.

3.10 Router ICD

To be developed.

3.11 ATN Ground-Ground Transition Plan

Title:

ASIA/PAC ATN Transition Plan.

Latest Version: 1.0

Purpose:

This document describes the transition activities that are to be performed by States in the region for a coordinated migration from AFTN to the new ATN environment.

Contents:

Subjects covered by the document:

- Existing ground infrastructure.
- ATN End system applications.
- ATN Traffic, both ground-ground and air-ground communication paths.
- ATN routing architecture.
- ATN backbone trunks.
- Interconnection of ATN routers.
- Transition activities.

Remarks:

Subsequent to discussions stemming from the CNS/MET SG/5 meeting much of the document's contents has been included into the CNS FASID. This document will under go no further revisions.

3.12 ATN Routing Architecture

Title:

ASIA/PAC ATN Routing Architecture.

Latest Version: 1.0

Purpose:

This document presents the routing architecture for the ground-ground infrastructure to eventually replace the existing AFTN. It is intended that this architecture will also be suitable for the accommodation of the air-ground communications traffic at some later time.

Contents:

Subjects covered by the document:

- Routing Domain Fundamentals.
- Router Fundamentals.
- ASIA/Pacific regional routing architecture.
- Routing domains.
- ATN Transition.

3.13 ATN NSAP Addressing Plan

Title:

ASIA/PAC ATN Addressing Plan.

Latest Version: 1.0

Purpose:

This document presents recommendations for the assignment of ATN NSAP addresses within the region. It also defines the methods by which values are assigned to each field of the NSAP Address and specifies the assumptions upon which the addressing format has been defined.

Contents:

Subjects covered by the document:

- NSAP Address structure adopted by states of the ASIA/PAC Region.
- Recommendations for the values of each field of the NSAP address.
- Authority responsible for NSAP field assignments.

3.14 AMHS Naming Plan

Title:

ASIA/PAC AMHS Naming Plan.

Latest Version: 1.0

Purpose:

This document presents recommendations for the AMHS naming conventions to be adopted by AMHS users within the region.

Contents:

Subjects covered by the document:

- MF-Addressing scheme.
- XF-Addressing scheme.
- Conventions for use of MF-Addressing Format.
- Conventions for use of XF-Addressing Format.
- General use of X.400 O/R Addresses.

3.15 ATN NSAP Registration Form

Title:

ASIA/PAC ATN NSAP Registration Form.

Latest Version: 1.0

Purpose:

This document specifies the information that is required for registration of devices that are to connect to the ATN environment within the Region.

Contents:

Subjects covered by the document:

- Registration of NSAP Addresses for ATN Routers and ATN End-System.
- Registration of Communication Circuits for ATN Routers and ATN End-Systems.

3.16 Guidance Material for Ground Elements in ATN Transition

Title:

Guidance Material for Ground Elements in ATN Transition.

Latest Version: 2.0

Purpose:

This document contains guidance material for ATN transition planning within the ASIA/PAC region.

Contents:

Subjects covered by the document:

- ATN overview
  - Ground-ground service components.
  - Air-ground service components.
  - ATN security service.
  - ATN system management.
  - ATN directory.
- Planning Issues to be considered
  - ATM operational concept.
  - Transition planning.
  - Implementation planning.
  - Proposed regional planning activities for transition.
  - Proposed State planning activities for transition.
- Guidance material for ground based elements
  - Integration of new and existing infrastructure.
  - Message service definition, benefit and procedure in inter-domain operation.
  - Guidance for administrative domain definition.
  - Guidance for architectural design of ATN ground elements.
  - Connection for inter-domain operation and guidance material.
  - Identification of traffic type, quality of service with respect to inter-domain operation.
  - Performance issues of reliability, maintainability, and reliability with respect to inter-domain operation.
  - Transition paths and transitional procedure in inter-domain operation.
  - Cost analysis of ATN ground elements in transitional development for inter-domain operation.
  - ATN security solution.

3.17 AMHS ICD

Title:

ICD for ATS Message Handling System (AMHS) in Asia/Pacific Region

Latest Version: 1.0

Purpose:

This ICD has been developed in order to facilitate interoperability between States in the deployment of AMHS within the ASIA/PAC region.

Contents:

Subjects covered by the document:

- AMHS functions.
- Network configuration.
- Protocol specification overview.
- AMHS specifications.
- Upper layer specifications.
- Lower layer specifications.
- AHMS PICS.

3.18 Facilities and Services Implementation Document (FASID)

Title:

Facilities and Services Implementation Document.

Latest Version: To be advised.

Purpose:

This document contains elements of Part IV, CNS of the ASIA/PAC FASID.

Contents:

Subjects covered by the document:

- Table 1A, AFTN/Data Circuit Plan.
- Table 1B, ATN Router Plan.
- Table 1C, ATSMHS Routing Plan.
- Table 1D, AIDC Circuit Plan.

ASIA/PAC (ICD)

ATS Message Handling System (AMHS)

Version 1.0

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DOCUMENT CONTROL LOG

Version	Revised contents	Date
1.0	Version 1.0 as endorsed by the ATNTTF.	9 April 2002

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1.2 AMHS Functions
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2. AMHS Specifications

2.1 Guidance for Optional Parameters
2.2 AMHS Specifications
2.3 Upper Layer Specifications
2.4 Lower Layer Specifications

Appendix: PICS of AMHS

<References>

1) ICAO Doc 9705/AN-956, “MANUAL OF TECHNICAL PROVISIONS FOR THE AERONAUTICAL TELECOMMUNICATION NETWORK (ATN)”, SECOND EDITION (Effective 10 December 1999)
   a) Sub-Volume I : 1.1 “DEFINITIONS AND REFERENCES”
   b) Sub-Volume III : 3.1 “ATS Message Handling Services (ATSMHS)
   c) Sub-Volume V : “Internet Communication Service”

2) ICAO Doc 9739/AN-961 Comprehensive ATN Manual (Edition 1)

3) ICAO Annex 10, Vol. II, Fifth edition (July 1995)

NOTE: This ICD does not include the additional features such as CIDIN/AMHS Gateway, Security and Directory Service which are added in ICAO Doc 9705/AN-965, THIRD EDITION. This ICD may be enhanced to include such additional features in the future.

1. Guidance for AMHS specification

1.1 Introduction

1.1.1 This document is the Interface Control Document (ICD) based on which the AMHS is to be implemented in the Asia/Pacific Region. It is essential that the implementation of the AMHS be fully compliant with ICAO ATN SARPs (Doc9705) as well as this ICD, in order to preserve interoperability between States and ensure that future ATN applications are accommodated. To assist the reader, the following clauses serve as an overview of the AMHS and its underlying network protocols.

1.2 AMHS Functions

1.2.1 The AMHS defines two End Systems, these being an AFTN/AMHS Gateway and an ATS Message Server (with ATS Message User Agent). It is expected that early implementations of AMHS will require the use of an AFTN/AMHS Gateway as during the transitional process to full AMHS AFTN may need to operate concurrently with AMHS either within or between outside States. However, it is also possible to replace AFTN with ATS Message Server (with User Agent) all at once, in this situation there will be no need for AFTN/AMHS Gateways as AFTN will not be required to coexist with AMHS.

NOTE: ATN Pass-Through Service (AFTN/ATN Type A Gateway) should not be implemented since it cannot be connected with AFTN/AMHS Gateway nor ATS Message Server. The description concerning the ATN Pass-Through Service has been deleted in the Third Edition of ICAO ATN SARPs. In addition, CIDIN/AMHS Gateway has been added as a new End System of AMHS in the Third Edition SARPs.

1.2.2 Even in the case that all the AFTN connections within States (i.e. domestic communication) are replaced with X.400 (MHS and NOT AMHS) connections, the connections outside State (i.e. international communication using ATN Routers) are to be complied with ICAO ATN SARPs and this ICD. When the domestic communication is implemented prior to the international communication, the domestic MHS Server may be so modified as to comply with ATN.

1.3 Network Configuration

1.3.1 The network configuration will grow according to the level of implementation of AMHS. The followings are the typical phases of AMHS implementation. The network configuration of each phase is shown in Figure 1.

1) Phase-1
AFTN connections are currently used for both all the domestic communication within State and all the international communication with other States.

2) Phase-2
AFTN/AMHS Gateways and ATN Routers are implemented for the international communication between at least two States.

3) Phase-3
Domestic AFTN connections are replaced with AMHS connections within State. AFTN/AMHS Gateway is enhanced to ATS Message Server. However, AFTN/AMHS Gateway System/Function remains for the AFTN connections (like State C in Figure). There may be AMHS-AMHS direct international communication (via ATN Routers) with the other States.

NOTE: It is a local matter whether to implement ATS Message Server and AFTN/AMHS Gateway in separated computer systems or in one computer system.

4) Phase-4
All the States in the Region implement either ATS Message Server or AFTN/AMHS Gateway and all the international communications are done by AMHS. There may be AMHS-AMHS direct international communication (via ATN Routers) with the other States.

5) Phase-5
AMHS connections are fully applied to both the domestic communication within States and the international communication with all the neighbor States.

6) Phase-6
Full ATN connection is applied within the Region. All the data of ATN applications including AMHS are exchanged through ATN Routers.

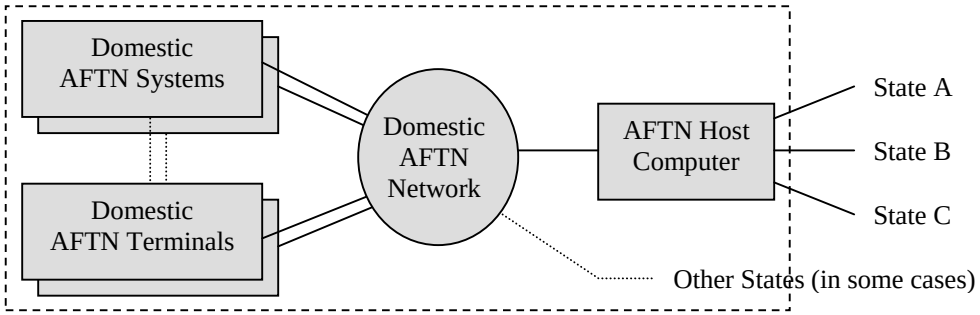
1.3.2 The systems in Figure 1 are as follows;

AMHS Gateway : AFTN/AMHS Gateway

AMHS Server : ATS Message Server (enhanced from AFTN/AMHS Gateway)

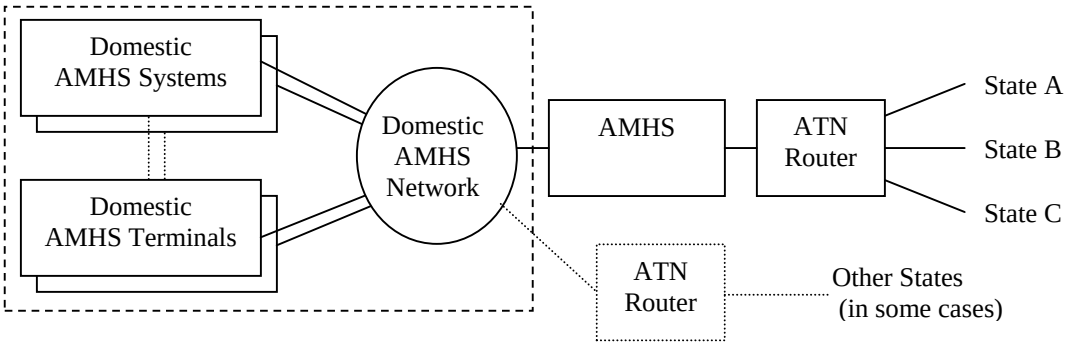
End Systems of ATN Applications
: End Systems of ATN applications including Air/Ground applications such as CM (Context Management), ADS (Automatic Dependent Surveillance), CPDLC (Controller and Pilot Data Link Communication) or FIS (Flight Information Service), whose ground to ground data is forwarded through the same ground network using ATN routers. The system may consist of computer(s) and/or equipment for ATN application for communication, ATM application, Human Machine Interface and maintenance.

AFTN System : AFTN host computer, domestic AFTN network and distributed AFTN systems/terminals (as shown below for an example)

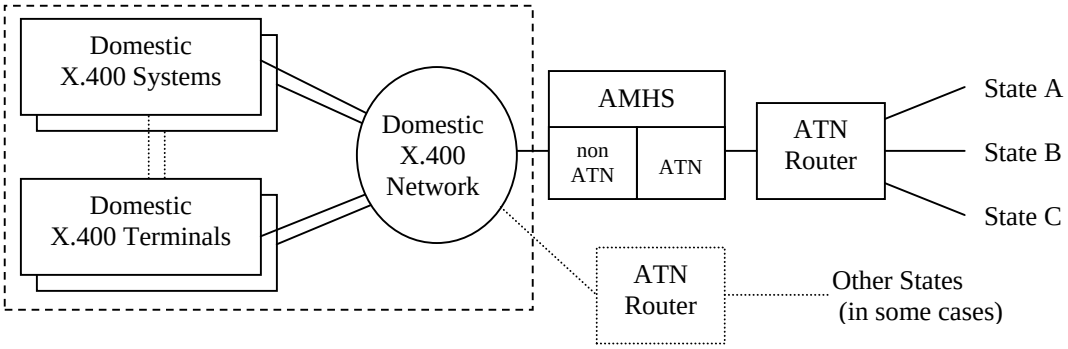


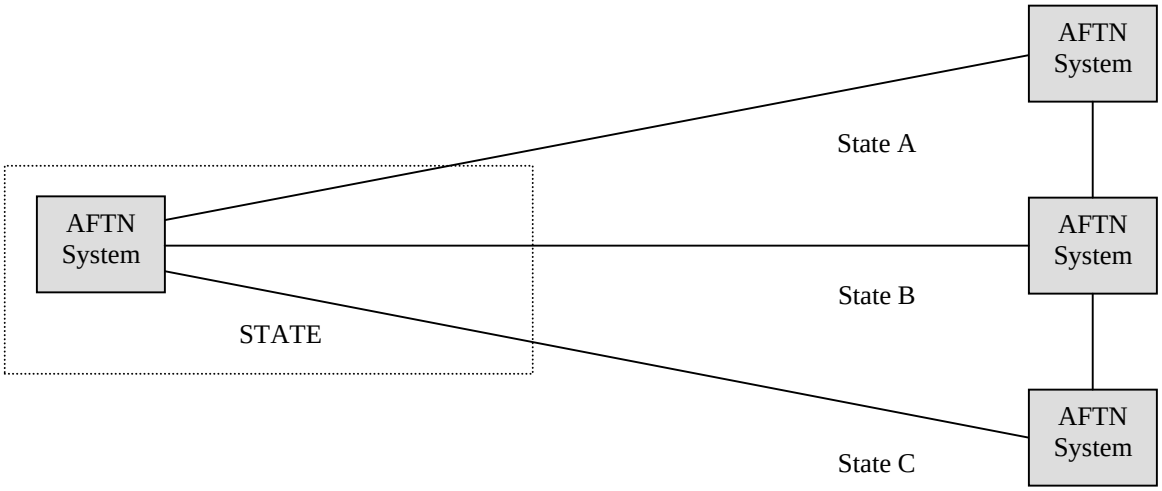
AMHS System : domestic AMHS (or X.400 MHS) network, distributed AMHS (or X.400 MHS) systems/terminals (User Agents) and AMHS (or X.400 MHS) local servers if necessary (as shown below for an example)

AMHS domestic connections

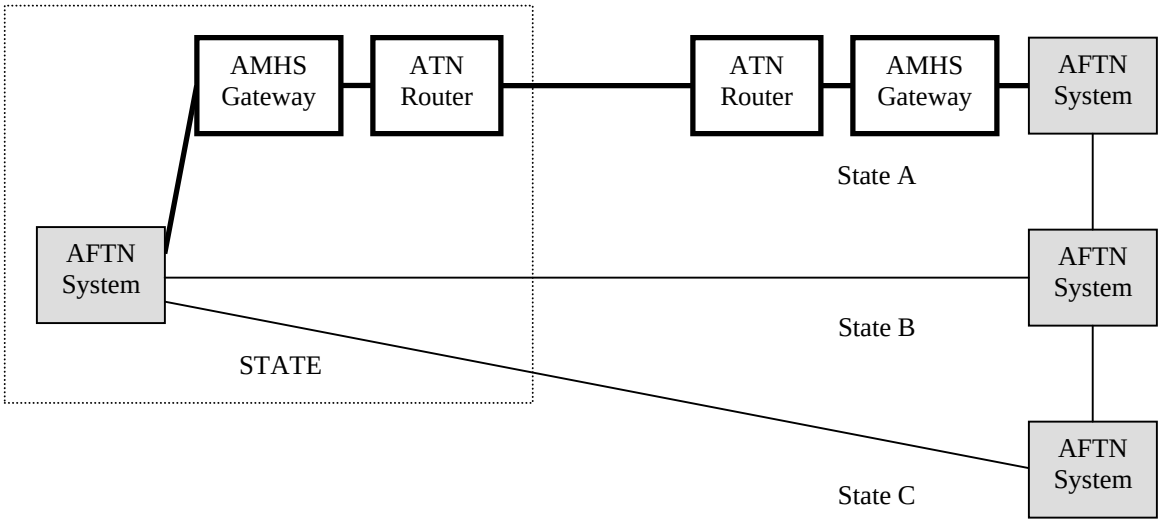


X.400 MHS domestic connections



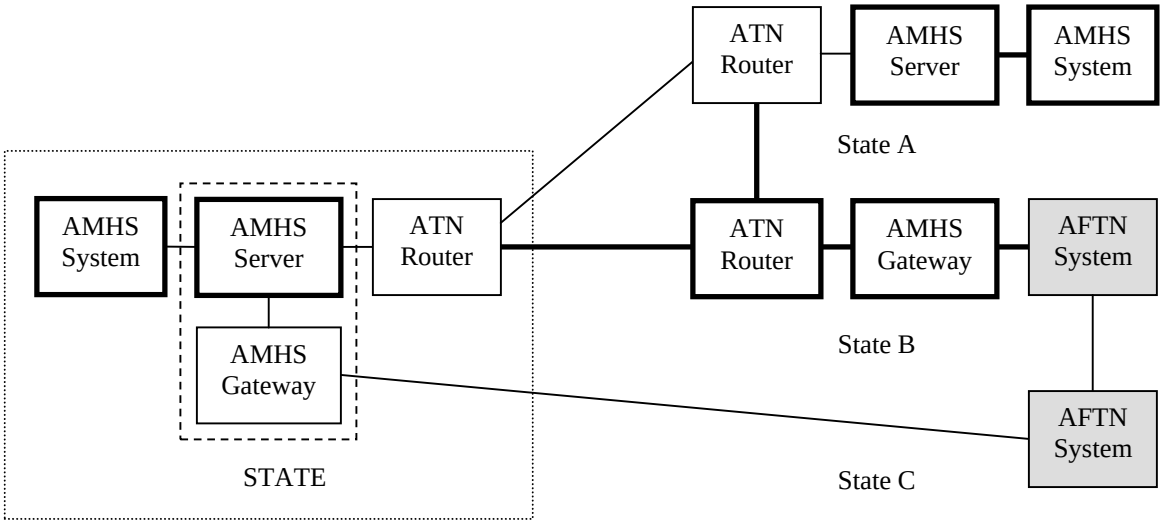


(1) Phase-1
Current AFTN connections

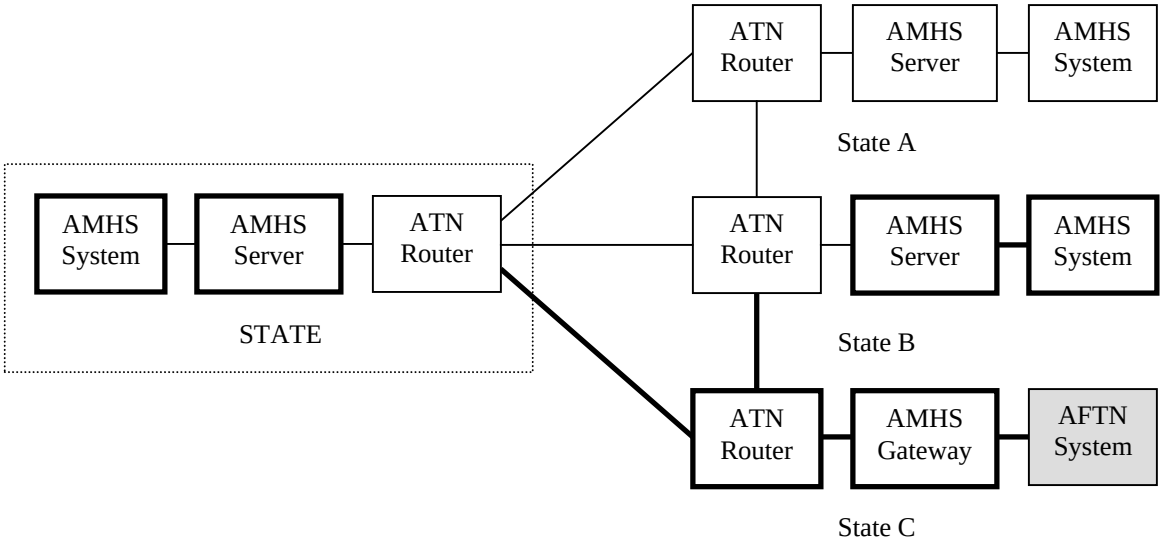


(2) Phase-2
Implementation of AFTN/AMHS Gateways and ATN Routers

Figure 1. AMHS Network Configuration (to be continued)

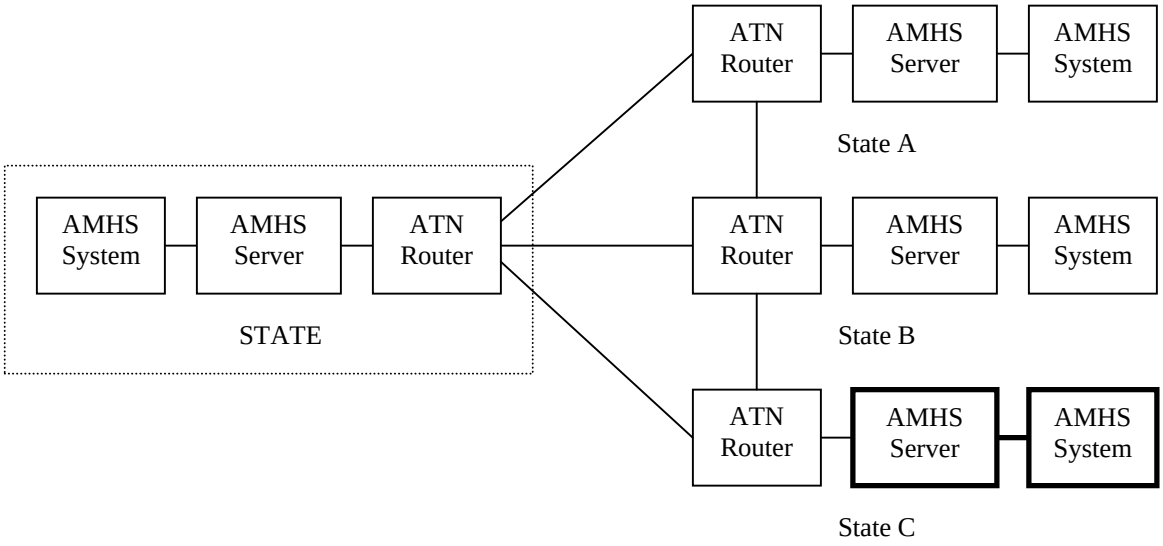


(3) Phase-3
Implementation of ATS Message Server and AMHS connections within State

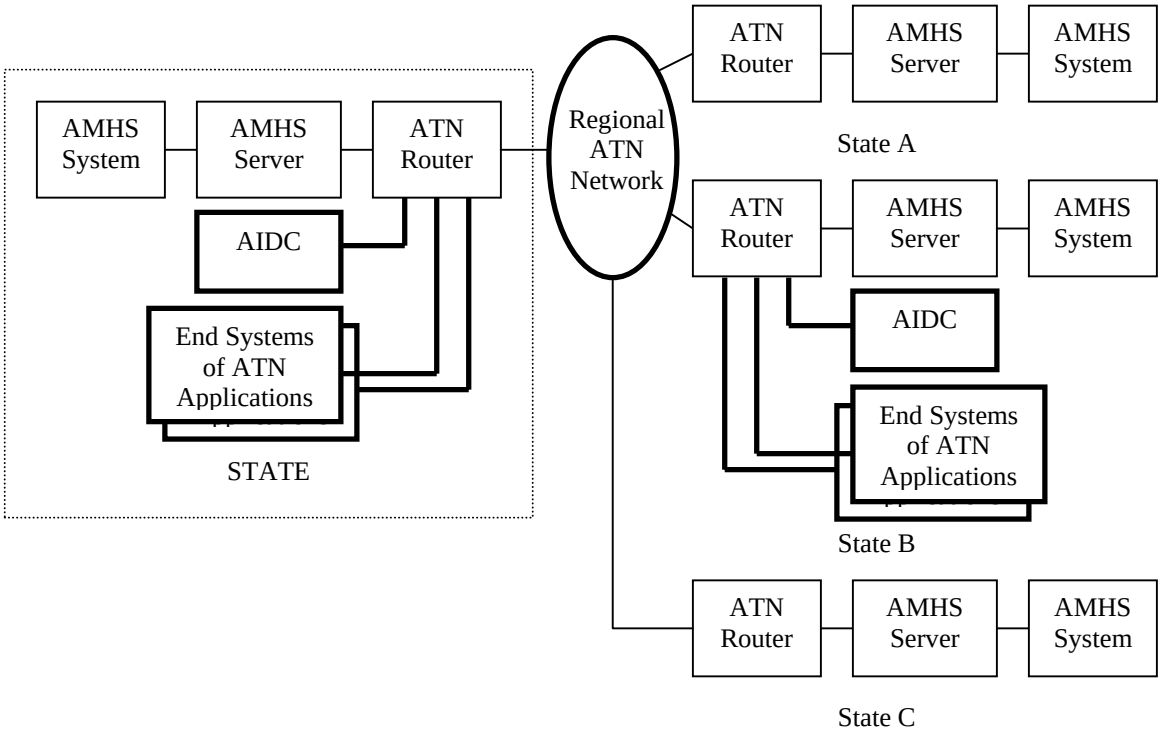


(4) Phase-4
Full AMHS international connections

Figure 1. AMHS Network Configuration (to be continued)



(5) Phase-5
Full AMHS connections



(6) Phase-6
Full ATN connections

Figure 1. AMHS Network Configuration

1.4 Protocol Specification Overview

1.4.1 Protocol Stack of AMHS and ATN Router

1.4.1.1 The following figure shows the OSI protocol stack of ES and IS in the ATN. AMHS is ES and ATN Router is IS.

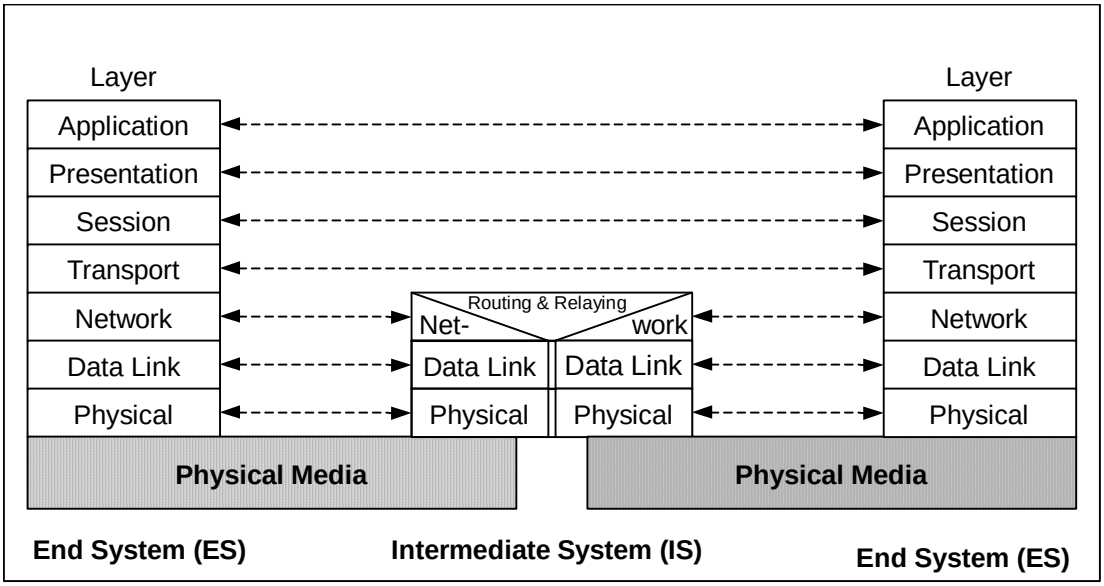


Figure 2. OSI Protocol Stack of ES and IS

1.4.2 AMHS Protocol Specification

1.4.2.1 The followings are the standards and/or ICAO Doc 9705/AN-956 descriptions of protocols at each OSI protocol layer, with which AMHS should comply.

(1) Application Layer

Application Layer is composed of MHS, RTSE, and ACSE.

MHS should comply with ITU-T X.400 (1988) and the additional requirements specified in 3.1 “ATS MESSAGE HANDLING SERVICE” of ICAO Doc 9705/AN-956. MHS supports all the mandatory elements of AMH11 and AMH21, and also supports the DL functional group.

RTSE should comply with ISO 9066-2 and support the mandatory services listed below among the services specified in ISO/IEC ISP 10611-2.

RT-OPEN
RT-CLOSE
RT-TRANSFER
RT-P-ABORT
RT-U-ABORT

ACSE should comply with ISO 8650 and support the mandatory functions of normal mode specified in ISO/IEC 10611-2. Moreover, the application-context name, which is used as a parameter of A-ASSOCIATE, should comply with ISO/IEC 10021-6.

(2) Presentation Layer

Presentation Layer should comply with ISO 8823 and support mandatory functions of normal mode specified in ISO/IEC ISP 10611-2.

(3) Session Layer

Session Layer should comply with ISO 8327 and support functional units listed below which are specified in ICAO Comprehensive ATN Manual and ISO/IEC ISP 10611-2.

Kernel
half duplex
exceptions
minor synchronize
activity management

(4) Transport Layer

COTP (Connection Oriented Transport Protocol) specified in ICAO Doc 9705/AN-956 should be used. COTP should comply with ISO/IEC8073 Class 4 and 5.5 “TRANSPORT SERVICE AND PROTOCOL SPECIFICATION” of ICAO Doc 9705/AN-956. The following functions should be supported as specified mandatory by ICAO Doc 9705/AN-956.

Both Initiating CR TPDU and Responding to CR TPDU	
Function of Non-use of checksum	
CR/CC/DR/DC/DT/ED/AK/EA/ER TPDUs	
Optional Parameters of CR/CC TPDUs	
	TSAP-ID (Transport-Selector designation)
	Additional option selection parameter
	Priority
	Acknowledgment time Negotiation
	Inactivity timer Negotiation
Optional Parameters of AK TPDU	
	Flow control confirmation
	Subsequence number

(5) Network Layer

The connection between AMHS and ATN Router may be a local matter. However, CLNP (Connectionless Network Protocol) should be used for the communication of subnetwork with Transport Layer. CLNP should comply with ISO/IEC8473 and 5.6 “INTERNETWORK SERVICE AND PROTOCOL SPECIFICATION” of ICAO Doc 9705/AN-956. The following functions should be supported as specified mandatory by ICAO Doc 9705/AN-956.

Security Parameter
Partial Route Recording
Priority
QoS Maintenance Information
Congestion Notification
X.25 Priority procedure

CLNP uses SNDCF (Subnetwork Dependent Convergence Function) over the subnetwork. SNDCF should comply with ISO/IEC 8473-3 and 5.7 “SPECIFICATION OF SUBNETWORK DEPENDENT CONVERGENCE FUNCTIONS” of ICAO Doc 9705/AN-956. Only ES-IS in compliance with ISO/IEC9543 is used for addressing. Routing protocol IDRP will not be supported.

(6) Data Link Layer

The connection between AMHS and ATN Router may be a local matter.

(7) Physical Layer

The connection between AMHS and ATN Router may be a local matter.

2. AMHS Specification

2.1 Guidance for Optional Parameters

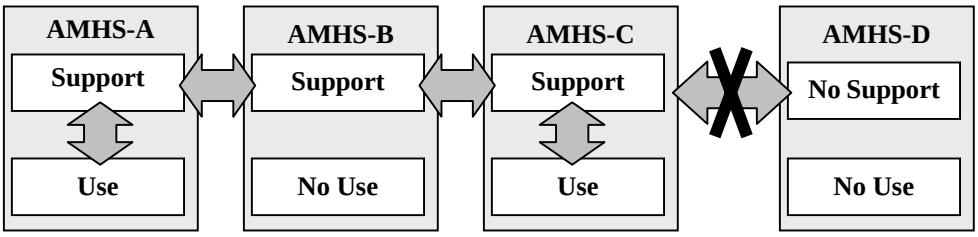
2.1.1 In the ICAO ATN SARPs (Doc 9705) as well as the International Standards, there are two kinds of parameters specified as “Mandatory” and “Optional”.

“Mandatory” parameters are the requirements that all the AMHS must handle the parameters.
“Optional” parameters are specified as local matters and the handling must be decided locally; within State or Region.

2.1.2 In addition, each handling of parameter is specified by two profiles: “AMHS Support” and “AMHS Use”.

“AMHS Support” means that the AMHS can receive or transfer the parameter.
“AMHS Use” means that AMHS uses the functionality specified by the parameter.

Conversely, “No Support” means that the AMHS cannot receive nor transfer the parameter, and “No Use” means that AMHS does not use the functionality.



AMHS-B does not use the optional parameter, however it can transfer the parameter.
AMHS-D does not support the optional parameter, therefore it cannot receive the parameter.
There is no combination of “No Support” with “Use”.

When AMHS-B receives the parameter, no action will be performed.
When AMHS-D receives the parameter, there may be some error, which will depend on the system.

2.1.3 In order to keep the interoperability within the State and/or Region, it is necessary to unify the handling of the optional parameters by specifying the “AMHS Support” and “AMHS Use” uniformly.

2.1.4 As for the Inter-Regional AMHS connection, it is also preferable to unify the specification between the regions. However, in case there will be difference, handling of such difference will be done at either of the following AMHSs:

1) AMHS in the region who wants to communicate directly with the AMHS in the other region.
   (This is the case when direct routing by BISs will be applied, where direct AMHS connection can be made.)

2) AMHS in the State who has Inter-Regional Trunk Connection by Backbone BIS.
   (This is the case when AMHS routing will be applied, where all the connection of the AMHS in the region with the other region will be made, all the time, via the AMHS in the said State.)

NOTE : The detail of the handling for the difference deeply depends on which parameter will be concerned and how. Therefore, it is recommended to discuss the issue in the region when it becomes revealed. It is also recommended to watch the status in the other regions.

2.2 AMHS Specifications

2.2.1 Set up condition of each parameter for both AFTN/AMHS Gateway and ATS Message Server is specified in the appendix in the form of PICS. (Appendix: PICS of AMHS)

2.2.2 When only ATS Message Server without AFTN/AMHS Gateway is implemented, some part (the column “AMHS Action”) in the PICS can be ignored.

2.3 Upper Layer Specifications

2.3.1 Protocol Specification

The meaning of the each column in the tables is as follows:

(1) PICS Proforma Reference

The first letter of the column identifies the specific PICS proforma.
- A : ACSE – ISO/IEC 8650-2
- P : Presentation – ISO/IEC 8823-2
- S : Session – ISO/IEC 8327-2

The characters from the second character to the solidus (/) form a reference to the specific sub clause in annex A of that PICS proforma which contains the table in question.

The number after the solidus references the row number in the table.

(2) Name of Item

(3) Normative reference

It is the referenced clause number in the ISO/IEC ISP 11188-1(1995).

(4) Status

Support Level is specified below:
- m : mandatory support
- o : optional support
- o.n : optional with at least one of the marked items with the same number “n” being selected
- c : conditional support
- i : out of scope
- – : not applicable

Where the status entry contains two classifications separated by a comma, these reference the sending and receiving capabilities respectively.

(5) Profile

The profile column reflects the requirement of this part of ISO/IEC ISP 11188. Each entry in this column is chosen from the following list:
- m : mandatory support
- C : conditional support
- i : out of scope

Where the profile entry contains two classifications separated by a comma, these reference the sending and receiving capabilities respectively.

The value of “Cxx” is “m” or “i” according to the specified condition described below the each table.

NOTE: The definition of the value of “Cxx” is made by the following procedures:
a) Confirm the item of reference number.

b) If AMHS supports referenced item, the item is "m" (mandatory).
c) If AMHS does not support referenced item, the item is "i" (out of scope).

<Example> The following is an example in the case of "support operation of Session version 2" for ACSE in the next clause 2.3.1.1.

1) Condition
C11: if A.A.7/1 (1st row in the table of A.7 of ISO/IEC 8650-2) then m else I

2) Procedures
a) The 1st row in the table of A.7 of ISO/IEC 8650-2 is the "Normal mode".
b) If AMHS supports "Normal mode", "support operation of Session version 2" is" m" (mandatory).
c) If AMHS does not support "Normal mode", "support operation of Session version 2" is "i" (out of scope).

(6) AMHS Use

The column "AMHS use" states whether each item is "used (yes)" or "not used (no)".

2.3.1.1 ACSE

2.3.1.1.1 ACSE should comply with ISO 8650 and support the level specified in ISO/IEC ISP 11188-1(1995).

PICS Proforma Reference	Name of Item	Normative reference	Status	Profile	AMHS Use
A.A.7/4 (4th row in the table of A.7 of ISO/IEC 8650-2)	support operation of Session version 2	9.2.1	o	C11	Yes

C11 : if A.A.7/1 (1st row in the table of A.7 of ISO/IEC 8650-2) then m else i

NOTE: The relation between the Initiator/responder roles of ACSE, presentation and session in specified in 2.2.2 and 2.2.3.

2.3.1.2 Presentation PRL

2.3.1.2.1 Presentation PRL should comply with ISO 8823 and should support the level specified in ISO/IEC ISP 11188-1(1995) and AMHS Requirements.

Table 1 ISO/IEC ISP 11188-1

PICS Proforma Reference	Name of Item	Normative reference	Status	Profile	AMHS Use
P.A.6.1/1 (1st row in the table of A.6.1 of ISO/IEC 8823-2)	X.410(1984)	2.2.2	o.01	C21	No
P.A.6.1/2 (2nd row in the table of A.6.1 of ISO/IEC 8823-2)	Normal	2.2.2	o.01	C22	Yes
P.A.7.1.1.1/1 (1st row in the table of A.7.1.1.1 of ISO/IEC 8823-2)	Initiator(Presentation connection)		o.03	C23	Yes
P.A.7.1.1.1/2 (2nd row in the table of A.7.1.1.1 of ISO/IEC 8823-2)	Responder(Presentation connection)		o.03	C24	Yes
P.A.7.1.1.3/1 (1st row in the table of A.7.1.1.3 of ISO/IEC 8823-2)	Requestor(orderly release)		o.05	C25	Yes
P.A.7.1.1.3/2 (2nd row in the table of A.7.1.1.3 of ISO/IEC 8823-2)	Acceptor (orderly release)		o.05	C26	Yes

C21 : if A.A.7/2 (2nd row in the table of A.7 of ISO/IEC 8650-2) then m else i
C22 : if A.A.7/1 (1st row in the table of A.7 of ISO/IEC 8650-2) then m else i
C23 : if A.A.6.1/1 (1st row in the table of A.6.1 of ISO/IEC 8650-2) then m else i
C24 : if A.A.6.1/2 (2nd row in the table of A.6.1 of ISO/IEC 8650-2) then m else i
C25 : if A.A.6.2/1 (1st row in the table of A.6.2 of ISO/IEC 8650-2) then m else i
C26 : if A.A.6.2/2 (2nd row in the table of A.6.2 of ISO/IEC 8650-2) then m else i

Table 2 AMHS Requirements

Name of Item	ISO/IEC 8823-1 Reference	ISO Support	AMHS Use
user-data of CP PPDU	8.2	Either Simply-Encoded-Data or Fully-Encoded-Data	Fully-Encoded-Data
user-data of CPA PPDU	8.2	Either Simply-Encoded-Data or Fully-Encoded-Data	Fully-Encoded-Data
user-data of CPR PPDU	8.2	Either Simply-Encoded-Data or Fully-Encoded-Data	Fully-Encoded-Data
presentation-data-values of PDV-list	8.4.2	Either single-ASN1-type, octet-aligned, or arbitrary	single-ASN1-type

2.3.1.3 Session PRL

2.3.1.3.1 Session PRL should comply with ISO 8327 and support the level specified in ISO/IEC ISP 11188-1 (1995).

PICS Proforma Reference	Name of Item	Normative reference	Status	Profile	AMHS Use
S.A.6.2/2 (2nd row in the table of A.6.2 of ISO/IEC 8327-2)	Reuse of transport connection		o	i	Yes
S.A.6.2/4 (4th row in the table of A.6.2 of ISO/IEC 8327-2)	Extended Concatenation (sending)		o	i	Yes
S.A.6.2/5 (5th row in the table of A.6.2 of ISO/IEC 8327-2)	Extended Concatenation (receiving)		o	i	Yes
S.A.7.1.1.1/1 (1st row in the table of A.7.1.1.1 of ISO/IEC 8327-2)	initiator (session connection)		o.3	C41	Yes
S.A.7.1.1.1/2 (2nd row in the table of A.7.1.1.1 of ISO/IEC 8327-2)	Responder (session connection)		o.3	C42	Yes
S.A.7.1.1.2/1 (1st row in the table of A.7.1.1.2 of ISO/IEC 8327-2)	Requestor (orderly release)		o.4	C43	Yes
S.A.7.1.1.2/2 (2nd row in the table of A.7.1.1.2 of ISO/IEC 8327-2)	Acceptor (orderly release)		o.4	C44	Yes
S.A.7.1.1.3/1 (1st row in the table of A.7.1.1.3 of ISO/IEC 8327-2)	Requestor (normal data transfer)		o.5	C45	Yes
S.A.7.1.1.3/2 (2nd row in the table of A.7.1.1.3 of ISO/IEC 8327-2)	Acceptor (normal data transfer)		o.5	C46	Yes
S.A.7.1.2/2 (2nd row in the table of A.7.1.2 of ISO/IEC 8327-2)	Overflow Accept (OA)	9.2.2	c5,c6	i,i	No, No
S.A.7.1.2/3 (3rd row in the table of A.7.1.2 of ISO/IEC 8327-2)	Connection Data Overflow (CDO)	9.2.2	c5,c6	i,i	No, No

PICS Proforma Reference	Name of Item	Normative reference	Status	Profile	AMHS Use
S.A.7.5.1/1 (1st row in the table of A.7.5.1 of ISO/IEC 8327-2)	Requestor (expedited data)		o.6	C47	No
S.A.7.5.1/2 (2nd row in the table of A.7.5.1 of ISO/IEC 8327-2)	Acceptor (expedited data)		o.6	C48	No
S.A.7.6.1/1 (1st row in the table of A.7.6.1 of ISO/IEC 8327-2)	Requestor (typed data)		o.7	C49	No
S.A.7.6.1/2 (2nd row in the table of A.7.6.1 of ISO/IEC 8327-2)	Acceptor(typed data)		o.7	C50	No
S.A.7.7.1/1 (1st row in the table of A.7.7.1 of ISO/IEC 8327-2)	Requestor (capability data)		o.8	C51	No
S.A.7.7.1/2 (2nd row in the table of A.7.7.1 of ISO/IEC 8327-2)	Acceptor (capability data)		o.8	C52	No
S.A.7.8.1/1 (1st row in the table of A.7.8.1 of ISO/IEC 8327-2)	Requestor (minor synchronize)		o.9	C53	Yes
S.A.7.8.1/2 (2nd row in the table of A.7.8.1 of ISO/IEC 8327-2)	Acceptor (minor synchronize)		o.9	C54	Yes
S.A.7.11.1/1 (1st row in the table of A.7.11.1 of ISO/IEC 8327-2)	Requestor (major synchronize)		o.10	C55	No
S.A.7.11.1/2 (2nd row in the table of A.7.11.1 of ISO/IEC 8327-2)	Acceptor (major synchronize)		o.10	C56	No
S.A.7.14.1.1/1 (1st row in the table of A.7.14.1.1 of ISO/IEC 8327-2)	Requestor (activity start)		o.12	C57	Yes
S.A.7.14.1.1/2 (2nd row in the table of A.7.14.1.1 of ISO/IEC 8327-2)	Acceptor (activity start)		o.12	C58	Yes
S.A.7.14.1.2/1	Requestor (activity resume)		o.13	C59	Yes

PICS Proforma Reference	Name of Item	Normative reference	Status	Profile	AMHS Use
(1st row in the table of A.7.14.1.2 of ISO/IEC 8327-2)					
S.A.7.14.1.2/2 (2nd row in the table of A.7.14.1.2 of ISO/IEC 8327-2)	Acceptor (activity resume)		o.13	C60	Yes
S.A.7.14.1.3/1 (1st row in the table of A.7.14.1.3 of ISO/IEC 8327-2)	Requestor (activity interrupt)		o.14	C61	Yes
S.A.7.14.1.3/2 (2nd row in the table of A.7.14.1.3 of ISO/IEC 8327-2)	Acceptor (activity interrupt)		o.14	C62	Yes
S.A.7.14.1.4/1 (1st row in the table of A.7.14.1.4 of ISO/IEC 8327-2)	Requestor (activity discard)		o.15	C63	Yes
S.A.7.14.1.4/2 (2nd row in the table of A.7.14.1.4 of ISO/IEC 8327-2)	Acceptor (activity discard)		o.15	C64	Yes
S.A.7.14.1.5/1 (1st row in the table of A.7.14.1.5 of ISO/IEC 8327-2)	Requestor (activity end)		o.16	C65	Yes
S.A.7.14.1.5/2 (2nd row in the table of A.7.14.1.5 of ISO/IEC 8327-2)	Acceptor (activity end)		o.16	C66	Yes
S.A.7.14.1.6/1 (1st row in the table of A.7.14.1.6 of ISO/IEC 8327-2)	Requestor (give tokens confirm)		o	C67	Yes
S.A.7.14.1.6/2 (2nd row in the table of A.7.14.1.6 of ISO/IEC 8327-2)	Acceptor (give tokens confirm)		o	C68	Yes
S.A.8.1.3/4 (4th row in the table of A.8.1.3 of ISO/IEC 8327-2)	Data Overflow Item (CN)	9.2.2	c6,c5	i, i	No, No

1) Status

c5 : Condition is to support “Responder (session connection)”.
c6 : Condition is to support “Requestor (orderly release)”.

2) Profile

C41 : if A.A.6.1/1 (1st row in the table of A.6.1 of ISO/IEC 8650-2) then m else i
C42 : if A.A.6.1/2 (2nd row in the table of A.6.1 of ISO/IEC 8650-2) then m else i
C43 : if A.A.6.2/1 (1st row in the table of A.6.2 of ISO/IEC 8650-2) then m else i
C44 : if A.A.6.2/2 (2nd row in the table of A.6.2 of ISO/IEC 8650-2) then m else i
C45 : if P.A.7.1.1.2/1 (1st row in the table of A.7.1.1.2 of ISO/IEC 8823-2) then m else i
C46 : if P.A.7.1.1.2/2 (2nd row in the table of A.7.1.1.2 of ISO/IEC 8823-2) then m else i
C47 : if P.A.7.4.4/1 (1st row in the table of A.7.4.4 of ISO/IEC 8823-2) then m else i
C48 : if P.A.7.4.4/2 (2nd row in the table of A.7.4.4 of ISO/IEC 8823-2) then m else i
C49 : if P.A.7.4.5/1 (1st row in the table of A.7.4.5 of ISO/IEC 8823-2) then m else i
C50 : if P.A.7.4.5/2 (2nd row in the table of A.7.4.5 of ISO/IEC 8823-2) then m else i
C51 : if P.A.7.4.6/1 (1st row in the table of A.7.4.6 of ISO/IEC 8823-2) then m else i
C52 : if P.A.7.4.6/2 (2nd row in the table of A.7.4.6 of ISO/IEC 8823-2) then m else i
C53 : if P.A.7.4.7/1 (1st row in the table of A.7.4.7 of ISO/IEC 8823-2) then m else i
C54 : if P.A.7.4.7/2 (2nd row in the table of A.7.4.7 of ISO/IEC 8823-2) then m else i
C55 : if P.A.7.4.10/1 (1st row in the table of A.7.4.10 of ISO/IEC 8823-2) then m else i
C56 : if P.A.7.4.10/2 (2nd row in the table of A.7.4.10 of ISO/IEC 8823-2) then m else i
C57 : if P.A.7.4.13.1/1 (1st row in the table of A.7.4.13.1 of ISO/IEC 8823-2) then m else i
C58 : if P.A.7.4.13.1/2 (2nd row in the table of A.7.4.13.1 of ISO/IEC 8823-2) then m else i
C59 : if P.A.7.4.13.2/1 (1st row in the table of A.7.4.13.2 of ISO/IEC 8823-2) then m else i
C60 : if P.A.7.4.13.2/2 (2nd row in the table of A.7.4.13.2 of ISO/IEC 8823-2) then m else i
C61 : if P.A.7.4.13.3/1 (1st row in the table of A.7.4.13.3 of ISO/IEC 8823-2) then m else i
C62 : if P.A.7.4.13.3.2 (2nd row in the table of A.7.4.13.3 of ISO/IEC 8823-2) then m else i
C63 : if P.A.7.4.13.4/1 (1st row in the table of A.7.4.13.4 of ISO/IEC 8823-2) then m else i
C64 : if P.A.7.4.13.4/2 (2nd row in the table of A.7.4.13.4 of ISO/IEC 8823-2) then m else i
C65 : if P.A.7.4.13.5/1 (1st row in the table of A.7.4.13.5 of ISO/IEC 8823-2) then m else i
C66 : if P.A.7.4.13.5/2 (2nd row in the table of A.7.4.13.5 of ISO/IEC 8823-2) then m else i
C67 : if P.A.7.4.13.6/1 (1st row in the table of A.7.4.13.6 of ISO/IEC 8823-2) then m else i
C68 : if P.A.7.4.13.6/2 (2nd row in the table of A.7.4.13.6 of ISO/IEC 8823-2) then m else i

2.4 Lower Layer Specifications

2.4.1 Protocol Implementation Conformance Statements of COTP

2.4.1.1 In protocol layer 4, ICS SARPs recommend COTP. The functions of COTP are specified below.

(1) "ATN Support" indicates that the item is Mandatory ("M"), Option ("O") or Mandatory implemented and Optionally used ("MO").
(2) "AMHS Support" indicates whether the item is Supported ("yes") or NOT Supported ("no").
(3) "AMHS Use" indicates whether the item is Used ("yes") or NOT Used ("no") in transfer.

Table 1 Support Class

Class	ATN Support	AMHS Support	AMHS Use
Class 0	O	no	no
Class 1	O	no	no
Class 2	O	no	no
Class 3	O	no	no
Class 4 operation over CONS	O	no	no
Class 4 operation over CLNS	M	yes	yes

Table 2 ATN Requirements

Feature	ATN Support	AMHS Support	AMHS Use
Congestion Avoidance	M	yes	yes
Transport to Network Priority	M	yes	yes
ATN Security Label	M	yes	yes
Configurable Transport Timers	M	yes	yes
Enhanced encoding of Acknowledgment Time Parameter	M	yes	yes

NOTE: Implementation of the transport protocol shall support configurable values for all timers and protocol parameters, rather than having fixed values, in order to allow modification as operational experience is gained. The actual values of transport timers are to be determined through bilateral agreement on the AMHS systems connected each other. (See the Clause 2.4.2).

Table 3 Initiator/Responder Capability

Class	ATN Support	AMHS Support	AMHS Use
Initiating CR TPDU	M	yes	yes
Responding to CR TPDU	M	yes	yes

Table 4 Mandatory Functions

Function	ATN Support	AMHS Support	AMHS Use
TPDU transfer	M	yes	yes
Segmenting	M	yes	yes
Reassembling	M	yes	yes
Separation	M	yes	yes
Connection establishment	M	yes	yes
Connection refusal	M	yes	yes
Data TPDU numbering (normal)	M	yes	yes
Retention and acknowledgement of TPDUs (AK)	M	yes	yes
Explicit flow control	M	yes	yes
Checksum	M	yes	yes
Frozen references	M	yes	yes
Retransmission on time-out	M	yes	yes
Resequencing	M	yes	yes
Inactivity control	M	yes	yes

Table 5 Optional Functions

Feature	ATN Support	AMHS Support	AMHS Use
Data TPDU numbering (extended)	O	yes	yes
Non-use of checksum	M	yes	yes
Concatenation	O	no	no
Retention and acknowledgement of TPDUs Use of selective acknowledgement	O	no	no
Retention and acknowledgement of TPDUs Use of request acknowledgement	O	no	no

Table 6 Supported TPDUs

TPDUs		ATN Support	AMHS Support	AMHS Use
CR	supported on transmission	M	yes	yes
CR	supported on receipt	M	yes	yes
CC	supported on transmission	M	yes	yes
CC	supported on receipt	M	yes	yes
DR	supported on transmission	M	yes	yes
DR	supported on receipt	M	yes	yes
DC	supported on transmission	M	yes	yes
DC	supported on receipt	M	yes	yes
DT	supported on transmission	M	yes	yes
DT	supported on receipt	M	yes	yes
ED	supported on transmission	MO	no	no
ED	supported on receipt	MO	no	no
AK	supported on transmission	M	yes	yes
AK	supported on receipt	M	yes	yes
EA	supported on transmission	MO	no	no
EA	supported on receipt	MO	no	no
ER	supported on receipt	M	yes	yes

Table 7 Parameter Values for CR TPDU

Feature	ATN Support	AMHS Support	AMHS Use
Bits 8 and 7 in the additional options selection parameter of a CR TPDU set to zero	M	yes	yes

Table 8 Optional Parameter for a CR TPDU

Supported parameters	ATN Support	AMHS Support	AMHS Use
Called Transport-Selector	M	yes	yes
Calling Transport-Selector	M	yes	yes
TPDU size	O	no	no
Version Number	O	no	no
Protection parameters	O	no	no
Additional option selection	M	yes	yes
Throughput	O	no	no
Residual error rate	O	no	no
Priority	M	yes	yes
Transit delay	O	no	no
Acknowledgement time	M	yes	yes
Preferred maximum TPDU size	O	no	no
Inactivity timer	M	yes	yes

Table 9 Optional Parameter for a CC TPDU

Supported parameters	ATN Support	AMHS Support	AMHS Use
Called Transport-Selector	M	yes	yes
Calling Transport-Selector	M	yes	yes
TPDU size	O	no	no
Protection parameters	O	no	no
Additional option selection	M	yes	yes
Throughput	O	no	no
Residual error rate	O	no	no
Priority	M	yes	yes
Transit delay	O	no	no
Acknowledgement time	M	yes	yes
Preferred maximum TPDU size	O	no	no
Inactivity timer	M	yes	yes

Table 10 Optional Parameter for a DR TPDU

Supported parameter	ATN Support	AMHS Support	AMHS Use
Additional information	O	no	no

Table 11 Optional Parameter for a DT TPDU

Supported parameter	ATN Support	AMHS Support	AMHS Use
Request of acknowledgement	M	yes	no

Table 12 Optional Parameter for an AK TPDU

Supported parameter	ATN Support	AMHS Support	AMHS Use
Flow control confirmation	M	yes	yes

Table 13 Subsequence Number Parameter in the AK TPDU

Supported parameter	ATN Support	AMHS Support	AMHS Use
Subsequence number	M	yes	yes

Table 14 Selective Acknowledgement Parameter in the AK TPDU

Supported parameter	ATN Support	AMHS Support	AMHS Use
Selective acknowledgement parameters	O	no	no

Table 15 Optional Parameter for an ER TPDU

Supported parameter	ATN Support	AMHS Support	AMHS Use
Invalid TPDU	O	no	no

Table 16 User Data in Issued TPDUs

User Data	ATN Support	AMHS Support	AMHS Use
User data of up to 32 octets in a CR with preferred class 4 ?	M	yes	yes
User data of up to 32 octets in a CC ?	M	yes	yes
User data of up to 64 octets in a DR ?	M	yes	yes

Table 17 User Data in Received TPDUs

User Data	ATN Support	AMHS Support	AMHS Use
32 octets of user data in a CC TPDU ?	M	yes	yes
64 octets of user data in a DR TPDU ?	M	yes	yes
32 octets of user data in a CR TPDU ?	M	yes	yes

Table 18 Class Negotiation - Initiator

Feature	ATN Support	AMHS Support	AMHS Use
The preferred class in the CR TPDU may contain any of the classes supported by the implementation	Class 4	Class 4	Class 4

Table 19 The table below specifies valid alternative classes

Preferred class	ATN Support	AMHS Support	AMHS Use
Class 4 over CLNS	None	None	None

Table 20 Class negotiation - responder side

Preferred class	ATN Support	AMHS Support	AMHS Use
What classes can you respond with if CR proposes only class 4?	Class 4	Class 4	Class 4
What classes can you respond with if CR proposes class 4 as preferred class and the alternative class parameter is present?	Class 4	Class 4	Class 4

Table 21 TPDU Size Negotiation

TPDU Size	ATN Support	AMHS Support	AMHS Use
If maximum TPDU size is proposed in a CR TPDU then the initiator shall support all TPDU sizes from 128 octets to the maximum proposed	M	yes	yes
If the preferred maximum TPDU size parameter is used in a CR TPDU then the initiator shall support all TPDU sizes, except 0, that are multiples of 128 octets up to the preferred maximum proposed	M	yes	yes
What is the largest value of the preferred maximum TPDU size parameter in a CR TPDU?	any multiple of 128 octets	any multiple of 128 octets	any multiple of 128 octets
What is the largest value of the preferred maximum TPDU size parameter in a CC TPDU?	any multiple of 128 octets	any multiple of 128 octets	any multiple of 128 octets
What is the largest value of the maximum TPDU size parameter in a CR TPDU with preferred class 4?	One of 128, 256, 512, 1024, 2048	One of 128, 256, 512, 1024, 2048	One of 128, 256, 512, 1024, 2048
What is the largest value of the maximum TPDU size parameter which may be sent in the CC TPDU when class 4 is selected?	128, 256, 512, 1024, 2048	128, 256, 512, 1024, 2048	128, 256, 512, 1024, 2048

Table 22 Use of Extended Format

Extended format	ATN Support	AMHS Support	AMHS Use
What formats can you propose in the CR TPDU in class 4?	normal, extended	extended	extended
What formats can you select in CC when extended has been proposed in CR in class 4?	normal, extended	extended	extended

NOTE: Extended format is needed to be selected for the use of the Data TPDU numbering (extended) (see the Table 5 in this Clause). The Data TPDU numbering (extended) is able to increase the throughput of messages between AMHS systems by increasing the number of the data which can be sent without waiting for the acknowledgement from the other AMHS system.

Table 23 Expedited data Transport service

Expedited data	ATN Support	AMHS Support	AMHS Use
Is the expedited data indication supported in CR and CC TPDU?	MO	yes	yes

Table 24 Non-use of Checksum

Non-use of checksum	ATN Support	AMHS Support	AMHS Use
What proposals can you make in the CR?	non-use, use	use	non-use
What proposals can you make in CC when non-use of checksum has been proposed in CR?	non-use, use	use	non-use

Table 25 Use of selective acknowledgement

Selective Acknowledgement	ATN Support	AMHS Support	AMHS Use
Is use of selective acknowledgement proposed in CR TPDUs ?	O	no	no
Is use of selective acknowledgement selected in a CC when it has been proposed in a CR ?	O	no	no

Table 26 Use of Request Acknowledgement

Request of Acknowledgement	ATN Support	AMHS Support	AMHS Use
Is use of request of acknowledgement proposed in CR TPDUs ?	O	no	no
Is use of request of acknowledgement selected in a CC when it has been proposed in a CR ?	O	no	no

Table 27 Action on Detection of a Protocol Error

Item	ATN Support	AMHS Support	AMHS Use
Class 4 over CLNS	ER, DR, Discard	ER, DR, Discard	ER, DR, Discard

Table 28 Actions on receipt of an invalid or undefined parameter in a CR TPDU

Event	ATN Support	AMHS Support	AMHS Use
A parameter not defined in ISO/IEC 8073 shall be ignored	M	yes	yes
An invalid value in the alternative protocol class parameter shall be treated as a protocol error	M	yes	yes
An invalid value in the class and option parameter shall be treated as a protocol error	M	yes	yes
On receipt of the additional option selection parameter bits 8 to 7, and bits 6 to 1 if not meaningful for the proposed class, shall be ignored	M	yes	yes
On receipt of the class option parameter bits 4 to 1 if not meaningful for the proposed class shall be ignored	M	yes	yes
What action is supported on receipt of a parameter defined in ISO 8073 (other than those covered above) and having an invalid value ?	Ignore, Protocol Error	Ignore, Protocol Error	Ignore, Protocol Error

Table 29 Actions on receipt of an invalid or undefined parameter in a TPDU other than a CR

Event	ATN Support	AMHS Support	AMHS Use
A parameter not defined in ISO/IEC 8073 shall be treated as a protocol error	M	yes	yes
A parameter which has an invalid value as defined in ISO/IEC 8073 shall be treated as a protocol error	M	yes	yes
A TPDU received with a checksum which does not satisfy the defined formula shall be discarded	M	yes	yes

Table 30 Class 4 Timers and Protocol Parameters

Parameters	ATN Support	AMHS Support	AMHS Use
T1 (Local Retransmission)	M	yes	yes
N (Maximum Transmission)	M	yes	yes
I_L (Local Inactivity Time)	M	yes	yes
W (Window Update)	M	yes	yes
L (Frozen Reference Time)	M	yes	yes
R (Persistence)	O	no	no
M_{LR} (NSDU Lifetime)	O	no	no
M_{RL} (NSDU Lifetime)	O	no	no
E_{LR} (Maximum Transit Delay)	O	no	no
E_{RL} (Maximum Transit Delay)	O	no	no
A_L (Acknowledgement Time)	M	yes	yes
A_R (Acknowledgement Time)	M	yes	yes
I_R (Remote Inactivity Time)	M	yes	yes
Does IUT support optional timer TS2 when operating in class 4?	O	no	no

2.4.2 Parameter values

2.4.2.1 The range of values set in the protocol layer 3 and 4 of AMHS are specified below. The actual values are to be determined through bilateral agreement on the AMHS systems connected each other.

2.4.2.2 The following table shows only the parameters, which may influence interoperability. Other parameters are also to be determined through the bilateral agreement.

Parameters set or set to the frame are shown in the following table.

Name	Lower	Upper
Local Retransmission Time(T1){COTP}[SEC]	12	300
Window Time(W){COTP}[SEC]	160	6000
Maximum Number of Transmissions(N){COTP}	1	10
Maximum size of TPDU{COTP}[OCTETS]	1024	1024
Lifetime{CLNS}[IN UNITS OF 500MSEC]	10	30
Reassembly Time{CLNS}[IN UNITS OF 500MSEC]	10	30

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Appendix: PICS of AMHS

This appendix specifies the PICS of AMHS for both AFTN/AMHS Gateway and ATS Message Server. When only ATS Message Server without AFTN/AMHS Gateway is implemented, the column "AMHS Action" in the tables can be ignored.

Followings are the contents included in this appendix.

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INTRODUCTION

Description of each column in the table header is as follows;

"support" indicates the specification in the ISP and in the SARPs (ICAO ATN SARPs) respectively. The contents in the table are extracted from the ISP and the SARPs.

"AMHS-Action" indicates the specified action at Origination and at Reception in the SARPs. Please refer to the "Action" column in the SARPs. The contents in the table are extracted from the SARPs.

"AMHS-support" indicates the status of AMHS to be implemented.

"Detailed Action" indicates the detailed action specified in the SARPs, when it is described in the SARPs. The contents in the table are extracted from the SARPs.

"Origination" and "Reception" are also the terms described in the SARPs. They are abbreviated as “O” and “R” respectively in the column of “AMHS-Action” and “AMHS-support” in the table headings.

Definition of each support level and actions is specified in the table below :

support level and actions	Origination	Reception
M	The value is always set.	It is mandatory to set the value.
O	The value is set on conditions.	When the value is set, service is provided.
M-	-	Only the minimal support of this element. 1) allowed to set the value but no service provided 2) value is transparent when relayed
X	The value is not set.	When the value exists, it is considered to be an error.
T	Translated.	Translated.
G	Generated.	-
G1	Optionally generated.	-
G2	Conditionally generated.	-
D	-	Discarded.

1. Message Transfer Envelope for IPM

Table 1.1 Message Transfer Envelope
(Based on : ATSMHS SARPs Table 3.1.2-6 for O, Table 3.1.2-12 for R)

NO.	element	support		AMHS-Action		AMHS-support		size	Detailed Action		Note
		ISP	SARPs	O	R	O	R		Origination	Reception	
1	MessageTransferEnvelope	M	M	T	T	M	M	-			
1.1	per message fields										
1.1.1	message-identifier	M	M	G	D	M	M	-			See Table 2/1
1.1.2	originator-name	M	M	T	T	M	M	-			
1.1.3	original-encoded-information-types	O	M	G	D	M	M	-			
1.1.4	content-type	M	M	G	D	M	M	-	BuiltInContentType is set the abstract value "interpersonal-messaging-1984(2)"	If the value of BuiltInContentType is neither interpersonal-messaging-1984(2) nor interpersonal-messaging-1988(22), then generate NDR[NDRC=1,NDDC=15].	
1.1.5	content-identifier	O	M-	G	D	M	M-	<=16			"G"
1.1.6	priority	M	M	T	D	M	M	-			
1.1.7	per-message-indicators	M	M	G	D	M	M	-			See Table 1.2/4
1.1.8	deferred-delivery-time	O	M-	G	D	M	M-	-			
1.1.9	per-domain-bilateral-information	O	M-	X	D	X	M-	-			
1.1.10	trace-information	M	M	G	D	M	M	-			
1.1.11	extensions	M	M	G	D	M	O	-			In X.400, if the value doesn't exist, it is considered to be not selected.

NO.	element	support		AMHS-Action		AMHS-support		size	Detailed Action		Note
		ISP	SARPs	O	R	O	R		Origination	Reception	
	type	M	M	G	D	M	M	-			Only supports "standard-extension".
	criticality	M	M	G	D	M	M	-			In X.400, if the value doesn't exist, it is considered to be not selected.
	value	M	M	M	D	M	M	-	Set the value of "internal-trace-information"		
1.1.11.1	recipient-reassignment-prohibited	O	M-	X	D	X	M-	-			
1.1.11.2	dl-extension-prohibited	O	M-	X	D	X	M-	-			
1.1.11.3	conversion-with-loss-prohibited	O	M-	X	D	X	M-	-			
1.1.11.4	latest-delivery-time	O	M-	X	D	X	O	-		If this exists, and the current time exceeds the value, then generate NDR[NDRC=1,NDDC=5].	
1.1.11.5	originator-return-address	O	M-	X	D	X	M-	-			
1.1.11.6	originator-certificate	O	M-	X	X	X	M-/X	-		If the value is "CRITICAL FOR DELIVERY" then generate NDR[NDRC=1,NDDC=18].	
1.1.11.7	content-confidentiality-algorithm-identifier	O	M-	X	X	X	M-/X	-		If the value is "CRITICAL FOR DELIVERY" then generate NDR[NDRC=1,NDDC=18].	

NO.	element	support		AMHS-Action		AMHS-support		size	Detailed Action		Note
		ISP	SARPs	O	R	O	R		Origination	Reception	
1.1.11.8	message-origin-authenti cation-check	O	M-	X	X	X	M-/X	-		If the value is "CRITICAL FOR DELIVERY" then generate NDR[NDRC=1,NDDC=18].	
1.1.11.9	message-security-label	O	M-	X	X	X	M-/X	-		If the value is "CRITICAL FOR DELIVERY" then generate NDR[NDRC=1,NDDC=18].	
1.1.11.10	content-correlator	O	M-	X	D	X	M-	<= 512			
1.1.11.11	dl-expansion-history	O	M-	X	D	X	O	-			
1.1.11.12	internal-trace-informatio n	O	M-	G	D	M	M-	-			See Table 3/5
1.2	per-recipient-fields	M	M	T	T	M	M	-		Support maximum of 21 parameters. (This number may be changed when negotiated.)	
1.2.1	recipient-name	M	M	T	T	M	M	-	Set the values of the recipient's MF (or XF) address.		
1.2.2	originally-specified-reci pient-number	M	M	G	D	M	M	-	Set the value which comply with 12.2.1.1.1.5 of ISO/IEC 10021-4. (set continuous number from 1 to the first recipient)		

NO.	element	support		AMHS-Action		AMHS-support		size	Detailed Action		Note
		ISP	SARPs	O	R	O	R		Origination	Reception	
1.2.3	per-recipient-indicators	M	M	G	D	M	M	-	Set following value : responsibility=responsible(1) originating-MTA-reportrequest=non-delivery-report(01) originator-report-request= non-delivery-report(01)	For the parameter "per-recipients-fields", only "responsibility=responsible (1)" is relayed or delivered. Reportrequest=delivery-request(10) is ignored.	BITSTRING
1.2.4	explicit-conversion	O	M-	X	D	X	M-	-			
1.2.5	extensions	M	M-	X	D	X	M	-			In X.400, if the value doesn't exist, it is considered to be not selected.
	type	M	M	-	D	X	M	-			Only supports "standard-extension".
	criticality	M	M	-	D	X	M	-		If the value does not exist, all bits are considered to be OFF.	BITSTRING for-submission(0) for-deliver(1) for-transfer(2)
	value	M	M	-	D	X	M	-			
1.2.5.1	originator-requested-alternate-recipient	O	M-	-	D	X	M-	-			
1.2.5.2	requested-delivery-method	O	M-	-	D	X	M-	-			
1.2.5.3	physical-forwarding-prohibited	O	M-	-	X	X	M-/X	-		If the criticality is "CRITICAL FOR DELIVERY", then generate NDR[NDRC=3,NDDC=18].	

NO.	element	support		AMHS-Action		AMHS-support		size	Detailed Action		Note
		ISP	SARPs	O	R	O	R		Origination	Reception	
1.2.5.4	physical-forwarding-address-request	O	M-	-	X	X	M-/X	-		If the criticality is "CRITICAL FOR DELIVERY", then generate NDR[NDRC=3,NDDC=18].	
1.2.5.5	physical-delivery-modes	O	M-	-	X	X	M-/X	-		If the criticality is "CRITICAL FOR DELIVERY", then generate NDR[NDRC=3,NDDC=18].	
1.2.5.6	registed-mail-type	O	M-	-	X	X	M-/X	-		If the criticality is "CRITICAL FOR DELIVERY", then generate NDR[NDRC=3,NDDC=18].	
1.2.5.7	recipient-number-for-advice	O	M-	-	X	X	M-/X	-		If the criticality is "CRITICAL FOR DELIVERY", then generate NDR[NDRC=3,NDDC=18].	
1.2.5.8	physical-redirection-attributes	O	M-	-	X	X	M-/X	-		If the criticality is "CRITICAL FOR DELIVERY", then generate NDR[NDRC=3,NDDC=18].	

NO.	element	support		AMHS-Action		AMHS-support		size	Detailed Action		Note
		ISP	SARPs	O	R	O	R		Origination	Reception	
1.2.5.9	physical-delivery-report-request	O	M-	-	X	X	M-/X	-		If the criticality is "CRITICAL FOR DELIVERY", then generate NDR[NDRC=3,NDDC=18].	
1.2.5.10	message-token	O	M-	-	X	X	M-/X	-		If the criticality is "CRITICAL FOR DELIVERY", then generate NDR[NDRC=3,NDDC=18].	
1.2.5.11	content-integrity-check	O	M-	-	X	X	M-/X	-		If the criticality is "CRITICAL FOR DELIVERY", then generate NDR[NDRC=3,NDDC=18].	
1.2.5.12	proof-of-delivery-request	O	M-	-	X	X	M-/X	-		If the criticality is "CRITICAL FOR DELIVERY", then generate NDR[NDRC=3,NDDC=18].	
1.2.5.13	redirection-history	O	M-	-	D	X	M-	-			
2	content	M	M	T	T	M	M	-	Set the generated IPM.		

Table 1.2 Common Data Types

(Based on : ATSMHS SARPs Table 3.1.2-6 for O, Table 3.1.2-12 for R)

NO.	element	support		AMHS-Action		AMHS-support		size	Detailed Action		Note
		ISP	SARPs	O	R	O	R		Origination	Reception	
1	MTS-Identifier										
1.1	global-domain-identifier	M	M	G	D	M	M	-			
1.2	local-identifier	M	M	G	D	M	M	<=32	Set the characters which identifies message in ia-5 characters.		
2	GlobalDomainIdentifier										
2.1	country-name	M	M	G	D	M	M	2 or 3	Set the country name of AMHS management domain.		
2.2	administration-domain-name	M	M	G	D	M	M	<=16	Set the AMHS management domain name.		
2.3	private-domain-identifier	O	M-	X	D	X	M-	<=16			The value of this parameter may be used in the future.
3	EncodedInformationTypes										
3.1	built-in-encoded-information-types	M	M	G	D	M	M	-	Set the value of "ia5-text(2)=1"		BITSTRING
3.2	non-basic parameters	O	M-	X	D	X	M-	-			
3.3	extended-encoded-information-types	O	M	X	D	X	O	-			
4.	PerMessageIndicators	M	M	G	D	M	M	-			BITSTRING In X.400, if the value doesn't exist, all bits are considered to be OFF.
4.1	disclosure-of-other-recipients(0)	M	M	G	D	M	M	-	Set the abstract value "disclosure-of-other-recipients-prohibited(0)"		

NO.	element	support		AMHS-Action		AMHS-support		size	Detailed Action		Note
		ISP	SARPs	O	R	O	R		Origination	Reception	
4.2	implicit-conversion-prohibited(1)	M	M	G	D	M	M	-	Set the abstract value "implicit-conversion-prohibited(1)"		
4.3	alternate-recipient-allowed(2)	M	M	G	D	M	M	-	Set the abstract value "alternate-recipient-allowed(1)"		
4.4	content-return-request(3)	M	M	G	D	M	M	-	Set the abstract value "content-return-not-requested(0)"	Ignored and considered "content-return-not-requested(0)". However, if error occurs in the ATN component of AMHS and "content-return-request(1)" is set, it is impossible to restrain this service.	
5	PerDomainBilateralInformation	O	M-	X	D	X	M-	-			
6	TraceInformation										
6.1	TraceInformationElement	M	M	G	D	M	M	-			
6.1.1	global-domain-identifier	M	C1	X	D	X	M	-		If the last trace information of this parameter differs from the input MTA, then generate NDR.	
6.1.2	domain-supplied-information	M	M	G	D	M	M	-			
6.1.2.1	arrival-time	M	C2	G	D	M	M	-	Set the value of the time which AFTN/AMHS Gateway received the message.		
6.1.2.2	routing-action	M	M-	G	D	M	M	-	Set the abstract value of "relayed(0)".		
6.1.2.3	attempted-domain	O	M-	X	D	X	M-	-			

NO.	element	support		AMHS-Action		AMHS-support		size	Detailed Action		Note
		ISP	SARPs	O	R	O	R		Origination	Reception	
6.1.2.4	additional actions	O	M-	X	D	X	M-	-			
6.1.2.4.1	deferred-time	O	M-	X	D	X	M-	-			
6.1.2.4.2	converted-encode-information-types	O	M-	X	D	X	O	-			
6.1.2.4.3	other-actions	O	M-	X	D	X	M-	-			

Table 1.3 Extension Data Types

(Based on : ATSMHS SARPs Table 3.1.2-6 for O, Table 3.1.2-12 for R)

NO.	element	support		AMHS-Action		AMHS-support		size	Detailed Action		Note
		ISP	SARPs	O	R	O	R		Origination	Reception	
5	internal-trace-information	O	M-	G	D	M	M-	-			
5.1	global-domain-identifier	M	M	G	D	M	M	<=16	Set the value which identifies AMHS Management Domain.		
5.2	mta-name	M	M	G	D	M	M	<=32	Set the value of mta-name of AMHS.		
5.3	domain-supplied-information	M	M	G	D	M	M	-			
5.3.1	arrival-time	M	M	G	D	M	M	-	Set the value of the time which AFTN/AMHS Gateway received the message		
5.3.2	routing-action	M	M	G	D	M	M	-	Set the abstract value "relayed(0)"		
5.3.3	attempt-domain	O	C1	X	D	X	M-	-			
5.3.4	additional actions	O	C2	X	D	X	M-	-			
5.3.4.1	deferred-time	O	M-	X	D	X	M-	-			
5.3.4.2	converted-encoded-information-types	O	M-	X	D	X	O	-			
5.3.4.3	other-actions	O	M-	X	D	X	M-	-			

2. IPM

Table 2.1 IPM
(Based on : ATSMHS SARPs Table 3.1.2-5 for O, Table 3.1.2-11 for R)

NO.	element	support		AMHS-Action		AMHS-support		size	Detailed Action		Note
		ISP	SARPs	O	R	O	R		Origination	Reception	
1	Interpersonal message(IPM)	M	M	T	T	M	M	-			
1.1	heading	M	M	T	T	M	M	-			
1.1.1	this-IPM	M	M	T	D	M	M	-			
1.1.1.1	user	O	M	T	D	M	M-	-	Set the same value as the originator.		
1.1.1.2	user-relative-identifier	M	M	G	D	M	M	<=64			Set the value which identifies this IPM in less than 64 octets.
1.1.2	originator	O	M	T	D	M	M-		Set the originator XF address converted from AF address of AFTN message.		
1.1.3	authorizing-users	O	O	X	D	X	M-	-			
1.1.4	primary-recipients	O	M	T	D	M	O	-		At least one of the primary-recipients, copy-recipients, or blind-copy-recipients is mandatory.	
1.1.4.1	RecipientSpecifier	M	M	T	D	M	M	-			If the value of this parameter is as same as P1, then maximum number is 21.
1.1.4.2	recipient	M	M	T	D	M	M	-	Set the recipient XF address converted from AF address of AFTN message.		

NO.	element	support		AMHS-Action		AMHS-support		size	Detailed Action		Note
		ISP	SARPs	O	R	O	R		Origination	Reception	
1.1.4.3	notification-requests	O	M	T	D	M	M	-	Set the bit of rn and nrn ON if and only if the value of ATS-priority-indicator is SS. (In other cases, both bits are not ON.)	If ATS-priority-indicator is SS, and value of notification of the element "primary-recipient", "copy-recipient", "blind-copy-recipient is different from "rn", and the value of per-recipient-fields is "responsible", then it is logged as an error.	According to X.400, if this parameter does not exist, all bits are considered OFF.
1.1.4.3.1	rn(0)	O	O	T	D	M	O	-			
1.1.4.3.2	nrn(1)	O	M	T	D	M	M-	-		Ignored.	
1.1.4.3.3	ipm-return(2)	O	O	X	D	X	M-	-	Always set OFF.	Ignored.	
1.1.5	copy-recipients	O	M	X	D	X	O	-	Not set.	Processed as same as primary-recipients.	
1.1.6	blind-copy-recipients	O	M	X	D	X	O	-	Not set.	Processed as same as primary-recipients.	
1.1.7	replied-to-IPM	O	M	X	D	X	M-	-			
1.1.8	obsoleted-IPMs	O	M	X	D	X	M-	-			
1.1.9	related-IPMs	O	M	X	D	X	M-	-			
1.1.10	subject	O	M	G2	D	O	M-	<=128			
1.1.11	expiry-time	O	M	X	D	X	M-	-			
1.1.12	reply-time	O	M	X	D	X	M-	-			
1.1.13	reply-recipients	O	O	X	D	X	M-	-			
1.1.14	importance	O	O	X	D	X	M-	-			
1.1.15	sensitivity	O	O	X	D	X	M-	-			
1.1.16	auto-forwarded	O	O	X	D	X	M-	-			
1.1.17	extensions	O	O	X	D	X	M-	-			
1.1.17.1	incomplete-copy	O	O	X	D	X	M-	-			
1.1.17.2	langages	O	O	X	D	X	M-	-			

		support		AMHS-Action		AMHS-support			Detailed Action		
NO.	element	ISP	SARPs	O	R	O	R	size	Origination	Reception	Note
1.1.17.3	auto-submitted	O	O	X	D	X	M-	-			
1.2	IPM BODY	M	M	M	M	M	M	-		One of the ia5-text, ia5-text-body-part, or general-text-body-part has to be set.	
1.2.1	ia5-text	O	M	T	T	M	O	-			
1.2.1.1	parameters	M	M	G	D	M	M	-			
1.2.1.1.1	repertoire	M	M	G	D	M	M	-	Set the value IA5(5).		
1.2..1.2	data	M	M	T	T	M	M	-			
1.2.2	voice	I	X	X	X	X	X	-			
1.2.3	g3-facsimile	O	X	X	X	X	X	-			
1.2.4	g4-class-1	O	X	X	X	X	X	-			
1.2.5	teletex	O	X	X	X	X	X	-			
1.2.6	videotex	O	X	X	X	X	X	-			
1.2.7	encrypted	I	X	X	X	X	X	-			
1.2.8	message	O	X	X	X	X	X	-			
1.2.9	mixed-mode	O	X	X	X	X	X	-			
1.2.10	bilaterally-defined	O	X	X	X	X	X	-			
1.2.11	nationally-defined	O	X	X	X	X	X	-			
1.2.12	externally-defined	O	X	X	X	X	X	-			
1.3	Extended Body Part										
1.3.1	ia5-text-body-part	O	X	X	T	X	O	-			
1.3.2	g3-facsimile-body-part	O	X	X	X	X	X	-			
1.3.3	g4-class1-body-part	O	X	X	X	X	X	-			
1.3.4	teletex-body-part	O	X	X	X	X	X	-			
1.3.5	videotex-body-part	O	X	X	X	X	X	-			
1.3.6	encrypt-body-part	I	X	X	X	X	X	-			
1.3.7	message-body-part	O	X	X	X	X	X	-			
1.3.8	mixed-mode-body-part	O	X	X	X	X	X	-			
1.3.9	bilaterally-defined-body-part	O	X	X	X	X	X	-			
1.3.10	nationally-defined-body-part	O	X	X	X	X	X	-			

NO.	element	support		AMHS-Action		AMHS-support		size	Detailed Action		Note
		ISP	SARPs	O	R	O	R		Origination	Reception	
1.3.11	general-text-body-part	O	X	X	T	X	O	-			
1.3.12	file-transfer-body-part	O	X	X	X	X	X	-			
1.3.13	voice-body-part	I	X	X	X	X	X	-			
1.3.14	oda-body-part	O	X	X	X	X	X	-			

Table 2.2 IPM Support of the Basic ATS Message Service
(Based on : ATSMHS SARPs Table 3.1.2-5 for O, Table 3.1.2-11 for R)

		support		AMHS-Action		AMHS-support			Detailed Action		
NO.	element	ISP	SARPs	O	R	O	R	size	Origination	Reception	Note
1	ATS-Message-Header	-	M	T	T	M	M	-			
1.1	start- of heading	-	M	G	-	M	M	-	Set (SOH)		
1.2	ATS-Message-Priority	-	M	T	T	M	M	-			
1.2.1	priority-prompt	-	M	G	-	M	M	-	Set the value "PRI:(single space)".		
1.2.2	priority-indicator	-	M	T	T	M	M	-			
1.2.3	priority-separater	-	M	G	-	M	M	-	Set (CR)(LF)		
1.3	ATS-Message-Filing-Time	-	M	T	T	M	M	-			
1.3.1	filing-time-prompt	-	M	G	-	M	M	-	Set the value "FT:(single space)".		
1.3.2	filing-time	-	M	T	T	M	M	-			
1.3.3	filing-time-separater	-	M	G	-	M	M	-	Set (CR)(LF)		
1.4	ATS-Message-Optional-Heading-Info	-	O	T1	T1	O	M	-			
1.4.1	OHI-prompt	-	M	G	-	M	M	-	Set the value "OHI:(single space)".		
1.4.2	optional-heading-information	-	M	T	T	M	M	-			
1.4.3	OHI-separater	-	M	G	-	M	M	-	Set (CR)(LF)		
1.5	end-of-heading-blank-line	-	M	G	-	M	M	-	Set (LF)		
1.6	start-of-text	-	M	G	-	M	M	-	Set (STX)		
2	ATS-Message-Text	-	M	T	T	M	M	-			

3. Message Transfer Envelope for IPN

Table 3.1 Message Transfer Envelope (IPN)
(Based on: ATSMHS SARPs Table 3.1.2-6 and Table 3.1.2-9 for O, Table 3.1.2-12 and Table 3.1.2-15 for R)

NO.	element	support		AMHS-Action		AMHS-support		size	Detailed Action		Note
		ISP	SARPs	O	R	O	R		Origination	Reception	
1	MessageTransferEnvelope	M	M	T	T	M	M	-			
1.1	per message fields	M	M					-			
1.1.1	message-identifier	M	M	G	D	M	M-	-			
1.1.2	originator-name	M	M	T	T	M	M	-	Set the originator XF address converted from AF address of AFTN acknowledgement message.		
1.1.3	original-encoded-information-types	O	M-	G	D	X	M-	-			
1.1.4	content-type	M	M	G	D	M	M	-	BuiltInContentType is set the abstract value "interpersonal-messaging-1984(2)"	If the value of BuiltInContentType is neither interpersonal-messaging-1984(2) nor interpersonal-messaging-1988(22), then generate NDR[NDRC=1,NDDC=15].	
1.1.5	content-identifier	O	M-	G	D	X	M-	<=16			
1.1.6	priority	M	M	G	D	M	M	-	Set "urgent".		
1.1.7	per-message-indicators	M	M	G	D	M	M	-			See Table 3.2/4
1.1.8	deferred-delivery-time	O	M-	X	D	M	M-	-			
1.1.9	per-domain-bilateral-information	O	M-	X	D	X	M-	-			
1.1.10	trace-information	M	M	G	D	M	M	-			

NO.	element	support		AMHS-Action		AMHS-support		size	Detailed Action		Note
		ISP	SARPs	O	R	O	R		Origination	Reception	
1.1.11	extensions	M	M	G	D	M	M-	-			In X.400, if the value doesn't exist, it is considered to be not selected.
	type	M	M	G	D	M	M	-	Set the abstract value "internal-trace-information (38)".		Only supports "standard-extension".
	criticality	M	M	G	D	M	M	-			In X.400, if the value doesn't exist, it is considered to be not selected.
	value	M	M	M	D	M	M	-	Set the value of "internal-trace-information"		
1.1.11.1	recipient-reassignment-prohibited	O	M-	X	D	X	M-	-			
1.1.11.2	dl-extension-prohibited	O	M-	X	D	X	M-	-			
1.1.11.3	conversion-with-loss-prohibited	O	M-	X	D	X	M-	-			
1.1.11.4	latest-delivery-time	O	M-	X	D	X	M-	-		If this exists, and the current time exceeds the value, then generate NDR[NDRC=1,NDDC=5].	
1.1.11.5	originator-return-address	O	M-	X	D	X	M-	-			
1.1.11.6	originator-certificate	O	M-	X	X	X	X	-		If the value is "CRITICAL FOR DELIVERY" then generate NDR[NDRC=1,NDDC=18].	

NO.	element	support		AMHS-Action		AMHS-support		size	Detailed Action		Note
		ISP	SARPs	O	R	O	R		Origination	Reception	
1.1.11.7	content-confidentiality-algorithm-identifier	O	M-	X	X	X	X	-		If the value is "CRITICAL FOR DELIVERY" then generate NDR[NDRC=1,NDDC=19].	
1.1.11.8	message-origin-authentication-check	O	M-	X	X	X	X	-		If the value is "CRITICAL FOR DELIVERY" then generate NDR[NDRC=1,NDDC=20].	
1.1.11.9	message-security-label	O	M-	X	X	X	X	-		If the value is "CRITICAL FOR DELIVERY" then generate NDR[NDRC=1,NDDC=21].	
1.1.11.10	content-correlator	O	M-	X	D	X	M-	<= 512			
1.1.11.11	dl-expansion-history	O	M-	X	D	X	O	-			
1.1.11.12	internal-trace-information	O	M-	G	D	M	M-	-			
1.2	per-recipient-fields	M	M	T	D	M	M	-			Number of recipient is always one.
1.2.1	recipient-name	M	M	T	D	M	M	-	Set the MF address of the originator of the subject IPM.		
1.2.2	originally-specified-recipient-number	M	M	G	D	M	M	-	Set "1".		

NO.	element	support		AMHS-Action		AMHS-support		size	Detailed Action		Note
		ISP	SARPs	O	R	O	R		Origination	Reception	
1.2.3	per-recipient-indicators	M	M	G	D	M	M	-	Set the following values : responsibility=responsible(1) originating-MTA-reportrequest=non-delivery-report(01) originator-report-request= non-delivery-report(00)		BITSTRING
1.2.4	explicit-conversion	O	M-	X	D	X	M-	-			
1.2.5	extensions	M	M-	X	D	X	M-	-			In X.400, if the value doesn't exist, it is considered to be not selected.
	type	M	M	-	D	-	M	-			Only supports "standard-extension".
	criticality	M	M	-	D	-	M	-			
	value	M	M	-	D	-	M	-			
1.2.5.1	originator-requested-alternate-recipient	O	M-	-	D	-	M-	-			
1.2.5.2	requested-delivery-method	O	M-	-	D	-	M-	-			
1.2.5.3	physical-forwarding-prohibited	O	M-	-	X	-	M-/X	-		If the criticality is "CRITICAL FOR DELIVERY", then generate NDR[NDRC=3,NDDC=18].	
1.2.5.4	physical-forwarding-address-request	O	M-	-	X	-	M-/X	-		If the criticality is "CRITICAL FOR DELIVERY", then generate NDR[NDRC=3,NDDC=18].	

		support		AMHS-Action		AMHS-support			Detailed Action		
NO.	element	ISP	SARPs	O	R	O	R	size	Origination	Reception	Note
1.2.5.5	physical-delivery-modes	O	M-	-	X	-	M-/X	-		If the criticality is "CRITICAL FOR DELIVERY", then generate NDR[NDRC=3,NDDC=18].	
1.2.5.6	registed-mail-type	O	M-	-	X	-	M-/X	-		If the criticality is "CRITICAL FOR DELIVERY", then generate NDR[NDRC=3,NDDC=18].	
1.2.5.7	recipient-number-for-advice	O	M-	-	X	-	M-/X	-		If the criticality is "CRITICAL FOR DELIVERY", then generate NDR[NDRC=3,NDDC=18].	
1.2.5.8	physical-redirection-attributes	O	M-	-	X	-	M-/X	-		If the criticality is "CRITICAL FOR DELIVERY", then generate NDR[NDRC=3,NDDC=18].	
1.2.5.9	physical-delivery-report-request	O	M-	-	X	-	M-/X	-		If the criticality is "CRITICAL FOR DELIVERY", then generate NDR[NDRC=3,NDDC=18].	

		support		AMHS-Action		AMHS-support			Detailed Action		
NO.	element	ISP	SARPs	O	R	O	R	size	Origination	Reception	Note
1.2.5.10	message-token	O	M-	-	X	-	M-/X	-		If the criticality is "CRITICAL FOR DELIVERY", then generate NDR[NDRC=1,NDDC=18].	
1.2.5.11	content-integrity-check	O	M-	-	X	-	M-/X	-		If the criticality is "CRITICAL FOR DELIVERY", then generate NDR[NDRC=1,NDDC=18].	
1.2.5.12	proof-of-delivery-request	O	M-	-	X	-	M-/X	-		If the criticality is "CRITICAL FOR DELIVERY", then generate NDR[NDRC=1,NDDC=18].	
1.2.5.13	redirection-history	O	M-	-	D	-	M-	-			
2	content	M	M	T	T	M	M	-	Set the generated IPN.		

Table 3.2 Common Data Type

(Based on : ATSMHS SARPs Table 3.1.2-6 and Table 3.1.2-9 for O, Table 3.1.2-12 and Table 3.1.2-15 for R)

NO.	element	support		AMHS-Action		AMHS-support		size	Detailed Action		Note
		ISP	SARPs	O	R	O	R		Origination	Reception	
1	MTS-Identifier										
1.1	global-domain-identifier	M	M	G	D	M	M	<=16			
1.2	local-identifier	M	M	G	D	M	M	<=32	Set the characters which identifies message in ia-5 characters.		
2	GlobalDomainIdentifier										
2.1	country-name	M	M	G	D	M	M	2 or 3	Set the country name of AMHS management domain.		
2.2	administration-domain-name	M	M	G	D	M	M	<=16	Set the AMHS management domain name.		
2.3	private-domain-identifier	O	M-	X	D	X	M-	-			
3	EncodedInformationTypes										
3.1	built-in-encoded-information-types	M	M	G	D	X	M	-			BITSTRING
3.2	non-basic parameters	O	M-	X	D	X	M-	-			
3.3	extended-encoded-information-types	O	M	X	D	X	O	-			
4.	PerMessageIndicators	M	M	G	D	G	D	-			BITSTRING In X.400, if the value doesn't exist, all bits are considered to be OFF.
4.1	disclosure-of-other-recipients(0)	M	M	G	D	G	D	-	Set the abstract value "disclosure-of-other-recipients-prohibited(0)"		
4.2	implicit-conversion-prohibited(1)	M	M	G	D	G	D	-	Set the abstract value "implicit-conversion-prohibited(1)"		

NO.	element	support		AMHS-Action		AMHS-support		size	Detailed Action		Note
		ISP	SARPs	O	R	O	R		Origination	Reception	
4.3	alternate-recipient-allowed(2)	M	M	G	D	G	D	-	Set the abstract value "alternate-recipient-allowed(1)"		
4.4	content-return-request(3)	M	M	G	D	G	D	-	Set the abstract value "content-return-not-requested(0)"	Ignored and considered "content-return-not-requested(0)". However, if error occurs in the ATN component of AMHS and "content-return-request(1)" is set, it is impossible to restrain this service.	
5	PerDomainBilateralInformation	O	M-	X	D	X	D	-			
6	TraceInformation										
6.1	TraceInformationElement	M	M	G	D	M	M	-			
6.1.1	global-domain-identifier	M	C1	X	D	M	M	-		If the last trace information of this parameter differs from the input MTA, then generate NDR.	
6.1.2	domain-supplied-information	M	M	G	D	M	M	-			
6.1.2.1	arrival-time	M	C2	G	D	M	M	-	Set the value of the time which AFTN/AMHS Gateway received the message		
6.1.2.2	routing-action	M	M-	G	D	M	M	-	Set the abstract value of "relayed(0)".		
6.1.2.3	attempt-domain	O	M-	X	D	X	M-	-			
6.1.2.4	additional actions	O	M-	X	D	X	M-	-			
6.1.2.4.1	deferred-time	O	M-	X	D	X	M-	-			

NO.	element	support		AMHS-Action		AMHS-support		size	Detailed Action		Note
		ISP	SARPs	O	R	O	R		Origination	Reception	
6.1.2.4.2	converted-encode-information-types	O	M-	X	D	X	M-	-			
6.1.2.4.3	other-actions	O	M-	X	D	X	M-	-			

Table 3.3 Extension Data Types

(Based on: ATSMHS SARPs Table 3.1.2-6 for O, Table 3.1.2-12 for R)

		support		AMHS-Action		AMHS-support			Detailed Action		
NO.	element	ISP	SARPs	O	R	O	R	size	Origination	Reception	Note
5	internal-trace-information	O	M-	G	D	M	M-	-			
5.1	global-domain-identifier	M	M	G	D	M	M	16	Set the value which identifies AMHS Management Domain.		
5.2	mta-name	M	M	G	D	M	M	32	Set the value of mta-name of AMHS.		
5.3	domain-supplied-information	M	M	G	D	M	M	-			
5.3.1	arrival-time	M	M	G	D	M	M	-	Set the value of the time which AFTN/AMHS Gateway received the message		
5.3.2	routing-action	M	M	G	D	M	M	-	Set the abstract value "relayed(0)"		
5.3.3	attempt-domain	O	C1	X	D	X	M-	-			
5.3.4	additional actions	O	C2	X	D	X	M-	-			
5.3.4.1	deferred-time	O	M-	X	D	X	M-	-			
5.3.4.2	converted-encoded-information-types	O	M-	X	D	X	O	-			
5.3.4.3	other-actions	O	M-	X	D	X	M-	-			

3. IPN

Table 4.1 IPN
(Based on: ATSMHS SARPs Table 3.1.2-8 for O, Table 3.1.2-14 for R)

NO.	element	support		AMHS-Action		AMHS-support		size	Detailed Action		Note
		ISP	SARPs	O	R	O	R		Origination	Reception	
1	Interpersonal Notification(IPN)	M	M	-	-	M	M	-			
1.1	Common-fields	M	M	-	-	M	M	-			
1.1.1	subject-ipm	M	M	G	D	M	M	-	Set the value of this-IPM of the subject IPM.		
1.1.2	ipn-originator	O	M	T	D	M	O	-	Set the originator XF address converted from AF address of AFTN message.		
1.1.3	ipm-preferred-recipient	O	M	G2	D	O	O	-	This parameter exists when the recipient indicated by subject IPM and the real recipient differs, and set the recipient which was on the subject IPM.		
1.1.4	conversion-eits	O	M	G2	D	O	O	-	If the originally-encoded-information-types of the subject IPM and encoded-information types at the reception differ, set the encoded-information-types at the reception.		
1.1.5	notification-extensions	O	M	X	D	X	M	-			
1.2	non-receipt-fields	M	M	X	D	X	O	-		Either non-receipt-field or receipt-field is mandatory.	

NO.	element	support		AMHS-Action		AMHS-support		size	Detailed Action		Note
		ISP	SARPs	O	R	O	R		Origination	Reception	
1.3	receipt-fields	M	M	T	T	M	M	-			
1.3.1	receipt-time	M	M	T	T	M	M	-	Convert the time to UTC-TIME format and set the value.	Convert to AFTN format.	UTC-TIME format is YYMMDDhhmm[ss]Z or YYMMDDhhmm[ss]+(or -) hhmm
1.3.2	acknowledgment-mode	O	O	G	D	M	M-	-	Set the abstract value "manual(0)"		The default value of this element is "manual", so it is not necessary to set the value.
1.3.3	suppl-receipt-info	O	O	X	D	X	M-	-			
1.3.4	rn-extension	O	I	X		X	M-	-			
1.3.5	other-notification-type-fields	O	I	X		X	M-	-			

Table 4.2 OR Descripor

(Based on: ATSMHS SARPs Table 3.1.2-8 for O, Table 3.1.2-14 for R)

NO.	element	support		AMHS-Action		AMHS-support		size	Detailed Action		Note
		ISP	SARPs	O	R	O	R		Origination	Reception	
1	ORDescriptor										
1.1	formal-name	M	M	T	-	M	M	-			
1.2	free-form-name	O	O	X	-	X	M-	<=64			
1.3	telephone-number	O	O	X	-	X	M-	-			

5. ReportTransfer Envelope

Table 5.1 Report Transfer Envelope
(Based on: ATSMHS SARPs Table 3.1.2-17 for O, Table 3.1.2-18 for R)

NO.	element	support		AMHS-Action		AMHS-support		size	Detailed Action		Note
		ISP	SARPs	O	R	O	R		Origination	Reception	
1	ReportTransferEnvelope	M	M	G	D	M	M	-			
1.1	report-identifier	M	M	G	D	M	M	-			
1.2	report-destination-name	M	M	G	T	M	M	-	If the subject message has the element "dl-expansion-history", and OR name of last element of dl-expansion-history does not exist, set the originator-name of the subject message.		
1.3	trace-information	M	M	G	D	M	M	-			
1.4	extensions	M	M	G	D	M	M	-			In X.400, if the value doesn't exist, it is considered to be not selected.
1.4.1	type	M	M	G	D	M	M	-			Only supports "standard-extension".
1.4.2	criticality	M	M	G	D	M	M	-			In X.400, if the value doesn't exist, it is considered to be not selected.
1.4.3	value	M	M	M	D	M	M	-	Set the value of "internal-trace-information".		
1.4.4	message-security-label	O	M-	X	D	X	D	-			

NO.	element	support		AMHS-Action		AMHS-support		size	Detailed Action		Note
		ISP	SARPs	O	R	O	R		Origination	Reception	
1.4.5	originator-and-DL-expansion-history	O	M-	G2	D	O	D	-	Only when the element "DL-expansion-history" exists in the subject message, set the value.		
1.4.6	reporting-DL-name	O	M-	X	D	X	M-	-			
1.4.7	reporting-MTA-certificate	O	M-	X	D	X	M-	-			
1.4.8	report-origin-authentication-check	O	M-	X	D	X	M-	-			
1.4.9	internal-trace-information	O	M-	G	D	M	M-	-			
1.4.9.1	global-domain-identifier	M	M	G	D	M	M	<=16	Set the value which identifies the AMHS management domain.		
1.4.9.2	domain-supplied-information	M	M	G	D	M	M	-			
1.4.9.3	arrival-time	M	M	G	D	M	M	-	Set the value of the time which AFTN/AMHS Gateway received the message		
1.4.9.4	routing-action	M	M	G	D	M	M	-	Set the abstract value "relayed(0)".		
1.4.9.5	attempt-domain	O	C1	X	D	X	M	-			
1.4.9.6	additional actions	O	C2	X	D	X	M	-			
1.4.9.7	deferred-time	O	M-	X	D	X	M	-			
1.4.9.8	converted-encoded-information-types	O	M-	X	D	X	M	-			
1.4.9.9	other-actions	O	M-	X	D	X	M	-			
2	ReportTransferContent	M	M			M	M	-			
2.1	per report fields							-			
2.1.1	subject-identifier	M	M	G	D	M	M	-	Set the value of the "message-identifier" of the subject message."	It is expected that the value of message-identifier of the subject message is set.	

NO.	element	support		AMHS-Action		AMHS-support		size	Detailed Action		Note
		ISP	SARPs	O	R	O	R		Origination	Reception	
2.1.2	subject-intermediate-trace-information	O	M	G2	D	O	M-	-	If the originating-MTA-report-request of the per-recipient-indicator of the recipient of the subject message per-recipient-indicator takes the value "audited-report", set the value of trace-information of the subject message.		
2.1.3	original-encoded-information-types	O	M	X	D	X	M-	-			
2.1.4	content-type	O	M	X	D	X	M-	-			
2.1.5	content-identifier	O	M	X	D	X	M-	-			
2.1.6	returned-content	O	M-	X	D	X	M-	-			
2.1.7	additional-information	O	M-	X	D	X	M-	-			
2.1.8	extensions	M	M	G2	D	O	M-	-			
2.1.8.1	content-correlator	O	M	G2	D	O	M-	-	If the element "content-correlator" exists in the subject message, the value of the element is set.		
2.2	per-recipient-fields	M	M	T	T	M	M	-			
2.2.1	actual-recipient-name	M	M	T	T	M	M	-	Set the recipient-name of the corresponding per-recipient field of the subject message.		

NO.	element	support		AMHS-Action		AMHS-support		size	Detailed Action		Note
		ISP	SARPs	O	R	O	R		Origination	Reception	
2.2.2	originally-specified-recipient-number	M	M	G	D	M	M	-	Set the value of originally-specified recipient number of the corresponding per-recipient field of the subject message.		
2.2.3	per-recipient-indicators	M	M	G	D	M	M	-	Set the value of the corresponding per-recipient-indicator of the per-recipient-fields of the subject message.		BITSTRING
2.2.4	last-trace-information	M	M	G	D	M	M	-			
2.2.4.1	arrival-time	M	M	G	D	M	M	-	Set the value of the time which AFTN/AMHS Gateway received the message		
2.2.4.2	converted-encoded-information-types	O	M	G2	D	O	M-	-	If the original-EIT and the final EIT are different, set the value of the final EIT. In other cases, nothing is set.		
2.2.4.3	report-type	M	M	G	D	M	M	-			
2.2.4.3.1	delivery	M	M	G2	D	O	X	-	Set this value when the probe is successfully passed to AFTN Component.		
2.2.4.3.2	message-delivery-time	M	M	G	D	M	X	-	If the report is a delivery report, set the time at which the subject message has been successfully passed to AFTN Component.		

NO.	element	support		AMHS-Action		AMHS-support		size	Detailed Action		Note
		ISP	SARPs	O	R	O	R		Origination	Reception	
2.2.4.3.3	type-of-MTS-user	M	M	G	D	M	X	-	Set the abstract value "other(6)".		If this parameter is omitted, then set the value "public(0)".
2.2.4.3.2	non-delivery	M	M	G	D	M	M	-			
2.2.4.3.2.1	non-delivery-reason-code	M	M	G	D	M	M	-	Set the defined NDRC.	If NDRC=1 and NDDC=0, then generate unknown addressee AFTN service message.	
2.2.4.3.2.2	non-delivery-diagnostic-code	O	M	G	D	M	M	-	Set the defined NDDC.		
2.2.5	originally-intended-recipient-name	O	M-	G2	D	O	O	-	If there exists redirection-history element, set the first O/R name of the subject message.		
2.2.6	supplementary-information	O	M-	G2	D	O	O	<=256	a) If delivery report (probe), set the value "This report only indicates successful (potential) conversion to AFTN, not delivery to a recipient" b) If non-delivery report set the value defined in each error (if not defined, set nothing)		
2.2.7	extensions	M	M-	G2	D	O	O	-			In X.400, if the value doesn't exist, it is considered to be not selected.
2.2.7.1	type	M	M	G2	D	M	M	-			Only supports "standard-extension".
	criticality	M	M	G2	D	M	M	-			
	value	M	M	G2	D	M	M	-			

		support		AMHS-Action		AMHS-support			Detailed Action		
NO.	element	ISP	SARPs	O	R	O	R	size	Origination	Reception	Note
2.2.7.1.1	redirection-history	O	M-	G2	D	O	M-	-	If there exists the "redirection-history", set that value.		
2.2.7.1.2	physical-forwarding-address	O	M-	X	X	X	X	-			
2.2.7.1.3	recipient-certificate	O	M-	X	X	X	X	-			
2.2.7.1.4	proof-of-delivery	O	M-	X	X	X	X	-			

Table 5.2 Common Data Types
(Based on: ATSMHS SARPs Table 3.1.2-17 for O, Table 3.1.2-18 for R)

NO.	element	support		AMHS-Action		AMHS-support		size	Detailed Action		Note
		ISP	SARPs	O	R	O	R		Origination	Reception	
1	MTS-Identifier										
1.1	global-domain-identifier	M	M	G	D	M	M	<=16			
1.2	local-identifier	M	M	G	D	M	M	<=32	Set the value which identifies the report in ia-5 characters.		
2	GlobalDomainIdentifier										
2.1	country-name	M	M	G	D	M	M	2 or 3	Set the country name of the AMHS management domain.		
2.2	administration-domain-name	M	M	G	D	M	M	<=16	Set the name of the AMHS management domain.		
2.3	private-domain-identifier	O	M-	X	D	X	M-	<=16			
6	TraceInformation										
6.1	TraceInformationElement	M	M	G	D	M	M	-			
6.1.1	global-domain-identifier	M	C1	X	D	M	M	-		If the last trace information of the global-domain-identifier differs from input MTA, generate NDR.	
6.1.2	domain-supplied-information	M	M	G	D	M	M	-			
6.1.2.1	arrival-time	M	C2	G	D	M	M	-	Set the value of the time which AFTN/AMHS Gateway received the message.		
6.1.2.2	routing-action	M	M-	G	D	M	M	-	Set the abstract value "relayed(0)".		
6.1.2.3	attempt-domain	O	M-	X	D	X	M-	-			

NO.	element	support		AMHS-Action		AMHS-support		size	Detailed Action		Note
		ISP	SARPs	O	R	O	R		Origination	Reception	
6.1.2.4	additional actions	O	M-	X	D	X	M-	-			
6.1.2.4.1	deferred-time	O	M-	X	D	X	M-	-			
6.1.2.4.2	converted-encode-information-types	O	M-	X	D	X	M-	-			
6.1.2.4.3	other-actions	O	M-	X	D	X	M-	-			

6. Probe Transfer Envelope

Table 6.1 Probe Transfer Envelope

NO.	element	support ISP	AMHS support	size	Detailed Action Reception	Note
1	probeTransferEnvelope	M	M	-		
1.1	per message fields	M	M	-		
1.1.1	probe-identifier	M	M	-		
1.1.2	originator-name	M	M	-		
1.1.3	original-encoded-information-types	O	M	-		
1.1.4	content-type	M	M	-	If the value of BuiltInContentType is neither interpersonal-messaging-1984(2) nor interpersonal-messaging-1988(22), then generate NDR[NDRC=1,NDDC=15].	
1.1.5	content-identifier	O	M-	<=16		It was agreed to be "X" in the TMC.
1.1.6	content-length	O	M-	-		
1.1.7	per-message-indicators	M	M	-		BITSTRING In X.400, if the value doesn't exist, all bits are considered to be OFF.
1.1.7.1	disclosure-of-other-recipients(0)	M	M	-		
1.1.7.2	implicit-conversion-prohibited(1)	M	M	-		
1.1.7.3	alternate-recipient-allowed(2)	M	M	-		
1.1.7.4	content-return-request(3)	M	M	-		
1.1.8	per-domain-bilateral-information	O	M-	-		It was agreed to be "X" in the TMC."
1.1.9	trace-information	M	M	-		
1.1.10	extensions	M	M	-		In X.400, if the value doesn't exist, it is considered to be not selected.

NO.	element	support ISP	AMHS support	size	Detailed Action Reception	Note
	type	M	M	-		Only supports "standard-extension".
	criticality	M	M	-		In X.400, if the value doesn't exist, it is considered to be not selected.
	value	M	M	-		
1.1.10.1	recipient-reassignment-prohibited	O	M-	-		
1.1.10.2	dl-extension-prohibited	O	M-	-		
1.1.10.3	conversion-with-loss-prohibited	O	M-	-		
1.1.10.4	originator-certificate	O	M-/X	-	If the value is "CRITICAL FOR DELIVERY", then generate NDR[NDRC=1,NDDC=18].	
1.1.10.5	message-security-label	O	M-/X	-	If the value is "CRITICAL FOR DELIVERY", then generate NDR[NDRC=1,NDDC=21].	
1.1.10.6	content-correlator	O	M-	<=512		
1.1.10.7	probe-origin-authentication-check	O	M-	-		
1.1.10.8	internal-trace-information	O	M-	-		
1.1.10.8.1	global-domain-identifier	M	M	-		
1.1.10.8.2	mta-name	M	M	<=32	Set the value which identifies AMHS.	
1.1.10.8.3	mta-supplied-information	M	M	-		
1.1.10.8.3.1	arrival-time	M	M	-		
1.1.10.8.3.2	routing-action	M	M	-		
1.1.10.8.3.3	attempt-domain	O	M-	-		

NO.	element	support ISP	AMHS support	size	Detailed Action Reception	Note
1.1.10.8.4	additional actions	O	M-	-		
1.1.10.8.4.1	deferred-time	O	M-	-		
1.1.10.8.4.2	converted-encoded-information-types	O	M-	-		
1.1.10.8.4.3	other-actions	O	M-	-		
1.2	per-recipient-fields	M	M	-		
1.2.1	recipient-name	M	M	-		
1.2.2	originally-specified-recipient-number	M	M	-		
1.2.3	per-recipient-indicators	M	M	-		BITSTRING
1.2.4	explicit-conversion	O	M-	-		
1.2.5	extensions	M	M-	-		In X.400, if the value doesn't exist, it is considered to be not selected.
	type	M	M	-		Only supports "standard-extension".
	criticality	M	M	-		
	value	M	M	-		
1.2.5.1	originator-requested-alternate-recipient	O	M-	-		
1.2.5.2	requested-delivery-method	O	M-	-		
1.2.5.3	physical-redirection-attributes	O	M-/X	-	If the value is "CRITICAL FOR DELIVERY", then generate NDR[NDRC=1,NDDC=18].	
1.2.5.4	redirection-history	O	O	-		

Table 6.2 Common Data Type

NO.	element	support ISP	AMHS support	size	Action Reception	Note
1.	MTS-Identifier					
1.1	global-domain-identifier	M	M	<=16		
1.2	local-identifier	M	M	<=32		
2	GlobalDomainIdentifier					
2.1	country-name	M	M	2 or 3		
2.2	administration-domain-name	M	M	<=16		
2.3	private-domain-identifier	O	M-	<=16		The value of this parameter may be used in the future.
3	EncodedInformationTypes					
3.1	built-in-encoded-information-types	M	M	-		BITSTRING
3.2	non-basic parameters	O	M-	-		
3.3	extended-encoded-information-types	O	O	-		
6	TraceInformation					
6.1	TraceInformationElement	M	M	-		
6.1.1	global-domain-identifier	M	M	-	If the last trace information of this parameter differs from the input MTA, then generate NDR.	
6.1.2	domain-supplied-information	M	M	-		
6.1.2.1	arrival-time	M	M	-		
6.1.2.2	routing-action	M	M	-		
6.1.2.3	attempt-domain	O	M-	-		
6.1.2.4	additional actions	O	M-	-		
6.1.2.4.1	deferred-time	O	M-	-		

NO.	element	support ISP	AMHS support	size	Action Reception	Note
6.1.2.4.2	converted-encode-information-types	O	M-	-		
6.1.2.4.3	other-actions	O	M-	-		

Checklist for Implementation of Ground/Ground ATN Network Infrastructure[1]
Phase I: Initial Network Deployment for Ground/Ground Applications

No.	Items to check	References	Remarks
1.	**Establish ATN Implementation Team (AIT).** Designation of Programme/Project Manager and required staff. Secure funding support.		AIT membership may include representatives from: - CAA/ATS Service provider(s); - Operations and engineering units; - Industry; - Airlines; - Aeronautical communication service provider(s); - Telecommunication service providers
2.	**State Plan.** Develop a phase plan with target date for the implementation of ATN infrastructure based on the regional planning documents and the ATN Standards and Recommended Practices (SARPs) and Guidance Material. Secure budget to support: - Trials/demonstrations, - Phased implementation, - Human resources and training.	ANNEX 10 Vol. III - Doc. 9705-AN/956 *Manual of Technical Provisions for the ATN*; - Doc. 9739-AN/961 *Comprehensive Aeronautical Telecommunication Network Manual*; Table CNS –1B of ASIA/PAC FASID ASIA/PAC Region ATN Transition Plan.	Edition 2 of Doc. 9705.

No.	Items to check	References	Remarks
3.	**Determine network architecture, policy.** Consider factors such as: (a) Redundancy (no single point of failure); (b) Status and position within the regional ATN network; (c) Number and type of intra-State facilities to be connected (ATS, AOC, *etc.*); (d) Site geographical locations; (e) Security, availability, integrity (Quality of Service) requirements (depending on application type); (f) Projected circuit loadings *vs.* capacity of existing circuits; (g) Router loading; which will determine: - network topology, type and media, - network infrastructure requirements, - intra-State routing domains (AOC, ATS *etc.*) and routing policies	Interface Control Documents (ICDs) for ATN End Systems. Asia/Pacific Regional ICD: ATN Ground-Ground BIS Router. Asia/Pacific ATN Routing Architecture Plan. Asia/Pacific ATN Addressing Plan Table CNS –1B of ASIA/PAC FASID ASIA/PAC Region ATN Transition Plan.	(a) May require multiple routers at each network node and divers connectivity between nodes. (b) Backbone sites have greater requirements for availability and throughput. (c) Will AOCs be permitted access to the ATN backbone through ATS routers? (d) Affects network topology, choice of subnetwork, physical communications medium/media. (e) QoS and Security issues influence use of communications service provider, public network/leased line *vs.* dedicated private connection, *etc.* (f) Determine bandwidth requirement, including growth capacity (g) Avoid “choke points” that place excessive load on a single node. Local network deployment may use ATN BIS, ATN IS or OSI IS routers. Choice of router type depends on cost, capability, suitability for application requirements (aeronautical grade *vs.* commercial communications grade) *etc.* Commercial network simulation packages can help analysis of network performance under normal and abnormal conditions
	Develop ATN address allocation plan. Designate responsible agent for administering address allocation and registration of addresses with ICAO.		
4.	**Equipment Acquisition and Evaluation.** Conduct laboratory tests with proposed BIS, IS and ES to ensure connectivity and performance. Begin deployment at different network sites as tests proceed, and pre-operational testing.	ICDs.	Equipment Protocol Implementation Conformance Statements (PICS) can help evaluation of equipment compatibility and can assist in creating ICDs. Verify network performance: throughput, effects of failures *etc.*

No.	Items to check	References	Remarks
5.	**Inter-State ATN router inter-connection.** Coordination with States concerned for agreement on implementation of inter/intra regional connections including technical interface, routing policy and target dates. The following aspects should be considered: - Applications to be supported. - Capability to support air/ground applications. - Use of existing circuits. - Connectivity and integrity. - Security. - Alternate routing capability. - System reliability. - QoS. - Capacity and predicted load demand.	Asia/Pacific Region ATN Transition Plan. Asia/Pacific ATN Routing Architecture Plan. Asia/Pacific ATN Addressing Plan Asia/Pacific Regional BIS Router ICD. Applicable ES ICDs.	For AMHS, there is no need to provide two separate physical lines to support existing AFTN service and to introduce new AMHS circuit, as both requirements can be satisfied using one physical link given adequate capacity and QoS.
6.	**AMHS inter-connection.** - Provide AMHS/AFTN gateway while transitioning between ATFN and AMHS; - Follow the ASIA/PAC AMHS naming convention, detail arrangements for AMHS naming plan for MF-Addressing and XF-Addressing Scheme; - Register all PRMDs with ICAO Regional Office; - Conduct close coordination with States concerned. - Establish date for phasing out of AFTN connections, once sufficient route diversity has been established in ATN network.	- PRMD value shall be selected as prescribed in Doc. 9705.	Inter- and intra-regional connections should be based on bilateral agreements and in compliance with AMHS SARPs, technical specification and ICD.

List of Abbreviations:

AFTN	Aeronautical Fixed Telecommunication Network
AMHS (ATSMHS)	ATS Message Handling System
ATN	Aeronautical Telecommunication Network
ATS	Air Traffic Service
BIS	Boundary Intermediate System
ES	End System
FASID	
ICD	Interface Control Document
IS	Intermediate System
PICS	Protocol Implementation Conformance Statements
SARPs	Standards and Recommended Practices

List of References:

[1]	ICAO Annex 10 Volume III, DOC. 9705-AN/956 *Manual of Technical Provisions for the Aeronautical Telecommunications Network*	Edition 2
[2]	ICAO Annex 10 Volume III, DOC. 9739-AN/961 *Comprehensive Aeronautical Telecommunication Network Manual*	
[3]	Asia/Pacific Regional Interface Control Document (ICD): ATN Ground-Ground Boundary Intermediate System (BIS) Router	Draft rev. 1.1 (not yet approved)
[4]	Asia/Pacific FASID	
[5]	Asia/Pacific Region ATN Transition Plan.	
[6]	Asia/Pacific ATN Addressing Plan	
[7]	ATN Routing Policy for Asia/Pacific Region.	Draft (not yet approved)
[8]	Asia/Pacific ATN Routing Architecture Plan.	
[9]	AMHS ICD in Asia/Pacific Region	Final Draft (To be approved at Mumbai ATNTTF)

[1] This document comprises a checklist for the deployment of an ATN Ground Network to support initial ground-ground ATN applications, notably ATSMHS/AMHS, based on the Standards and Recommended Practices (SARPs) specified by Edition 2 of ICAO Doc. 9705-AN/956.

CNS/ATM Implementation Planning Matrix
Implementation Status of CNS Elements

State/Organization	ATN G/G Boundary Intermediate System (BIS) Router/AMHS	AIDC	CPDLC	GNSS		ADS	Remarks
				NPA Supplemental Means (S) Primary means (P)	En-route Supplemental Means (S) Primary means (P)		
AUSTRALIA	ATN tests were conducted. BIS Router and Backbone BIS Router will be implemented by 2004. and AMHS in 2005	AFTN based AIDC Implemented between Brisbane and Auckland.	Implemented to support FANS1/A equipped aircraft.	Implemented (S) 260 GPS NPA Final 26 aerodromes to be completed 2002	Developed en-route as (P) for approval to use in domestic airspace.	ADS-C Implemented. ADS-B trial being conducted	
BANGLADESH							
BHUTAN	ATN BIS Router planned for 2005						
BRUNEI DARUSSALAM	Implementation of ATN BIS Router planned by 2005.		No CPDLC planned in view of full VHF coverage within their airspace.	NPA (S) planned for 2003.		No ADS planned due to complete Radar coverage.	
CAMBODIA							

CNS/ATM Implementation Planning Matrix
Implementation Status of CNS Elements

State/Organization	ATN G/G Boundary Intermediate System (BIS) Router/AMHS	AIDC	CPDLC	GNSS		ADS	Remarks
				NPA Supplemental Means (S) Primary means (P)	En-route Supplemental Means (S) Primary means (P)		
CHINA	ATN BIS Router will be implemented by 2005.	AIDC between ACCs within China are being implemented.	Implemented to support ATS Route L888 and polar routes. Trial on HF data link conducted for use in western China.		Implemented in certain airspace as (S).	Implemented to support L888 and polar routes.	
HONG KONG, CHINA	AMHS and BBIS tests were conducted with Japan and Thailand for implementation in 2004 Trial with Australia being conducted.	Trial on the AFTN based AIDC with Guangzhou China commenced. Implementation planned for 2002/2003.	Trials continuing for CPDLC. D-ATIS D-VOLMET and PDC implemented. VDL Mode-2 trial planned for 2002.		Implemented in certain airspace as (S)	Trials continuing for ADS-C.	
MACAO, CHINA							
COOK ISLANDS							

CNS/ATM Implementation Planning Matrix
Implementation Status of CNS Elements

State/Organization	ATN G/G Boundary Intermediate System (BIS) Router/AMHS	AIDC	CPDLC	GNSS		ADS	Remarks
				NPA Supplemental Means (S) Primary means (P)	En-route Supplemental Means (S) Primary means (P)		
DEMOCRATIC PEOPLE'S REPUBLIC OF KOREA							
FIJI	ATN BIS Router will be implemented in 2005.	Trial planned implementation of AFTN based AIDC with Brisbane and Auckland in 2002	EUROCAT 2000 X system implemented for CPDLC.	NPA procedures for (S) to be completed in Dec. 2002.	Implemented as (S).	Implemented in oceanic airspace using EUROCAT 2000 X. ADS-B trials in 2002/2003. Implementation in 2004.	
FRANCE French Polynesia Tahiti		Implementation of limited message sets with adjacent centres under discussion.	Implemented since 1996.			Implemented since March 1999.	
INDIA	ATN BIS router and BBIS router planned for implemented at Mumbai in 2005.		Implemented at Kolkata and Chennai.			Implemented at Kolkata and Chennai.	
INDONESIA	ATN BIS router planned fr implementation in 2005	AFTN based AIDC planned for implementation between Brisbane and Jakarta in 2004	CPDLC in Jakarta, Ujung Pandang FIRs planned for 2003.	Planned for implementation in 2002as (S).		70% of area covered by RADAR ADS trial planned for Jakarta and Ujung Pandang FIRs for 2003.	

CNS/ATM Implementation Planning Matrix
Implementation Status of CNS Elements

State/Organization	ATN G/G Boundary Intermediate System (BIS) Router/AMHS	AIDC	CPDLC	GNSS		ADS	Remarks
				NPA Supplemental Means (S) Primary means (P)	En-route Supplemental Means (S) Primary means (P)		
JAPAN	ATN BBIS will be implemented in 2002. Router Tests are progressing. AMHS implementation between Japan and USA, Australia and Hong King planned for 2004.	AIDC based on AFTN procedure implemented with USA.	FANS1/A system Implemented in Tokyo FIR.			Implemented in Tokyo FIR.	
KIRIBATI							
LAO PDR	ATN BIS Router planned for implementation with Bangkok in 2002.		Planned for Bay of Bengal and South China Sea areas. Equipment is under test operation.		Implemented as (S).	Planned for Bay of Bengal and South China Sea areas. Equipment under test operation.	

CNS/ATM Implementation Planning Matrix
Implementation Status of CNS Elements

State/Organization	ATN G/G Boundary Intermediate System (BIS) Router/AMHS	AIDC	CPDLC	GNSS		ADS	Remarks
				NPA Supplemental Means (S) Primary means (P)	En-route Supplemental Means (S) Primary means (P)		
MALAYSIA	ATN BIS Router planned for 2005.		Planned for Bay of Bengal and South East Asia areas and the equipment is under test operation.			Planned for Bay of Bengal and South East Asia areas and equipment is under test operation.	
MALDIVES							
MARSHALL ISLANDS				NPA (S) implemented at Majuro Atoll.			
MICRONESIA FEDERATED STATES OF							
Chuuk				NPA(S) implemented			
Kosrae				NPA(S) implemented			
Pohnpei				NPA(S) implemented			
Yap				NPA(S) implemented			

CNS/ATM Implementation Planning Matrix
Implementation Status of CNS Elements

State/Organization	ATN G/G Boundary Intermediate System (BIS) Router/AMHS	AIDC	CPDLC	GNSS		ADS	Remarks
				NPA Supplemental Means (S) Primary means (P)	En-route Supplemental Means (S) Primary means (P)		
MONGOLIA	ATN BIS Router planned for 2005.		Function available. Regular trials are conducted.	GPS procedures are being developed.	Implemented as (P).	ADS-C implemented since August 1998. ADS-B trial in progress implementation planned for 2002/2003.	
MYANMAR							
NAURU							
NEPAL	BIS Router planned for 2005			Development of arrival procedure and NPA as (S) completed end development of departure procedure is being develop.	Implemented as (S).		

CNS/ATM Implementation Planning Matrix
Implementation Status of CNS Elements

State/Organization	ATN G/G Boundary Intermediate System (BIS) Router/AMHS	AIDC	CPDLC	GNSS		ADS	Remarks
				NPA Supplemental Means (S) Primary means (P)	En-route Supplemental Means (S) Primary means (P)		
NEW ZEALAND	BIS Router planned for 2005	AFTN based AIDC implemented between New Zealand and Australia. Tests with Fiji and USA planned for 2002.	Implemented			Implemented	
PAKISTAN	Implementation of ATN considered for Phase II (2005-2010).					RADAR coverage in Karachi and Lahore FIRs.	
PAPUA NEW GUINEA							
PHILIPPINES	ATN BIS Router planned for 2005. Implementation for AMHS also planned.		D-ATIS and CPDLC Planned for 2006.			Planned for 2006.	

CNS/ATM Implementation Planning Matrix
Implementation Status of CNS Elements

State/Organization	ATN G/G Boundary Intermediate System (BIS) Router/AMHS	AIDC	CPDLC	GNSS		ADS	Remarks
				NPA Supplemental Means (S) Primary means (P)	En-route Supplemental Means (S) Primary means (P)		
REPUBLIC OF KOREA	ATN BIS planned for 2005	AFTN based AIDC implemented between Incheon ACC and Seoul APP.				Planned for 2002	
SINGAPORE	ATN BIS Router planned for 2005.		Implemented since 1997. Integrated in the ATC system in 1999. D-ATIS implemented since February 2000.			Implemented since 1997. Integrated with ATC system in 1999.	
SRI LANKA	ATN BIS Router Planned for 2005.		CPDLC implemented since November 2000.	NPA (S) planned for 2003.		ADS-C implemented since November 2000.	GPS based domestic route structure being developed.

CNS/ATM Implementation Planning Matrix
Implementation Status of CNS Elements

State/Organization	ATN G/G Boundary Intermediate System (BIS) Router/AMHS	AIDC	CPDLC	GNSS		ADS	Remarks
				NPA Supplemental Means (S) Primary means (P)	En-route Supplemental Means (S) Primary means (P)		
THAILAND	ATN G/G system implemented for domestic services. BBIS/BIS Routers planned for 2002. AMHS test with Hong Kong conducted.	ATN based AIDC Implemented in Domestic Sector.	Implemented	Implemented at international airports	Implemented as (S).	Implemented	
TONGA							
UNITED STATES							
Anchorage				NPA(S) implemented	En-route (P) implemented		
Fairbanks				NPA(S) implemented			
Guam (Agana NAS)				NPA(S) implemented			
Guam (Anderson)				NPA(S) implemented			
Honolulu Intl.				NPA(S) implemented	En-route (P) implemented	ADS-C planned for Dec. 2004	
Johnston Atoll				NPA(S) implemented			
Kahului				NPA(S) implemented			

CNS/ATM Implementation Planning Matrix
Implementation Status of CNS Elements

State/Organization	ATN G/G Boundary Intermediate System (BIS) Router/AMHS	AIDC	CPDLC	GNSS		ADS	Remarks
				NPA Supplemental Means (S) Primary means (P)	En-route Supplemental Means (S) Primary means (P)		
Oakland	ATN BBIS will be implemented in 2002. Router Tests are progressing. AMHS implementation between Japan and USA in 2004	Implemented using AFTN procedure. ATN AIDC planned for 2005.	Phase I ATN CPDLC implemented in Sept 2001. Phase IA planned for implementation at 20 en-route centres in USA for en-route function in 2006/2007 time frame.	NPA (S) implemented	En-route (P) implemented	ADS-C planned for Dec. 2004.	
Saipan				NPA (S) implemented			
VIETNAM	ATN BIS Router planned for 2003 and AMHS in 2005.	ATN based AIDC planned between Ho-Chi-Minh and Bangkok in 2005	Planned for 2003 – 2005	Planned for NPA (S) for 2003-2005 period	Implemented as (S) planned for 2002	Most of air space in Hanoi and Ho-Chi-Minh FIRs covered by RADAR. ADS planned for 2003-2005.	

TITLE AND TERMS OF REFERENCE

TITLE: ATN Transition Task Force

TERMS OF REFERENCE:

Plan for implementation of the Aeronautical Telecommunication Network (ATN) in the ASIA/PAC region to meet performance and capacity requirements of CNS/ATM Systems. The planning also addresses the ongoing development of the AFS including digital speech communication.

Appendix E - 2

Subject/Tasks of the ATN Transition Task Force

No.	Ref.	Task	Priority	Action Proposed/In Progress	Target
1	RAN/3 C 10/12 C 10/11d	Subject: ATN Transition Guidance Material Task: Develop Regional ATN Transition Guidance Material.		1) Development of detailed guidance material.	Completed
2	RAN/3 C 10/11d	Subject: ATN Transition Plan Task: Develop an ATN Transition Plan to provide seamless transition to ATN.	A	1) Develop Ground Transition Plan taking into account Air-to-Ground aspects. 2) Develop a set of planning documents covering: i) ATN Regional Routing Architecture ii) ATN Naming and Addressing Conventions, and iii) Documentation of the Assigned ATN Names and Addresses.	Completed
3		Subject: ATN major elements. Task: Provide performance and functional requirements of ATN.	A	1) Develop ATN Technical Documents. - Security - Performance - System Management	~~2003~~ 2003 2003 2003
4	RAN/3 C 10/11b	Subject: AFTN related issues Task: Review operation of AFTN.	B	1) Evaluate and review the effect of increases or decreases in capacity and network changes, on circuit loading. 2) Plan network changes for support of OPMET and AIS databases, automated VOLMET broadcast.	On-going 2003
5		Subject: Planning and implementation information in ANP. Task: Develop G/G part of the CNS FASID.	A	Development of detail description for the existing tables and Charts for the G/G part of the CNS FASID. 1) Table CNS 1B – ATN Router Plan 2) Table CNS 1C – ATS MHS 3) Table CNS 1D – AIDC Routing Plan	 Completed 2002 ~~2002~~ 2003

No.	Ref.	Task	Priority	Action Proposed/In Progress	Target
6		Subject: ATN Documentation Task: Development of ATN Routing Documentations and ICDs.	A	Development of ATN Documents: 1) A Router ICD 2) A Routing Policies (IDRP/MTA) 3) Directory of Service 4) An AMHS ICD 5) An AIDC ICD	~~2002~~ 2003 ~~2002~~ 2003 ~~2002~~ 2003 Completed ~~2005~~ 2004
7		Subject: Use of the public Internet Task: Develop guidance material for the use of the public internet technology to support AFTN, where required	A	Study the possibility of using the public Internet and develop guidance material for its use to support low speed AFTN stations, as an interim measure, with particular emphasis on security and reliability.	2003
8		Subject: Use of IP Task: Develop guidance material for the use of IP as a Sub-Network for ATN	B	In accordance with the work being performed by ATNP, develop guidance material for the support of IP as a Sub-Network of the ATN, with particular emphasis on system compatibility between adjacent centers and security	2005

TABLE CNS 1A - AFTN PLAN

Explanation of the Table

Column

1 — The AFS station or facility of individual State, listed alphabetically. Each circuit appears twice in the Table.

2 — Category of circuit

- M - Main trunk circuit connecting Main AFTN communication centres.
- T - Tributary circuit connecting Main AFTN communication centre and AFTN stations to relay or retransmit AFTN traffic.
- S - AFTN circuit which is used to transmit and receive AFTN traffic to and from a Main or Tributary AFTN communication centre directly connected to it and does not relay AFTN traffic except for the purpose of serving national station(s).

3 and 7 — Type of circuit provided:

- HF — High frequency radio teletype
- LTT/a — landline teletypewriter, analogue (eg. cable, microwave)
- LTT/d — landline teletypewriter, digital (eg. cable, microwave)
- LDD/a — landline data circuit, analogue (eg. cable, microwave)
- LDD/d — landline data circuit, digital (eg. cable, microwave)
- SAT/n/a/d — satellite link, the number indicates the number of hops in the circuit: Also use/a for analogue or/d for digital appropriate to the tail circuit.

4 and 8 — Circuit signalling speed, current or planned.

5 and 9 — Circuit protocols, current or planned.

6 and 10 — Data transfer code (syntax), current or planned.

- ITA-2 — International Telegraph Alphabet No. 2 (Baudot code).
- IA-5 — International Alphabet No. 5 (ICAO 7 - unit code).
- CBI — Code and Byte Independent (ATN compliant).

11 — Target date of implementation

12 — Remarks

- Note 1: Circuit is required for alternate routing and for national routing for international traffic.
- Note 2: Requirements exist for speech and data (S + DX) communication.

TABLE CNS - 1A AFTN PLAN

State/Station	Cat.	CURRENT				PLANNED				Target date of implementation	Remarks
		Type	Signalling Speed	Protocol	Code	Type	Signalling Speed	Protocol	Code		
1	2	3	4	5	6	7	8	9	10	11	12
AMERICAN SAMOA											
PAGO PAGO - S/NSTU											
United States/KSLC	S	SAT/d	2400 bps	X.25	IA-5						
AUSTRALIA											
BRISBANE - M/YBBB											
Christchurch/NZCH	T	LDD/d	2400 bps	X.25	IA-5						Note 2
Honiara/AGGG	S					LTT	75 baud	None	IA-5		internet as interim measure
Jakarta/WIII	S	SAT/d	9600 bps	X.25	IA-5						Note 1,2
Mauritius/FIMP	S	LTT	50 baud	None	ITA-2						
Nadi/NFFN	M	LDD/d	2400 bps	IA-5	IA-5						Note 2
Nauru/ANAU	S					SAT/d	2400 bps	X.25	IA-5		internet as interim measure
Port Moresby/AYPM	S	SAT/d	9600 bps	X.25	IA-5						Note 2
Port Vila/NVVV	S	LTT	300 baud	None	ITA-2						SITA
Santiago/SCSC	M					LDD/d	2400 bps	X.25	IA-5	12/02	Current routing
Singapore/WSSS	M	LDD/d	2400 bps	X.25	IA-5						
United States/KSLC	M	SAT/d	2400 bps	X.25	IA-5						
BANGLADESH											
DHAKA - S/VGZR											
Bangkok/VTBB	S	SAT/d	300 baud	None	IA-5						
Kolkata/VECC	S	HF RTT	50 baud	None	ITA-2	LTT	2400 bps	None	IA-5	12/02	Routing to be proposed via VTBB/VABB
BHUTAN											
PARO - S/VQPR											
Mumbai/VABB	S					SAT/a	50 baud	None	ITA-2	12/02	Dial-up
BRUNEI DARUSSALAM											
BRUNEI - S/WBSB											
Singapore/WSSS	S	LTT	75 baud	None	ITA-2	LDD	2400 bps	X.25	IA-5	10/02	
Kuala Lumpur/WMKK	S	LTT	75 baud	None	ITA-2	LDD/d	2400 bps	X.25	IA-5	10/02	Note 1,2
CAMBODIA											
PHNOM PENH - S/VDPP											
Bangkok/VTBB	S	SAT/d	300 baud	None	ITA-2						Note 2

TABLE CNS - 1A AFTN PLAN

State/Station	Cat.	CURRENT				PLANNED				Target date of implemen-tation	Remarks
		Type	Signalling Speed	Protocol	Code	Type	Signalling Speed	Protocol	Code		
1	2	3	4	5	6	7	8	9	10	11	12
CHINA											
BEIJING - M/ZBBB											
Guangzhou/ZGGG	M	LDD/d	9600 bps	X.25	IA-5						
Karachi/OPKC	M	LTT	50 baud	None	ITA-2	LDD/a	300 baud	None	IA-5	12/02	
Kathmandu/VNKT	S	SAT/d	300 baud	None	IA-5						
Russian Fedration/UHHH	M	SAT/d	2400 bps	None	IA-5						via Khabarovsk
Pyongyang/ZKKK	S	SAT/d	300 baud	None	IA-5						
Seoul/RKSS	S	SAT/d	9600 bps	X.25	IA-5						AMSS Connection 12/01
Tokyo/RJAA	M	LDD/d	9600 bps	X.25	IA-5						
Ulaan Baatar/ZMUB	S	SAT/d	300 baud	None	IA-5						Note 2
Yangon/VYYY	S					SAT/d	300 baud	None	IA-5	12/02	
GUANGZHOU-M/ZGGG											
Beijing/ZBBB	M	LDD/d	9600 bps	X.25	IA-5						
Hong Kong/VHHH	M	LDD/d	2400 bps	None	IA-5						Note 1
Macau/VMMC	S	SAT/d	2400 bps	None	IA-5						
Sanya/ZJSY	S	LDD/d	2400 bps	None	IA-5						
SANYA-S/ZJSY											
Guangzhou/ZGGG	S	LDD/d	2400 bps	None	IA-5						
Hong Kong/VHHH	S	LDD/d	2400 bps	None	IA-5						
TAIBEI - S/RCTP											
Hong Kong/VHHH	S	LDD/d	4800 bps	X.25	IA-5						
Manila/RPLL	S	LTT	75 baud	None	ITA-2	LDD/d	300 baud	None	ITA-2	12/02	Note 1, 2
Naha/ROAH	S	LDD/d	4800 bps	X.25	IA-5						
HONG KONG, CHINA											
HONG KONG-M/VHHH											
Bangkok/VTBB	M	LDD/d	2400 bps	X.25	IA-5						
Guangzhou/ZGGG	M	LDD/d	2400 bps	None	IA-5						Note 1
Ho-Chi-Minh/VVTS	S	SAT/a	300 baud	None	IA-5	SAT/d	2400 bps	None	IA-5	09/02	
Macau/VMMC	S	LDD/d	2400 bps	None	IA-5						
Manila/RPLL	S	LDD/d	300 baud	None	ITA-2						
Sanya/ZJSY	S	LDD/d	2400 bps	None	IA-5						Note 1
Taibei/RCTP	S	LDD/d	4800 bps	X.25	IA-5						
Tokyo/RJAA	M	LDD/d	9600 bps	X.25	IA-5						

TABLE CNS - 1A AFTN PLAN

State/Station	Cat.	CURRENT				PLANNED				Target date of implemen-tation	Remarks
		Type	Signalling Speed	Protocol	Code	Type	Signalling Speed	Protocol	Code		
1	2	3	4	5	6	7	8	9	10	11	12
MACAU, CHINA											
MACAU - S/VMMC											
Hong Kong/VHHH	S	LDD/d	2400 bps	None	IA-5						
Guangzhou/ZGGG	S	SAT/d	2400 bps	None	IA-5						
COOK ISLAND											
RAROTONGA-S/NCRG											
Christchurch/NZCH	S	LDD/d	2400 bps	None	IA-5						
DPR KOREA											
PYONGYANG-S/ZKKK											
Beijing/ZBBB	S	SAT/d	300 baud	None	IA-5						
FIJI											
NADI - M/NFFN											
Brisbane/YBBB	M	LDD/d	2400 bps	X.25	IA-5						Note 2
Christchurch/NZCH	S	LDD/d	2400 bps	X.25	IA-5						Note 2
Funafuti/NGFU	S					LDD/d	2400 bps	None	IA-5		dial-up
Noumea/NWWW	S	LDD/d	2400 bps	X.25	IA-5						Note 2
Tarawa/NGTT	S	LTT	2400 bps	None	IA-5						
United States/KSLC	M	SAT/d	2400 bps	X.25	IA-5						Note 2
Wallis Is./NLWW	S					LDD/a	2400 bps	None	IA-5	when traffic justifies	Current routing via Noumea
FRENCH POLYNESIA (FRANCE)											
PAPEETE/NTAA											
Christchurch/NZCH	S	LDD/d	2400 bps	X.24	IA-5						
INDIA											
MUMBAI - M/VABB											
Bangkok/VTBB	M	SAT/a	2400 bps	X.25	IA-5						
Kokata/VECC	S	LTT	2x50	None	ITA-2	LDD/d	2400 bps	X.25	IA-5	09/02	
Colombo/VCCC	M	SAT/a	50 baud	None	ITA-2	LDD/d	2400 bps	X.25	IA-5	07/02	
Karachi/OPKC	M	SAT/a	200 baud	None	ITA-2						Note 2
Kathmandu/VNKT	S	SAT/a	50 baud	None	ITA-2						
Muscat Seeb/OOMS	M	SAT/a	300 baud	None	ITA-2	SAT	2400 bps	X.25	IA-5	07/02	Note 2
Nairobi/HKNC	M	SAT/a	50 baud	None	ITA-2	LDD/d	2400 bps	X.25	IA-5	09/02	
Paro/VQPR	S					SAT/a	50 baud	None	ITA-2	12/02	Dial-up

TABLE CNS - 1A AFTN PLAN

State/Station	Cat.	CURRENT				PLANNED				Target date of implementation	Remarks
		Type	Signalling Speed	Protocol	Code	Type	Signalling Speed	Protocol	Code		
1	2	3	4	5	6	7	8	9	10	11	12
KOLKATA - S/VECC											
Dhaka/VGZR	S	RTT	50 baud	None	ITA-2	LTT	2400 bps	None	ITA-2	12/02	Routing to be proposed via VTBB/VABB
Mumbai/VABB	S	LTT	2x50	None	ITA-2	LDD/d	2400 bps	X.25	IA-5	09/02	
DELHI - S/VIDD											
Tashkent/UTTT	S	SAT/a	50 baud	None	ITA-2						
CHENNAI - S/VOMM											
Kuala Lumpur/WMKK	S	LTT	50 baud	None	ITA-2	LDD/d	2400 bps	X.25	IA-5	07/02	Note 1, 2
INDONESIA											
JAKARTA - S/WIII											
Brisbane/YBBB	S	SAT/d	9600 bps	X.25	IA-5						Note1,2
Singapore/WSSS	S	SAT/d	2400 bps	X.25	IA-5						Note 2
JAPAN											
TOKYO - M/RJAA											
Beijing/ZBBB	M	LDD/d	9600 bps	X.25	IA-5						
Hong Kong/VHHH	M	LDD/a	9600 bps	X.25	IA-5						
Russian Federation/UHHH	M	LTT	2400 bps	None	IA-5						
Russian Federation/UUUU	M	LTT	200 baud	None	IA-5	LDD	2400 bps	None	IA-5	12/03	(Moscow)
Naha/ROAH	S	LDD/d	9600 bps	X.25	IA-5						
Seoul/RKSS	S	LDD/d	9600 bps	X.25	IA-5						Note 2
Singapore/WSSS	M	LDD/a	1200 bps	COP-B	IA-5	LDD/d	9600 bps	X.25	IA-5	12/02	
United States/KSLC	M	LDD/d	9600 bps	X.25	IA-5						
NAHA - S/ROAH											
Taibei/RCTP	S	LDD/d	4800 bps	X.25	IA-5						
Tokyo/RJAA	S	LDD/d	9600 bps	X.25	IA-5						
KIRIBATI											
TARAWA - S/NGTT											
Nadi/NFFN	S	LTT	2400 bps	None	IA-5						
LAO PDR											
VIENTIANE - S/VLVT											
Bangkok/VTBB	S	SAT/d	300 baud	COP-B	IA-5						Note 2
Ho-Chi-Minh/VVTS	S	SAT/d	9600 bps	None	IA-5						Note 1 via Hanoi

TABLE CNS - 1A AFTN PLAN

State/Station	Cat.	CURRENT				PLANNED				Target date of implementation	Remarks
		Type	Signalling Speed	Protocol	Code	Type	Signalling Speed	Protocol	Code		
1	2	3	4	5	6	7	8	9	10	11	12
MALAYSIA											
KUALA LUMPUR-S/WMKK											
Bangkok/VTBB	S	SAT/d	2400 bps	X.25	IA-5						Note 1, 2
Chennai/VOMM	S	LTT	50 baud	None	ITA-2	LDD/d	2400 bps	X.25	IA-5	07/02	Note 1, 2
Singapore/WSSS	S	SAT/d	1200 bps	X.25	IA-5						Note 2
Brunei/WBSB	S	LTT	75 baud	None	ITA-2	LDD/d	2400 bps	X.25	IA-5	10/02	Note 1, 2
MALDIVES											
MALE - S/VRMM											
Colombo/VCCC	S	LTT	50 baud	None	ITA-2	SAT/d	2400 bps	X.25	IA-5	12/02	Note 2
MARSHAL ISLAND											
MAJURO - S/PKMJ											
United States/KSLC	S	SAT/d	1200 bps	X.25	IA-5						
MICRONESIA FEDERATED STATE OF											
CHUUK - S/PTKK											
United States/KSLC	S	SAT/a	1200 bps	X.25	IA-5						
KOSRAE - S/PTSA											
United States/KSLC	S	SAT/a	1200 bps	X.25	IA-5						
PONAPEI - S/PTPN											
United States/KSLC	S	SAT/a	1200 bps	X.25	IA-5						
YAP - S/PTYA											
United States/KSLC	S	SAT/a	1200 bps	X.25	IA-5						
MONGOLIA											
ULAANBAATAR-S/ZMUB											
Beijing/ZBBB	S	SAT/d	300 baud	None	IA-5						Note 2
Russian Federation/UIII	M	LTT	50 baud	None	ITA-2						(Irkutsk)
MYANMAR											
YANGON - S/VYYY											
Bangkok/VTBB	S	SAT/d	300 baud	COP-B	IA-5						Note 2
Beijing/ZBBB	S					SAT/d	300 baud	None	IA-5	12/02	Note 1,2

TABLE CNS - 1A AFTN PLAN

State/Station	Cat.	CURRENT				PLANNED				Target date of implemen-tation	Remarks
		Type	Signalling Speed	Protocol	Code	Type	Signalling Speed	Protocol	Code		
1	2	3	4	5	6	7	8	9	10	11	12
NAURU											
NAURU - S/ANAU											
Brisbane/YBBB	S					SAT/d	2400 bps	X.25	IA-5		VIA Internet as interium measure
NEPAL											
KATHMANDU - S/VNKT											
Beijing/ZBBB	S	SAT/d	300 baud	None	IA-5						
Mumbai/VABB	S	SAT/a	50 baud	None	ITA-2						
NEW CALEDONIA (FRANCE)											
NOUMEA - S/NWWW											
Nadi/NFFN	S	LDD/d	2400 bps	X.25	IA-5						Note 2
NEW ZEALAND											
CHRISTCHURCH-T/NZCH											
Brisbane/YBBB	T	LDD/d	2400 bps	X.25	IA-5						Note 2
Nadi/NFFN	S	LDD/d	2400 bps	X.25	IA-5						Note 1, 2
Niue/NIUE	S										Currently by FAX
Papeete/NTAA	S	SAT/d	2400 bps	X.25	IA-5						
Rarotonga/NCRG	S	LDD/d	2400 bps	None	IA-5						
Tongatapu/NFTF	S					LDD/d	2400 bps	None	IA-5	07/02	
NIUE IS											
NIUE - S/NIUE											
Christchurch/NZCH	S										Currently by FAX
PAKISTAN											
KARACHI - M/OPKC											
Beijing/ZBBB	M	LTT	50 baud	None	ITA-2	LDD/a	300 baud	None	IA-5	12/02	
Mumbai/VABB	M	SAT/a	200 baud	None	ITA-2						Note 2
Kabul/OAKB	S	SAT/d	300 baud	None	IA-5						Note 2
Kuwait/OKBK	M	SAT/a	50 baud	None	ITA-2						
PALAU											
KOROR - S/PTRO											
United States/KSLC	S	SAT/d	1200 bps	X.25	IA-5						
PAPUA NEW GUINEA											
PORT MORESBY-S/AYPM											
Brisbane/YBBB	S	SAT/d	9600 bps	X.25	IA-5						Note 2

TABLE CNS - 1A AFTN PLAN

State/Station	Cat.	CURRENT				PLANNED				Target date of implementation	Remarks
		Type	Signalling Speed	Protocol	Code	Type	Signalling Speed	Protocol	Code		
1	2	3	4	5	6	7	8	9	10	11	12
PHILIPPINES											
MANILA - S/RPLL											
Hong Kong/VHHH	S	LDD/d	300 baud	None	ITA-2						Note 2
Singapore/WSSS	S	LDD/d	300 baud	None	ITA-2						Note 1, 2
Taibei/RCTP	S	LTT	75 baud	None	ITA-2	LDD/d	300 baud	None	ITA-2	12/02	Note 1, 2
REPUBLIC OF KOREA											
SEOUL - S/RKSS											
Beijing/ZBBB	S	SAT/d	9600 bps	X.25	IA-5						AMSS Connection 12/01
Tokyo/RJAA	S	LDD/d	9600 bps	X.25	IA-5						Note 2
SAMOA											
APIA - S/NSFA											
USA/KSLC	S					SAT/d	2400	X.25	IA-5	12/02	
SINGAPORE											
SINGAPORE-M/WSSS											
Bahrain/OBBI	M	LTT	200 baud	None	ITA-2	SAT/a	2400 bps	X.25	IA-5	12/02	
Bangkok/VTBB	M	LDD/d	1200 bps	X.25	IA-5						Note 2
Brisbane/YBBB	M	LDD/d	2400 bps	X.25	IA-5						
Brunei/WBSB	S	LTT	75 baud	None	ITA-2	LDD/d	2400 bps	X.25	IA-5	10/02	
Colombo/VCCC	M	LTT	75 baud	None	ITA-2	LDD/d	2400 bps	X.25	IA-5	12/02	
Ho-Chi-Minh/VVTS	S	SAT/a	300 baud	None	IA-5						
Jakarta/WIII	S	LDD/a	2400 bps	X.25	IA-5						Note 2
Kuala Lumpur/WMKK	S	SAT/d	1200 bps	X.25	IA-5						Note 1,2
London/EGGG	M	LDD/d	1200 bps	X.25	IA-5						
Manila/RPLL	S	LDD/d	300 baud	None	ITA-2				IA-5		
Tokyo/RJAA	M	LDD/a	1200 bps	COP-B	IA-5	LDD/d	9600 bps	X.25	IA-5	12/02	
SOLOMON IS.											
HONIARA - S/AGGG											
Brisbane/YBBB	S					LTT	75 baud	None	IA-5	12/02	VIA Internet as intermedium measure
SRI LANKA											
COLOMBO - M/VCCC											
Mumbai/VABB	M	SAT/a	50 baud	None	ITA-2	LDD/d	2400 bps	X.25	IA-5	07/02	
Male/VRMM	S	LTT	50 baud	None	ITA-2	SAT/d	2400 bps	X.25	IA-5	06/02	Note2
Singapore/WSSS	M	LTT	75 baud	None	ITA-2	LDD/d	2400 bps	X.25	IA-5	12/02	

TABLE CNS - 1A AFTN PLAN

State/Station	Cat.	CURRENT				PLANNED				Target date of implementation	Remarks
		Type	Signalling Speed	Protocol	Code	Type	Signalling Speed	Protocol	Code		
1	2	3	4	5	6	7	8	9	10	11	12
THAILAND											
BANGKOK - M/VTBB											
Mumbai/VABB	M	SAT/a	2400 bps	X.25	IA-5						
Dhaka/VGZR	S	SAT/d	300 baud	None	IA-5						
Ho-Chi-Minh/VVTS	S	SAT/d	2400 bps	None	IA-5						
Hong Kong/VHHH	M	LDD/d	2400 bps	X.25	IA-5						
Kuala Lumpur/WMKK	S	SAT/d	2400 bps	X.25	IA-5						Note 1, 2
Phnom Penh/VDPP	S	SAT/d	300 baud	None	ITA-2						Note 2
Rome/LIII	M	SAT/d	2400 bps	X.25	IA-5						
Singapore/WSSS	M	LDD/d	1200 bps	X.25	IA-5						Note 2
Vientiane/VLVT	S	SAT/d	300 baud	COP-B	IA-5						
Yangon/VYYY	S	SAT/d	300 baud	COP-B	IA-5						Note 2
TONGA											
TONGATAPU - S/NFTF	S										
Cristchurch/NZCH						LDD/d	2400 bps	None	IA-5	07/02	
TUVALU											
FUNAFUTI - S/NGFU											
Nadi/NFFN	S					LTT	50 baud	None	ITA-2	12/02	Dial-up Note 2
UNITED STATES											
Apia/NSFA						SAT/d	2400 bps	X.25	IA-5	12/02	
USA-M/KSLC											
Brisbane/YBBB	M	SAT/d	2400 bps	X.25	IA-5						
Chuuk/PTKK	S	SAT/d	1200 bps	X.25	IA-5						
Koror/PTRO	S	SAT/d	1200 bps	X.25	IA-5						
Kosrae/PTSA	S	SAT/d	1200 bps	X.25	IA-5						
Majuro/PKMJ	S	SAT/d	1200 bps	X.25	IA-5						
Nadi/NFFN	M	SAT/d	2400 bps	X.25	IA-5	LDD/d				07/03	
Pago Pago/NSTU	S	SAT/d	2400 bps	X.25	IA-5						
Ponapei/PTPN	S	SAT/a	1200 bps	X.25	IA-5						
Tokyo/RJAA	M	LDD/d	9600 bps	X.25	IA-5						
Yap/PTYA	S	SAT/d	1200 bps	X.25	IA-5						
VANUATU											
PORT VILA - S/NVVV											
Brisbane/YBBB	S	LTT	300 baud	None	ITA-2						SITA

TABLE CNS - 1A AFTN PLAN

State/Station	Cat.	CURRENT				PLANNED				Target date of implemen-tation	Remarks
		Type	Signalling Speed	Protocol	Code	Type	Signalling Speed	Protocol	Code		
1	2	3	4	5	6	7	8	9	10	11	12
VIET NAM											
HO-CHI-MINH - S/VVTS											
Bangkok/VTBB	S	SAT/d	2400 bps	None	IA-5						
Hanoi-S/VVTS		SAT/d	9600 bps	None	IA-5						
Hong Kong/VHHH	S	SAT/a	300 baud	None	ITA-2	SAT/d	2400 bps	None	IA-5	09/02	
Singapore/WSSS	S	SAT/a	300 baud	None	IA-5						
HANOI-S/VVNB											
Vientiane/VLVT	S	SAT/d	9600 bps	None	IA-5						
Ho-Chi-Minh	M	SAT/d	9600 bps	None	IA-5						
WALLIS IS. (FRANCE)											
WALLIS - S/NLWW											
Nadi/NFFN	S					LDD/A	2400 bps	None	IA-5		Current routing via Noumea

Table CNS 1C

ATS MESSAGE HANDLING SERVICES (ATSMHS)

ROUTING PLAN

Explanation of the Table

Column

1	Administration – the name of the Administration, State or Organization responsible for management of the AMHS
2	Location of AMHS
3	ATSMHS Type: AFTN/AMHS Gateway Message Transfer Agent (MTA) Server
4	AMHS Pair – name of the city or location of the correspondent end of the AMHS Service
5	Target Date of Implementation – date of implementation of the AMHS services
6	Remarks

Appendix G - 2 **ATS MESSAGE HANDLING SERVICE (ATSMHS) ROUTING PLAN**

Administration	Location of AMHS	ATSMHS Type	AMHS Pair	Target Date of Implementation	Remarks
American Samoa	Pago Pago	AFTN/AMHS Gateway	Salt Lake City	2005	
Australia	Brisbane	MTA	Singapore	2005	
		MTA	Salt Lake City	2005	
		MTA	Nadi	2005	
		AFTN/AMHS Gateway	Jakarta	2005	
		AFTN/AMHS Gateway	Nauru	2005	
		AFTN/AMHS Gateway	East Timor	2005	Under construction
		MTA	Christchurch	2005	
		AFTN/AMHS Gateway	Port Moresby	2005	
		AFTN/AMHS Gateway	Solomon Islands	2005	
		AFTN/AMHS Gateway	Vanuatu	2005	
Bangladesh	Dhaka	AFTN/AMHS Gateway	India	2005	
		AFTN/AMHS Gateway	Bangkok	2005	
Bhutan	Paro	AFTN/AMHS Gateway	India	2005	
Brunei Darussalam	Brunei	AFTN/AMHS Gateway	Singapore	2005	
		AFTN/AMHS Gateway	Kuala Lumpur	2005	
Cambodia	Phnom Penh	AFTN/AMHS Gateway	Bangkok	2005	
China	Beijing	MTA	Tokyo	2005	
		MTA	Hong Kong	2005	
		MTA	India	2005	
		MTA	Russian Federation	2005	
		MTA	Bangkok	2005	

Administration	Location of AMHS	ATSMHS Type	AMHS Pair	Target Date of Implementation	Remarks
		AFTN/AMHS Gateway	Pyongyang	2005	
		AFTN/AMHS Gateway	Macau	2005	
		AFTN/AMHS Gateway	Mongolia	2005	
		AFTN/AMHS Gateway	Myanmar	2005	
		AFTN/AMHS Gateway	Nepal	2005	
		AFTN/AMHS Gateway	Pakistan	2005	
		MTA	Seoul	2005	
Hong Kong, China	Hong Kong	MTA	Beijing	2005	
		MTA	Japan	2005	
		MTA	Bangkok	2005	
		AFTN/AMHS Gateway	Macau	2005	
		AFTN/AMHS Gateway	Manilia	2005	
		AFTN/AMHS Gateway	Taibei	2005	
		MTA	Viet Nam	2005	
Macau, China	Macau	AFTN/AMHS Gateway	Beijing	2005	
		AFTN/AMHS Gateway	Hong Kong	2005	
Cook Island	Rarotonga	AFTN/AMHS Gateway	Christchurch	2005	
East Timor	Dili	AFTN/AMHS Gateway	Brisbane	2005	Under construction
DPR Korea	Pyongyang	AFTN/AMHS Gateway	Beijing	2005	
Fiji	Nadi	MTA	Brisbane	2005	
		MTA	Christchurch	2005	
		AFTN/AMHS Gateway	Kiribati	2005	

ATS MESSAGE HANDLING SERVICE (ATSMHS) ROUTING PLAN

Administration	Location of AMHS	ATSMHS Type	AMHS Pair	Target Date of Implementation	Remarks
		AFTN/AMHS Gateway	Tuvalu	2005	
		MTA	Salt Lake City	2005	
		AFTN/AMHS Gateway	Wallis	2005	
French Polynesia	Papeete	AFTN/AMHS Gateway	Christchurch	2005	
India	Mumbai	MTA	Beijing	2005	
		AFTN/AMHS Gateway	Kenya, Nairobi	2005	
		AFTN/AMHS Gateway	Oman, Muscat Seeb	2005	
		MTA	Singapore	2005	
		MTA	Bangkok	2005	
		AFTN/AMHS Gateway	Bhutan	2005	
		AFTN/AMHS Gateway	Nepal	2005	
		AFTN/AMHS Gateway	Pakistan	2005	
		AFTN/AMHS Gateway	Sri Lanka	2005	
	Kolkata	AFTN/AMHS Gateway	Bangladesh	2005	
Indonesia	Jakarta	AFTN/AMHS Gateway	Brisbane	2005	
		AFTN/AMHS Gateway	Singapore	2005	
Japan	Tokyo	MTA	Beijing	2005	
		MTA	Hong Kong	2005	
		MTA	Singapore	2005	
		MTA	Salt Lake City	2005	
		MTA	Europe	2005	

Administration	Location of AMHS	ATSMHS Type	AMHS Pair	Target Date of Implementation	Remarks
		MTA	Russian Federation	2005	
		MTA	Seoul	2005	
	Naha	AFTN/AMHS Gateway	Taibei	2005	
Kiribati	Tarawa	AFTN/AMHS Gateway	Nadi	2005	
Lao PDR	Vientiane	AFTN/AMHS Gateway	Bangkok	2005	
		AFTN/AMHS Gateway	Viet Nam	2005	
Malaysia	Kuala Lumpur	AFTN/AMHS Gateway	Singapore	2005	
		AFTN/AMHS Gateway	Bangkok	2005	
Maldives	Male	AFTN/AMHS Gateway	Sri Lanka	2005	
Marshal Island	Majuro	AFTN/AMHS Gateway	Salt Lake City	2005	
Micronesia	Chuuk	AFTN/AMHS Gateway	Salt Lake City	2005	
Federated State of	Kosrai	AFTN/AMHS Gateway	Salt Lake City	2005	
	Ponapei	AFTN/AMHS Gateway	Salt Lake City	2005	
	Yap	AFTN/AMHS Gateway	Salt Lake City	2005	
Mongolia	Ulaanbaatar	AFTN/AMHS Gateway	Beijing	2005	
Myanmar	Yangon	AFTN/AMHS Gateway	Beijing	2005	
		AFTN/AMHS Gateway	Bangkok	2005	
Nauru	Nauru	AFTN/AMHS Gateway	Brisbane	2005	
Nepal	Kathmandu	AFTN/AMHS Gateway	Beijing	2005	
		AFTN/AMHS Gateway	India	2005	
New Caledonia	Noumea	AFTN/AMHS Gateway	Nadi	2005	
New Zealand	Christchurch	MTA	Brisbane	2005	

ATS MESSAGE HANDLING SERVICE (ATSMHS) ROUTING PLAN

Administration	Location of AMHS	ATSMHS Type	AMHS Pair	Target Date of Implementation	Remarks
		MTA	Salt Lake City	2005	
		AFTN/AMHS Gateway	Cook Is	2005	
		AFTN/AMHS Gateway	Tonga	2005	
		MTA	Nadi	2005	
		AFTN/AMHS Gateway	French Polynesia	2005	
		AFTN/AMHS Gateway	Niue Is	2005	
Niue Is	Niue	AFTN/AMHS Gateway	Christchurch	2005	
Pakistan	Karachi	AFTN/AMHS Gateway	Beijing	2005	
		AFTN/AMHS Gateway	India	2005	
Palau	Koror	AFTN/AMHS Gateway	Salt Lake City	2005	
Papua New Guinea	Port Moresby	AFTN/AMHS Gateway	Brisbane	2005	
Philippines	Manila	AFTN/AMHS Gateway	Hong Kong	2005	
		AFTN/AMHS Gateway	Singapore	2005	
Republic of Korea	Seoul	MTA	Beijing	2005	
		MTA	Tokyo	2005	
Samoa	Apia	AFTN/AMHS Gateway	Salt Lake City	2005	
Singapore	Singapore	MTA	Brisbane	2005	
		AFTN/AMHS Gateway	Bahrain	2005	
		AFTN/AMHS Gateway	England	2005	
		MTA	Tokyo	2005	
		MTA	India	2005	

Administration	Location of AMHS	ATSMHS Type	AMHS Pair	Target Date of Implementation	Remarks
		MTA	Bangkok	2005	
		AFTN/AMHS Gateway	Brunei Darussalam	2005	
		AFTN/AMHS Gateway	Jakarta	2005	
		AFTN/AMHS Gateway	Malaysia	2005	
		AFTN/AMHS Gateway	Philippines	2005	
		AFTN/AMHS Gateway	Sri Lanka	2005	
		AFTN/AMHS Gateway	Viet Nam	2005	
Solomon Is	Honiara	AFTN/AMHS Gateway	Brisbane	2005	
Sri Lanka	Colombo	AFTN/AMHS Gateway	India	2005	
		AFTN/AMHS Gateway	Maldives	2005	
		AFTN/AMHS Gateway	Singapore	2005	
Thailand	Bangkok	AFTN/AMHS Gateway	Italy	2005	
		MTA	Beijing	2005	
		MTA	Hong Kong	2005	
		MTA	India	2005	
		MTA	Singapore	2005	
		AFTN/AMHS Gateway	Bangladesh	2005	
		AFTN/AMHS Gateway	Cambodia	2005	
		AFTN/AMHS Gateway	Lao PDR	2005	
		AFTN/AMHS Gateway	Malaysia	2005	
		AFTN/AMHS Gateway	Mayanmar	2005	
		AFTN/AMHS Gateway	Viet Nam	2005	

ATS MESSAGE HANDLING SERVICE (ATSMHS) ROUTING PLAN

Administration	Location of AMHS	ATSMHS Type	AMHS Pair	Target Date of Implementation	Remarks
Tonga	Tongatapu	AFTN/AMHS Gateway	Christchurch	2005	
Tuvalu	Funafuti	AFTN/AMHS Gateway	Nadi	2005	
United States	Salt Lake City	MTA	Brisbane	2005	
		MTA	Tokyo	2005	
		MTA	Nadi	2005	
		MTA	Christchurch	2005	
		AFTN/AMHS Gateway	American Somoa	2005	
		AFTN/AMHS Gateway	Marshal Islands	2005	
		AFTN/AMHS Gateway	Micronesia	2005	
		AFTN/AMHS Gateway	Palau	2005	
		AFTN/AMHS Gateway	Samoa	2005	
Vanuatu	Port Vila	AFTN/AMHS Gateway	Brisbane	2005	
Viet Nam	Ho-Chi-Minh	AFTN/AMHS Gateway	Hong Kong	2005	
		AFTN/AMHS Gateway	Bangkok	2005	
		AFTN/AMHS Gateway	Singapore	2005	
	Hanoi	AFTN/AMHS Gateway	Lao PDR	2005	
Wallis Is.	Wallis	AFTN/AMHS Gateway	Nadi	2005	

PART IV
COMMUNICATIONS, NAVIGATION AND SURVEILLANCE (CNS)

1. INTRODUCTION

1.1 This part of the Asia and Pacific Basic Air Navigation Plan (ANP) contains elements of the existing system and the basic planning principles, operational requirements and planning criteria related to Communications, Navigation and Surveillance (CNS) system and are considered to be minimum necessary for effective planning of CNS facilities and services in the ASIA/PAC region. A detailed description of the facilities and services to be provided by States in order to fulfill the requirements of the Basic ANP is contained in the ASIA/PAC Facilities and Services Implementation Document (FASID). During the transition and pending full implementation of the CNS/ATM system, it is expected that the existing requirements will gradually be replaced by new CNS/ATM system requirements. Furthermore, it is expected that some elements of the CNS/ATM system will be subject to amendment, as necessary, on the basis of experience gained in their implementation.

1.2 This Standards, Recommended Practices and Procedures to be applied are contained in:

a) Annex 10 – *Aeronautical Telecommunications and*

b) *Regional Supplementary Procedures – Communications* (MID/ASIA and PAC SUPPS, Part 2 of Doc. 7030)

1.3 Background information which is of importance in the understanding and effective application of the plan, is contained in the Report of the Third Asia/Pacific Regional Air Navigation Meeting (Doc. 9614, ASIA/PAC/3 (1993)) on Agenda Items 10, 11 and 12.

1.4 Relevant Recommendations and/or Conclusions of ASIA/PAC/3 RAN Meeting and Regional Planning Groups, where applicable, are shown within brackets to indicate the source.

2. COMMUNICATIONS

2.1 *General*

2.1.1 The plan and details of the operational requirements for communications are contained in the Tables CNS-1A, CNS-1B, CNS-1C, CNS-1D, CNS-IE and CNS-2 and associated Charts of Part IV of ASIA/PAC FASID.

2.2 The Aeronautical Fixed Service comprises:

a) the Aeronautical Fixed Telecommunication Network (AFTN);

b) Ground elements of the Aeronautical Telecommunication Network (ATN). The data communications sub-networks and associated systems supporting the ground-ground applications of the aeronautical telecommunication network (ATN), namely the ATS message handling services (ATS MHS) and ATS Inter-Facility Data Communication (AIDC);

c) gateways that will allow inter-operation between AFTN and ATS MHS.

d) ATS direct speech circuits; and

e) Meteorological operational circuits, networks and broadcast systems.

2.2.1 *Aeronautical Fixed Telecommunication Network (AFTN)*

2.2.1.1 States should ensure that telecommunication agencies engaged in providing aeronautical circuits be impressed of the need for:

a) high reliability terrestrial links connecting aeronautical facilities and common carrier terminals inclusive

of priority restoration of service commensurate with the requirements of a safety service; and

b) rapid restoration of circuits in the event of breakdown.

[ASIA/PAC/3, Conc. 10/1]

2.2.1.2 States operating AFTN circuits which do not function satisfactorily 97 per cent of the time during which the circuit is scheduled to be in operation, should exchange monthly circuit performance charts on the form provided in Appendix A of Agenda Item 10 of ICAO Doc. 9614, ASIA/PAC/3 (1993). Where a circuit consistently achieves 97 per cent reliability, the exchange of performance charts may cease. The circuit performance charts should be exchanged directly between the correspondent stations, with copies to the Administrations concerned and to the ICAO Regional Office. States should also identify the causes for inadequate circuit performance and take necessary remedial measures.
[ASIA/PAC/3, Con. 10/2]

2.2.1.3 States responsible for the operation of AFTN circuits which are not adequately meeting transit time requirements should record transit time statistics on the 23rd day of each third month (January, April, July and October) of each year, in accordance with the existing practices, for the AFTN circuits and terminals under their jurisdiction which do not meet the specified transit time criteria. The data recorded should be exchanged directly between the correspondent stations, with copies to Administration concerned and to the ICAO Regional Office.
[ASIA/PAC/3 Conc. 10/3]

2.2.1.4 States operating AFTN circuits should:

a) record AFTN statistics in the form contained in Appendix B of Agenda Item 10 of ICAO Doc. 9614, ASIA/PAC (1993) from 23 to 25 April and October each year;

b) exchange the circuit loading data for each circuit with each correspondent station, provide a copy to ICAO Regional Office; and

c) evaluate circuit loading and take appropriate remedial action when occupancy level exceeds permissible levels specified in the *Manual on the Planning and Engineering of the Aeronautical Fixed Telecommunications Network*, Doc. 8259-An/936)

[ASIA/PAC/3, Conc. 10/4]

2.2.1.5 States concerned should take positive measures to ensure system reliability and provide adequate management and supervision of facilities to eliminate system failure, and to ensure data integrity and timely delivery of messages.
[ASIA/PAC/3, Concl. 10/5]

2.2.1.6 The AFTN entry/exit points:

a) between ASIA/PAC and AFI should be Brisbane and Mumbai;

b) between ASIA/PAC and EUR should be Bangkok, Singapore and Tokyo;

c) between ASIA/PAC and MID should be Karachi, Mumbai and Singapore;

d) between ASIA/PAC and NAM should be Brisbane, Nadi and Tokyo;

e) between ASIA/PAC and SAM should be Brisbane.

[APANPIRG/11 Conc. 11/6]

2.2.1.7 *Technical aspects of Aeronautical Fixed Telecommunications Network (AFTN) rationalization.*

2.2.1.7.1 The main trunk circuits interconnecting main AFTN communication centers should be provided by LTT facilities, operate at a modulation rate commensurate with operational requirement, and employ international alphabet number 5 (IA-5) and character-oriented data link control procedures – system category B, or bit-oriented data link control procedures as defined in Annex 10, Volume III, Part I, Chapter 8.

2.2.1.7.2 Also the tributary circuits interconnecting tributary AFTN communication centers with main

AFTN communication centers, with other tributary AFTN communication centers, or with AFTN stations should be provided with LTT facilities where available and feasible, and preferably operate at a modulation rate commensurate with operational requirement and employ IA-5 code and procedures and an appropriate controlled circuit protocol.
[ASIA/PAC AFS RPG/3, Rec. 3/1]

2.2.1.8 To support data communication requirements and to provide needed data integrity and minimal transit time, the CCITT X.25 protocol should be used between AFTN COM Centres and Main Tributary COM Centres in the ASIA/PAC Region.
[APANPIRG/4, Conc. 4/27 and
APANPIRG/7, Conc. 7/14]

2.2.1.9 States consider implementing digital communication networks or circuits in a co-ordinated manner in order to meet current and future Aeronautical Fixed Service (AFS) communication requirements for data/voice communications and to facilitate the introduction of ATN.
(APANPIRG Concl. 11/14)

2.2.2 ATN Infrastructure Transition and Implementation

2.2.2.1 The ATN Transition Plan outlines the requirements to increase bandwidth and upgrade protocols for those trunk circuits that will support main data flow of traffic in the ASIA/PAC region. The plan also provides target dates for implementation of Backbone Boundary Intermediate Systems (BBIS) and Boundary Intermediate System (BIS) in the ASIA/PAC region.
(APANPIRG, Concl. 12/14)

2.2.2.2 ATN development should be introduced in an evolutionary and cost-effective manner based on available ICAO SARPs materials and regional ATN technical and planning documents. The ATN infrastructure transition is expected to be implemented in three phases as follows:

- Phase 1, Upgrade of existing AFTN circuits where necessary to support the introduction of the ATN BBISs;
- Phase 2, Implementation of the ATN Regional BBISs; and
- Phase 3, Implementation of supporting ATN BISs.

2.2.3 *ATS Direct Speech Circuits*

2.2.3.1 ATS direct speech communications
[ASIA/PAC/3, Conc. 5/21]

States concerned should assign a high priority to the establishment, in accordance with Annex 11, 3.6.1.1, of efficient direct-speech communications between ATS units serving adjacent areas in order to permit proper use of air-ground frequencies and further implementation of the air traffic control service.

2.2.3.2 Voice switching centers should be provided at the following locations:

1) Auckland	2) Bangkok
3) Beijing	4) Mumbai
5) Calcutta	6) Guangzhou
7) Jakarta	8) Karachi
9) Lahore	10) Kuala Lumpur
11) Chennai	12) Nadi
13) Tokyo	14) Brisbane

[ASIA/PAC/3, Rec. 10/15]

2.2.3.3 Dissemination of World Area Forecast System (WAFS) products in the ASIA/PAC region will be accomplished by satellite broadcast.
[ASIA/PAC/3, Rec. 10/19]

2.2.4 *ATS Inter-facility Data Communication (AIDC) Circuits*

State consider implementing the ATN application ATS Interfacility Data Communication (AIDC) in order to enable the exchange of ATS messages for active flights related to flight notification, flight coordination, transfer of control, surveillance data and free (unstructured) text data.

2.3 Air/ground communications

2.3.1 *Aeronautical Mobile Service and Aeronautical Mobile Satellite Service*

2.3.2 *Frequency utilization list*

2.3.2.1 States in the ASIA/PAC region should co-ordinate, as necessary, with the ICAO Asia and Pacific Regional Office all radio frequency assignments for both national and international facilities in the 190-526.50 kHz, 108-117.975 MHz, 960-1215 MHz and 117.975-137 MHz bands. The ICAO Asia and Pacific Regional Office, based on the information provided for this purpose by States, will issue, frequency lists No. 1, 2 and 3 at periodic intervals.
[ASIA/PAC/3, Conc. 11/4, 11/15 and 12/9]

2.3.3 *HF en-route communications*

2.3.3.1 States should be urged to co-ordinate on a national basis with the appropriate interested authorities, a programme directed towards achieving the elimination of the interference currently being experienced on some of the frequencies allocated to the Aeronautical Mobile (R) Service in the Region. When reviewing methods for developing such a national programme, consideration should be given to the procedures in Article S15 of the ITU Radio Regulations.

2.3.3.2 In the case of an unidentified interfering station, States should notify the Regional Office concerned, utilizing the procedure and the Report Form* developed by the Fifth Session of the Communications Division (1954) updated by the Communications Divisional Meeting (1978), Doc. 9239, Agenda Item 5. However, in the case of persistent harmful interference to an aeronautical service which may affect safety, it should be immediately reported to ICAO, and to the ITU using the prescribed format, for appropriate action.
[ASIA/PAC/3, Concl. 11/6]

* The harmful Interference Report Form is provided in Attachment B to CNS part IV of FASID.

2.3.4 *Air-Ground elements of ATN*

2.3.4.1 With the implementation of the air-ground applications of ATN, it is important to ensure that transit response times are kept to a minimum level so as not to affect the overall response time that it takes for traffic such as ADS reports and CPDLC messages to be delivered to their final destination. This also reflects the need to ensure that critical ground links within the Region are capable of handling this information efficiently.

2.3.4.2 One important factor with air-ground traffic is the generation of routing information caused by aircraft that will move between various ATN routing domains. As aircraft move through various coverage media and FIR boundaries the ATN Routing Backbone will be notified of the changing routing data for each mobile aircraft in the region. To allow this routing information to be propagated within the region will require a minimum number of backbone routers to be implemented which protect all other ATN routers from being inundated with routing information.
[ASIA/PAC ATN Transition Plan]

3. **NAVIGATION**

3.1 *General*

3.1.1 The plan and details of operational requirements for radio navigation aids are contained in the Table CNS-3 and associated of Part IV of ASIA/PAC FASID.

3.1.2 States should continue to provide ICAO with information on their flight inspection activities for inclusion in the ASIA/PAC Catalogue of Flight Inspection Units and circulation to States in the Regions and to the ASIA/PAC Air Navigation Planning and Implementation Regional Group (APANPIRG).
[ASIA/PAC/3, Conc. 12/8]

3.1.3 The development of the radio navigation aids plan, and its subsequent documentation in relevant air navigation plan (ANP) publications, defines the respective radio navigation aid requirements at each location without reference to discrete frequency assignments. The ICAO Regional Office will continue to maintain its frequency selection and co-ordination role, including the maintenance and promulgation of Frequency List Nos. 1 and 2 in a timely and periodic manner.
[ASIA/PAC/3, Conc. 12/9]

3.2 *Radio navigation aid requirements*

3.2.1 States which have not yet done so should install VHF omni directional radio range (VOR) supplemented by distance measuring equipment (DME) as the primary aid for en-route navigation

and, except in specified circumstances, delete any parallel requirement for a non-directional radio beacon (NDB) from the air navigation plan. [ASIA/PAC/3, Rec. 5/22]

4. SURVEILLANCE

4.1 *General*

4.1.1 The plan and details of operational requirements for surveillance are contained in Table CNS 4 of ASIA/PAC FASID.

4.1.2 Surveillance systems for terminal and en-route air traffic control purposes should be installed, maintained and operated at those international aerodromes and en-route area control centers, whenever it is necessary to improve the safe and expeditious handling of air traffic and where the traffic density and associated complexity of operation, system delays, meteorological conditions and/or transition from oceanic to continental airspace would justify these installations.
[ASIA/PAC/3, Rec. 5/28]

4.1.3 Where different systems are used for navigation and position determination within the same controlled airspace, the ground facilities involved should be collocated and/or oriented so as to provide compatible fight paths and to ensure, as far as practicable, a fully integrated air traffic control pattern.
[ASIA/PAC, Rec. 7/14]

4.1.4 The Asia and Pacific region is characterized by use of:

a) SSR Mode A, C and, in the near future, Mode S in some terminal and high density continental airspace;

b) ADS in some parts of the region; and

c) The diminishing use of primary radar.

4.1.5 Automatic Dependent Surveillance (ADS) is becoming available over the oceanic and continental airspace of the Asia and Pacific regions. SSR (augmented as necessary with Mode S) will continue to be used in terminal areas and in some high-density airspace.

4.2 *Automatic Dependent Surveillance (ADS)*

4.2.1 *Co-ordination of activities related to the implementation of ADS*

4.2.1.1 The introduction of air-ground data links, together with sufficiently accurate and reliable aircraft navigation systems, present the opportunity to provide surveillance services in areas which lack such services in the present infrastructure, in particular oceanic areas and other areas where the current systems prove difficult, uneconomic, or even impossible, to implement. ADS is a function for use by ATS in which aircraft automatically transmit, via a data link, data derived from on-board navigation systems. As a minimum, the data should include the four-dimensional position. Additional data may be provided as appropriate. The ADS data would be used by the automated ATC system to present information to the controller. In addition to areas which are at present devoid of traffic position information other than pilot provided position reports, ADS will find beneficial application in other areas, including high-density areas, where ADS may serve as an adjunct and/or back-up for secondary surveillance radar and thereby reduce the need for primary radar. Also, in some circumstance, it may even substitute for secondary radar in the future. As with current surveillance systems, the full benefit of ADS requires supporting complementary two-way pilot-controller data and/or voice communication (voice for at least emergency and non-routine communication).

4.2.1.2 States should closely co-operate in the development of procedures for the implementation of ADS in the Region and participate to the extent possible in trials and demonstration related to the implementation of ADS.
[ASIA/PAC/3, Conc. 14/21]

4.3 *Secondary Surveillance Radar (SSR)*

4.3.1 *Implementation of surveillance systems*

4.3.1.1. Implementation of surveillance systems should be pursued as an enhancement to air traffic services where so required and the use of secondary surveillance radar (SSR) alone, in accordance with the *Regional Supplementary Procedures* (Doc. 7030), should be considered as a cost-effective alternative to primary surveillance radar.
[ASIA/PAC/3, Rec. 14/20]

PART IV
COMMUNICATIONS, NAVIGATION AND SURVEILLANCE (CNS) SERVICES

INTRODUCTION

1. The standards, Recommended Practices and Procedures to be applied are listed in paragraph 1.2, Part IV – CNS of the ASIA/PAC Basic ANP. The material in this Part complements that contained in Part I – BORPC of the ASIA/PAC Basic ANP and should be taken into consideration in the overall planning process for the ASIA/PAC region.

2. This Part contains a detailed description/list of the facilities and/or services to be provided to fulfill the basic requirements of the Plan and are as agreed between the provider and user States concerned. Such agreement indicates a commitment on the part of the State(s) concerned to implement the requirement (s) specified. The element of the ASIA/PAC Facilities and Services Implementation Document (FASID), in conjunction with the ASIA/PAC Basic ANP, is kept under constant review by the Asia and Pacific Air Navigation Planning and Implementation Regional Group (APANPIRG) in accordance with its schedule of management, in consultation with user and provider States and with the assistance of the ICAO Asia and Pacific Office.

AERONAUTICAL FIXED SERVICE (AFS)
(FASID Tables CNS-1A, 1B, 1C, 1D and IE
Charts CNS-1, 2 and 3)

3. Table CNS-1A, 1B and Charts CNS-1, CNS-2 show the requirements and implementation status for AFTN circuits and ATN Router connection ~~plan~~. ATS message handling system (AMHS) and ATS inter-facility data communication (AIDC) routing plans in the ASIA/PAC region are show in Table CNS-1C and 1D. The requirement and implementation status of ATS direct speech circuits is shown in Table CNS-1E and Chart CNS-3

3.1 Inter-regional and intra-regional routing of AFTN messages is contained in the ASIA/PAC AFTN Routing Directory. ICAO Asia and Pacific Office continues to maintain its coordinating role for amendments to the Directory and publish updated editions. States are required to co-ordinate any change in the routing with the ICAO Asia and Pacific Office well in advance to allow sufficient time to examine the proposal and finalize required details.

3.2 The regional Interface Control Documents (ICDs) are published by the ICAO Asia and Pacific Office, as required, to ensure standardization of controlled circuit protocols used for AFTN and ATS direct speech circuit signaling system. The ICDs published are as follows:

1) Character Oriented Data Link control Procedures System Category-B (APANPIRG, Concl. 5/14);

2) X.25 protocol for AFTN (APANPIRG, Concl. 7/14;

3) PSS1 Signaling System for digital ATS speech circuit network (APANPIRG, Concl. 8/17; and

4) Radar Data Exchanges (APANPIRG, Concl. 9/17);

5) AMHS ICD;

6) Router ICD.

3.3 Aeronautical Telecommunication Network

3.3.1 The Guidance Material for ATN Transition adopted by APANPIRG provides technical guidance for regional transition planning, primarily focusing on ATN initial ground-to-ground applications .

(APANPIRG, Concl. 10/11 and 11/18)

ATN Transition Plan

3.3.2 The ATN Transition Plan outlines the requirements to increase bandwidth and upgrade protocols for those trunk circuits that will support main data flow of traffic in the ASIA/PAC region. The plan also provides target dates for implementation of Backbone Boundary Intermediate Systems (BBIS) and Boundary Intermediate System (BIS) in the ASIA/PAC region.
(APANPIRG, Concl. 12/14)

Regional ATN Planning Documents

3.3.3 The ASIA/PAC ATN ATS Message Handling System Addressing Plan; ATN Network Service Access Point (NSAP); NSAP Address Registration Form and ATN Routing Architecture Plan provide guidance to States.
(APANPIRG, Concl. 12/13)

3.3.3.1 The ATN ATS Message Handling System Addressing Plan provides planning and technical guidance to States in the assignment and registration of addresses and names for transition of ground Aeronautical Fixed Telecommunication network (AFTN) services to the ATS Message Handling System (AMHS) within the ASIA/PAC region. The ASIA/PAC ATN AMHS Naming Plan aligns itself with the global AMHS naming scheme.

3.3.3.2 The ATN Network Service Access Point (NSAP) Addressing Plan and NSAP Address Registration Form provide guidance for States to assign regional NSAP addresses in a consistent manner within the ASIA/PAC region. Each field of the NSAP address is described with the recommended method of assigning value. This is important so that consistency in the use of NSAP addresses is obtained and efficiency in routing is maintained. Fields with purely local State matter are identified. ICAO ASIA/PAC Regional Office is the temporary allocation authority of the ADM field.

3.3.3.3 The regional ATN Routing Architecture is based upon the need for ground-ground infrastructure to eventually replace the existing AFTN infrastructure. For this reason, the routing architecture uses the existing AFTN infrastructure as a guideline for the positioning of ATN equipment. The ATN routing architecture is designed primarily for the ground-ground environment. However, it is intended that the architecture will also be suitable as the routing architecture for the introduction of the air-ground communication requirements.

3.3.4 Until a formal registration authority is established within ICAO, the ICAO ASIA/PAC Regional Office will maintain a local register within the region for registering all Private Management Domains (PRMDs).

3.4 A Form for recording AFTN circuit loading statistics with the instruction for use of the Form, is provided in Attachment A (APANPIRG, Concl. 4/23)

AERONAUTICAL MOBILE SERVICE (AMS) AND AERONAUTICAL MOBILE SATELLITE SERVICE (AMSS)
(FASID Table CNS-2, Chart CNS-4)

4. Table CNS-2 shows the requirements and implementation status of aeronautical mobile services (AMS) and aeronautical mobile satellite service (AMSS) for HF VHF and satellite data links in the ASIA/PAC region. Chart CNS-4 shows radio telephony networks and the Appendix to Chart CNS-4 shows HF allotment areas and specific frequencies allocated to each network.

4.1 The ICAO Asia and Pacific Office continues to maintain its frequency selection and co-ordination role including the maintenance and promulgation of VHF frequency list (List No. 3) in the band 118 to 137 MHz, at appropriate periodic intervals. (ASIA/PAC/3 Concl. 11/4)

4.2 HF interference reporting Form specified in Conclusion 11/6 of ASIA/PAC/3RAN Meeting is provided in Attachment B.

4.3 A list of frequency designators to be included in HF air-ground communication log in accordance with provision of para 5.2.3.3 of Annex 10 Vol. II is provided in Attachment C.

AERONAUTICAL RADIO NAVIGATION SERVICE

(FASID Table CNS-3, Charts CNS-5A, 5B, 6A and 6B)

5. Table CNS-3 lists, State-by-State in alphabetical order, requirements for ground based and satellite based radio navigation aids for various functions. Charts CNS-5A and CNS-5B provide locations where radio navigation aids are located in the Asia and Pacific regions, respectively. Chart CNS-6A and CNS-6B p provide locations where radio navigation aids for final approach and landing functions are located in the Asia and Pacific regions, respectively.

5.1 The ICAO Asia and Pacific Office, continues to maintain its frequency selection and coordination role including maintenance and promulgation of frequencies in the bands 108 to 137 MHz and 960 –1215 MHz bands, assigned to national and international aeronautical radio navigation facilities. Updated Frequency Lists No. 1 and 2 of radio navigation aids are published at periodic intervals (ASIA/PAC/3, Concl. 11/5 and 12/9).

5.2 The detailed description of flight inspection units available in the ASIA/PAC region is contained in the Catalogue of Flight Inspection Units published by the ICAO Asia and Pacific Office.

SURVEILLANCE SERVICE (FASID Table CNS-4)

6. Table CNS-4 contains information on the radar, facilities and ADS workstations that required for en-route and terminal surveillance in the ASIA/PAC region.

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Attachment 1 - 2

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International Civil Aviation Organization

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Transition Task Force of APANPIRG

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LIST OF WORKING PAPERS (WP) and
INFORMATION PAPERS (IP)

WP/No.	Agenda Item	Subject	Presented by
1	-	Provisional Agenda	Secretariat
2	1	ATNTTF Documentation Tree	Australia
3	2	Proposed Final Draft of the AMHS ICD in Asia/Pacific Region	APANPIRG/ ATNTTF Working Group B)
4	2	Guidance for the Specification between End System and Intermediate System	Japan
5	3	An example of Technical Memorandum of Cooperation (TMC) for Bi-lateral Agreement	Japan
6	5, 7	Necessity of Establishing a New ATN Circuit between New Zealand and the United States of America	New Zealand
7	5	Review of AFTN Circuits Performance	Secretariat
8	6	Review Status of Implementation of the ASIA/PAC AFTN Plan	Secretariat
9	5	Delivery of AFTN Traffic over the Internet	Australia
10	3	Review of ASIA/PAC AFTN Routing Directory	Secretariat
11	3	CNS/ATM Implementation and Planning Matrix	Secretariat
12	7	Review of Table CNS 1B and Chart CNS 2 of ASIA/PAC FASID	Secratriat
13	5	AFTN Circuit Statistics of Tokyo	Japan
14	10	Review of Comparison Status of Regional Development of Air Navigation Systems Including CNS/ATM Systems	Secretariat
15	8	Tables CNS 1C – AMHS and CNS 1D – AIDC	Secretariat

WP/No.	Agenda Item	Subject	Presented by
16	3	Routing Policy (IDRP)	Japan
17	3	Technical Document on ATN Performance: Proposed RCPS	Japan
18	3	Draft Checklist for Implementation of Ground/Ground Network Infrastructure	Japan
19	1	First Draft of AMHS Routing Policy Planning	United States
20	3	Policy Based Network Management	United States
21	2	Draft ASIA/PAC Regional Router Interface Control Document (ICD)	United States
22	3	ATN Routing Policy for ASIA/PAC Region	United States
23	4	Terms of Reference (TOR) and Subject/Tasks List of the ATN Transition Task Force	Secretariat
24	5	Proposal for amending of AFTN Plan and updating of AFTN Circuits	Viet Nam
25	9	Review of the CNS part of ASIA/PAC Basic ANP and FASID	Secretariat
26	7	ATN Gateway between ASIA/PAC and NAM region	Fiji
27	5	FAA AFTN traffic analysis	USA

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IP/No.	Agenda Item	Subject	Presented by
1	-	Conference bulletin	Secretariat
2	1	ATNTTF Ad Hoc Working Group B Progress Report	Australia
3	3	Publication of Regional ATN Planning Documents	Secretariat
4	3	Hong Kong, China's Experience in ATN Trials	Hong Kong, China
5	10	Information for the Incorporation of the IP (Internet Protocol) in the ATN	Japan
6	3	ICAO ATN Panel policy on technical documents preparation	United States
7	3	Status of ATN Security Provisions by ATNP WG	United States