AERONAUTICAL TELECOMMUNICATION NETWORK PANEL

Working Group 2

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Proposed Changes to Sub-Volume V Chapter 4

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SUMMARY

Flimsy #1 generated by the ATN SARPs editorial committee recognised a number of agreed problems with chapter 4 of the ATN SARPs. This working paper provides a revised version of chapter 4 that has been edited in line with the proposed resolution of Flimsy #1 and it is recommended that the Working Group reviews and adopts the proposed replacement text.

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1. Introduction

The ATNP/WG2 Editorial Committee reviewed Chapter 4 (Addressing) of the draft ATN Internet SARPs and found a number of editorial and technical problems with the specification. Flimsy #1 was then produced in order to record the problems found, and to suggest how a solution may be found. The contents of Flimsy #1 are repeated below.

2. Editorial Meeting Flimsy #1

2.1 Problem Statement

The following problems were identified:

1. 5.4.1.10 misleadingly re-defines Administrative Domains as addressing domains. This hides a greater problem, that is that the notion of a Network Addressing Domain (as defined in ISO 8348) is not properly introduced and related to the ATN Addressing Plan. In particular, it is necessary to introduce the idea that there is an ATN Network Addressing Domain that is a subset of the Global NSAP Addressing Domain, and this is sub-divided into a number of nested Addressing Domain, each administered by a different authority i.e. that the administration of NSAP Addressing is iteratively devolved, to states and organisations and possible to subordinate organisations.

2. The ICAO secretariat has already objected to ICAO being responsible for administering NSAP Addresses. In many places, ICAO is required to be responsible for address administration that is fully defined in the draft SARPs. This is clearly unnecessary. Furthermore, even when administration of addresses is devolved to (e.g.) Administrations, ICAO is still specified as the administrative authority.

3. AINSC organisations are only recommended as to how the ADM field is assigned. However, for unambiguous address assignment, it is necessary for either the draft SARPs, or a separate IATA specification, to definitively specify how this field is administered. A recommendation does not appear to be appropriate here.

4. The encoding of the AFI and IDI fields is specified without reference to ISO 8348 and the preferred binary encoding. Instead, it is specified as “BCD” without a clear statement of whether a big or little endian approach is required. Furthermore, this is not consistent with the modified encoding specified in ISO 10589 and used by ISO 10747 for the encoding of NSAP Address Prefixes that end within the IDP.

5. Alphanumeric and “Identifier” encodings for addressing fields are defined. However, neither is referenced by Table 5-4.1, which defines which encodings are used. The Alphanumeric encoding does appear to be used for the ADM field. However, no use is made of the identifier encoding.

6. There is confusion in several fields of the DSP (e.g. the ADM field, which is unclear as to whether the hexadecimal or alphanumeric encoding is being used.

7. The ADM field does not provides values for International Organisations (e.g. Eurocontrol) and ignores the need for efficient NSAP Address Allocation to the members of an ATN Island.

2.2 Resolution

There appear to be three major changes required to this chapter:

1. The first is to clearly define the nested addressing domains associated with the ATN NSAP Addressing Plan and revise which organisation, or type of organisation, is responsible for each such addressing domain.

2. The second is to separate out the encoding of the AFI and IDI (which should follow the International standards) from the encoding of the DSP fields and to make clear which encoding is used for each field.

3. The third is to introduce additional addressing domains (i.e. further ADM field allocations) for International Organisations and regions (e.g. ATN Islands). This may require the establishment of international addressing authorities.

3. Proposed Revisions to Chapter 4

The following attachment provides replacement text for chapter 4. The following changes have been carried out:

1. The specification of the TSAP Selector has been moved up to be before the NSAP Address specification. This was a change discussed by the editorial meeting and appears to be a more logical presentation. The encoding specification is changed to a reference to ISO 8073 as this provides the definitive specification.

2. I have placed the definitions of “reserved” and character encoding in the introduction section, so that these are clearly defined “up front”.

3. The Network Layer Addressing now starts with definitions of NSAP Address, NET, NSAP Address Prefix and the Network Addressing Domain.

4. The NSAP Address Syntax is now first introduced with reference to ISO 10589. This is after all, the only structure that is known to Routers and makes clear the derivation of the SYS and SEL fields in context.

5. The IDP fields (AFI and IDI) are then introduced and defined with reference to the ISO 8348 addressing plan. I have specified their values at this point as decimal numbers, as these are essentially constants for the ATN Addressing Plan.

6. The Reference Publication Format is then defined. This is part of the ISO standard, but was not previously part of the ATN Addressing Plan. I have introduced it here so that example NSAP Addresses can be readily referred to in the remainder of the chapter. A lack of examples had been noted by the editorial meeting.

7. The full format of the ATN NSAP Address is then introduced and related back to ISO 8348 and ISO 10589 through the new figure (5.4-3).

8. A technical defect is then fixed by making it clear that encoding of the NSAP Address is outside of the scope of this chapter. Indeed, many of the subsequent changes relate to removing the word “encoding” from the specification.

9. The DSP fields are then specified. Although the field sizes and prescribed values are unchanged, the approach to the specification has had to be changed very significantly in order to provide examples, make clear administration responsibilities, and to concentrate on specifying the binary values of the fields instead of the misleading references to encoding.

10. An additional VER field value and ADM encoding is added for Regional Addressing Plans (e.g. ATN Islands).

11. The Default NSAP Address Prefixes for all Mobiles and to “Home” providers are now defined here.

12. Given the replace all nature of the changes to field definitions, I have not included the struck out text in this part of the revised text.

4. Recommendation

It is recommended that WG2 conducts a line by line review of the attachment prior to considering it as replacement text for Chapter 4 of the draft ATN Internet SARPs.

5.4. NETWORK AND TRANSPORT ADDRESSING SPECIFICATION

5.4.1 Introduction

Note 1.— The ATN Internet Addressing Plan defines an OSI Network Service Access Point (NSAP) address structure which can support efficient internet routing procedures, and which conforms to common abstract syntax, semantic and encoding rules throughout the ATN OSI environment.

Note 2.— This addressing plan also defines the format and use of TSAP Selectors to enable the unambiguous identification of Multiple Transport Service users within a single End System.

~~*Note 2. — In general, where reference is made in this chapter to delegation of administrative responsibility by ICAO to States or organisations, it is expected that the practical effect of this delegation is that the respective States or organisations assume full administrative duties related to the delegated responsibilities. This means, for example, that if ICAO delegates to one or more States or organisations the responsibility for allocation, assignment and general administration of particular segments of the ATN address space, then those States or organisations must place into operation the necessary administrative structure to carry out the delegated allocation, assignment and administration activities. After having carried out the delegated administration of these field values, the State or organisation is then obliged to inform ICAO on a mutually agreed basis of administrative actions taken, so that ICAO may fulfill its responsibility as the ATN addressing authority in terms of publication and communication of this information for use by the civil aviation community. It is also important to note that a State or organisation may request delegation by ICAO of direct responsibility for its own administrative address space, if and when that State or organisation wishes to commence its own administrative activities. Finally, it is important to note that the role of ICAO in this area is one of international coordination, advice and consultation in order to ensure orderly and efficient operation of the global aspects of the ATN. Thus, ICAO may be expected to provide counsel to States and organisations having assumed such delegated responsibilities, in order to ensure that address administration is carried out in a manner that supports the orderly and efficient global operation of the ATN Internet*~~

5.4.1.1 Addressing Plan Scope

5.4.1.1.1 The ATN Internet Addressing Plan shall be used by ATN End Systems and Intermediate Systems.

Note.— The ATN Internet Addressing Plan serves the needs of a variety of aeronautical data communication user groups, including ATSC and AINSC users.

5.4.1.2 Addressing Plan Applicability

Note.— The ATN Internet Addressing Plan defines the Network and Transport Layer addressing information to be utilized by ATN End Systems, and by ATN Intermediate Systems.

5.4.1.3 Reserved Values in Address Fields

5.4.1.3.1 Address field values specified as "reserved" shall not be used until assigned by future versions of the specification.

5.4.1.4 Values of Character Format Fields

5.4.1.4.1 When the value of a field is defined as a character string, then the actual value of the field shall be derived from the IA-5 encoding of each character in the character string.

5.4.1.4.2 The IA-5 encoding of the first character in the string shall be taken as the value of the first octet of the field and so on until all octets in the field have been given a value.

5.4.1.4.3 If the length of the character string is smaller than the number of octets in the field, then the character string shall be right padded with the space character.

5.4.1.4.4 The most significant bit of each octet shall be set to zero

Note. .— For example, the character string 'EUR' would be encoded as 455552 hexadecimal, in a three octet field.

5.4.2 Transport Layer Addressing

5.4.2.1 General

Note 1.— This section provides requirements on the format of ATN TSAP addresses. An ATN TSAP address is an NSAP address and a TSAP selector.

Note 2.— The requirements in this section apply to the administration of transport addresses local to an ATN End System. They do not apply to all systems in a global OSI Environment. An ATN System may allow remote transport addresses to obey different standards, e.g. when interworking with a non-ATN system is required.

5.4.2.2 ATN TSAP Selector

5.4.2.2.1 An ATN TSAP selector shall be either one or two octets in length.

5.4.2.3 Format

5.4.2.3.1 The TSAP Selector field shall be interpreted as an unsigned binary integer.

5.4.2.4 Administration

5.4.2.4.1 The TSAP Selector field shall be administered on a local basis.

5.4.2.5 Range

5.4.2.5.1 Valid ATN TSAP Selector field values shall be in the range **[0 -65535]**.

5.4.2.6 Encoding

5.4.2.6.1 The TSAP Selector field shall be encoded as an unsigned binary number.~~using binary rules, as defined in 5.~~

5.4.2.6.2 If the TSAP Selector needs to be encoded in more than one octet, then the number shall be encoded with the most significant octet first.

Note.— This follows the encoding rules specified in ISO/IEC 8073.

5.4.2.6.3 **Recommendation**.— *TSAP selector values in the range **[0 -255]** should be encoded using one octet, higher values should be encoded using two octets.*

5.4.3 Network Layer Addressing

5.4.3.1 NSAP Addresses and Network Entity Titles (NETs)

Note 1.— The NSAP Address is formally defined in ISO/IEC 8348. It is the name of a Network Service Access Point (NSAP) located in an End System, and uniquely identifies that NSAP. It is also an address that may be used to find that NSAP.

Note 2.— The Network Entity Title (NET) is also formally defined in ISO/IEC 8348 and is the name of a Network Entity located within an End or Intermediate System. NETs are syntactically identical to NSAP Addresses and are allocated from the same address space. An NET is also an address that may be used to find the Network Entity.

Note 3..— An NSAP Address Prefix is a substring of an NSAP Address or NET that is comprised of the first 'n' characters of the NSAP Address or NET.

5.4.3.2 Network Addressing Domains

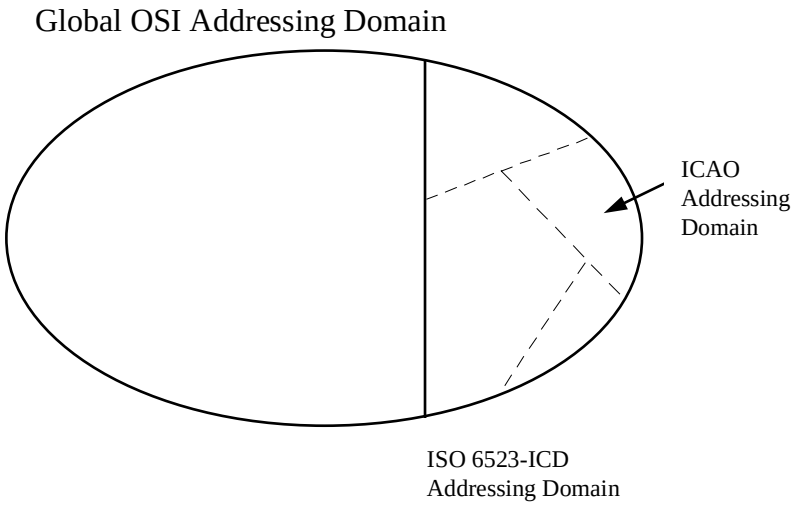

Figure 5.5.4-1 The OSI Global Network Addressing Domain

Note 1.— A Network Addressing Domain comprises all NSAP Addresses and NETs with a common NSAP Address Prefix, and is always a sub-domain of the Global NSAP Addressing Domain which contains all NSAP Addresses. This nesting of network addressing domains within the Global Network Addressing Domain is conceptually illustrated in Figure 5.5.4-1.

Note 2.— A Network Addressing Domain has a single Administrator responsible for the assignment of NSAP Addresses and NSAP Address Prefixes within the domain. A Network Addressing Domain is often sub-divided into a number of sub-ordinate domains each characterised by a unique NSAP Address Prefix. Management of such sub-ordinate Network Addressing Domains may then be devolved to another Administrator.

5.4.3.3 The Syntax of an NSAP Address

Note 1.— The only knowledge of an NSAP Address's syntax that a Router is allowed to make use of is that specified in ISO/IEC 10589 for intra-domain routing. This is illustrated in Figure 5.5.4-2 below.

Note 2.— An Area Address is typically common to all NSAP Addresses and NETs assigned to systems in a single Routing Area.

Note 3.— An Area Address is an example of an NSAP Address Prefix.

Note 4.— A System Identifier uniquely identifies an End or Intermediate System within a Routing Area.

Note 5.— A Selector (SEL) identifies a Network Service User or Network Entity within an End or Intermediate System.

5.4.3.4 The ATN Addressing Plan

Note 1. — ISO/IEC 8348 has specified how the Global Network Addressing Domain is broken down into a number of sub-ordinate Network Addressing Domains, each of which is identified by a unique identifier that forms the initial part of all NSAP Addresses and NETs in those sub-ordinate domains. This initial part is known as the Initial Domain Part (IDP). The IDP itself is defined as comprising two parts: an Authority Format Identifier (AFI) and an Initial Domain Identifier (IDI). The AFI identifies the format and allocation procedures for the IDI and the

Figure 5.5.4-2 ISO/IEC 10589 NSAP Address Syntax

format of the remainder of the NSAP Address.

Note 2. — The ATN Network Addressing Domain is such a sub-ordinate Network Addressing Domain and has an IDP that uses an ISO 6523-ICD IDI.

Note 3. — The IDP is always expressed as decimal digits. However, ISO/IEC 8348 permits NSAP Addresses in an ISO 6523-ICD domain to have either a binary or a decimal format for the remainder of the address - the Domain Specific Part (DSP). The format of the DSP is determined by the AFI.

5.4.3.4.1 All ATN NSAP Addresses shall have an AFI with the value 47 decimal.

Note. — This AFI value is defined by ISO/IEC 8348 to imply an ISO 6523-ICD IDI with a binary format DSP.

5.4.3.4.2 All ATN NSAP Addresses shall have an IDI value of 0027 decimal.

Note. — This value has been allocated by ISO to ICAO under the ISO 6523-ICD scheme. An IDP of 470027 therefore forms the common NSAP Address Prefix to all ATN NSAP Addresses and effectively defines the ATN Network Addressing Domain, as a sub-domain of the Global Network Addressing Domain.

5.4.3.5 The Reference Publication Format

Note. — The Reference Publication Format is defined by ISO/IEC 8348 for the publication of NSAP Addresses and NETs in a form suitable for text documents.

5.4.3.5.1 For the purposes of publication in a text format, ATN NSAP Addresses and NETs shall be written as the character sequence "470027+", identifying the common prefix for all ATN NSAP Addresses, followed by the DSP expressed as a sequence of hexadecimal characters.

Note. — The "+" sign is used as a separator between the decimal syntax IDP and the hexadecimal syntax DSP.

5.4.3.5.2 Each successive pair of hexadecimal digits shall correspond to the next binary octet of the DSP.

5.4.3.6 The ATN NSAP Address Format

Note 1. — The derivation of the ATN NSAP Address Format is illustrated in Figure 5.5.4-3. This starts with the AFI and IDI fields required by ISO/IEC 8348. It ends with the System ID (SYS) and SEL fields required by ISO/IEC 10589. The remaining DSP fields are specified below and used to co-ordinate the allocation of ATN NSAP Addresses.

Note 2. — The VER field is used to partition the ATN Addressing Domain into a number of sub-ordinate addressing domains, each of which provides a different approach to address management.

Note 3.— The ADM field is then used to break down each such partition into a number of sub-ordinate addressing domains, each of which may then be managed by a different manager.

Note 4.— The ARS field may then be used to identify a Network Addressing Domain that will correspond to each Routing Domain under the control of each such manager, and the LOC field may then be used to idenitfy each Routing Area within each Routing Domain.

Note 5.— The reason for the existance of the RDF field is historical.

Note 6.—The DSP fields other than the SYS and SEL fields are not recognised by Routers and exist solely for the purposes of allocation and administration of the NSAP Addresses and NETs.

5.4.3.7 NSAP Address Encoding

Note 1. — In ISO/IEC 8348 terms, the IDP has an abstract decimal syntax, and the DSP has an abstract binary syntax. The reason for the use of the word abstract is to emphasise the fact that the actual encoding is outside of the scope of ISO/IEC 8348, and instead is the responsibility of the standards that specify the encoding of network layer protocols.

Note 2. — ISO/IEC 8348 does, however, describe two possible encoding schemes, the "preferred binary encoding" and the "preferred decimal encoding". ISO/IEC 8473 mandates the use of the preferred binary

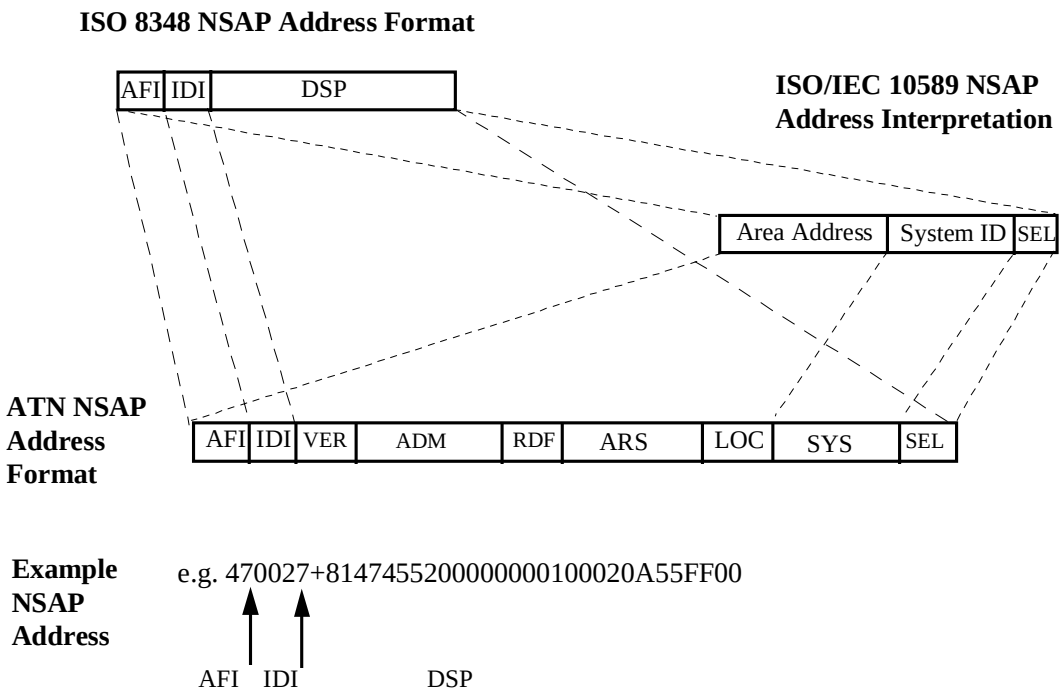

Figure 5.5.4-3 Derivation of the ATN NSAP Address Format

encoding for CLNP, while ISO/IEC 10747 mandates a modified version of the preferred binary encoding in order to cope with bit aligned NSAP Address Prefixes.

Note 3. — In consequence, this specification only specifies how each field of the DSP is allocated as an unsigned binary number. The actual encoding of the resulting bitstring in an NPDU is then according to the applicable protocol specification.

5.4.3.8 Allocation of the DSP

Note. — The DSP fields of an ATN NSAP Address are the VER, ADM, RDF, ARS, LOC, SYS and SEL fields. The size of each of these fields is given in Table 5.5.4-1

5.4.3.8.1 The Version (VER) Field

Note 1. — The purpose of the VER field is to partition the ATN Network Addressing Domain into a number of sub-ordinate Addressing Domains.

Note 2. — The values currently specified for the VER Field and the Network Addressing Domains so defined, are summarised in Table 5.5.4-2.

5.4.3.8.1.1 The VER Field shall be one octet in length.

5.4.3.8.1.2 A VER field value of **[0000 0001]** shall be used for all NSAP Addresses and NETs in the Network Addressing Domain that comprises all Fixed AINSC NSAP Addresses and NETs.

Note. — The NSAP Address Prefix "470027+01" is therefore the common NSAP Address Prefix for the Fixed AINSC Network Addressing Domain.

5.4.3.8.1.3 A VER field value of **[0100 0001]** shall be used for all NSAP Addresses and NETs in the Network Addressing Domain that comprises all Mobile AINSC NSAP Addresses and NETs.

Note. — The NSAP Address Prefix "470027+41" is therefore the common NSAP

Address Prefix for the Mobile AINSC Network Addressing Domain.

Address Field Name	Address Field Size
VER	1 Octet
ADM	3 Octets
RDF	1 Octet
ARS	3 Octets
LOC	2 Octets
SYS	6 Octets
SEL	1 Octet

Table 5.5.4-1 DSP NSAP Address Field Sizes

5.4.3.8.1.4 A VER field value of **[1000 0001]** shall be used for all NSAP Addresses and NETs in the Network Addressing Domain that comprises all Fixed ATSC NSAP Addresses and NETs.

Note. — The NSAP Address Prefix "470027+81" is therefore the common NSAP Address Prefix for the Fixed ATSC Network Addressing Domain.

5.4.3.8.1.5 A VER field value of **[1100 0001]** shall be used for all NSAP Addresses and NETs in the Network Addressing Domain that comprises all Mobile ATSC NSAP Addresses and NETs.

Note. — The NSAP Address Prefix "470027+C1" is therefore the common NSAP Address Prefix for the Mobile ATSC Network Addressing Domain.

5.4.3.8.1.6 A VER field value of **[1101 0001]** shall be used for all NSAP Addresses and NETs in the Network Addressing Domain that comprises all NSAP Addresses and NETs allocated on a regional basis.

Note 1. — Such a Network Addressing Domain may be set up to co-ordinate the allocations of NSAP Addresses and NETs within a single ATN Island.

Note 2. — The NSAP Address Prefix "470027+D1" is therefore the common NSAP Address Prefix for the Regional Network Addressing Domain.

5.4.3.8.1.7 All other VER field values shall be reserved.

5.4.3.8.2 The Administration (ADM) Field

5.4.3.8.2.1 General

Note. — The purpose of the ADM field is to sub-divide each of the Network Addressing Domains introduced by the VER field into a further set of sub-ordinate Network Addressing Domains, and to permit devolved administration (i.e. address allocation) of each resulting domain to an individual state or Organisation.

5.4.3.8.2.2 The ADM field shall be three octets in length.

5.4.3.8.2.3 Fixed AINSC NSAP Addresses and NETs

5.4.3.8.2.3.1 In the Fixed AINSC Network Addressing Domain, the ADM field shall be used to sub-divide this Addressing Domain into a number of sub-ordinate Network Addressing Domains, each of which comprises NSAP Addresses and NETs for

VER Field Value	Network Addressing Domain	Common NSAP Address Prefix for Domain
[0000 0001]	Fixed AINSC	470027+01
[0100 0001]	Mobile AINSC	470027+41
[1000 0001]	Fixed ATSC	470027+81
[1100 0001]	Mobile ATSC	470027+C1
[1101 0001]	Regional	470027+D1

Table 5.5.4-2 VER Field Assigned Values

fixed systems operated by a single AINSC Organisation.

5.4.3.8.2.3.2 Allocation of NSAP Addresses and NETs in each such Network Addressing Domain subordinate to the Fixed AINSC Network Addressing Domain shall be the responsibility of the organisation identified by the value of the ADM field.

5.4.3.8.2.3.3 **Recommendation. —** *The field value should be derived from the set of three-character alphanumeric symbols representing an IATA Airline or Aeronautical Stakeholder Designator, according to 5.5.4.1.4.*

5.4.3.8.2.4 Fixed ATSC NSAP Addresses and NETs

5.4.3.8.2.4.1 In the Fixed ATSC Network Addressing Domain, the ADM field shall be used to sub-divide this Addressing Domain into a number of sub-ordinate Network Addressing Domains, each of which comprises NSAP Addresses and NETs for fixed systems operated by a single ATSC State.

5.4.3.8.2.4.2 Allocation of NSAP Addresses and NETs in each such Network Addressing Domain subordinate to the Fixed ATSC Network Addressing Domain shall be the responsibility of the state identified by the value of the ADM field.

5.4.3.8.2.4.3 In this case, the ADM field shall contain the state's three-character alphanumeric ISO 3166 Country Code, represented as upper case characters.

5.4.3.8.2.4.4 The value of the field shall be determined according to 5.5.4.1.4

Note. — For example, the encoding of 'GBR' is 744252 in hexadecimal. Therefore the NSAP Address Prefix 470027+41744252 is the common NSAP Address Prefix for all NSAP Addresses and NETs in the UK Fixed Network Address Domain.

5.4.3.8.2.4.5 All ADM field values in the Fixed ATSC Network Addressing Domain that do not correspond to valid ISO 3166 Country Codes shall be reserved.

5.4.3.8.2.5 NSAP Addresses and NETs in Regional Network Addressing Domains

5.4.3.8.2.5.1 In the Regional Network Addressing Domain, the ADM field shall be used to sub-divide that Addressing Domain into a number of sub-ordinate Network Addressing Domains, each of which comprises NSAP Addresses and NETs within a single region.

5.4.3.8.2.5.2 In the Regional Network Addressing Domain, the currently assigned ADM values are listed in Table 5.5.4-3.

5.4.3.8.2.5.3 All other ADM field values for the Regional Network Addressing Domain are reserved.

Note. — Table 5.5.4-3 may be extended by future versions of this specification. Requests for additional Regional Network Addressing Domains may be made to the responsible ICAO Panel.

ADM Field Value (Hexadecimal)	Region
000001	Europe
000002	North Atlantic

Table 5.5.4-3 Assigned ADM Values for the Regional Network Addressing Domain

5.4.3.8.2.6 Mobile NSAP Addresses and NETs

5.4.3.8.2.6.1 In both the Mobile AINSC and the Mobile ATSC Network Addressing Domains, the ADM field shall be used to sub-divide this Addressing Domain into a number of sub-ordinate Network Addressing Domains, each of which comprises NSAP Addresses and NETs for mobile systems operated by a single Airline or onboard the General Administration aircraft of a single state.

5.4.3.8.2.6.2 For Mobile AINSC NSAP Address and NETs, the ADM field value shall be set according to 5.5.4.3.8.2.3, and the corresponding sub-ordinate Network Addressing Domain administered by the organisation identified by the value of the ADM field.

5.4.3.8.2.6.3 For Mobile ATSC NSAP Address and NETs, the ADM field value shall be set according to 5.5.4.3.8.2.4, and the corresponding sub-ordinate Network Addressing Domain administered by the state identified by the value of the ADM field.

5.4.3.8.3 The Routing Domain Format (RDF) Field

Note 1. — There is no absolute requirement for the remainder of the DSP in each of the above defined Network Addressing Domains to be allocated according to a co-ordinated addressing plan, or for even the same fields to exist, or the NSAP Addresses to have the same length. However, in order to encourage common equipment development, this specification specifies the existence, size and use of the RDF, ARS and LOC fields.

Note 2. — The purpose of the RDF field is reserved.

5.4.3.8.3.1.1 The RDF field shall be one octet is length and its value shall be **[0000 0000]** in binary.

5.4.3.8.3.1.2 All other values shall be reserved.

5.4.3.8.4 The Administrative Region Selector (ARS) Field

Note. — The purpose of the ARS field is to distinguish Routing Domains operated by the same State or Organisation, or within the same region.

5.4.3.8.4.1 In the Fixed AINSC and ATSC, and the Regional Network Addressing Domains, the value of the ARS field shall be a 24-bit unsigned binary number that uniquely identifies the NSAPs Addresses and NETs assigned to systems in a single Routing Domain.

5.4.3.8.4.2 In the Fixed AINSC and ATSC, and the Regional Network Addressing Domains, responsibility for assigning the field values lies with the administrator of the Network Addressing Domain.

Note 1. — This will be the Organisation, State or Regional Authority identified by the value of the ADM field.

Note 2. — For example, 470027+417442520000000 and 470027+417442520000001 are therefore NSAP Address Prefixes common to all NSAP Addresses and NETs assigned to fixed systems in two distinct Routing Domains operated by the UK ATSC authority.

Note 3. — Where necessary, the allocation of NSAP Addresses and NETs may thus readily be devolved to a Network Administrator responsible for each the Network Addressing Domain that therefore corresponds with each Routing Domain.

5.4.3.8.4.3 In Mobile AINSC and ATSC Network Addressing Domains, the value of the ARS field shall be a 24-bit ICAO Aircraft Identifier that uniquely identifies the NSAP Addresses and NETs in a single Routing Domain.

Note 1. — The systems onboard a single aircraft are assumed to form a single Routing Domain.

Note 2. — The ARS field therefore uniquely identifies the NSAP Addresses and NETs in systems onboard a single aircraft.

Note 3. — If the aircraft is operated by an IATA Airline then the NSAP Address or NET is in a Mobile AINSC Network Addressing Domain.

Note 4. — For General Aviation Aircraft, the NSAP Address or NET is in a Mobile ATSC Network Addressing Domain.

5.4.3.8.5 The Location (LOC) Field

Note. — The purpose of the LOC field is to distinguish Routing Areas with the same Routing Domain. The combination of AFI. IDI, VER, ADM, RDF, ARS and LOC fields therefore forms an Area Address.

5.4.3.8.5.1 The LOC field shall be two octets in length and may be given any binary value.

5.4.3.8.5.2 The administrator of the Network Addressing Domain that co-incides with the Routing Domain in which a given Routing Area is located, is responsible for the allocation of a LOC field value that provides a unique Area Address for that Routing Area.

Note. — For example, 470027+4174425200000010045 is an Area Address in a Routing Domain operated by the UK ATSC Administration.

5.4.3.8.6 The System Identifier (SYS) Field

Note.— ISO/IEC 10589 defines the System Identifier is a variable length field and

uniquely identifies an End or Intermediate System within a ISO/IEC 10589 Routing Area. Within a Routing Area, all System Identifiers are of the same length, although a Router is not able to make assumptions about the length of this field outside of its own Routing Area. However, the ATN Addressing Plan does specify this field to always be six octets in length in order to encourage a common equipment base.

5.4.3.8.6.1 In an ATN NSAP Address or NET, the System Identifier (SYS field) shall be six octets in length.

5.4.3.8.6.2 The value of the SYS field shall be a unique binary number assigned by the addressing authority responsible for the Network Addressing Domain that corresponds with the Routing Area in which the identified system is located.

Note. — If the System is attached to an IEEE 802 Local Area Network (e.g. an Ethernet), then a common approach is to use the 48-bit LAN address as the value of the SYS field.

5.4.3.8.7 The NSAP Selector (SEL) Field

Note . — The NSAP Selector (SEL) field identifies the End System or Intermediate System network entity or network service user process responsible for originating or receiving Network Service Data Units (NSDUs).

5.4.3.8.7.1 The SEL field value for an Intermediate System network entity shall be **[0000 0000]**, except for the case of an airborne Intermediate~~iIntermediate~~ System implementing the procedures for the optional non-use of IDRP.

5.4.3.8.7.2 In that case, the SEL field value shall be **[1111 1110~~fe~~]**.

5.4.3.8.7.3 The SEL field value **[1111 1111~~ff~~]** shall be reserved.

Note 1. — In an Intermediate System, any other SEL field value may be assigned to NSAPs. The actual value chosen is a local matter.

Note 2. — SEL field values in stand-alone End Systems (i.e. in End Systems not co-located with Intermediate Systems) are not constrained.

5.4.3.9 Pre-Defined NSAP Address Prefixes

5.4.3.9.1 All AINSC Mobiles

5.4.3.9.1.1 The NSAP Address Prefix 470027+41 shall provide a common NSAP Address Prefix for all AINSC Mobiles.

5.4.3.9.2 All ATSC Mobiles

5.4.3.9.2.1 The NSAP Address Prefix 470027+C1 shall provide a common NSAP Address Prefix for all ATSC Mobiles.

Note. —The NLRI for the Default Route to all Mobiles comprises both the NSAP Address Prefixes defined above.

5.4.3.9.3 All Aircraft Belonging to an Airline

5.4.3.9.3.1 The NSAP Address Prefix 470027+41 plus the value of the ADM field assigned to the airline shall provide a common NSAP Address Prefix for all AINSC Mobiles operated by a single airline.

Note. —The NLRI for the Route to the "Home" for the aircraft belonging to a given airline contains this NSAP Address Prefix.

5.4.3.9.4 All General Aviation Aircraft Registered by a State

5.4.3.9.4.1 The NSAP Address Prefix 470027+C1 plus the value of the ADM field assigned to the State shall provide a common NSAP Address Prefix for all ATSC Mobiles registered by a single state.

Note. —The NLRI for the Route to the "Home" for the General Aviation aircraft registered by a single state contains this NSAP Address Prefix.