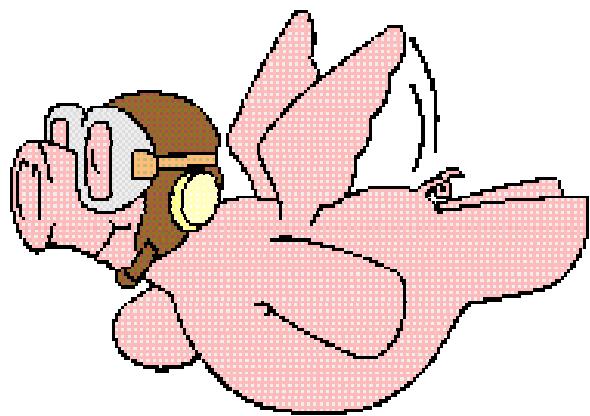


The ATN SARPs



Subvolume Nine

ATN Registration (Reg)

Third Edition
(Final Editor's Draft)

Please note that this is the final editor's draft of the "Manual of Technical Provisions for the Aeronautical Telecommunication Network (ATN) – ICAO DOC 9705/AN956 - as circulated within the ATNP. This text will be passed to ICAO for publication. However, it should be noted that this text in no way replaces the ICAO version, nor can it be considered to be of equal status. The official definitive version is that published in hardcopy by ICAO and all claims of compliance must be made against that version.

Errata and Disclaimer

Please note that this document has been prepared from a number of separate files and no attempt has been made to ensure continuity of page numbers. You may therefore find some overlap between page numbers.

This document has been prepared on a “best efforts” basis and no warrantee is offered as to its correctness.

FOREWORD

The material contained in this document was originally developed as the detailed part of the first set of Standards and Recommended Practices (SARPs) for the aeronautical telecommunication network (ATN) which has commonly been referred to as the CNS/ATM-1 Package. It was intended to make the material an appendix to the new Chapter 3 of Annex 10, Volume III, Part I, containing broad, general, stable and mostly regulatory-type provisions (the core part of new ATN SARPs).

In December 1997, the Air Navigation Commission (ANC), while conducting the final review of draft ATN SARPs, agreed that the detailed part of ATN SARPs should be published as an ICAO manual (to be updated annually, if necessary), while retaining its SARPs-style language. The ANC has reviewed the status of the document in light of continuing worldwide ATN implementation. The Third Edition includes amendments from implementors and regulatory authorities, as well as four new Sub-Volumes to answer requirements for further standardization, in the interests of safety, regularity and efficiency of international civil aviation.

This document consists of nine Sub-Volumes:

- 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 Service (ULCS)
- Sub-Volume V — Internet Communications Service (ICS)
- Sub-Volume VI — System Management (SM)
- Sub-Volume VII — Directory Services (DIR)
- Sub-Volume VIII — Security (SEC)
- Sub-Volume IX — Registration (REG)

Provisions contained in Sub-Volumes II, III, IV, V, VI, VII, VIII, and IX have been developed in accordance with system requirements specified in Sub-Volume I.

In line with the agreement by the ANC that the document should be updated on a yearly basis (if deemed necessary), the Third Edition has been published to incorporate changes necessitated by continuing validation and actual implementation activities.

TABLE OF CONTENTS

SUB-VOLUME I. INTRODUCTION AND SYSTEM LEVEL REQUIREMENTS

| | | |
|-------|----------------------------------|------|
| 1.1 | Definitions and References | I-1 |
| 1.1.1 | Definitions | I-1 |
| 1.1.2 | References | I-24 |
| 1.2 | General | I-37 |
| 1.3 | System Level Requirements | I-39 |

SUB-VOLUME II. AIR-GROUND APPLICATIONS

| | | |
|-------|--|--------|
| 2.1 | Context Management Application | II-1 |
| 2.1.1 | Introduction | II-1 |
| 2.1.2 | General Requirements | II-7 |
| 2.1.3 | The Abstract Service | II-8 |
| 2.1.4 | Formal Definitions of Messages | II-31 |
| 2.1.5 | Protocol Definition | II-38 |
| 2.1.6 | Communication Requirements | II-107 |
| 2.1.7 | CM User Requirements | II-109 |
| 2.1.8 | Subsetting Rules | II-123 |
| 2.2 | Automatic Dependent Surveillance Applications | II-126 |
| 2.2.1 | Automatic Dependent Surveillance Application | II-126 |
| 2.2.2 | Automatic Dependent Surveillance Report Forwarding Application | II-264 |
| 2.3 | Controller Pilot Data Link Communication Application | II-296 |
| 2.3.1 | Introduction | II-296 |
| 2.3.2 | General Requirements | II-298 |
| 2.3.3 | The Abstract Service | II-299 |
| 2.3.4 | Formal Definitions of Messages | II-313 |
| 2.3.5 | Protocol Definition | II-363 |
| 2.3.6 | Communication Requirements | II-419 |
| 2.3.7 | CPDLC User Requirements | II-420 |
| 2.3.8 | Subsetting Rules | II-477 |
| 2.4 | Flight Information Services Application | II-481 |
| 2.4.1 | Introduction | II-481 |
| 2.4.2 | General Requirements | II-488 |
| 2.4.3 | The Abstract Service | II-489 |
| 2.4.4 | Formal Definitions of Messages | II-500 |
| 2.4.5 | Protocol Definition | II-542 |
| 2.4.6 | Communication Requirements | II-594 |

| | | |
|-------|---------------------------------|--------|
| 2.4.7 | FIS User Requirements | II-595 |
| 2.4.8 | Subsetting Rules | II-602 |

SUB-VOLUME III. GROUND-GROUND APPLICATIONS

| | | |
|--------|--|---------|
| 3.1 | ATS Message Handling Services (ATSMHS) | III-1 |
| 3.1.1 | Introduction | III-1 |
| 3.1.2 | ATS Message Service | III-7 |
| 3.2 | ATS Interfacility Data Communications | III-327 |
| 3.2.1 | Introduction | III-327 |
| 3.2.2 | General Requirements | III-331 |
| 3.2.3 | The AIDC-AE Abstract Service | III-332 |
| 3.2.4 | The AIDC-ASE Abstract Service | III-347 |
| 3.2.5 | The AIDC Control Function | III-358 |
| 3.2.6 | The AIDC-ASE Protocol Definition | III-389 |
| 3.2.7 | AIDC Formal Definitions | III-428 |
| 3.2.8 | Communication Requirements | III-451 |
| 3.2.9 | AIDC-user Requirements | III-452 |
| 3.2.10 | Sequence Diagrams | III-455 |

SUB-VOLUME IV. UPPER LAYER COMMUNICATIONS SERVICE

| | | |
|-------|--|-------|
| 4.1 | INTRODUCTION | IV-1 |
| 4.1.1 | Scope and Objectives | IV-1 |
| 4.1.2 | Background | IV-2 |
| 4.1.3 | Structure of UL Communications Service Specification | IV-3 |
| 4.1.4 | Upper Layer Functionality | IV-4 |
| 4.1.5 | Conventions | IV-6 |
| 4.2 | DIALOGUE SERVICE DESCRIPTION | IV-7 |
| 4.2.1 | Scope of Dialogue Service | IV-7 |
| 4.2.2 | Service Primitives | IV-8 |
| 4.2.3 | Service Definition | IV-9 |
| 4.3 | APPLICATION ENTITY (AE) DESCRIPTION | IV-18 |
| 4.3.1 | Introduction | IV-18 |
| 4.3.2 | Application Level Naming and Context Definition | IV-20 |
| 4.3.3 | Control Function Specification | IV-29 |
| 4.4 | SESSION LAYER REQUIREMENTS | IV-93 |
| 4.4.1 | Protocol versions implemented | IV-94 |
| 4.4.2 | Session Functional units | IV-95 |
| 4.4.3 | Protocol mechanisms | IV-97 |
| 4.4.4 | Supported Roles | IV-99 |

| | |
|--|---------------|
| 4.4.5 Supported SPDUs | IV-101 |
| 4.4.6 Use of null-encoding and short-connect protocol options | IV-104 |
| 4.4.7 Mapping to the ATN Internet Transport Service | IV-105 |
| 4.5 PRESENTATION LAYER REQUIREMENTS | IV-107 |
| 4.5.1 Protocol mechanisms | IV-108 |
| 4.5.2 Use of null-encoding and short-connect protocol options | IV-109 |
| 4.5.3 Mapping of Presentation Primitives to the Null Encoding option | IV-110 |
| 4.5.4 Functional units | IV-111 |
| 4.5.5 Elements of procedure | IV-113 |
| 4.5.6 Supported Presentation Protocol Data Units (PPDUs) | IV-115 |
| 4.6 ACSE SPECIFICATION | IV-117 |
| 4.6.1 Protocol details | IV-117 |
| 4.6.2 Protocol versions | IV-118 |
| 4.6.3 Supported roles | IV-119 |
| 4.6.4 Protocol mechanisms | IV-121 |
| 4.6.5 ACSE Functional units | IV-122 |
| 4.6.6 Supported APDUs | IV-123 |
| 4.6.7 Mapping to the Presentation Service | IV-130 |
| 4.7 CONNECTIONLESS DIALOGUE SERVICE AND PROFILE | IV-131 |
| 4.7.1 Scope of Connectionless Dialogue Service | IV-131 |
| 4.7.2 Service Primitives | IV-132 |
| 4.7.3 The D-UNIT-DATA service | IV-133 |
| 4.7.4 Control Function for the Connectionless Mode Dialogue Service | IV-136 |
| 4.7.5 Subsetting Rules | IV-143 |
| 4.7.6 APRL for Connectionless Session Protocol | IV-144 |
| 4.7.7 APRL for Connectionless Presentation Protocol | IV-146 |
| 4.7.8 APRL for Connectionless ACSE Protocol | IV-148 |
| 4.8 SECURITY APPLICATION SERVICE OBJECT | IV-152 |
| 4.8.1 Scope and Structure | IV-152 |
| 4.8.2 General Requirements | IV-155 |
| 4.8.3 The SA Abstract Service | IV-156 |
| 4.8.4 Formal Definition of Messages | IV-160 |
| 4.8.5 Definition of the Security ASO Control Function (SA-CF) | IV-163 |
| 4.8.6 SESE Profile Requirements | IV-173 |
| 4.9 GENERIC ATN COMMUNICATIONS SERVICE SPECIFICATION | IV-180 |
| 4.9.1 Scope and Structure | IV-180 |
| 4.9.2 GACS Service Definition | IV-185 |
| 4.9.3 Protocol Definition | IV-194 |
| 4.9.4 Communication Requirements | IV-230 |
| 4.9.5 User Requirements | IV-232 |
| 4.9.6 Subsetting Rules | IV-233 |

SUB-VOLUME V. INTERNET COMMUNICATIONS SERVICE

| | | |
|-------|--|-------|
| 5.1 | Introduction | V-1 |
| 5.2 | Definitions and Concepts | V-2 |
| 5.2.1 | Objectives and Goals | V-2 |
| 5.2.2 | Definitions | V-3 |
| 5.2.3 | ATN End Systems | V-8 |
| 5.2.4 | ATN Routers | V-10 |
| 5.2.5 | ATN Subnetworks | V-13 |
| 5.2.6 | Quality of Service Concept | V-16 |
| 5.2.7 | ATN Security Concept | V-17 |
| 5.2.8 | ATN Use of Priority | V-23 |
| 5.3 | ATN Routing | V-28 |
| 5.3.1 | Introduction | V-28 |
| 5.3.2 | Service Provided by an ATN Router | V-30 |
| 5.3.3 | The Deployment of ATN Components | V-38 |
| 5.3.4 | Ground/Ground Interconnection | V-40 |
| 5.3.5 | Air/Ground Interconnection | V-43 |
| 5.3.6 | Handling Routing Information | V-69 |
| 5.3.7 | Policy Based Selection of Routes for Advertisement to Adjacent RDs | V-70 |
| 5.4 | Network and Transport Addressing Specification | V-78 |
| 5.4.1 | Introduction | V-78 |
| 5.4.2 | Transport Layer Addressing | V-79 |
| 5.4.3 | Network Layer Addressing | V-81 |
| 5.5 | Transport Service and Protocol Specification | V-95 |
| 5.5.1 | General | V-95 |
| 5.5.2 | Connection Mode Transport Layer Operation | V-98 |
| 5.5.3 | Connectionless Mode Transport Protocol Operation | V-125 |
| 5.5.4 | Extended 32-bit Checksum | V-129 |
| 5.6 | Internetwork Service and Protocol Specification | V-134 |
| 5.6.1 | Introduction | V-134 |
| 5.6.2 | ATN Specific Features | V-135 |
| 5.6.3 | ATN Specific Requirements for ISO/IEC 8473 | V-142 |
| 5.6.4 | APRLs | V-144 |
| 5.7 | Specification of Subnetwork Dependent Convergence Functions | V-166 |
| 5.7.1 | Introduction | V-166 |
| 5.7.2 | Service Provided by the SNDCF | V-167 |
| 5.7.3 | SNDCF for ISO/IEC 8802-2 Broadcast Subnetworks | V-169 |
| 5.7.4 | SNDCF for the Common ICAO Data Interchange Network (CIDIN) | V-170 |
| 5.7.5 | SNDCF for ISO/IEC 8208 General Topology Subnetworks | V-171 |
| 5.7.6 | SNDCF for ISO/IEC 8208 Mobile Subnetworks | V-174 |

| | | |
|-------|---|-------|
| 5.7.7 | ATN SNDCF Protocol Requirements List | V-236 |
| 5.8 | Routing Information Exchange Specification | V-309 |
| 5.8.1 | Introduction | V-309 |
| 5.8.2 | End System to Intermediate System Routing Information Exchange Protocol (ES-IS) over Mobile Subnetworks | V-310 |
| 5.8.3 | Intermediate System to Intermediate System Inter-Domain Routing Information Exchange Protocol | V-318 |
| 5.9 | Systems Management Provisions | V-353 |
| 5.9.1 | Introduction | V-353 |

SUB-VOLUME VI. SYSTEMS MANAGEMENT SERVICE

| | | |
|-------|---|-------|
| 6.1. | INTRODUCTION | VI-1 |
| 6.1.1 | Scope and Objectives | VI-1 |
| 6.1.2 | Structure of ATN Systems Management Specification | VI-3 |
| 6.1.3 | Systems Management Model | VI-3 |
| 6.1.4 | Ground-ground ATN Management Communications | VI-4 |
| 6.1.5 | Air-ground ATN Management Communications | VI-4 |
| 6.1.6 | Terms and abbreviations | VI-6 |
| 6.2. | NAMING AND ADDRESSING PROVISIONS | VI-7 |
| 6.2.1 | Assignment of Object Identifiers | VI-7 |
| 6.3. | ATN SYSTEMS MANAGEMENT GENERAL REQUIREMENTS | VI-10 |
| 6.3.1 | General Provisions | VI-10 |
| 6.3.2 | General Management Provisions for ATN Upper Layers and Applications | VI-12 |
| 6.3.3 | General Provisions for ATN Transport Layer | VI-14 |
| 6.3.4 | General Provisions for ATN Lower Layers | VI-15 |
| 6.3.5 | General Provisions for ATN Subnetworks | VI-19 |
| 6.3.6 | Accounting Meter Provisions | VI-19 |
| 6.4. | ATN SYSTEMS MANAGEMENT COMMUNICATION PROFILES | VI-22 |
| 6.4.1 | General Provisions | VI-22 |
| 6.4.2 | ATN Management Communications Profile using Full OSI Stack | VI-23 |
| 6.4.3 | ATN Management Communications Profile using ULCS | VI-25 |
| 6.5. | ATN SYSTEMS MANAGEMENT FUNCTION PROFILE | VI-34 |
| 6.5.1 | Basic Systems Management Functionality | VI-35 |
| 6.5.2 | Peer entity authentication at time of association establishment | VI-35 |
| 6.5.3 | Systems Management functional unit negotiation | VI-35 |
| 6.5.4 | Access Control | VI-35 |
| 6.6. | CROSS-DOMAIN MANAGEMENT INFORMATION BASE (XMIB) | VI-36 |
| 6.6.1 | General Provisions | VI-36 |
| 6.6.2 | Summary of requirements for cross-domain exchange of management information | VI-36 |

| | |
|--|-------|
| 6.6.3 Management Information Containment Structure | VI-38 |
| 6.6.4 Managed Object Class Definitions | VI-41 |
| 6.6.5 GDMO specification of XMIB | VI-50 |

SUB-VOLUME VII. DIRECTORY SERVICE

| | |
|--|---------|
| 7.1 INTRODUCTION | VII-1 |
| 7.1.1 ATN Directory | VII-1 |
| 7.1.2 ATN Directory Service Model | VII-2 |
| 7.2 SYSTEM LEVEL PROVISIONS | VII-5 |
| 7.2.1 ATN DIR System Level Requirements | VII-5 |
| 7.3: DIRECTORY SERVICE DEPLOYMENT | VII-5 |
| 7.4: DIRECTORY OBJECT CLASS AND ATTRIBUTE SPECIFICATION | VII-6 |
| 7.4.1 DSA Object Class Requirements | VII-6 |
| 7.4.2 DSA Supported Attribute Types | VII-12 |
| 7.4.3 DUA Object Class Requirements | VII-20 |
| 7.4.4 DUA Supported Attribute Types | VII-24 |
| 7.5: DIRECTORY SYSTEM SCHEMA | VII-31 |
| 7.5.1 Directory Object Class Content Rules | VII-31 |
| 7.5.2 ASN.1 Notation of Object Class Definitions | VII-44 |
| 7.5.3 ASN.1 Notations of ATN Specific Attribute Types | VII-48 |
| 7.5.4 Specific DIT Structure for Operational Information | VII-51 |
| 7.5.5 Operational Content of Entries and Subentries | VII-51 |
| 7.5.6 Content Rules for the Directory System Schema | VII-55 |
| 7.5.7 ATN Directory Information Tree (DIT) Structure | VII-55 |
| 7.5.8 ATN Directory Matching Rules | VII-60 |
| 7.6: DUA PROTOCOL SPECIFICATION | VII-64 |
| 7.6.1 DUA Support of Directory Access Protocol (DAP) | VII-64 |
| 7.6.2 DUA Support of Distributed Operations | VII-90 |
| 7.6.3 DUA Authentication as DAP Initiator | VII-100 |
| 7.7: DSA PROTOCOL SPECIFICATION | VII-114 |
| 7.7.1 DSA Support of Directory Access | VII-114 |
| 7.7.2 DSA Support of Distributed Operations | VII-135 |
| 7.7.3 DSA Authentication as DAP Responder | VII-140 |
| 7.7.4 DSA to DSA Authentication | VII-155 |
| 7.8 USE OF UNDERLYING SERVICES | VII-165 |
| 7.8.1 Use of ROSE services | VII-165 |
| 7.8.2 Use of RTSE services | VII-165 |
| 7.8.3 Use of ASCE services | VII-166 |

| | |
|---|---------|
| 7.8.4 Use of the Presentation service | VII-168 |
| 7.8.5 Use of the Session service | VII-169 |
| 7.8.6 Mapping to the ATN internet | VII-178 |

SUB-VOLUME VII. SECURITY SERVICES

| | |
|--|---------|
| 8.1 INTRODUCTION | VIII-1 |
| 8.2 ATN GENERIC SECURITY SERVICES | VIII-3 |
| 8.3 ATN SECURITY FRAMEWORK | VIII-4 |
| 8.3.1 ATN Information Security Framework | VIII-4 |
| 8.3.2 ATN Physical Security Framework | VIII-14 |
| 8.4 ATN PUBLIC KEY INFRASTRUCTURE | VIII-15 |
| 8.4.1 Certificate Policy | VIII-15 |
| 8.4.2 Certificate Practice Statement | VIII-16 |
| 8.4.3 ATN PKI Certificate Format | VIII-17 |
| 8.4.4 ATN PKI CRL Format | VIII-25 |
| 8.4.5 ATN PKI Certificate and CRL Validation | VIII-26 |
| 8.5 ATN CRYPTOGRAPHIC INFRASTRUCTURE | VIII-28 |
| 8.5.1 Terms | VIII-28 |
| 8.5.2 Notational Conventions | VIII-29 |
| 8.5.3 ATN Cryptographic Setting | VIII-32 |
| 8.5.4 ATN Key Agreement Scheme (AKAS) | VIII-35 |
| 8.5.5 ATN Digital Signature Scheme (ADSS) | VIII-37 |
| 8.5.6 ATN Keyed Message Authentication Code Scheme (AMACS) | VIII-39 |
| 8.5.7 ATN Auxiliary Cryptographic Primitives and Functions | VIII-41 |
| 8.6 ATN SYSTEM SECURITY OBJECT | VIII-43 |
| 8.6.1 Introduction | VIII-43 |
| 8.6.2 General Processing Requirements | VIII-45 |
| 8.6.3 SSO Functions | VIII-46 |
| 8.7 ATN SECURITY ASN.1 MODULE | VIII-64 |

SUB-VOLUME IX. REGISTRATION SERVICE

| | |
|---|------|
| 9.1 INTRODUCTION | IX-1 |
| 9.2 SUBVOLUME IDENTIFIERS | IX-2 |
| 9.2.1 Application Level Naming and Context Definition | IX-2 |
| 9.3 ATN ADDRESS REGISTRATION | IX-7 |

| | |
|--|------|
| 9.3.1 Reserved for State Addresses | IX-7 |
|--|------|

9. ATN IDENTIFIER REGISTRATION

9.1 INTRODUCTION

9.1.1 The ATN Identifier Registration acts as a central repository for common identifiers used in the ATN. This includes object identifiers (OIDs), application identifiers and other common identifier information.

9.1.2 OIDs are used to name information objects, such as application contexts, abstract syntaxes and ASN.1 modules within an OSI application protocol specification. For the ATN applications, this includes the objects contained in the various Sub-volumes of ICAO Doc 9705-AN/956. In order to ensure that successive applications do not have OID conflicts within the ATN domain, all of the ATN-specific OIDs are specified in this document. Other OIDs which are local to the various Sub-volumes (either OSI standard or ATN defined) are not specified here; they are referenced and/or defined as applicable by the Sub-volume that uses them. OIDs which are used by two or more Sub-volumes may be specified here.

9.1.3 Application identifiers are ATN applications' AE Qualifiers. These are assigned to individual applications as operational needs are identified and the applications themselves are developed.

9.1.4 Additionally, this document will serve as a repository for ATN addresses.

Note.—Structure:

- a) 9.1: *INTRODUCTION contains the purpose, structure, and a summary of 9.*
- b) 9.2: *SUB-VOLUME IDENTIFIERS describes the names and hierarchies used by the ATN entities.*
- c) 9.3: *ATN ADDRESS REGISTRATION contains a list of published ATN addresses, which includes but is not limited to regional and/or national Context Management (CM) addresses.*

9.2 SUB-VOLUME IDENTIFIERS

9.2.1 Application Level Naming and Context Definition

9.2.1.1 ATN Naming Hierarchy

Note 1.—Names, in the form of object identifiers (OIDs), are assigned here to the defined ATN entities.

Note 2.—ISO/IEC 9834-1 / ITU-T Rec. X.660 Amd. 2 specifies the top of the hierarchical OID name space. At the first level, provision is made for ISO, International Telecommunication Union - Telecommunication Standardisation Sector (ITU-T) and joint ISO/ITU-T sub-name spaces. The ISO name space is further subdivided into:

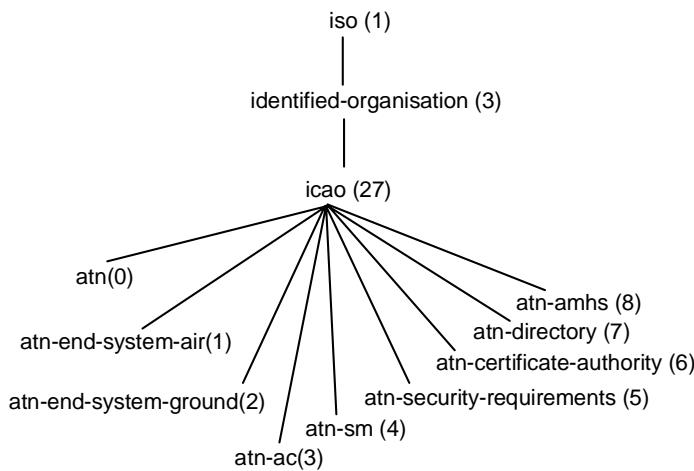
- a) standard (0)
- b) registration-authority (1)
- c) member-body (2)
- d) identified-organisation (3)

Note 3.—ICAO has requested and obtained the allocation of an International Code Designator (ICD), according to ISO 6523. The ICD obtained, name and number “icao (27)”, uniquely identifies ICAO and allows ICAO to establish its own object identifier name space within the International Organisation arc using the prefix: { iso (1) identified-organisation (3) icao (27) }.

9.2.1.1.1 Within the ICAO name space, the initial allocation of object identifiers shall follow the structure and values defined here.

Note 1.—In the future, it is likely that the ATN object identifier tree will have further levels of structure, and that fully location-independent values will be assigned.

Note 2.—The ATN naming hierarchy is illustrated in Figure 9-1.

**Figure 9-1. ATN Naming Hierarchy**

9.2.1.1.2 Immediately under the ICAO arc, the values specified in Table 9-1 shall be used to specify the next level of the naming hierarchy.

Table 9-1. Top-level ICAO Identifiers

| <i>Name and numeric value</i> | <i>Description</i> |
|-------------------------------|--|
| atn (0) | General ATN identifiers |
| atn-end-system-air (1) | ATN aircraft end systems. The subsequent OID components beneath are defined in 4.3 |
| atn-end-system-ground (2) | ATN ground end systems. The subsequent OID components beneath this arc are defined in 4.3 |
| atn-ac (3) | ATN application context names. The subsequent OID components beneath this arc are defined in 4.3 |
| atn-sm (4) | ATN system management. The subsequent OID components beneath this arc are defined in 6 |
| atn-security-requirements (5) | ATN security. The subsequent OID components beneath this arc are defined in this sub-volume and in 4.8 |
| atn-certificate-authority (6) | ATN certificate authority. The subsequent OID components beneath this arc are defined in 8 |
| atn-directory (7) | ATN Directory. The subsequent OID components beneath this arc are defined in 7 |
| atn-amhs (8) | ATN AMHS application. The subsequent OID components beneath this arc are defined in 3 |

9.2.1.2 Application Types

Note.— In the Application Process title (as defined in 4.3) that identifies each ATN application process type, there is an <app-type> element. Table 9-2 will serve as a global register for all standard ATN application types. Additionally, Table 9-2 may be used to identify application types, for example in the Context Management application CM-logon service.

9.2.1.2.1 The app-type arc of the Application Process title object identifier represents the ATN application type (e.g. “ADS” or “CMA”), and shall take one of the values specified in Table 9-2.

Table 9-2. Assigned app-types and values

| <i>ATN ASE type</i> | <i>ATN app-type name and numeric value</i> |
|--|--|
| Automatic Dependent Surveillance | ADS (0) |
| Context Management Application | CMA (1) |
| Controller-pilot Data Link Communication | CPC (2) |
| Automatic Terminal Information Services (ATIS) | ATI (3) |
| RESERVED | (4) |
| Systems Management Application (SMA) | SMA (5) |
| ATS Inter-Facility Data Communications (AIDC) | IDC (6) |
| ATS Message Application | AMS (7) |
| AFTN-AMHS Gateway | GWB (8) |
| ATS Message User Agent | AUA (9) |
| ADS Report Forwarding | ARF (10) |
| Aviation Routine Weather Report (METAR) | MET (11) |
| Generic ATN Communication Service AE (GACS) | GAC (12) |
| CIDIN-AMHS Gateway | GWC (13) |

9.2.1.3 ATN Object Identifiers ASN.1

```
ATNObjectIdentifiers { iso(1) identified-organization(3) icao(27) atn(0)
                      objectIdentifiers(0) }
```

DEFINITIONS AUTOMATIC TAGS ::=
BEGIN

-- EXPORTS everything

icao-arc OBJECT IDENTIFIER ::= { iso(1) identified-organization(3)

icao(27) }

-- Root of the ICAO OBJECT IDENTIFIER space

icao-atn OBJECT IDENTIFIER ::= { icao-arc atn(0) }

-- General ATN

icao-atn-end-system-air
 OBJECT IDENTIFIER ::= { icao-arc atn-end-system-air(1) }

-- ATN aircraft end system

icao-atn-end-system-ground
 OBJECT IDENTIFIER ::= { icao-arc atn-end-system-ground(2) }

-- ATN ground end system

icao-atn-ac OBJECT IDENTIFIER ::= { icao-arc atn-ac(3) }

-- ATN application context names

icao-atn-sm OBJECT IDENTIFIER ::= { icao-arc atn-sm(4) }

-- ATN system management

icao-atn-security-requirements
 OBJECT IDENTIFIER ::= { icao-arc
 atn-security-requirements(5) }

-- ATN security

icao-atn-certificate-authority
 OBJECT IDENTIFIER ::= { icao-arc
 atn-certificate-authority(6) }

-- ATN certificate authority

icao-atn-directory
 OBJECT IDENTIFIER ::= { icao-arc atn-directory(7) }

-- ATN Directory

icao-atn-amhs OBJECT IDENTIFIER ::= { icao-arc atn-amhs(8) }

-- ATN AMHS

--

```
-- ATN security OIDs shared between Sub-volumes IV and VIII
--
secids      OBJECT IDENTIFIER ::= { icao-atn-security-requirements }

-- Categories of information object --
modules      OBJECT IDENTIFIER ::= { secids 1 }

-- Security ASN.1 modules in Sub-volume IV --
securityExchanges      OBJECT IDENTIFIER ::= { modules 1 }
abstractSyntax      OBJECT IDENTIFIER ::= { modules 2 }

-- Security ASN.1 module in Sub-volume VIII --
atnPKI      OBJECT IDENTIFIER ::= { modules 3 }
```

END -- ATN OID definitions

9.3 ATN ADDRESS REGISTRATION

9.3.1 Reserved for State Addresses

— END —