ARINC

NAVIGATION SYSTEM DATABASE

ARINC SPECIFICATION 424-22

PUBLISHED: July 23, 2018

Prepared by the AEEC
Published by
SAE ITC
16701 Melford Blvd., Suite 120, Bowie, Maryland 20715 USA

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ARINC SPECIFICATION 424-22

NAGIVATION SYSTEM DATABASE

Published: July 23, 2018

Prepared by the Airlines Electronic Engineering Committee (AEEC)

Adopted by the AEEC Executive Committee

	Adoption Date	Published Date
Specification 424	May 21, 1975	July 16, 1975
Supplements to this ARINC Standard		
Specification 424-22	April 24, 2018	July 23, 2018

A summary of the changes introduced by each supplement is included at the end of this document.

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ARINC Industry Activities organizes and provides the secretariat for international aviation organizations (AEEC, AMC, FSEMC) which coordinate the work of aviation industry technical professionals and lead the development of technical standards for airborne electronic equipment, aircraft maintenance equipment and practices, and flight simulator equipment used in commercial, military, and business aviation. The AEEC, AMC, and FSEMC develop consensus-based, voluntary standards that are published by SAE ITC and are known as ARINC Standards. The use of ARINC Standards results in substantial technical and economic benefit to the aviation industry.

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ARINC SPECIFICATION 424
SUMMARY OF SUPPLEMENTS

Prepared by the Airlines Electronic Engineering Committee (AEEC)

Adopted by the AEEC Executive Committee

	Adoption Date	Published Date
Specification 424	May 21, 1975	July 16, 1975
	Supplements to this ARINC Standard	
Specification 424-1	June 19, 1980	September 8, 1980
Specification 424-2	December 9, 1981	February 5, 1982
Specification 424-3	November 4, 1982	January 17, 1983
Specification 424-4	October 12, 1983	November 10, 1983
Specification 424-5	October 10, 1984	March 18, 1985
Specification 424-6	November 7, 1985	January 31, 1986
Specification 424-7	October 8, 1986	January 14, 1987
Specification 424-8	February 28, 1989	October 15, 1989
Specification 424-9	October 26, 1989	March 2, 1990
Specification 424-10	August 16, 1993	August 20, 1993
Specification 424-11	August 16, 1993	August 20, 1993
Specification 424-12	May 17, 1994	September 15, 1994
Specification 424-13	May 23, 1995	December 31, 1995
Specification 424-14	August 24, 1999	February 11, 2000
Specification 424-15	January 12, 2000	February 11, 2000
Specification 424-16	April 8, 2002	August 30, 2002
Specification 424-17	May 5, 2004	August 31, 2004
Specification 424-18	October 5, 2005	November 23, 2005
Specification 424-19	October 22, 2008	December 19, 2008
Specification 424-20	October 6, 2011	December 12, 2011
Specification 424-21	April 26, 2016	July 25, 2016
Specification 424-22	April 24, 2018	July 23, 2018

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ATTACHMENTS

FIGURES

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1.0 INTRODUCTION

1.1 Purpose of this Document

This document sets forth the air transport industry's recommended standards for the preparation of airborne navigation system reference data files. The data on these files are intended for merging with airborne navigation computer operational software to produce media for use by such computers on board aircraft. Since the industry does not desire to standardize the operational software of these computers, this merging process is not described in this document, nor do the standards set forth necessarily apply to the aircraft employed data.

The databases prescribed by this document are also used by computer flight planning systems, flight simulators, and other applications.

The purpose of this standard, **ARINC Specification 424:** *Navigation System Database*, is to be an enabling document. It enables database suppliers, avionics systems, and other users of the databases to fly and flight plan procedures as prescribed by procedure designers. The document is not meant to be a prescriptive document for procedure designers.

This document is also not a requirements document for airborne navigation systems.

Procedures that are not compatible with this database standard in some cases cannot be coded for inclusion in some airborne databases.

1.1.1 Coverage of Flight Simulator Needs

Supplement 4 to this document added material related to the special navigation database needs of flight simulators. The approach taken, i.e., the definition of three new subsections to the master file and the exploitation of previously unused continuation record capability, was designed to ensure that users who wish to continue using the document solely as the basis for supporting airborne navigation system operation can do so without simulator related records nor be concerned that the software used to merge ARINC Specification 424 data with airborne equipment operational software will need modification as the result of the changes. Users who wish to support both airborne navigation system and flight simulator operations can also do so without having to modify this merging software. Only the simulator navigation database compilers need take into account the presence of the simulator related components in the input (ARINC Specification 424) data.

1.1.2 Coverage of Flight Planning Needs

Supplement 5 of this document added material related to the special navigation database needs to flight planning computer systems. The approach taken, i.e., the definition of the new material and the exploitation of previously unused continuation record capability, was designed to ensure that users who wish to continue using the document solely as the basis for supporting airborne navigation system operations can do so without penalty. Such users need not obtain the flight planning related records nor be concerned that the software used to merge ARINC Specification 424 data with airborne equipment operational software will need modification as the result of the changes. Users who wish to support both airborne navigation system and flight planning system operations can also do so without having to modify this merging software. Only the flight planning navigation database systems need to

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take into account the presence of the flight planning related components in the input (ARINC Specification 424) data.

1.2 Data Format Standardization Philosophy

The production of navigation data for use with onboard navigation computers may be viewed as a four-step process (Attachment 1). The first step is the assembly of a data bank. The second is the production of data files organized such that individual airlines' operational needs can be met. The third step is the merging of these data with the operational software of those airlines' navigation computers. The final step is the production of final storage media containing these merged data for use on individual aircraft.

Data banks will contain world-wide navigation reference information obtained both from public sources (ICAO, governments, etc.) and from navigation system users. They could be assembled and maintained by public bodies (e.g., government agencies or international organizations), by commercial institutions, or both. The information needed by an airline to make use of a navigation system over its own routes will consist of a section from the public part of the bank and the data it requires from the user part of the bank. It will occupy one of the airline nav. data files shown at the step 2 level in Attachment 1.

To facilitate the sorting process necessary to produce individual airline files, every record in the data bank is encoded as to type. Those in the public part of the bank are termed standard records, and may appear in any airline's file. The Master Airline User File shown at the step 1 level in the diagram of Attachment 1 is made up of such records. They contain the data specified in Chapter 3 of this document, and are formatted according to the rules set forth in Chapters 4 and 5. Records in the user part of the bank are termed tailored records, and each one is entered into the bank to support the operations of the particular user (airline) that requires it. Chapter 4 of this document sets forth a standard format for encoding tailored route information, while Chapter 5 includes definitions of certain fields used exclusively for this purpose.

Individual airline files are used in step 3 of the airborne navigation system media production process. This may be performed either by the airline itself (as may step 4), or by an agency contracted to support the airline's navigation system operations, such as the airborne equipment manufacturer.

It can readily be seen that in the absence of air transport industry guidance, individual navigation system manufacturers could follow equipment design approaches that impose different requirements on the format of the navigation reference data. Although, as implied in Section 1.1 above, the airlines do not wish unnecessarily to constrain equipment design, the cost to them as an industry of supporting the production of files in several different formats would be prohibitively high. For this reason, they have produced in this document data format and encoding standards to be applied in the production of these files. These standards are not intended to be used in the final two steps of file production, nor are any obligation imposed on anyone to make use of every data element defined. In this way manufacturers are free to optimize their hardware and software designs as they see fit, and reference data acquisition costs are minimized.

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COMMENTARY

In some cases, in this document data fields are defined offering greater resolution than is usually available for the data in question from the source databases. This is intended to reflect the airlines' desire for the use of the best available data. It is not, however, intended to suggest a need for special surveys in order to provide the data to the resolutions shown. Also, consideration of the application of the database described in this document, with the aim of determining whether or not a standard earth model reference should be defined, produced the conclusion that such action was not necessary.

Readers should note that ARINC Specification 424 is not a database specification per se. It is a standard for the preparation and transmission of data for assembly of airborne navigation system databases.

1.3 Organization of this Document

A glossary of data processing and special navigation terms precedes the chapters of the document in which the recommended standards are defined. In the first of these chapters, the organization and content of the master airlines user file (see Attachment 1) is defined. The next chapter describes records in terms of their field structures. Following that, individual fields are defined in terms of the data elements from which they are constructed. Figure 1-1 pictorially relates these methods of information presentation to the layout of data on one of the individual airline files shown at the step 2 level in the diagram of Attachment 1. With the file structure definition complete, attention is turned to the encoding of data for computer processing.

1.3.1 Coverage of Helicopter Operation Needs

Supplement 14 of this document added material related to the special navigation database needs of rotor wing flight operations. The approach taken was to define as dual use as much of the database as possible, specifically the ground base navigation and landing aids. These records are defined as the Master Airline User File. Where dual use was not possible, new content was defined as the Master Helicopter User File. The new content was all related directly to the heliport and flight operations into and out of heliports. It included helicopter SIDs, STARs and Approach Procedures and Heliport Terminal Waypoint. Minor adjustments to the content of records that are dual usage were required; an example would be a new route type code for Enroute Airways dedicated to helicopter airways. All changes were made so as to have no impact on any other application of ARINC Specification 424, provided database suppliers avail themselves of the data selection capabilities built into that revision. Supplement 19 of this document added material required to provide for Helicopter Company Routes.

1.4 Reference Documentation

ARINC Characteristic 702: *Flight Management Computer System*

ARINC Characteristic 702A: *Advanced Flight Management Computer System*

ARINC Characteristic 756: *GNSS Navigation and Landing Unit (GNLU)*

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1.0 INTRODUCTION

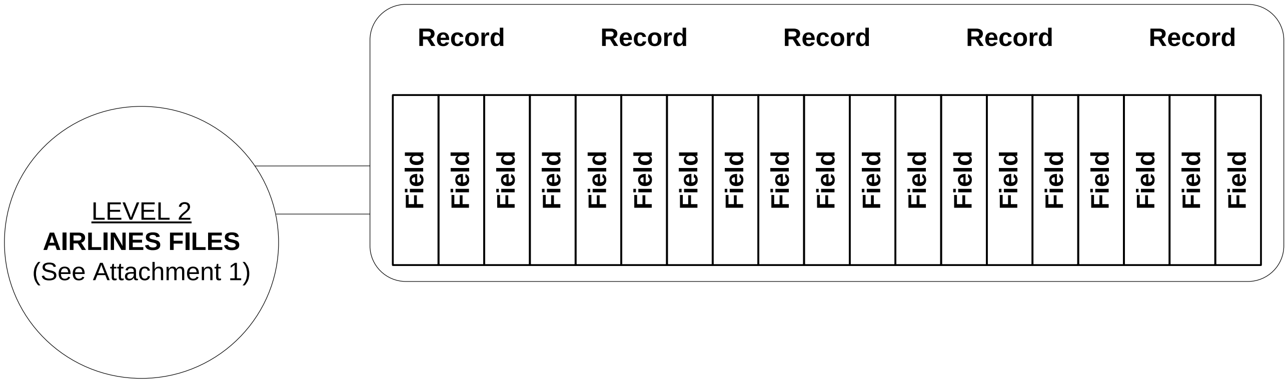

Figure 1-1 – ARINC Specification 424 Information Presentation

CHAPTER 3 defines content and organization of the Master Airline User File (Attachment 1)

CHAPTER 4 defines locations for fields in RECORDS

CHAPTER 5 describes FIELDS

CHAPTER 7 defines data ENCODING STANDARDS

1.5 Associated Electronic Files

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ARINC Specification 424-22 consists of this document and the following electronic files:

- ARINC424_22_XmlSchemas.zip
- ARINC424_22HtmlSchemas.zip
    - HTML representation of the Schema Documentation
- ARINC424_Xml.pdf
    - PDF representation of the Schema Documentation

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2.0 GLOSSARY OF TERMS

2.1 Data Processing Terms

This section contains definitions for the data processing terms used in this document. They are listed alphabetically.

Alpha

The terms employed to describe any letter of the alphabet (A through Z); any punctuation; or any printable character, other than a numeric, including space.

Character

The basic human-oriented data element, e.g., a single letter of the alphabet or a single number (0 through 9). The entry RW26L is said to consist of five characters.

Column

The spaces for data entry on each record. One column can accommodate one character.

Field

The collection of characters needed to define one item of information. The entry RW26L identifies runway 26 left and is described as a five-character field.

Numeric

The term employed to describe any single number in the range 0 through 9.

Record

A single line of computer data made up of the fields necessary to define fully a single useful piece of data. A VORTAC station record, for example, contains fields for station name, coordinates, frequency, elevation, variation, ICAO code, ident code, plus certain administrative data pertaining to the record itself.

Subsection

A collection of records of functional data items. The records for Approach routes form a subsection of the Airport database.

Section

The first division of the database. Each section is made up of subsections as defined above.

2.2 Special Navigation Terms

This section contains definitions of certain special navigation-related terms used in this specification. This section is divided into four subsections: Special Data Terms, Procedure and Route Terms, Support Terms, and Precision RNAV Terms.

2.2.1 Special Data Terms

ATC Compulsory Reporting Point

Essential or nonessential waypoints may be classified as ATC compulsory points. ATC requires the pilot to make a communications report at these waypoints. All other waypoints may be classified as non-compulsory reporting points and are reported only when specifically requested by ATC.

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Essential Waypoints

An Essential Waypoint is defined as any waypoint at which a change in course is required or as the intersection of two or more airways.

Gateway Fix

A Gateway Fix is a waypoint associated with organized track systems across large areas which no ATS Routes have been established such as the Atlantic Ocean. It is coded into the database to indicate the point at which a change is made from ATS Route flying to random track flying.

GNSS Landing System (GLS) Reference Point

The exact location for which the differential corrections provided by the ground augmentation system are referenced. The GLS ground station reference point is defined in WGS-84 coordinates. The location of the GLS reference point is provided in the uplink Message Type 2. Nonessential Waypoints

Nonessential Waypoints include all other waypoints of an airway not included under Essential Waypoints.

Off-Route Floating Waypoint

Waypoints which are not part of any route system but are designated by the ATC authority to be charted are considered to be Off-Route Floating Waypoints.

Phantom Waypoint

A database waypoint established during procedure coding to facilitate more accurate navigation by the Flight Management Computer than would be allowed using air-mass related Path Terminators to replicate source data. The waypoint finds use when such considerations as increased environmental restrictions and the congestion of the available airspace come into play. Used to permit route construction with track to a fix (TF) legs.

Transition Essential Waypoints

A waypoint which normally would be classified as non-essential may be required to transition from the enroute structure to the terminal structure. Waypoints falling into this category are classified as Transition Essential Waypoints.

Uncharted Airway Intersection

A database waypoint established during airway coding that is not designated as part of that airway by government source. Used generally to establish intersections at route crossings and transition points for airways to terminal procedures that have not been provided by government source, but are necessary to provide the route or procedure in accordance with the rules of this specification.

2.2.2 Procedure and Route Terms

Approach Transition

An Approach Transition is that series of sequences of a coded procedure that represent the government source data for Arrival Routes or Feeder Routes, generally used to define a path from a fix in the enroute environment to an Initial Approach Fix (IAF), as well as the series of procedure sequences from the IAF to the Final Approach Course Fix (FACF) or to the Final Approach Fix (FAF) when no

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FACF is coded. The transition may end at a source published Intermediate Fix (IF) or the Intermediate Fix designation may be included prior to the ending sequence.

Final Approach Course Fix (FACF)

The FACF is a waypoint located at the beginning of the Final Approach Coding. If a FACF exists, it must be the first waypoint of the Final Approach Coding**. Rules governing when and where a FACF is coded are contained in Attachment 5 of this specification**.

Final Approach Fix (FAF)

The Final Approach Fix or Final Approach Point is a fix designated by government source documentation as the fix at which the Final Approach Segment of the approach begins. An Approach Procedure must have exactly one FAF. Rules governing where the FAF/FAP is coded and how one is established if none is published are contained in Attachment 5 of this specification.

Final End Point (FEP)

The FEP is a waypoint located in the coded Final Approach Course (FAC). It is located at a point defined by the intersection of the FAC and a line perpendicular to that course through the runway threshold for procedures designed to straight-in criteria or threshold the first usable landing surface for circling only procedures. Rules governing when a FEP waypoint is coded are contained in Attachment Five of this specification.

Final Approach Coding

The Final Approach Coding is that series of sequences of a coded procedure that represent the government source data for the Intermediate Approach Segment when only one Intermediate Segment for the procedure is published, (IF to Final Approach Fix (FAF)), when appropriate source is available, as well as the Final Approach Segment (FAF to Missed Approach Point (MAP)).

Final Approach Course (FAC)

A straight-line extension of a localizer course, a final approach radial/bearing or an extended runway centerline, all without regard to distance.

Initial Approach Fix (IAF)

An Initial Approach Fix is that fix designated by the government source documentations as the fix at which the Initial Approach segment begins. An Approach Procedure may have no IAF or multiple IAFs.

Intermediate Fix (IF)

An Intermediate Fix is a fix designated by government source documentation as the fix at which the Intermediate Approach Segment of the approach begins. **An Approach Procedure may have no IF, one IF, or multiple IFs. If the government source provides a named fix or an unnamed fix that is designated as the Intermediate Fix, such a position could be coded as the FACF. Rules governing when the FACF is coded at the published IF are contained in Attachment 5 of this specification.**

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Missed Approach Point (MAP)

A Missed Approach Point is designated by government source documentation as the point at which the Missed Approach Segment of the approach begins. This may be at a fix or at a Decision Altitude. A coded Approach Procedure must have exactly one MAP. Rules governing where the MAP is coded and how one is established if none is published are contained in Attachment 5 of this specification.

Missed Approach Procedure

The Missed Approach Procedure is that series of sequences of a coded procedure that represent the government source data for the Missed Approach Segment (MAP to Missed Approach Holding Fix).

Precision Approach Procedures

A Precision Approach Procedure is any procedure for which specific altitude and angle information with reference to an electronic glideslope is included in the coding of that procedure.

Precision Final Approach Fix (PFAF)

Used in MLS Procedure Coding. The PFAF is located at a point where the glide path intercepts the intermediate altitude. This point is the beginning of the MLS precision final approach segment.

Terminal Procedure

Collectively, all Standard Instrument Departures (SIDs), Standard Terminal Arrival Routes (STARs) and Instrument Approach Procedures (IAPs) coded to the standards in this specification are referred to as Terminal Procedures.

VNAV Path

The Vertical Navigation or VNAV Path is the term used to identify the angular data provided on non-precision Final Approach Coding. Refer to Attachment Five, Section 8.9, of this specification for information on how the VNAV Path data is provided.

2.2.3 Support Terms

Enroute Airway (ER) to Restrictive Airspace (UR) Link

The ER to UR Link indicates the physical effect of Enroute Airway to a Restrictive Airspace through which that Airway is designated, defined by the airway segment centerline. The Link is reflected in one or more dedicated Enroute Airway Continuation Records.

Localizer

Except where this term is specifically related to a particular type of approach procedure, the term Localizer is used as a general reference to all types of approach facilities that provide an electronic course guidance signal, including ILS, LOC, BC, IGS, LDA and SDF type signals.

Mandatory Hold

Any Flight maneuver of a holding nature defined in a terminal procedure where execution is part of the source defined flight path.

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Precision ARC

A circular arc flight path between two known points, whose construction is tangent to the inbound and outbound paths to and from the known paths.

2.2.4 Precision RNAV Terms

COMMENTARY

The term RNAV-GPS/GLS is used to reference RNAV procedure formerly referenced as RNP.

Final Approach Flight Path

This is the path that is defined laterally and vertically by the GPA and three precision approach path points that lie in a vertical plane coincident with the center of the geodetic reference ellipsoid. These three points are the LTP/FTP, FPAP and the FPCP.

Final Approach Segment (FAS) Data Block

The FAS Data Block defines the lateral and vertical paths and associated criteria for the final approach segment of a SBAS (FAS) Data Block or **GLS** Approach Procedure.

Within an ARINC 424 output file, FAS Data Block data is carried in the Path Point Record and the two terms have been used interchangeably.

Flight Path Alignment Point (FPAP)

The FPAP is a point used to define the lateral alignment of the vertical plane containing the precision Final Approach Segment. For approach procedures that are aligned with the runway centerline, it is located at the designated center of the opposite runway threshold or an extension of a geodesic line calculated between the LTP and the designated center of the opposite runway landing threshold. It is positioned at a distance from the LTP to support a prescribed angular splay of lateral deviations. The FPAP is defined by latitude and longitude. The FPAP may be located beyond the opposite end of the landing runway, particularly on short runways. For Point-in-Space (PinS) approach procedures, the point is located on a geodesic line beyond the HP/FHP that is aligned with the PinS FAS.

Flight Path Control Point (FPCP)

The FPCP is a point above the LTP used to define the vertical component of the precision Final Approach Segment. It is in the vertical plane containing the LTP and the FPAP. Horizontally, the FPCP has the same latitude/longitude as the LTP. Vertically, the elevation of the FPCP is the LTP ellipsoidal elevation plus the threshold crossing height (TCH).

Glide Path Angle (GPA)

The GPA defines the descent angle of the precision final approach segment. It is defined relative to the horizontal plane, tangent to the WGS-84 ellipsoid at the LTP.

Landing Threshold Point/Fictitious Threshold Point (LTP/FTP)

The LTP is a point at the designated center of the landing runway threshold, defined by latitude, longitude, and height above the WGS-84 reference ellipsoid. The LTP is used in conjunction with the Flight Path Alignment Point (FPAP) to determine the lateral alignment of the vertical plane containing the precision Final Approach

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Segment. The FTP is the name applied to the LTP when that point is offset from the actual runway surface. When used in calculation and databases, it will generally be shown/referred as LTP/FTP.

Level of Service (LPV, LNAV/VNAV, and LNAV and RNP)

The terms LPV, LNAV/VNAV, and LNAV as used in this document starting with Supplement 18, the terminology developed was by the FAA to denote operating criteria for RNAV procedures. Within this document, these terms are used strictly with regard to operations based on SBAS, although LNAV/VNAV and LNAV operations are often authorized both with and without SBAS for the same procedure. Other government authorities may use other terms to define these criteria. The use of this terminology starting with Supplement 18 of this specification does not rule out using these terms for that source, as long as the intention of the government source identical to that of the FAA. Should other terms be developed that do not have the identical intent, they will be added to the appropriate portions of this specification.

SBAS-based Vertical Navigation

Using the SBAS, space-based augmentation system (e.g., WAAS, EGNOS, MSAS), to provide vertical path deviation guidance to the aircraft with respect to charted approach procedures that contain a TERPS-protected glide path.

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3.0 NAVIGATION DATA

3.1 User File Organization

The records defined in Chapter 4 of this document are sorted such that they appear on the master file in alphabetical/numerical order by column. The sorting necessary to achieve this process is as follows. Records are first divided into standard and tailored groups by the content of the first column. Standard or S records are located on the file ahead of the tailored or T records. The next columns order the standard records alphabetically by AREA Code and tailored records by Airline Code. After that the column content orders both standard and tailored records by sections. This process is illustrated in Figure 3-1. Sorting continues this way, column by column, until each record is uniquely defined.

The column number at which this occurs for each record type may be determined by inspecting the record layout forms of this document. The master file may then be assembled with records located in the positions thus defined.

While the sorting process is basically alphabetical, it must accommodate columns that are permitted to contain blanks or numeric characters. When this occurs, blank characters will be sorted before numeric and numeric characters will be sorted before alphabetic characters.

3.2 Master Airline User File Content

3.2.1 General

This section of this document defines the content of each section of the Master Airline User File. As indicated in Section 1.2 of this document, this file can be composed of the standard records or standard and tailored records, sorted according to the procedure set forth in Section 3.1 above.

The Master Airline User File includes all records listed in Section 3.2.

3.2.2 Navaid Section (D)

3.2.2.1 VHF Navaid Section (D), Subsection (Blank)

The VHF NAVAID Subsection should contain all the VORs, VORDMEs, VORTACs, DMEs, ILS DMEs, and MLS DMEs as well as all TACANs paired with civil-use VHF NAVAID frequencies. It may also contain TACANs paired with military-use VHF frequencies for specific applications. As a minimum, all VHF NAVAIDs referenced by records in Sections 3.2.3.3 **(EP)**, 3.2.3.4 **(ER)**, **3.2.3.8 (ET), 3.2.3.5 (EU), 3.2.3.6 (EV),** 3.2.4.1 **(PA)**, 3.2.4.4 **(PD)**, 3.2.4.5 **(PE)**, 3.2.4.6 **(PF)**, **3.2.4.8 (PI), 3.2.4.17 (PK), 3.2.4.9 (PL), 3.2.4.15 (PR),** 3.2.4.11 **(PS)**, 3.2.4.12 **(PV)**, **3.2.5.1 (R), 3.2.5.2 (RA)**, **3.3.3 (HA),** 3.3.5 **(HD)**, 3.3.6 **(HE)**, 3.3.7 **(HF)**, 3.3.8 **(HS), 3.3.9 (HV), and 3.3.11(RH)** should be available in the VHF NAVAID Subsection. ILS DMEs and MLS DMEs included can be for either Airports or Heliports.

3.2.2.2 NDB Navaid Section (D), Subsection (B)

The NDB NAVAID Subsection file should contain all LF and MF NDBs and selected Marine Beacons defined in the enroute structure. As a minimum, all Enroute NDB NAVAIDs referenced by records in **Sections 3.2.3.3 (EP), 3.2.3.4 (ER), 3.2.3.8 (ET), 3.2.3.5 (EU), 3,2,3.6 (EV), 3.2.4.4 (PD), 3.2.4.5 (PE), 3.2.4.6 (PF), 3.2.4.17 (PK), 3.2.4.15 (PR), 3.2.4.11 (PS), 3.2.4.12 (PV), 3.2.5.1 (R), 3.2.5.2 (RA), 3.3.5 (HD), 3.3.6 (HE), 3.3.7 (HF), 3.3.10 (HK), 3.3.8 (HS), 3.3.9 (HV), and 3.3.11 (RH) should be available in the NDB NAVAID Subsection.**

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3.2.2.3 TACAN Duplicates Section (D), Subsection (T)

The TACAN duplicates Subsection should contain all TACANs published with an identical identifier to another VHF navaid already included in Section 3.2.2.1 (D). As a minimum, all TACAN duplicates referenced by records in Sections 3.2.3.3 (EP), 3.2.3.4 (ER), 3.2.3.8 (ET), 3.2.3.5 (EU), 3.2.3.6 (EV), 3.2.4.1 (PA), 3.2.4.4 (PD), 3.2.4.5 (PE), 3.2.4.6 (PF), 3.2.4.8 (PI), 3.2.4.17 (PK), 3.2.4.9 (PL), 3.2.4.15 (PR), 3.2.4.11 (PS), 3.2.4.12 (PV), 3.2.5.1 (R), 3.2.5.2 (RA), 3.3.3 (HA), 3.3.5 (HD), 3.3.6 (HE), 3.3.7 (HF), 3.3.10 (HK), 3.3.8 (HS), 3.3.9 (HV), and 3.3.11 (RH) should be available in the TACAN duplicates Subsection.

3.2.3 Enroute Section

3.2.3.1 Enroute Waypoint Section (E), Subsection (A)

The Enroute Waypoint Subsection file should contain all named intersections defined in the enroute structure. The file will also contain those VFR waypoints not associated with Airports or Heliports. As a minimum, all enroute waypoints referenced in **Sections 3.2.3.3 (EP), 3.2.3.4 (ER), 3.2.3.8 (ET), 3.2.3.5 (EU), 3.2.4.4 (PD), 3.2.4.5 (PE), 3.2.4.6 (PF), 3.2.4.17 (PK), 3.2.4.15 (PR), 3.2.4.11 (PS), 3.2.4.12 (PV), 3.2.5.1 (R), 3.2.5.2 (RA), 3.3.5 (HD), 3.3.6 (HE), 3.3.7 (HF), 3.3.10 (HK), 3.3.8 (HS), 3.3.9 (HV), and 3.3.11 (RH)** should be available in the Enroute Waypoint Subsection.

3.2.3.2 Enroute Airway Marker Section (E), Subsection (M)

The Enroute Airway Markers Subsection file should contain all government-published airways marker facilities.

3.2.3.3 Holding Patterns (E), Subsection (P)

The Holding Pattern Subsection file should contain all holding patterns shown on aeronautical charts.

3.2.3.4 Enroute Airways Section (E), Subsection (R)

The Enroute Airways Subsection file should contain all government designated airways. **As a minimum, all enroute airways referenced in Sections 3.2.3.8 (ET), 3.2.3.5 (EU), 3.2.5.1 (R), and 3.3.11 (RH) should be available in the enroute airway Subsection.**

3.2.3.5 Enroute Airways Restrictions Section (E), Subsection (U)

The Enroute Airways Restrictions Subsection file contains the official altitude, time and usage restrictions for Enroute Airways referenced in Section 3.2.3.4.

3.2.3.6 Enroute Communications Section (E), Subsection (V)

The Enroute Communications Subsection file should contain all government-published enroute communications facilities.

3.2.3.7 Special Activity Areas Section (E), Subsection (S)

The Special Activity Area (SAA) Subsection file should contain all government-published areas that could be hazardous to aeronautical navigation around a specified location, e.g., parachute jumping area.

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3.2.3.8 Preferred Routes Section (E), Subsection (T)

The Preferred Route Subsection file will contain frequently used routes (e.g., North American Preferred Routes, North American Routes to the North Atlantic Traffic, and Europe Preferential Route System). These routes will, in effect, combine existing Subsection files [SID (PD), STAR (PE), Enroute Airway (ER), Enroute Waypoint (EA), Terminal Waypoint (PC, VHF NAVAID (D), NDB NAVAID (DB), Airport (P)] to form a continuous route structure. This route structure may be referenced by the Company Route records. As a minimum, all preferred routes referenced in Sections 3.2.5.1 (R_), and 3.3.11 (RH) should be included.

3.2.4 Airport Section (P)

3.2.4.1 Airport Reference Points Section (P), Subsection (A)

The Airport Reference Points subsection file should contain reference points for all airports having at least one hard surfaced runway. As a minimum, all airport reference points referenced in Sections **3.2.2.1 (D), 3.2.4.2 (PB), 3.2.4.3 (PC), 3.2.4.4 (PD), 3.2.4.5 (PE), 3.2.4.6 (PF), 3.2.4.7 (PG), 3.2.4.8 (PI), 3.2.4.9 (PL), 3.2.4.10 (PM), 3.2.4.11 (PS), 3.2.4.12 (PV), 3.2.4.13 (PN), 3.2.4.14 (PP), 3.2.4.15 (PR), 3.2.4.16 (PT), 3.2.4.17 (PK), 3.2.4.18 (PH), 3.2.4.19 (PQ), 3.2.5.1 (R), 3.2.5.2 (RA), 3.2.6.3 (UC), and 3.3.11 (RH) should be included.**

3.2.4.2 Airport Gates Section (P), Subsection (B)

The Airport Gates Subsection should contain all gates published in official government documents **associated to** the airport**s** referenced in Section 3.2.4.**1 (PA)** If the airport is provided as standard data, the gates may be provided as standard or tailored data, depending on whether the gate owner and operator is the public sector or a specific airline. If the airport is provided as tailored data, the gates must also be provided as tailored data.

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3.0 NAVIGATION DATA

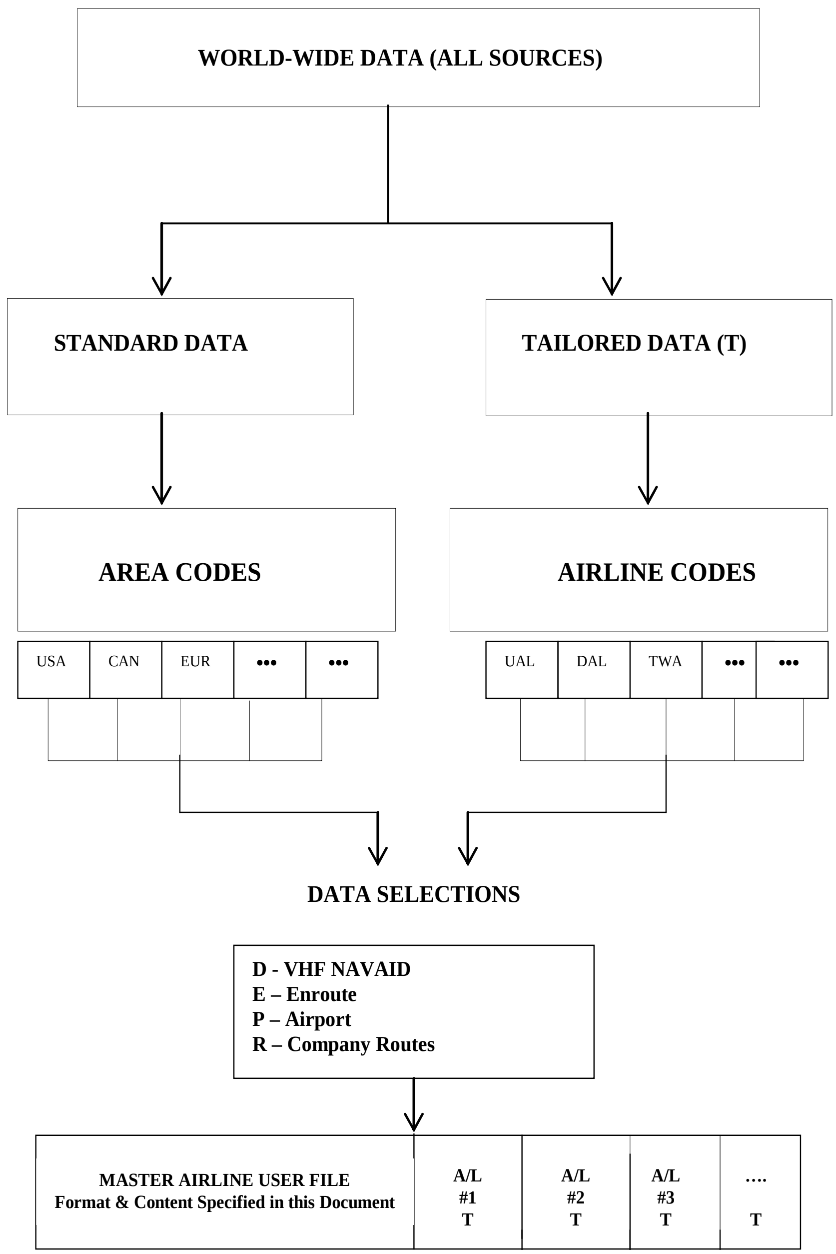

Figure 3-1 – Data Sorting Necessary to Achieve Step 1 of FDSU File Production Process

3.2.4.3 Airport Terminal Waypoints Section (P), Subsection (C)

The Terminal Waypoints Subsection file should contain those waypoints necessary to support Standard Instrument Departures (SIDs), Standard Terminal Arrival Routes (STARs) and Approaches specified in Sections 3.2.4.4 **(PD), 3.2.4.5 (PE), 3.2.4.6 (PF), 3.2.4.17 (PK), 3.2.4.15 (PR), 3.2.4.11 (PS), and 3.2.4.12 (PV),** excluding the landing threshold as a fix. The file will also contain those VFR waypoints associated with Airports. If a waypoint is used in both the terminal and enroute areas, it should appear in the Enroute (EA) file.

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3.2.4.4 Airport Standard Instrument Departures (SIDs) Section (P), Subsection (D)

The SIDs Subsection file should contain all government published SIDs **to** airports referenced in Section 3.2.4.1 **(PA)**.

3.2.4.5 Airport Standard Terminal Arrival Routes (STARs) Section (P), Subsection (E)

The STARs Subsection file should contain all government published STARs to the airports referenced in Section 3.2.4.1.

3.2.4.6 Airport Approaches Section (P), Subsection (F)

The Approach Route Subsection file should contain at least one instrument approach, if published, for each runway to the airports referenced in Section 3.2.4.1 except Radar Approaches. Approach Procedures types have been identified and are covered by coding rules elsewhere in this specification.

COMMENTARY

This specification originally subscribed to an approach procedures coding system known as the Multiple Approach Coding Concept. The concept is defined as one approach procedure for a given reference facility to a given single runway. For example, an ILS based and a VOR based procedure to the same runway may be included but not an ILS and an ILS Localizer only or a VORDME and a VOR only to the same runway. Through several supplements to this specification, modifications to this concept have been incorporated and it is now possible to have multiples of the same reference facility or to address reference facilities in a more specific manner. For details see Chapter Five, Sections 5.7 and 5.10. Data Suppliers are requested to supply to either the original or to the expanded concept.

3.2.4.7 Airport Runway Section (P), Subsection (G)

The Runway Subsection file should contain all runways published in official government documents associated to airports referenced in Section 3.2.4.1 (PA). As a minimum, the section should contain all runways referenced in Sections 3.2.4.4 (PD), 3.2.4.5 (PE), 3.2.4.6 (PF), 3.2.4.8 (PI), 3.2.4.17 (PK), 3.2.4.9 (PL), 3.2.4.10 (PM), 3.2.4.14 (PP), 3.2.10 (PQ), 3.2.4.15 (PR), 3.2.4.11 (PS), 3.2.4.16 (PT), 3.2.4.12 (PV), 3.2.5.1 (R), and 3.3.11 (RH).

3.2.4.8 Airport and Heliport Localizer/Glideslope Section (P), Subsection (I)

The Localizer/Glideslope Subsection file should contain all government published localizer type facilities to airport runways and/or helipad coded in Section 3.2.4.7 **(PG), 3.2.4.18 (PH), and 3.3.13 (HH)**. As a minimum, the section should contain all localizer type facilities referenced in Sections **3.2.4.4 (PD), 3.2.4.5 (PE), 3.2.4.6 (PF), 3.2.4.10 (PM), 3.3.5 (HD), 3.3.6 (HE), and 3.3.7 (HF).**

3.2.4.9 Airport and Heliport MLS Section (P), Subsection (L)

The MLS Subsection file should contain all government published MLS facilities for airport runways and/or helipads referenced in **Section 3.2.4.7 (PA) or 3.3.3 (HA). As a minimum, the section should contain all MLS facilities referenced in Sections 3.2.4.4 (PD), 3.2.4.5 (PE), 3.2.4.6 (PF), 3.2.4.10 (PM), 3.3.5 (HD), 3.3.6 (HE), and 3.3.7 (HF).**

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3.2.4.10 Airport and Heliport Marker/Localizer Section (P), Subsection (M)

The Airport and Heliport Localizer Marker Subsection file should contain all government published Markers and locators associated with the localizers referenced in Section 3.2.4.8 **(PI)**. As a minimum, this Subsection should contain all markers referenced in Sections 3.2.4.6 **(PF)** and 3.3.7 **(HF)**.

3.2.4.11 MSA Section (P), Subsection (S)

The MSA (Minimum Sector Altitude) Subsection should contain the Sector Altitude for all government published SIDs referenced in Section 3.2.4.4, published STARs referenced in Section 3.2.4.5 and approach procedures referenced in Section 3.2.4.6.

3.2.4.12 Airport Communications Section (P), Subsection (V)

The Airport Communications Subsection file should contain all government published airport communications facilities for airports referenced in Section 3.2.4.1 **(PA)**.

3.2.4.13 Airport and Heliport Terminal NDB Section (P), Subsection (N)

The Terminal NDB Subsection file should contain those Terminal NDB NAVAIDS referenced by records in **Sections 3.2.3.3 (EP), 3.2.4.4 (PD), 3.2.4.5 (PE), 3.2.4.6 (PF), 3.2.4.17 (PK), 3.2.4.15 (PR), 3.2.4.11 (PS), 3.2.5.1 (R), 3.2.5.2 (RA), 3.2.3.8 (ET), 3.3.5 (HD), 3.3.6 (HE), 3.3.7 (HF), 3.3.10 (HK), 3.3.8 (HS), and 3.3.11 (RH).** If an NDB is used in both the terminal and enroute environments, it should appear in the Enroute NDB NAVAID (DB) file.

3.2.4.14 Airport SBAS Path Point Section (P), Subsection (P)

The Path Point Subsection file should contain the Path Point records required to support all RNAV-GPS Approach Procedures referenced in Section 3.2.4.6 **(PF)**.

3.2.4.15 Flight Planning Arrival/Departure Data Record Section (P), Subsection (R)

The Flight Planning Arrival/Departure Data Subsection should contain a set of data that meet the needs of computerized flight planning for Arrival and Departure designations, transitions and distances for airports referenced in Section 3.2.4.1 **(PA)**.

3.2.4.16 GNSS Landing System (GLS) Section (P), Subsection (T)

The GLS Subsection file should contain all those government-published GNSS Landing System approaches for airport runways and/or helipads referenced in Sections 3.2.4.7 **(PG), 3.2.4.18 (PH)** and 3.3.13 **(HH)**. As a minimum, the section should contain all GLS approaches referenced in Sections 3.2.4.6 **(PF)** and 3.3.7 **(HF)**.

3.2.4.17 Airport Terminal Arrival Altitude Section (P), Subsection (K)

The Airport TAA (Terminal Arrival Altitude) Subsection should contain the Sector Bearings, Sector Radii, and Sector Altitudes for all government published Approach Procedures referenced in Section 3.2.4.6 **(PF)**.

3.2.4.18 Airport Helipad Section (P), Subsection (H)

The Airport Helipad Subsection file should contain the all government published Helipads associated with the airports referenced in Section 3.2.4.1 **(PA)**.

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3.2.4.19 GBAS Path Point Section (P), Subsection (Q)

The GBAS Path Point Subsection file should contain the Path Point Records required to support all GLS Approach Procedures referenced in Sections 3.2.4.6 (PF) and 3.3.7 (HF).

3.2.5 Company Route and Alternate Destination Section (R)

This section supports Company Route information for the Master Airline User File. The Company Route information is available only as tailored data records.

3.2.5.1 Company Route Section (R), Subsection (Blank)

This section supports Company Route information for the Master Airline User File. The Company Route information is available only as tailored data records.

3.2.5.2 The Alternate Record Section (R), Subsection (A)

The Alternate Record Section defines departure, destination or enroute alternate airports or alternate company routes. The data is only available as tailored data records. This section supports Company Route information for the Master Airline User File.

3.2.6 Special Use Airspace Section (U)

3.2.6.1 Restrictive Airspace Section (U), Subsection (R)

The Restrictive Airspace Subsection should contain all government published restrictive airspace areas containing their lateral and vertical limits.

3.2.6.2 FIR/UIR Section (U), Subsection (F)

The FIR/UIR Subsection file should contain all government-published FIR and UIR boundaries, including both lateral and vertical limits.

3.2.6.3 Controlled Airspace Section (U), Subsection (C)

The Controlled Airspace Subsection file should contain those government-published airspaces required to support the specific needs of this specification, see Chapter Five, Section 5.217, as they relate to Airports and Heliports, including their lateral and vertical limits.

3.2.7 Cruising Tables Section (T)

3.2.7.1 Cruising Tables Section (T), Subsection (C)

The Cruising Table Subsection file should contain the standard ICAO Cruising Level Table and all modified Cruising Level Tables required to support Sections 3.2.3.4 **(ER)** and 3.2.6.2 **(UF)**.

3.2.7.2 Geographical Reference Table Section (T), Subsection (G)

The Geographical Reference Table Subsection file should contain all geographical cross reference entries required to create linkage to Preferred Route Identifiers, Section 3.2.**3.8 (ET)**, for wide area origin or destination entries.

3.2.7.3 Communication Type Translation Table Section (T), Subsection (V)

The Communication Type Translation Table Subsection file should contain all Communication Types used in Sections 3.2.3.6 (EV), 3.2.4.12 (PV), and 3.3.9 (HV).

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3.2.8 MORA Section (A

The MORA Subsection should contain all grid MORA values for each degree of latitude and longitude.

3.2.8.1 Grid MORA Section (A), Subsection (S)

The Grid MORA Subsection should contain all grid MORA values for each degree of latitude and longitude.

3.3 Master Helicopter User File Content

3.3.1 General

The Master Helicopter User File will incorporate the use of records from Section 3.2, Master Airline User File as well as sections unique to helicopter operations.

3.3.2 Jointly and Specifically Used Sections/Subsections

Section 3.3, Master Helicopter User File will jointly use the following sections from Section 3.2, Master Airline User File:

3.2.2 VHF Navaid Section

3.2.3 Enroute Section

3.2.4 Airport Section, but limited to Airports with Helipads and Airports with published helicopter procedures from/to runways.

3.2.4.7 Airport Runways **Subs**ection, but limited to Airports with published helicopter procedures from runways.

3.2.4.8 Airport and Heliport Localizer/Glideslope **Subsection**

3.2.4.9 Airport and Heliport MLS **Subsection**

3.2.4.10 Airport and Heliport Localizer Marker **Subsection**

3.2.4.13 Airport and Heliport Terminal NDB **Subsection**

3.2.4.16 Airport and Heliport GLS Station Subsection

3.2.6 Special Use Airspace Section

3.2.7 Tables Section

3.2.8 MORA Section

Section 3.3, Master Helicopter User File will include the following specifically used sections:

3.3.3 Heliport Section (H), Subsection (A)

3.3.4 Heliport Terminal Waypoint Section (H), Subsection (C) Heliport

3.3.5 **Heliport Standard Instrument Departures (**SID**) Section (H)** Subsection (D)

3.3.6 **Heliport Standard Terminal Arrival Routes (STAR) Section (H),** Subsection (E)

3.3.7 **Heliport** Approach**es Section (H)** Subsection (F)

3.3.8 Heliport MSA Section (H), Subsection (S)

3.3.9 Heliport Communications Section (H), Subsection (V)

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3.3.10 Heliport Terminal Arrival Altitude Section (H), Subsection (K)

3.3.11 Helicopter Operations Company Route Section (R), Subsection (H)

3.3.12 Helicopter Operations SBAS Path Point Section (H), Subsection (P)

3.3.13 Heliport Helipad Section (H), Subsection (H)

3.3.3 Heliport Section (H), Subsection (A)

The Heliport Subsection file should contain reference points for all government-published heliport facilities. **As a minimum, all heliport reference points referenced in Sections 3.2.2.1 (D), 3.2.4.8 (PI), 3.2.4.9 (PL), 3.2.4.10 (PM), 3.2.4.13 (PN), 3.2.4.16 (PT), 3.2.4.19 (PQ), 3.2.5.2 (RA), 3.2.6.3 (UC) 3.3.4 (HC), 3.3.5 (HD), 3.3.6 (HE), 3.3.7 (HF), 3.3.8 (HS), 3.3.9 (HV), 3.3.10 (HK), 3.3.11 (RH), 3.3.12 (HP), and 3.3.13 (HH), should be included.**

3.3.4 Heliport Terminal Waypoints Section (H), Subsection (C)

The Heliport Terminal Waypoint Subsection should contain those waypoints necessary to support Standard Terminal Departures (SIDs), Standard Terminal Arrival Routes (STARs) and Approaches specified in Sections 3.3.5 **(HD)**, 3.3.6 **(HE)**, and 3.3.7 **(HF)**, excluding Helipads as a fix. The file will also contain those VFR waypoints associated with Heliports. If a waypoint is used in both the terminal area and the enroute areas, is should appear in the Enroute (EA) file.

3.3.5 Heliport Standard Instrument Departures (SIDs) Section (H), Subsection (D)

The SIDs Subsection file should contain all government published SIDs from Heliports referenced in Section 3.3.3 **(HA)**.

3.3.6 Heliport Standard Terminal Arrival Routes (STARs) Section (H), Subsection (E)

The STARs Subsection file should contain all government published STARs to Heliports referenced in Section 3.3.3 **(HA)**.

3.3.7 Heliport Approaches Section (H), Subsection (F)

The Approach Route Subsection file should contain all government published approaches to Heliports referenced in Section 3.3.3 **(HA)**. Approach procedure types have been identified and are covered by coding rules elsewhere in this specification.

3.3.8 Heliport MSA Section (H), Subsection (S)

The MSA (Minimum Sector Altitude) Subsection should contain the Sector Altitude for all government published SIDS referenced in Section 3.3.5, published STARs referenced in Section 3.3.6 and approach procedures referenced in Section 3.3.7.

3.3.9 Heliport Communications Section (H), Subsection (V)

The Heliport Communications Subsection file should contain all government published heliport communications facilities for heliports referenced in Section 3.3.3 **(HA)**.

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3.3.10 Helicopter Terminal Arrival Altitude Section (H), Subsection (K)

The Heliport TAA (Terminal Arrival Altitude) Subsection should contain the Sector Bearings, Sector Radii, and Sector Altitudes for all government published Approach Procedures referenced in Section 3.3.7 **(HF)**.

3.3.11 Helicopter Operations Company Route Section (R), Subsection (H)

This section supports Company Route information for the Master Helicopter User File. The Helicopter Operations Company Route Subsection should contain any helicopter operations specific Company Route including operations from Heliport, Helipads at Airports and operations from Runways at Airports. Helicopter Company Route information is available only as tailored data records.

3.3.12 Helicopter Operations SBAS Path Point Section (H), Subsection (P)

The Helicopter Operations SBAS Path Point Subsection file should contain the Path Point records required to support all RNAV-GPS Point-In-Space Approach Procedures referenced in Section 3.3.7 **(HF)**.

3.3.13 Heliport Helipad Section (H), Subsection (H)

The Heliport Helipad Subsection file should contain the all government published Helipads associated with the Heliports referenced in Section 3.3.3 **(HA)**.

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4.0 NAVIGATION DATA – RECORD LAYOUT

4.0.1 General

In an effort to describe the Master Airline and Master Helicopter sections, Section 4 is divided into Section 4.1, Navigation Data - Record Layout, Master Airline User Content, and Section 4.2, Navigation Data - Record Layout, Master Helicopter User Content.

Each record is made up of combinations of the fields described in Chapter 5 of this document. This chapter sets forth the standard layout of each type of record found in the database. These layouts are also presented diagrammatically at the end of this section. Paragraphs and tables in the 4.1 series are the record types, which have been identified as being a part of Master Airline User Content. Paragraphs and tables in the 4.2 series are the record types, which have been identified as being part of the Master Helicopter User Content. This paragraph and table numbering system does not prevent any given database from including any of the records defined in this document. The separation is for editorial and reference purposes only.

Each record contains 132-character positions or columns. Not all of these are used in every record. Some are left blank to permit like information to appear in the same columns of different records and others are reserved for the possible future expansion of the record's content. In the tables that follow, the former is identified by the term Blank (Spacing) under the Field heading. The latter are identified by the term Reserved, followed by the function for which the reservation is made (where it can specifically be stated).

The tables show the record columns occupied by each field. For convenience, the number of characters in each field is shown in brackets following the field name. Also, the section numbers in Chapter 5 of this document wherein individual fields are defined are referenced. Each table appears under a section heading that is followed by the database section and subsection codes employed in the record described.

4.1 Master Airline User File

4.1.2 VHF NAVAID Record (D)

The VHF NAVAID file contains details of all VOR, VOR/DME, VORTAC, DME and TACAN stations within the geographical area of interest. The exception to this is when VOR and TACAN or VOR and DME stations at the same location have the same identifier but different operating frequencies as the file is based on having unique identifiers for stations at a given location. In such cases of identifier duplication, the VOR will be provided in this file and the TACAN or DME portion will be provided in the TACAN Only Navaid Record (DT).

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4.1.2.1 VHF NAVAID Primary Records

Column	Field Name (Length)	Reference
1	Record Type (1)	5.2
2 thru 4	Customer/Area Code (3)	5.3
5	Section Code (1)	5.4
6	Subsection Code (1)	5.5
7 thru 10	Airport ICAO Identifier (4)	5.6
11 thru 12	ICAO Code (2)	5.14
13	Blank (Spacing) (1)	
14 thru 17	VOR Identifier (4)	5.33
18 thru 19	Blank (Spacing) (2)	
20 thru 21	ICAO Code (2)	5.14
22	Continuation Record No. (1)	5.16
23 thru 27	VOR Frequency (5)	5.34
28 thru 32	NAVAID Class (5)	5.35
33 thru 41	VOR Latitude (9)	5.36
42 thru 51	VOR Longitude (10)	5.37
52 thru 55	DME Ident (4)	5.38
56 thru 64	DME Latitude (9)	5.36
65 thru 74	DME Longitude (10)	5.37
75 thru 79	Station Declination (5)	5.66
80 thru 84	DME Elevation (5)	5.40
85	Figure of Merit (1)	5.149
86 thru 87	ILS/DME Bias (2)	5.90
88 thru 90	Frequency Protection (3)	5.150
91 thru 93	Datum Code (3)	5.197
94 thru 118	VOR Name (25)	5.71
119 thru 121	Blank (Spacing) (3)	
122	Route Inappropriate DME (1)	5.297
123	DME Operational Service Volume (1)	5.277
124 thru 128	File Record No. (5)	5.31
129 thru 132	Cycle Date (4)	5.32

4.1.2.2 VHF NAVAID Continuation Records

Column	Field Name (Length)	Reference
1 thru 21	Fields as on Primary Records	
22	Continuation Record No. (1)	5.16
23	Application Type (1)	5.91
24 thru 92	Notes (69)	5.61
93 thru 123	Reserved (Expansion) (31)	
124 thru 128	File Record No. (5)	5.31
129 thru 132	Cycle Date (4)	5.32

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4.1.2.3 VHF NAVAID Simulation Continuation Records

Column	Field Name (Length)	Reference
1 thru 21	Fields as on Primary Records	
22	Continuation Record No. (1)	5.16
23	Application Type (1)	5.91
24 thru 27	Blank (Spacing) (4)	
28 thru 32	Facility Characteristics (5)	5.93
33 thru 74	Reserved (Spacing) (42)	
75 thru 79	Magnetic Variation (5)	5.39
80 thru 84	Facility Elevation (5)	5.92
85 thru 123	Reserved (Expansion) (39)	
124 thru 128	File Record No. (5)	5.31
129 thru 132	Cycle Date (4)	5.32

4.1.2.4 VHF NAVAID Flight Planning Continuation Records

This Continuation Record is used to indicate the FIR and UIR within which the VHF NAVAID defined in the Primary Record is located.

Column	Field Name (Length)	Reference
1 thru 21	Fields as on Primary Records	
22	Continuation Record No. (1)	5.16
23	Application Type (1)	5.91
24 thru 27	FIR Identifier (4)	5.116
28 thru 31	UIR Identifier (4)	5.116
32 thru 43	Blank (Spacing) (12)	
44 thru 123	Reserved (Expansion) (80)	
124 thru 128	File Record No. (5)	5.31
129 thru 132	Cycle Date (4)	5.32

4.1.2.5 VHF NAVAID Flight Planning Continuation Records

Deleted by Supplement 19.

4.1.2.6 VHF NAVAID Limitation Continuation Record

This Continuation Record is used to provide details on signal limitations of the VHF Navaid contained in the Primary Record Section 4.1.2.1. Note that multiple records formatted as in Section 4.1.2.6 may be included for a single Primary Record. As Service Volume or Designated Operational Coverage may also be considered limitations, this information is also provided for each navaid listed in the Primary Records, where such information is available.

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Column	Field Name (Length)	Reference
1 thru 21	Fields as on Primary Records	
22	Continuation Record No. (1)	5.16
23	Application Type (1)	5.91
24	Navaid Limitation Code (1)	5.205
25	Component Affected Indicator (1)	5.206
26 thru 27	Sequence Number (2)	5.12
28 thru 29	Sector From/Sector To (2)	5.207
30	Distance Description (1)	5.187
31 thru 36	Distance Limitation (6)	5.208
37	Altitude Description (1)	5.29
38 thru 43	Altitude Limitation (6)	5.209
44 thru 45	Sector From/Sector To (2)	5.207
46	Distance Description (1)	5.187
47 thru 52	Distance Limitation (6)	5.208
53	Altitude Description (1)	5.29
54 thru 59	Altitude Limitation (6)	5.209
60 thru 61	Sector From/Sector To (2)	5.207
62	Distance Description (1)	5.187
63 thru 68	Distance Limitation (6)	5.208
69	Altitude Description (1)	5.29
70 thru 75	Altitude Limitation (6)	5.209
76 thru 77	Sector From/Sector To (2)	5.207
78	Distance Description (1)	5.187
79 thru 84	Distance Limitation (6)	5.208
85	Altitude Description (1)	5.29
86 thru 91	Altitude Limitation (6)	5.209
92 thru 93	Sector From/Sector To (2)	5.207
94	Distance Description (1)	5.187
95 thru 100	Distance Limitation (6)	5.208
101	Altitude Description (1)	5.29
102 thru 107	Altitude Limitation (6)	5.209
108	Sequence End Indicator (1)	5.210
109 thru 123	Blank (Spacing) (15)	
124 thru 128	File Record No. (5)	5.31
129 thru 132	Cycle Date (4)	5.32

4.1.3 NDB NAVAID Record (DB or PN)

The Enroute NDB NAVAID file (DB) contains all enroute on-airway and off-airway NDBs within the geographical area of interest. The Terminal NDB NAVAID file (PN) contains NDBs associated with the Airports contained in Subsection 3.2.4.1 and Heliport contained in Section 3.3.3. Terminal NDBs referenced to two or more Airports or Heliports will be available in the Enroute NDB Subsection unless that handling would create duplicate NDB identifiers within that Subsection. Marine Beacons shown on aeronautical charts may also be included in this record type.

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4.1.3.1 NDB NAVAID Primary Records

Columns	Field Name (Length)	Reference
1	Record Type (1)	5.2
2 thru 4	Customer/Area Code (3)	5.3
5	Section Code (1)	5.4
6	Subsection Code (1)	5.5
7 thru 10	Airport ICAO Identifier (4)	5.6
11 thru 12	ICAO Code (2)	5.14
13	Blank (Spacing) (1)	
14 thru 17	NDB Identifier (4)	5.33
18 thru 19	Blank (Spacing) (2)	
20 thru 21	ICAO Code (2)	5.14
22	Continuation Record No. (1)	5.16
23 thru 27	NDB Frequency (5)	5.34
28 thru 32	NDB Class (5)	5.35
33 thru 41	NDB Latitude (9)	5.36
42 thru 51	NDB Longitude (10)	5.37
52 thru 74	Blank (Spacing) (23)	
75 thru 79	Magnetic Variation (5)	5.39
80 thru 85	Blank (Spacing) (6)	
86 thru 90	Reserved (Expansion) (5)	
91 thru 93	Datum Code (3)	5.197
94 thru 123	NDB Name (30)	5.71
124 thru 128	File Record No. (5)	5.31
129 thru 132	Cycle Data (4)	5.32

4.1.3.2 NDB NAVAID Continuation Records

Columns	Field Name (Length)	Reference
1 thru 21	Fields as on Primary Records	
22	Continuation Record No. (1)	5.16
23	Application Type (1)	5.91
24 thru 92	Notes (69)	5.61
93 thru 123	Reserved (Expansion) (31)	
124 thru 128	File Record No. (5)	5.31
129 thru 132	Cycle Data (4)	5.32

4.1.3.3 NDB NAVAID Simulation Continuation Record

Columns	Field Name (Length)	Reference
1 thru 21	Fields as on Primary Records	
22	Continuation Record No. (1)	5.16
23	Application Type (1)	5.91
24 thru 27	Blank (Spacing) (4)	
28 thru 32	Facility Characteristics (5)	5.93
33 thru 79	Reserved (Spacing) (47)	
80 thru 84	Facility Elevation (5)	5.92
85 thru 123	Reserved (Expansion) (39)	
124 thru 128	File Record No. (5)	5.31
129 thru 132	Cycle Data (4)	5.32

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4.1.3.4 NDB NAVAID Flight Planning Continuation Records

This Continuation Record is used to indicate the FIR and UIR within which the NDB NAVAID defined in the Primary Record is located.

Columns	Field Name (Length)	Reference
1 thru 21	Fields as on Primary Records	
22	Continuation Record No. (1)	5.16
23	Application Type (1)	5.91
24 thru 27	FIR Identifier (4)	5.116
28 thru 31	UIR Identifier (4)	5.116
32 thru 43	Blank (Spacing) (12)	
44 thru 123	Reserved (Expansion) (80)	
124 thru 128	File Record No. (5)	5.31
129 thru 132	Cycle Date (4)	5.32

4.1.3.5 NDB NAVAID Flight Planning Continuation Records

Deleted by Supplement 19.

4.1.4 Waypoint Record (EA) or (PC)

The Enroute Waypoint file (EA) contains all enroute on-airway and off-airway waypoints within a desired geographical area. The Airport Terminal Waypoint file (PC) contains all terminal waypoints and VFR waypoints within the geographical area of each airport. Airport Terminal Waypoints utilized by two or more airports will be stored in the Enroute Waypoint Subsection (EA) to eliminate duplication. Terminal Waypoints used jointly by an airport and a heliport are also stored in the Enroute Waypoint file. The Enroute Waypoint File will contain waypoints established for Helicopter Airways. For Heliport Terminal Waypoints (HC), see Section 4.2.2.

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4.1.4.1 Waypoint Primary Records

Column	Field Name (Length)	Reference
1	Record Type (1)	5.2
2 thru 4	Customer/Area Code (3)	5.3
5	Section Code (1)	5.4
6	Subsection Code (1)	5.5 Note 1
7 thru 10	Region Code (4)	5.41 Note 2
11 thru 12	ICAO Code (2)	5.14
13	Subsection (1)	5.5 Note 1
14 thru 18	Waypoint Identifier (5)	5.13
19	Blank (Spacing) (1)	
20 thru 21	ICAO Code (2)	5.14
22	Continuation Record No. (1)	5.16
23 thru 26	Blank (Spacing) (4)	
27 thru 29	Waypoint Type (3)	5.42
30	Reserved (1)	
31	Waypoint Usage (1)	5.82
32	Blank (Spacing) (1)	
33 thru 41	Waypoint Latitude (9)	5.36
42 thru 51	Waypoint Longitude (10)	5.37
52 thru 74	Blank (Spacing) (23)	
75 thru 79	Dynamic Magnetic Variation (5)	5.39
80 thru 84	Reserved (Expansion) (5)	
85 thru 87	Datum Code (3)	5.197
88 thru 95	Reserved (Expansion) (8)	
96 thru 98	Name Format Indicator (3)	5.196
99 thru 123	Waypoint Name/Description (25)	5.43
124 thru 128	File Record No. (5)	5.31
129 thru 132	Cycle Date (4)	5.32

Note 1: In Enroute Waypoint Records, the Subsection Code occupies column 6, with column 13 blank. In Airport or Heliport Terminal Waypoint Records, the Subsection Code occupies column 13, with column 6 blank.

Note 2: In Enroute Waypoint Records, the code ENRT is used. In Terminal Waypoint records, the region code field contains the Airport ICAO Identification code.

4.1.4.2 Waypoint Continuation Records

Columns	Field Name (Length)	Reference
1 thru 21	Fields as on Primary Records	
22	Continuation Record No. (1)	5.16
23	Application Type (1)	5.91
24 thru 92	Notes (69)	5.61
93 thru 123	Reserved (Expansion) (31)	
124 thru 128	File Record No. (5)	5.31
129 thru 132	Cycle Data (4)	5.32

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4.1.4.3 Waypoint Flight Planning Continuation Record

This Continuation Record is used to indicate the FIR and UIR within which the Waypoint defined in the Primary Record is located.

Column	Field Name (Length)	Reference
1 thru 21	Fields as on Primary Records	
22	Continuation Record No. (1)	5.16
23	Application Type (1)	5.91
24 thru 27	FIR Identifier (4)	5.116
28 thru 31	UIR Identifier (4)	5.116
32 thru 43	Blank (Spacing) (12)	
44	FIR/FRA Entry Point (1)	5.311
45	FIR/FRA Exit Point (1)	5.311
46	FRA Arrival Transition Point (1)	5.311
47	FRA Departure Transition Point (1)	5.311
48	FRA Intermediate Point (1)	5.311
49	FRA Terminal Holding Point (1)	5.311
50 thru 123	Reserved (Expansion) (74)	
124 thru 128	File Record No. (5)	5.31
129 thru 132	Cycle Date (4)	5.32

4.1.4.4 Waypoint Flight Planning Continuation Records

Deleted by Supplement 19.

4.1.5 Holding Pattern Records (EP)

The Enroute Holding Patterns contained in this file are holding patterns recommended by the official government authority for inclusion on enroute aeronautical charts. The Terminal Holding Patterns included in this file are holding patterns recommended for aeronautical charts for the geographical area of an airport or heliport. The type, Enroute or Terminal, will be determined by the Subsection of the fix upon which the holding is predicated.

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4.1.5.1 Holding Pattern Primary Records

Column	Field Name (Length)	Reference
1	Record Type (1)	5.2
2 thru 4	Customer/Area Code (3)	5.3
5	Section Code (1)	5.4
6	Subsection Code (1)	5.5
7 thru 10	Region Code (4)	5.41 Note 1
11 thru 12	ICAO Code (2)	5.14 Note 1
13 thru 27	Blank (Spacing) (15)	
28 thru 29	Duplicate Identifier (2)	5.114
30 thru 34	Fix Identifier (5)	5.13
35 thru 36	ICAO Code (2)	5.14
37	Section Code (1)	5.4
38	Subsection Code (1)	5.5
39	Continuation Record No. (1)	5.16
40 thru 43	Inbound Holding Course (4)	5.62
44	Turn Direction (1)	5.63
45 thru 47	Leg Length (3)	5.64
48 thru 49	Leg Time (2)	5.65
50 thru 54	Minimum Altitude (5)	5.30
55 thru 59	Maximum Altitude (5)	5.127
60 thru 62	Holding Speed (3)	5.175
63 thru 65	RNP (3)	5.211
66 thru 71	Arc Radius (6)	5.204
72 thru 74	Vertical Scale Factor (3)	5.293
75 thru 77	RVSM Minimum Level (3)	5.294
78 thru 80	RVSM Maximum Level (3)	5.295
81	Leg Inbound/Outbound Indicator (1)	5.298
82 thru 98	Reserved (Expansion) (17)	
99 thru 123	Name (25)	5.60
124 thru 128	File Record No. (5)	5.31
129 thru 132	Cycle Date (4)	5.32

Note 1: In Enroute Fix Holding Pattern records, the code of ENRT is used in the Region Code field and the ICAO Code field is blank. In Terminal Fix Holding Records, the Region Code field contains the identifier of the Airport or Heliport with which the holding is associated. The ICAO Code field will not be blank. This information will uniquely identify the Terminal NDB, Airport Terminal Waypoint or Heliport Terminal Waypoint.

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4.1.5.2 Holding Pattern Continuation Records

Column	Field Name (Length)	Reference
1 thru 38	Fields as on Primary Records	
39	Continuation Record No. (1)	5.16
40	Application Type (1)	5.91
41 thru 109	Notes (69)	5.61
110 thru 123	Reserved (Expansion) (14)	
124 thru 128	File Record No. (5)	5.31
129 thru 132	Cycle Date (4)	5.32

4.1.6 Enroute Airways Records (ER)

The Enroute Airways file will contain the sequential listing of officially published airways and other established ATS Routes by geographical areas. The file also contains published airways specific to helicopter operations.

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4.1.6.1 Enroute Airways Primary Records

Column	Field Name (Length)	Reference
1	Record Type (1)	5.2
2 thru 4	Customer/Area Code (3)	5.3
5	Section Code (1)	5.4
6	Subsection Code (1)	5.5
7 thru 13	Blank (Spacing) (7)	
14 thru 18	Route Identifier (5)	5.8
19	Reserved (1)	Note 1
20 thru 25	Blank (Spacing) (6)	
26 thru 29	Sequence Number (4)	5.12
30 thru 34	Fix Identifier (5)	5.13
35 thru 36	ICAO Code (2)	5.14
37	Section Code (1)	5.4
38	Subsection (1)	5.5
39	Continuation Record No. (1)	5.16
40 thru 43	Waypoint Description Code (4)	5.17
44	Boundary Code (1)	5.18
45	Route Type (1)	5.7
46	Level (1)	5.19
47	Direction Restriction (1)	5.115
48 thru 49	Cruise Table Indicator (2)	5.134
50	EU Indicator (1)	5.164
51 thru 54	Recommended NAVAID (4)	5.23
55 thru 56	ICAO Code (2)	5.14
57 thru 59	RNP (3)	5.211
60 thru 62	Blank (Spacing) (3)	
63 thru 66	Theta (4)	5.24
67 thru 70	Rho (4)	5.25
71 thru 74	Outbound Magnetic Course (4)	5.26
75 thru 78	Route Distance From (4)	5.27
79 thru 82	Inbound Magnetic Course (4)	5.28
83	Blank (Spacing) (1)	
84 thru 88	Minimum Altitude (5)	5.30
89 thru 93	Minimum Altitude (5)	5.30
94 thru 98	Maximum Altitude (5)	5.127
99 thru 101	Fix Radius Transition Indicator (3)	5.254
102 thru 104	Vertical Scale Factor (3)	5.293
105 thru 107	RVSM Minimum Level (3)	5.294
108 thru 110	VSF RVSM Maximum Level (3)	5.295
111 thru 114	Reserved (4)	
115 thru **120**	Blank (Spacing) (**6**)	
121	**Route Qualifier 1 (1)**	**5.7 Note 2**
122	**Route Qualifier 2 (1)**	**5.7 Note 2**
123	**Route Qualifier 3 (1)**	**5.7 Note 2**
124 thru 128	File Record No (5)	5.31
129 thru 132	Cycle Date (4)	5.32

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Note 1: The standard length for the Route Identifier is five characters. Some users envisage the need for a six-character field. This reserved column will permit this usage. Some data suppliers may use this position for the ATS Service suffix associated with some Route Identifiers.

Note 2: Route Qualifiers 1 through 3 will be provided for RNAV or RNP airways and those helicopter airways published referencing an ICAO PBN Navigation Specification.

4.1.6.2 Enroute Airways Continuation Records

Column	Field Name (Length)	Reference
1 thru 38	Fields as on Primary Records	
39	Continuation Record No. (1)	5.16
40	Application Type (1)	5.91
41 thru 109	Notes (69)	5.61
110 thru 123	Reserved (Expansion) (14)	
124 thru 128	File Record No. (5)	5.31
129 thru 132	Cycle Date (4)	5.32

4.1.6.3 Enroute Airways Flight Planning Continuation Records

This Continuation Record is used to indicate restrictive airspace that affects the Primary Record according to the definition given in Section 2.0, Glossary of Terms.

Column	Field Name (Length)	Reference
1 thru 38	Fields as on Primary Records	
39	Continuation Record No. (1)	5.16
40	Application Type (1)	5.91
41 thru 66	Blank (Spacing) (26)	
67 thru 68	Restricted Airspace ICAO Code (2)	5.14
69	Restricted Airspace Type (1)	5.128
70 thru 79	Restricted Airspace Designation (10)	5.129
80	Restricted Airspace Multiple Code (1)	5.130
81 thru 82	Restricted Airspace ICAO Code (2)	5.14
83	Restricted Airspace Type (1)	5.128
84 thru 93	Restricted Airspace Designation (10)	5.129
94	Restricted Airspace Multiple Code (1)	5.130
95 thru 96	Restricted Airspace ICAO Code (2)	5.14
97	Restricted Airspace Type (1)	5.128
98 thru 107	Restricted Airspace Designation (10)	5.129
108	Restricted Airspace Multiple Code (1)	5.130
109 thru 110	Restricted Airspace ICAO Code (2)	5.14
111	Restricted Airspace Type (1)	5.128
112 thru 121	Restricted Airspace Designation (10)	5.129
122	Restricted Airspace Multiple Code (1)	5.130
123	Restricted. Airspace Link Continuation (1)	5.174
124 thru 128	File Record No. (5)	5.31
129 thru 132	Cycle Date (4)	5.32

4.1.6.4 Enroute Airways Flight Planning Continuation Records

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4.1.7 Airport Records (PA)

This file contains airport information for all airports within the desired geographical reference area and meeting other criteria on available runways. Additionally, the file contains all airports required to support Enroute Airway structure coding for those areas where Airport reference points are used as enroute airway fixes.

4.1.7.1 Airport Primary Records

Column	Field Name (Length)	Reference
1	Record Type (1)	5.2
2 thru 4	Customer/Area Code (3)	5.3
5	Section Code (1)	5.4
6	Blank (Spacing) (1)	
7 thru 10	Airport ICAO Identifier (4)	5.6
11 thru 12	ICAO Code (2)	5.14
13	Subsection Code (1)	5.5
14 thru 16	ATA/IATA Designator (3)	5.107
17 thru 18	Reserved (Expansion) (2)	
19 thru 21	Blank (Spacing) (3)	
22	Continuation Record Number (1)	5.16
23 thru 27	Speed Limit Altitude (5)	5.73
28 thru 30	Longest Runway (3)	5.54
31	IFR Capability (1)	5.108
32	Longest Runway Surface Code (1)	5.249
33 thru 41	Airport Reference Point Latitude (9)	5.36
42 thru 51	Airport Reference Point Longitude (10)	5.37
52 thru 56	Magnetic Variation (5)	5.39
57 thru 61	Airport Elevation (5)	5.55
62 thru 64	Speed Limit (3)	5.72
65 thru 68	Recommended Navaid (4)	5.23
69 thru 70	ICAO Code (2)	5.14
71 thru 75	Transitions Altitude (5)	5.53
76 thru 80	Transition Level (5)	5.53
81	Public/Military Indicator (1)	5.177
82 thru 84	Time Zone (3)	5.178
85	Daylight Indicator (1)	5.179
86	Magnetic/True Indicator (1)	5.165
87 thru 89	Datum Code (3)	5.197
90 thru 93	Reserved (Expansion) (4)	
94 thru 123	Airport Name (30)	5.71
124 thru 128	File Record Number (5)	5.31
129 thru 132	Cycle Date (4)	5.32

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4.1.7.2 Airport Continuation Records

Column	Field Name (Length)	Reference
1 thru 21	Field as on Primary Records	
22	Continuation Record No. (1)	5.16
23	Application Type (1)	5.91
24 thru 92	Notes (69)	5.61
93 thru 123	Reserved (Expansion) (31)	
124 thru 128	File Record No. (5)	5.31
129 thru 132	Cycle Date (4)	5.32

4.1.7.3 Airport Flight Planning Continuation Records

This Continuation Record is used to indicate the FIR and UIR within which the Airport defined in the Primary Record is located and provides an indication if the Airport defined in the Primary Record is associated with Controlled Airspace.

Column	Field Name (Length)	Reference
1 thru 21	Fields as on Primary Records	
22	Continuation Record No. (1)	5.16
23	Application Type (1)	5.91
24 thru 27	FIR Identifier (4)	5.116
28 thru 31	UIR Identifier (4)	5.116
32 thru 66	Blank (Spacing) (35)	
67	Controlled Airspace Indicator (1)	5.217
68 thru 71	Controlled Airspace Airport Ident (4)	5.6
72 thru 73	Controlled Airspace Airport ICAO (2)	5.14
74 thru 123	Blank (Spacing) (50)	
124 thru 128	File Record No. (5)	5.31
129 thru 132	Cycle Data (4)	5.32

4.1.7.4 Airport Flight Planning Continuation Records

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4.1.8 Airport Gate Records (PB)

This file contains passenger gate information.

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4.1.8.1 Airport Gate Primary Record

Column	Field Name (Length)	Reference
1	Record Type (1)	5.2
2 thru 4	Customer/Area Code (3)	5.3
5	Section Code (1)	5.4
6	Blank (Spacing) (1)	
7 thru 10	Airport ICAO Identifier (4)	5.6
11 thru 12	ICAO Code (2)	5.14
13	Subsection Code (1)	5.5
14 thru 18	Gate Identifier (5)	5.56
19 thru 21	Blank (Spacing) (3)	
22	Continuation Record No. (1)	5.16
23 thru 32	Blank (Spacing) (10)	
33 thru 41	Gate Latitude (9)	5.36
42 thru 51	Gate Longitude (10)	5.37
52 thru 98	Reserved (Expansion) (47)	
99 thru 123	Name (25)	5.60
124 thru 128	File Record No. (5)	5.31
129 thru 132	Cycle Date (4)	5.32

4.1.8.2 Airport Gate Continuation Records

Column	Field Name (Length)	Reference
1 thru 21	Field as on Primary Records	
22	Continuation Record No. (1)	5.16
23	Application Type (1)	5.91
24 thru 92	Notes (69)	5.61
93 thru 123	Reserved (Expansion) (31)	
124 thru 128	File Record No. (5)	5.31
129 thru 132	Cycle Date (4)	5.32

4.1.9 Airport SID/STAR/Approach (PD, PE, and PF)

Airport SIDs, STARs, and Approach Procedures are contained in three separate Section/Subsection groupings, using this single record format. Section/Subsection PD contains a sequential listing of those published Airport Standard Instrument Departures that can be encoded according to this specification. Section/Subsection PE contains a sequential list of those published Airport Standard Terminal Arrival Routes that can be encoded according to this specification. Section/Subsection PF contains a sequential listing of those published Airport Standard Instrument Approach Procedures that can be encoded according to this specification.

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4.1.9.1 Airport SID/STAR/Approach Primary Records

Column	Field Name (Length)	Reference
1	Record Type (1)	5.2
2 thru 4	Customer/Area Code (3)	5.3
5	Section Code (1)	5.4
6	Blank (Spacing) (1)	
7 thru 10	Airport Identifier (4)	5.6
11 thru 12	ICAO Code (2)	5.14
13	Subsection Code (1)	5.5
14 thru 19	SID/STAR/Approach Identifier (6)	5.9, 5.10 Note 1
20	Route Type (1)	5.7
21 thru 25	Transition Identifier (5)	5.11
26	Procedure Design Aircraft Category or Type	5.301
27 thru 29	Sequence Number (3)	5.12
30 thru 34	Fix Identifier (5)	5.13
35 thru 36	ICAO Code (2)	5.14
37	Section Code (1)	5.4
38	Subsection Code (1)	5.5
39	Continuation Record Number (1)	5.16
40 thru 43	Waypoint Description Code (4)	5.17
44	Turn Direction (1)	5.20
45 thru 47	RNP (3)	5.211 Note 4
48 thru 49	Path and Termination (2)	5.21
50	Turn Direction Valid (1)	5.22
51 thru 54	Recommended Navaid (4)	5.23
55 thru 56	ICAO Code (2)	5.14
57 thru 62	ARC Radius (6)	5.204
63 thru 66	Theta (4)	5.24
67 thru 70	Rho (4)	5.25
71 thru 74	Magnetic Course (4)	5.26
75 thru 78	Route Distance/Holding Distance or Time (4)	5.27
79	RECD NAV Section (1)	5.4
80	RECD NAV Subsection (1)	5.5
81	Leg Inbound/Outbound Indicator (1)	5.298
82	Reserved (Expansion) (1)	
83	Altitude Description (1)	5.29
84	ATC Indicator (1)	5.81
85 thru 89	Altitude (5)	5.30
90 thru 94	Altitude (5)	5.30
95 thru 99	Transition Altitude (5)	5.53
100 thru 102	Speed Limit (3)	5.72
103 thru 106	Vertical Angle (4)	5.70
107 thru 111	Center Fix or TAA Procedure Turn Indicator (5)	5.144 or 5.271
112	Multiple Code or TAA Sector Identifier (1)	5.130 or 5.272
113 thru 114	ICAO Code (2)	5.14 Note 3
115	Section Code (1)	5.4 Note 3
116	Subsection Code (1)	5.5 Note 3
117	GNSS/FMS Indication (1)	5.222
118	Speed Limit Description (1)	5.261
119	Route Qualifier 1 (1)	5.7 Note 2
120	Route Qualifier 2 (1)	5.7 Note 2
121	Route Qualifier 3 (1)	5.7 Note 2
122	Preferred Multiple Approach Indicator (1)	5.306
123	Reserved (Expansion) (1)	
124 thru 128	File Record Number (5)	5.31
129 thru 132	Cycle Date (4)	5.32

Note 1: For approach route idents including Multiple Indicator, see Section 5.10.

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Note 2: Columns 119 thru 121 (Route Qualifier 1, 2, and 3) are required to match the Primary Record to the Continuation Record(s). This non-standard column sorting sequence was selected to preserve the Primary Record for SID/STAR/Records as much as possible as these new fields were introduced in Supplement 14.

Note 3: When columns 107 thru 116 are providing a reference to a MSA or the center fix for an RF leg, all of the columns are used. When they are providing a reference to a TAA, only columns 107 thru 112 are used and 113 thru 116 are blank.

Note 4: If there is only one set of RNP criteria for the RNAV procedure, that criteria is provided in the RNP value field for Primary Record. Otherwise, the Primary Record contains one consistent set of RNP values for the least restrictive RNAV operating criteria and not a mix of RNP values for different RNP operating criteria.

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4.1.9.2 Airport SID/STAR/Approach Primary Extension Continuation Records

Column	Field Name (Length)	Reference
1 thru 38	Fields as on Primary Records	
39	Continuation Record Number (1)	5.16
40	Application Type (1)	5.91
41 thru 43	Procedure TCH (3)	5.67
44 thru 60	Blank Spacing (17)	
61 thru 65	Procedure Design Mag Var (5)	5.290 Note 2
66	Procedure Design Mag Var Indicator (1)	5.291 Note 2
67 thru 71	Procedure Referenced Fix Ident (5)	5.299 Note 3
72 thru 73	ICAO Code (2)	5.14
74	Section Code	5.4
75	Subsection Code	5.5
76 thru 80	Procedure Referenced Fix Ident (5)	5.299 Note 3
81 thru 82	ICAO Code (2)	5.14
83	Section Code	5.4
84	Subsection Code	5.5
85 thru 89	Procedure Referenced Fix Ident (5)	5.299 Note 3
90 thru 91	ICAO Code (2)	5.14
92	Section Code	5.4
93	Subsection Code	5.5
94 thru 98	Procedure Referenced Fix Ident (5)	5.299 Note 3
99 thru 100	ICAO Code (2)	5.14
101	Section Code	5.4
102	Subsection Code	5.5
103 thru 104	CAT A Radii (2)	5.292
105 thru 106	CAT B Radii (2)	5.292
107 thru 108	CAT C Radii (2)	5.292
109 thru 110	CAT D Radii (2)	5.292
111	Special Indicator	5.307
112 thru 115	Reserved (4)	
116 thru 118	Vertical Scale Factor	5.293
119	Route Qualifier 1 (1)	5.7 Note 1
120	Route Qualifier 2 (1)	5.7 Note 1
121	Route Qualifier 3 (1)	5.7 Note 1
122 thru 123	Reserved (2)	
124 thru 128	File Record Number (5)	5.31
129 thru 132	Cycle Date (4)	5.32

Note 1: Columns 119 thru 121 (Approach Route Qualifier 1, 2, and 3) are required to match the Primary Record to the Continuation Record(s). This non-standard column sorting sequence was selected to preserve the Primary Record for SID/STAR/Approach Records as much as possible as these new fields were introduced in Supplement 14.

Note 2: When a government source provides Procedure Design Mag Var at the procedure level, a single Primary Extension Continuation Record will be provided, associated to the first sequence in each transition and the Procedure Design Mag Var Indicator will be set to P. This is consistent with the

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intent of this continuation record. When a government source provides Procedure Design Mag Var at the leg level, a Primary Extension Continuation Record will be provided associated with each sequence of each transitions and the Procedure Design Mag Var Indicator will be set to L.

Note 3: When government source provides more than four Procedure Referenced Fix Idents, multiple Airport SID/STAR/Primary Extension Approach Continuation Records will be provided.

4.1.9.3 Airport SID/STAR/Approach Flight Planning Continuation Records

This Continuation Record is used to indicate the Leg Distance for each segment of the Route.

Column	Field Name (Length)	Reference
1 thru 38	Field as on Primary	
39	Continuation Record No. (1)	5.16
40	Application Type (1)	5.91
41 thru 74	Blank (Spacing) (34)	
75 thru 78	Leg Distance (4)	5.260
79 thru 118	Reserved (Expansion) (40)	
119	Route Qualifier 1 (1)	5.7 Note 1
120	Route Qualifier 2 (1)	5.7 Note 1
121	Route Qualifier 3 (1)	5.7 Note 1
122 thru 123	Blank (Spacing) (2)	
124 thru 128	File Record No. (5)	5.31
129 thru 132	Cycle Date (4)	5.32

Note 1: Columns 119 thru 121 (Route Qualifier 1, 2, and 3) are required to match the Primary Record to the Continuation Record(s). This non-standard column sorting sequence was selected to preserve the Primary Record for SID/STAR/ Approach Records as much as possible as these new fields were introduced in Supplement 14.

4.1.9.4 Airport SID/STAR Flight Planning Continuation Records

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4.1.9.5 Airport Procedure Data Continuation Record

The Airport Procedure Data Continuation Record is used to provide Level of Service information on for RNAV Approach Procedures. Level of Service and Authorization are based on source-provided operating minimums as described in Sections 5.275, 5.276, and 5.296 of this document. This Continuation Record is provided once per procedure as a Continuation to Primary Approach Procedure Record that contains the encoding for Final Approach Fix (FAF) of the procedure.

Column	Field Name (Length)	Reference
1 thru 38	Fields as on Primary Record	
39	Continuation Record Number (1)	5.16
40	Application Type (1)	5.91
41	FAS Block Provided Authorized (1)	5.276
42 thru 51	FAS Block Provided Lev of Service Name (10)	5.275
52	LNAV/VNAV Authorized (1)	5.276
53 thru 62	LNAV/VNAV Level of Service Name (10)	5.275
63	LNAV Authorized (1)	5.276
64 thru 73	LNAV Level of Service Name (10)	5.275
74	Remote Altimeter Flag (1)	5.308
75 thru 88	Blank (Spacing) (14)	
89	RNP Authorized (1)	5.276
90 thru 92	RNP Level of Service value (3)	5.296
93	RNP Authorized (1)	5.276
94 thru 96	RNP Level of Service value (3)	5.296
97	RNP Authorized (1)	5.276
98 thru 100	RNP Level of Service value (3)	5.296
101	RNP Authorized (1)	5.276
102 thru 104	RNP Level of Service value (3)	5.296
105 thru 118	Blank (Spacing) (14)	
119	Route Qualifier 1 (1)	5.7 Note 1
120	Route Qualifier 2 (1)	5.7 Note 1
121	Route Qualifier 3 (1)	5.7 Note 1
122 thru 123	Blank (2)	
124 thru 128	File Record Number (5)	5.31
129 thru 132	Cycle Date (4)	5.32

Note 1: Columns 119 thru 121 (Approach Route Type Qualifiers 1, 2, and 3) are required to match the Primary Record to the Continuation Record(s). This non-standard column sorting sequence was selected to preserve the Primary Record for SID/STAR/Approach Records as much as possible as these new fields were introduced in Supplement 14.

4.1.10 Runway Records (PG)

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4.1.10.1 Runway Primary Records

Column	Field Name (Length)	Reference
1	Record Type (1)	5.2
2 thru 4	Customer/Area Code (3)	5.3
5	Section Code (1)	5.4
6	Blank (Spacing) (1)	
7 thru 10	Airport ICAO Identifier (4)	5.6
11 thru 12	ICAO Code (2)	5.14
13	Subsection Code (1)	5.5
14 thru 18	Runway Identifier (5)	5.46
19 thru 21	Blank (Spacing) (3)	
22	Continuation Record No. (1)	5.16
23 thru 27	Runway Length (5)	5.57
28 thru 31	Runway Magnetic Bearing (4)	5.58
32	Blank (Spacing) (1)	
33 thru 41	Runway Latitude (9)	5.36
42 thru 51	Runway Longitude (10)	5.37
52 thru 56	Runway Gradient (5)	5.212
57 thru 60	Blank (Spacing) (4)	
61 thru 66	(LTP) Ellipsoid Height (6)	5.225
67 thru 71	Landing Threshold Elevation (5)	5.68
72 thru 75	Displaced Threshold Distance (4)	5.69
76 thru 77	Blank Spacing (2)	
78 thru 80	Runway Width (3)	5.109
81	TCH Value Indicator (1)	5.270
82 thru 86	Blank (Spacing) (5)	
87 thru 90	Stopway (4)	5.79
91 thru 95	Blank (Spacing) (5)	
96 thru 98	Threshold Crossing Height (3)	5.67
99	**Runway Accuracy Compliance Flag (1)**	**5.318**
100	**Landing Threshold Elevation Accurary Compliance Flag (1)**	**5.319**
101	Reserved (Expansion) (**1**)	
102 thru 123	Runway Description (22)	5.59
124 thru 128	File Record No. (5)	5.31
129 thru 132	Cycle Date (4)	5.32

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4.1.10.2 Runway Continuation Records

Column	Field Name (Length)	Reference
1 thru 21	Fields as on Primary Records	
22	Continuation Record No. (1)	5.16
23	Application Type (1)	5.91
24 thru 92	Notes (69)	5.61
93 thru 96	Runway Surface Type (4)	5.302
97	Runway Surface Code (1)	5.249
98 thru 101	Starter Extension (4)	5.312
102 thru 106	**TORA (5)**	**5.313**
107 thru 111	**TODA (5)**	**5.314**
112 thru 116	**ASDA (5)**	**5.315**
117 thru 121	**LDA (5)**	**5.316**
122	**Runway Usage Indicator (1)**	**5.317**
123	Reserved (Expansion) (1)	
124 thru 128	File Record No. (5)	5.31
129 thru 132	Cycle Date (4)	5.32

4.1.10.3 Runway Simulation Continuation Records

Column	Field Name (Length)	Reference
1 thru 21	Fields as on Primary Records	
22	Continuation Record No. (1)	5.16
23	Application Type (1)	5.91
24 thru 51	Reserved (Spacing) (28)	
52 thru 56	Runway True Bearing (5)	5.94
57	True Bearing Source (1)	5.95
58 thru 65	Reserved (Spacing) (8)	
66	TDZE Location (1)	5.98
67 thru 71	Touchdown Zone Elevation (5)	5.97
72 thru 123	Reserved (Expansion) (52)	
124 thru 128	File Record No. (5)	5.31
129 thru 132	Cycle Date (4)	5.32

4.1.11 Airport and Heliport Localizer and Glideslope Records (PI)

This file will contain a sequential listing of all localizer type facilities and glideslopes associated with those facilities. The glideslope portion of the record may contain blanks if no glideslope is associated with the facilities (Classification 0, A, or F, see Section 5.80). When a glideslope is installed, a glideslope angle will be provided. The latitude and longitude fields for the glideslope may be set to blanks when such information is not available to the data supplier for a particular glideslope installation due to insufficient government source.

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4.1.11.1 Airport and Heliport Localizer and Glideslope Primary Records

Column	Field Name (Length)	Reference
1	Record Type (1)	5.2
2 thru 4	Customer/Area Code (3)	5.3
5	Section Code (1)	5.4
6	Blank (Spacing) (1)	
7 thru 10	Airport Identifier or Heliport (4)	5.6
11 thru 12	ICAO Code (2)	5.14
13	Subsection Code (1)	5.5
14 thru 17	Localizer Identifier (4)	5.44
18	ILS Category (1)	5.80
19 thru 21	Blank (Spacing) (3)	
22	Continuation Record No. (1)	5.16
23 thru 27	Localizer Frequency (5)	5.45
28 thru 32	Runway or Helipad Identifier (5)	5.46 or 5.180
33 thru 41	Localizer Latitude (9)	5.36
42 thru 51	Localizer Longitude (10)	5.37
52 thru 55	Localizer Bearing (4)	5.47
56 thru 64	Glideslope Latitude (9)	5.36
65 thru 74	Glideslope Longitude (10)	5.37
75 thru 78	Localizer Position (4)	5.48
79	Localizer Position Reference (1)	5.49
80 thru 83	Glideslope Position (4)	5.50
84 thru 87	Localizer Width (4)	5.51
88 thru 90	Glideslope Angle (3)	5.52
91 thru 95	Station Declination (5)	5.66
96 thru 97	Blank (2)	
98 thru 102	Glideslope Elevation (5)	5.74
103 thru 106	Supporting Facility ID (4)	5.33 Note 1
107 thru 108	Supporting Facility ICAO Code (2)	5.14 Note 1
109	Supporting Facility Section Code (1)	5.4 Note 1
110	Supporting Facility Subsection Code (1)	5.5 Note 1
111 thru 113	Glideslope Height at Landing Threshold (3)	5.67
114 thru 123	Reserved (Expansion) (10)	
124 thru 128	File Record No. (5)	5.31
129 thru 132	Cycle Date (4)	5.32

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4.1.11.2 Airport and Heliport Localizer and Glideslope Continuation Records

Column	Field Name (Length)	Reference
1 thru 21	Fields as on Primary Records	
22	Continuation Record No. (1)	5.16
23	Application Type (1)	5.91
24 thru 92	Notes (69)	5.61
93 thru 123	Reserved (Expansion) (31)	
124 thru 128	File Record (5)	5.31
129 thru 132	Cycle Date (4)	5.32

4.1.11.3 Airport and Heliport Localizer and Glideslope Simulation Continuation Records

Column	Field Name (Length)	Reference
1 thru 21	Fields as on Primary Record	
22	Continuation Record No. (1)	5.16
23	Application Type (1)	5.91
24 thru 27	Blank (Spacing) (4)	
28 thru 32	Facility Characteristics (5)	5.93
33 thru 51	Blank (Spacing) (19)	
52 thru 56	Localizer True Bearing (5)	5.94
57	Localizer Bearing Source (1)	5.95
58 thru 87	Reserved (Spacing) (30)	
88 thru 90	Glideslope Beam Width (3)	5.96
91 thru 96	Approach Route Ident (6)	5.10
97 thru 102	Approach Route Ident (6)	5.10
103 thru 108	Approach Route Ident (6)	5.10
109 thru 114	Approach Route Ident (6)	5.10
115 thru 120	Approach Route Ident (6)	5.10
121 thru 123	Blank (Spacing) (3)	
124 thru 128	File Record No. (5)	5.31
129 thru 132	Cycle Date (4)	5.32

4.1.12 Company Route Records (R)

This file contains company tailored route information.

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4.1.12.1 Company Route Primary Records

Column	Field Name (Length)	Reference
1	Record Type (1)	5.2
2 thru 4	Customer (3)	5.3
5	Section Code (1)	5.4
6	Subsection Code (1)	5.5
7 thru 11	From Airport/Fix (5)	5.75
12	Blank (Spacing) (1)	
13 thru 14	ICAO Code (2)	5.14
15	Section Code (1)	5.4
16	Subsection Code (1)	5.5
17 thru 21	To Airport/Fix (5)	5.75
22	Blank (Spacing) (1)	
23 thru 24	ICAO Code (2)	5.14
25	Section Code (1)	5.4
26	Subsection Code (1)	5.5
27 thru 36	Company Route ID (10)	5.76
37 thru 39	Sequence No. (3)	5.12
40 thru 42	VIA (3)	5.77
43 thru 48	SID/STAR/App/Awy (6)	5.78
49 thru 51	Area Code (3)	5.3
52 thru 57	To Fix (6)	5.83
58 thru 59	ICAO Code (2)	5.14
60	Section Code (1)	5.4
61	Subsection Code (1)	5.5
62 thru 66	Runway Trans (5)	5.84
67 thru 71	ENRT Trans (5)	5.85
72	Reserved (1)	
73 thru 77	Cruise Altitude (5)	5.86
78 thru 81	Terminal/Alternate Airport (4)	5.87
82 thru 83	ICAO Code (2)	5.14
84 thru 87	Alternate Distance (4)	5.88
88 thru 90	Cost Index (3)	5.89
91 thru 94	Enroute Alternate Airport (4)	5.148
95	SID/STAR/App/Awy Route Type (1)	5.7
96	S/S/A Route Type Qualifier 1 (1)	5.7
97	S/S/A Route Type Qualifier 2 (1)	5.7
98 thru 123	Reserved (Expansion) (26)	
124 thru 128	File Record No. (5)	5.31
129 thru 132	Cycle Date (4)	5.32

Note 1: This Company Route Record is defined for use with fixed wing aircraft and rotor wing aircraft operating from airports. Airports referenced will be in Section/SubSection PA, Runway in Section/SubSection PG, and Terminal Procedure referenced will be in Section/SubSections PD/PE/PF. For Helicopter Operations Company Routes, see Section 4.2.7.

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4.1.13 Airport and Heliport Localizer Marker Records (PM)

The Airport and Heliport Localizer Marker File (PM) contains details of all markers and locators associated with all types of localizers. It does not contain airway markers; see Section 4.1.15.

4.1.13.1 Airport and Heliport Localizer Marker Primary Records

Column	Field Name (Length)	Reference
1	Record Type (1)	5.2
2 thru 4	Customer/Area Code (3)	5.3
5	Section Code (1)	5.4
6	Blank (Spacing) (1)	
7 thru 10	Airport or Heliport Identifier (4)	5.6
11 thru 12	ICAO Code (2)	5.14
13	Subsection Code (1)	5.5
14 thru 17	Localizer Identifier (4)	5.44
18 thru 20	Marker Type (3)	5.99
21	Blank (Spacing) (1)	
22	Continuation Record No. (1)	5.16
23 thru 27	Locator Frequency (5)	5.34
28 thru 32	Runway Helipad Identifier (5)	5.46 or 5.180
33 thru 41	Marker Latitude (9)	5.36
42 thru 51	Marker Longitude (10)	5.37
52 thru 55	Minor Axis Bearing (4)	5.100
56 thru 64	Locator Latitude (9)	5.36
65 thru 74	Locator Longitude (10)	5.37
75 thru 79	Locator Class (5)	5.35
80 thru 84	Locator Facility Characteristics (5)	5.93
85 thru 88	Locator Identifier (4)	5.33
89 thru 90	Blank (Spacing) (2)	
91 thru 95	Magnetic Variation (5)	5.39
96 thru 97	Blank (Spacing) (2)	
98 thru 102	Facility Elevation (5)	5.92
103 thru 123	Reserved (Expansion) (21)	
124 thru 128	File Record No. (5)	5.31
129 thru 132	Cycle Date (4)	5.32

4.1.13.2 Airport and Heliport Localizer Marker Continuation Records

Column	Field Name (Length)	Reference
1 thru 21	Fields as on Primary Records	
22	Continuation Record No. (1)	5.16
23	Application Type (1)	5.91
24 thru 123	Reserved (Expansion) (100)	
124 thru 128	File Record No. (5)	5.31
129 thru 132	Cycle Date (4)	5.32

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4.1.14 Airport Communications Records (PV)

4.1.14.1 Airport Communications Primary Records

Column	Field Name (Length)	Reference
1	Record Type (1)	5.2
2 thru 4	Customer/Area Code (3)	5.3
5	Section Code (1)	5.4
6	Blank (Spacing) (1)	
7 thru 10	Airport Identifier (4)	5.6
11 thru 12	ICAO Code (2)	5.14
13	Subsection Code (1)	5.5
14 thru 15	Blank (Spacing) (2)	
16 thru 19	Communication Class (4)	5.283
20 thru 21	Sequence Number (2)	5.12
22	Continuation Number (1)	5.16
23 thru 25	Communication Types (3)	5.101
26 thru 32	Transmit Frequency (7)	5.103
33 thru 39	Receive Frequency (7)	5.103
40	Frequency Units (1)	5.104
41	Radar Units (1)	5.102
42	H24 Indicator (1)	5.181
43 thru 67	Call Signs (25)	5.105
68	Multi-Sector Indicator (1)	5.286
69 thru 74	Sectorization (6)	5.183
75 thru 78	Sector Facility (4)	5.185
79 thru 80	ICAO (2)	5.14
81	Section Code (1)	5.4
82	Subsection Code (1)	5.5
83	Altitude Description Code (1)	5.29
84 thru 86	Communication Altitude 1 (3)	5.184
87 thru 89	Communication Altitude 2 (3)	5.184
90	Distance Description Code (1)	5.187
91 thru 92	Communication Distance (2)	5.188
93 thru 101	Transmitter Latitude (9)	5.36
102 thru 111	Transmitter Longitude (10)	5.37
112 thru 114	Service Indicator (3)	5.106
115	Modulation (1)	5.198
116	Signal Emission (2)	5.199
117 thru 123	Blank (Spacing) (7)	
124 thru 128	File Record No. (5)	5.31
129 thru 132	Cycle Date (4)	5.32

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4.1.14.2 Airport Communications Primary Extension Continuation Records

Column	Field Name (Length)	Reference
1 thru 21	Fields as on Primary Records	
22	Continuation Record No. (1)	5.16
23	Application Type (1)	5.91
24 thru 27	Remote Facility (4)	5.200
28 thru 29	ICAO (2)	5.14
30	Section (1)	5.4
31	Subsection (1)	5.5
32 thru 36	Transmitter Site Mag Var (5)	5.39
37 thru 41	Transmitter Site Elevation (5)	5.92
42 thru 47	Additional Sectorization 1 (6)	5.183
48	Additional Sectorization 1 Altitude Description (1)	5.29
49 thru 51	Additional Sectorization 1 Altitude 1 (3)	5.184
52 thru 54	Additional Sectorization 1 Altitude 2 (3)	5.184
55 thru 60	Additional Sectorization 2 (6)	5.183
61	Additional Sectorization 2 Altitude Description (1)	5.29
62 thru 64	Additional Sectorization 2 Altitude 1 (3)	5.184
65 thru 67	Additional Sectorization 2 Altitude 2 (3)	5.184
68	Time Code (1)	5.131
69	NOTAM (1)	5.132
70	Time Indicator (1)	5.138
71 thru 80	Time of Operation (10)	5.195
81 thru 90	Time of Operation (10)	5.195
91 thru 100	Time of Operation (10)	5.195
101 thru 110	Time of Operation (10)	5.195
111 thru 120	Time of Operation (10)	5.195
121 thru 123	Blank (Spacing) (3)	
124 thru 128	File Record No. (5)	5.31
129 thru 132	Cycle Date (4)	5.32

4.1.14.3 Airport Communications Continuation Records

Column	Field Name (Length)	Reference
1 thru 21	Fields as on Primary Records	
22	Continuation Record No. (1)	5.16
23	Application Type (1)	5.91
24thru 83	Sectorization Narrative (60)	5.186
84 thru 123	Reserved (Spacing) (40)	
124 thru 128	File Record No. (5)	5.31
129 thru 132	Cycle Date (4)	5.32

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4.1.14.4 Airport Communications Continuation Records

Column	Field Name (Length)	Reference
1 thru 21	Field as on Primary Record	
22	Continuation Record Number (1)	5.16
23	Application Type (1)	5.91
24 thru 69	Blank (Spacing) (46)	
70 thru 79	Time of Operation (10)	5.195
80 thru 89	Time of Operation (10)	5.195
90 thru 99	Time of Operation (10)	5.195
100 thru 109	Time of Operation (10)	5.195
110 thru 119	Time of Operation (10)	5.195
120 thru 123	Blank (Spacing) (4)	
124 thru 128	File Record numbers (5)	5.31
129 thru 132	Cycle Date (4)	5.32

4.1.14.5 Airport Communications Continuation Records

Column	Field Name (Length)	Reference
1 thru 21	Field as on Primary Record	
22	Continuation Record Number (1)	5.16
23	Application Type (1)	5.91
24 thru 123	Time Narrative (100)	5.285
124 thru 128	File Record Numbers (5)	5.31
129 thru 132	Cycle Date (4)	5.32

4.1.15 Airways Marker Records (EM)

The Airways Marker file contains details of all airways markers.

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4.1.15.1 Airways Marker Primary Records

Column	Field Name (Length)	Reference
1	Record Type (1)	5.2
2 thru 4	Customer/Area Code (3)	5.3
5	Section Code (1)	5.4
6	Subsection Code (1)	5.5
7 thru 13	Blank (Spacing) (7)	
14 thru 17	Marker Identifier (4)	5.110
18 thru 19	Blank (Spacing) (2)	
20 thru 21	ICAO Code (2)	5.14
22	Continuation Record No. (1)	5.16
23 thru 26	Marker Code (4)	5.111
27	Reserved (Expansion) (1)	
28	Marker Shape (1)	5.112
29	Marker Power (1)	5.113
30 thru 32	Blank (Spacing) (3)	
33 thru 41	Marker Latitude (9)	5.36
42 thru 51	Marker Longitude (10)	5.37
52 thru 55	Minor Axis (4)	5.100
56 thru 74	Blank (Spacing) (19)	
75 thru 79	Magnetic Variation (5)	5.39
80 thru 84	Facility Elevation (5)	5.92
85 thru 87	Datum Code (3)	5.197
88 thru 93	Blank (Spacing) (6)	
94 thru 123	Marker Name (30)	5.71
124 thru 128	File Record No. (5)	5.31
129 thru 132	Cycle Date (4)	5.32

4.1.15.2 Airways Marker Continuation Records

Column	Field Name (Length)	Reference
1 thru 21	Fields as on Primary Records	
22	Continuation Record No. (1)	5.16
23	Application Type (1)	5.91
24 thru 123	Reserved (Expansion) (100)	
124 thru 128	File Record No. (5)	5.31
129 thru 132	Cycle Date (4)	5.32

4.1.16 Cruising Tables Records (TC)

The Cruising Tables file contains details relating to available Cruising Levels for IFR flights.

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4.1.16.1 Cruising Table Primary Records

Column	Field Name (Length)	Reference
1	Record Type (1)	5.2
2 thru 4	Blank (Spacing) (3)	
5	Section Code (1)	5.4
6	Subsection Code (1)	5.5
7 thru 8	Cruise Table Identifier (2)	5.134
9	Sequence Number (1)	5.12
10 thru 28	Blank (Spacing) (19)	
29 thru 32	Course From (4)	5.135
33 thru 36	Course To (4)	5.135
37	Mag/True (1)	5.165
38 thru 39	Blank (Spacing) (2)	
40 thru 44	Cruise Level From (5)	5.136
45 thru 49	Vertical Separation (5)	5.137
50 thru 54	Cruise Level To (5)	5.136
55 thru 59	Cruise Level From (5)	5.136
60 thru 64	Vertical Separation (5)	5.137
65 thru 69	Cruise Level To (5)	5.136
70 thru 74	Cruise Level From (5)	5.136
75 thru 79	Vertical Separation (5)	5.137
80 thru 84	Cruise Level To (5)	5.136
85 thru 89	Cruise Level From (5)	5.136
90 thru 94	Vertical Separation (5)	5.137
95 thru 99	Cruise Level To (5)	5.136
100 thru 123	Reserved (Expansion) (24)	
124 thru 128	File Record No. (5)	5.31
129 thru 132	Cycle Date (4)	5.32

4.1.17 FIR/UIR Records (UF)

The FIR/UIR file contains the lateral boundary description of the FIR/UIR in a sequence of records and the vertical boundary description of the FIR/UIR in the first of the sequence.

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4.1.17.1 FIR/UIR Primary Records

Column	Field Name (Length)	Reference
1	Record Type (1)	5.2
2 thru 4	Customer/Area Code (3)	5.3
5	Section Code (1)	5.4
6	Subsection Code (1)	5.5
7 thru 10	FIR/UIR Identifier (4)	5.116
11 thru 14	FIR/UIR Address (4)	5.151
15	FIR/UIR Indicator (1)	5.117
16 thru 19	Sequence Number (4)	5.12
20	Continuation Record No. (1)	5.16
21 thru 24	Adjacent FIR Identifier (4)	5.116
25 thru 28	Adjacent UIR Identifier (4)	5.116
29	Reporting Units Speed (1)	5.122
30	Reporting Units Altitude (1)	5.123
31	Entry Report (1)	5.124
32	Blank (Spacing) (1)	
33 thru 34	Boundary Via (2)	5.118
35 thru 43	FIR/UIR Latitude (9)	5.36
44 thru 53	FIR/UIR Longitude (10)	5.37
54 thru 62	Arc Origin Latitude (9)	5.36
63 thru 72	Arc Origin Longitude (10)	5.37
73 thru 76	Arc Distance (4)	5.119
77 thru 80	Arc Bearing (4)	5.120
81 thru 85	FIR Upper Limit (5)	5.121
86 thru 90	UIR Lower Limit (5)	5.121
91 thru 95	UIR Upper Limit (5)	5.121
96 thru 97	Cruise Table Ind (2)	5.134
98	Reserved (Expansion) (1)	
99 thru 123	FIR/UIR Name (25)	5.125
124 thru 128	File Record No. (5)	5.31
129 thru 132	Cycle Date (4)	5.32

4.1.17.2 FIR/UIR Continuation Records

Column	Field Name (Length)	Reference
1 thru 19	Fields as on Primary Records	
20	Continuation Record No. (1)	5.16
21	Application Type (1)	5.91
22 thru 123	Reserved (Expansion) (102)	
124 thru 128	File Record No. (5)	5.31
129 thru 132	Cycle Date (4)	5.32

4.1.18 Restrictive Airspace Records (UR)

The Restrictive Airspace Record File contains a sequential listing of vertical and lateral limits of restrictive areas.

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4.1.18.1 Restrictive Airspace Primary Records

Column	Field Name (Length)	Reference
1	Record Type (1)	5.2
2 thru 4	Customer/Area Code (3)	5.3
5	Section Code (1)	5.4
6	Subsection Code (1)	5.5
7 thru 8	ICAO Code (2)	5.14
9	Restrictive Type (1)	5.128
10 thru 19	Restrictive Airspace Designation (10)	5.129
20	Multiple Code (1)	5.130
21 thru 24	Sequence Number (4)	5.12
25	Continuation Record No. (1)	5.16
26	Level (1)	5.19
27	Time Code (1)	5.131
28	NOTAM (1)	5.132
29 thru 30	Blank (Spacing) (2)	
31 thru 32	Boundary Via (2)	5.118
33 thru 41	Latitude (9)	5.36
42 thru 51	Longitude (10)	5.37
52 thru 60	Arc Origin Latitude (9)	5.36
61 thru 70	Arc Origin Longitude (10)	5.37
71 thru 74	Arc Distance (4)	5.119
75 thru 78	Arc Bearing (4)	5.120
79 thru 81	Blank (Spacing) (3)	
82 thru 86	Lower Limit (5)	5.121
87	Unit Indicator (1)	5.133
88 thru 92	Upper Limit (5)	5.121
93	Unit Indicator (1)	5.133
94 thru 123	Restrictive Airspace Name (30)	5.126
124 thru 128	File Record No. (5)	5.31
129 thru 132	Cycle Date (4)	5.32

4.1.18.2 Restrictive Airspace Continuation Records

Column	Filed Name (Length)	Reference
1 thru 24	Fields as on Primary Records	
25	Continuation Record Number (1)	5.16
26	Application Type (1)	5.91
27	Time Code (1)	5.131
28	NOTAM (1)	5.132
29	Time Indicator (1)	5.138
30 thru 39	Time of Operations (10)	5.195
40 thru 49	Time of Operations (10)	5.195
50 thru 59	Time of Operations (10)	5.195
60 thru 69	Time of Operations (10)	5.195
70 thru 79	Time of Operations (10)	5.195
80 thru 89	Time of Operations (10)	5.195
90 thru 99	Time of Operations (10)	5.195
100 thru 123	Controlling Agency (24)	5.140
124 thru 128	File Record Number (5)	5.31
129 thru 132	Cycle Date (4)	5.32

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4.1.19 Grid MORA Records (AS)

The Grid MORA (Minimum Off Route Altitude) file contains a table of Minimum Off Route Altitudes.

4.1.19.1 Grid MORA Primary Records

Column	Field Name (Length)	Reference
1	Record Type (1)	5.2
2 thru 4	Blank (Spacing) (3)	
5	Section Code (1)	5.4
6	Subsection Code (1)	5.5
7 thru 13	Blank (Spacing) (7)	
14 thru 16	Starting Latitude (3)	5.141
17 thru 20	Starting Longitude (4)	5.142
21 thru 30	Blank (Spacing) (10)	
31 thru 33	MORA (3)	5.143
34 thru 36	MORA (3)	5.143
37 thru 39	MORA (3)	5.143
40 thru 42	MORA (3)	5.143
43 thru 45	MORA (3)	5.143
46 thru 48	MORA (3)	5.143
49 thru 51	MORA (3)	5.143
52 thru 54	MORA (3)	5.143
55 thru 57	MORA (3)	5.143
58 thru 60	MORA (3)	5.143
61 thru 63	MORA (3)	5.143
64 thru 66	MORA (3)	5.143
67 thru 69	MORA (3)	5.143
70 thru 72	MORA (3)	5.143
73 thru 75	MORA (3)	5.143
76 thru 78	MORA (3)	5.143
79 thru 81	MORA (3)	5.143
82 thru 84	MORA (3)	5.143
85 thru 87	MORA (3)	5.143
88 thru 90	MORA (3)	5.143
91 thru 93	MORA (3)	5.143
94 thru 96	MORA (3)	5.143
97 thru 99	MORA (3)	5.143
100 thru 102	MORA (3)	5.143
103 thru 105	MORA (3)	5.143
106 thru 108	MORA (3)	5.143
109 thru 111	MORA (3)	5.143
112 thru 114	MORA (3)	5.143
115 thru 117	MORA (3)	5.143
118 thru 120	MORA (3)	5.143
121 thru 123	Reserved (Expansion) (3)	
124 thru 128	File Record No. (5)	5.31
129 thru 132	Cycle Date (4)	5.32

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4.1.20 Airport MSA (Minimum Sector Altitude) Records (PS)

The Minimum Sector Altitude (MSA) file contains details relating to available sector altitudes.

4.1.20.1 Airport MSA Primary Records

Column	Field Name (Length)	Reference
1	Record Type (1)	5.2
2 thru 4	Customer/Area Code (3)	5.3
5	Section Code (1)	5.4
6	Blank (Spacing) (1)	
7 thru 10	Airport Identifier (4)	5.6
11 thru 12	ICAO Code (2)	5.14
13	Subsection Code (1)	5.5
14 thru 18	MSA Center (5)	5.144
19 thru 20	ICAO Code (2)	5.14
21	Section Code (1)	5.4
22	Subsection Code (1)	5.5
23	Multiple Code (1)	5.130
24 thru 38	Reserved (Expansion) (15)	
39	Continuation Record No. (1)	5.16
40 thru 42	Reserved (Spacing) (3)	
43 thru 48	Sector Bearing (6)	5.146
49 thru 51	Sector Altitude (3)	5.147
52 thru 53	Sector Radius (2)	5.145
54 thru 59	Sector Bearing (6)	5.146
60 thru 62	Sector Altitude (3)	5.147
63 thru 64	Sector Radius (2)	5.145
65 thru 70	Sector Bearing (6)	5.146
71 thru 73	Sector Altitude (3)	5.147
74 thru 75	Sector Radius (2)	5.145
76 thru 81	Sector Bearing (6)	5.146
82 thru 84	Sector Altitude (3)	5.147
85 thru 86	Sector Radius (2)	5.145
87 thru 92	Sector Bearing (6)	5.146
93 thru 95	Sector Altitude (3)	5.147
96 thru 97	Sector Radius (2)	5.145
98 thru103	Sector Bearing (6)	5.146
104 thru 106	Sector Altitude (3)	5.147
107 thru 108	Sector Radius (2)	5.145
109 thru 114	Sector Bearing (6)	5.146
115 thru 117	Sector Altitude (3)	5.147
118 thru 119	Sector Radius (2)	5.145
120	Magnetic/True Indicator (1)	5.165
121 thru 123	Reserved (Expansion) (3)	
124 thru 128	File Record No. (5)	5.31
129 thru 132	Cycle Date (4)	5.32

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4.1.20.2 Airport MSA Primary Record Extension

Column	Field Name (Length)	Reference
1 thru 38	Field as on Primary Records	
39	Continuation Record No. (1)	5.16
40	Application Type (1)	5.91
41 thru 42	Reserved (Spacing) (2)	
43 thru 48	Sector Bearing (6)	5.146
49 thru 51	Sector Altitude (3)	5.147
52 thru 53	Sector Radius (2)	5.145
54 thru 59	Sector Bearing (6)	5.146
60 thru 62	Sector Altitude (3)	5.147
63 thru 64	Sector Radius (2)	5.145
65 thru 70	Sector Bearing (6)	5.146
71 thru 73	Sector Altitude (3)	5.147
74 thru 75	Sector Radius (2)	5.145
76 thru 81	Sector Bearing (6)	5.146
82 thru 84	Sector Altitude (3)	5.147
85 thru 86	Sector Radius (2)	5.145
87 thru 92	Sector Bearing (6)	5.146
93 thru 95	Sector Altitude (3)	5.147
96 thru 97	Sector Radius (2)	5.145
98 thru 103	Sector Bearing (6)	5.146
104 thru 106	Sector Altitude (3)	5.147
107 thru 108	Sector Radius (2)	5.145
109 thru 114	Sector Bearing (6)	5.146
115 thru 117	Sector Altitude (3)	5.147
118 thru 119	Sector Radius (2)	5.145
120 thru 123	Field as on Primary Records	
124 thru 128	File Record No. (5)	5.31
129 thru 132	Cycle Date (4)	5.32

4.1.20.3 Airport MSA Continuation Records

Column	Field Name (Length)	Reference
1 thru 38	Field as on Primary Records	
39	Continuation Record No. (1)	5.16
40	Application Type (1)	5.91
41 thru 109	Notes (69)	5.61
110 thru 123	Reserved (Expansion) (14)	
124 thru 128	File Record No. (5)	5.31
129 thru 132	Cycle Date (4)	5.32

4.1.21 Enroute Airways Restriction Records (EU)

The Enroute Airway Restriction file will contain altitude and time restrictions for an airway, airway segment or sequence of airway segments. The Enroute Airway Restriction file may contain four different types of primary records, dependent on the type of restriction. A Restriction Code will identify the type of restriction contained in the record. Continuation Records may be used if a single record does not provide sufficient space for coding a single, complete restriction.

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4.1.21.1 Enroute Airways Restriction Altitude Exclusion Primary Records

Column	Field Name (Length)	Reference
1	Record Type (1)	5.2
2 thru 4	Customer/Area Code (3)	5.3
5	Section Code (1)	5.4
6	Subsection Code (1)	5.5
7 thru 11	Route Identifier (5)	5.8
12	Reserved (1)	Note 1
13 thru 15	Restriction Identifier (3)	5.154
16 thru 17	Restriction Type (2)	5.201
18	Continuation Record No. (1)	5.16
19 thru 23	Start Fix Identifier (5)	5.13
24 thru 25	Start Fix ICAO Code (2)	5.14
26	Start Fix Section Code (1)	5.4
27	Start Fix Subsection Code (1)	5.5
28 thru 32	End Fix Identifier (5)	5.13
33 thru 34	End Fix ICAO Code (2)	5.14
35	End Fix Section Code (1)	5.4
36	End Fix Subsection Code (1)	5.5
37	Blank (Spacing) (1)	
38 thru 44	Start Date (7)	5.157
45 thru 51	End Date (7)	5.157
52	Time Code (1)	5.131
53	Time Indicator (1)	5.138
54 thru 63	Time of Operation (10)	5.195
64 thru 73	Time of Operation (10)	5.195
74 thru 83	Time of Operation (10)	5.195
84 thru 93	Time of Operation (10)	5.195
94	Exclusion Indicator (1)	5.202
95	Units of Altitude (1)	5.160
96 thru 98	Restriction Altitude (3)	5.161
99	Block Indicator (1)	5.203
100 thru 102	Restriction Altitude (3)	5.161
103	Block Indicator (1)	5.203
104 thru 106	Restriction Altitude (3)	5.161
107	Block Indicator (1)	5.203
108 thru 110	Restriction Altitude (3)	5.161
111	Block Indicator (1)	5.203
112 thru 114	Restriction Altitude (3)	5.161
115	Block Indicator (1)	5.203
116 thru 118	Restriction Altitude (3)	5.161
119	Block Indicator (1)	5.203
120 thru 122	Restriction Altitude (3)	5.161
123	Block Indicator (1)	5.203
124 thru 128	File Record Number (5)	5.31
129 thru 132	Cycle Date (4)	5.32

Note 1: The standard length for the Route Identifier is five characters. Some users envisage the need for a six-character field. This reserved column will permit this usage.

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4.1.21A.1 Enroute Airways Restriction Note Restriction Primary Records

Column	Field Name (Length)	Reference
1	Record Type (1)	5.2
2 thru 4	Customer/Area Code (3)	5.3
5	Section Code (1)	5.4
6	Subsection Code (1)	5.5
7 thru 11	Route Identifier (5)	5.8
12	Reserved (1)	Note 1
13 thru 15	Restriction Identifier (3)	5.154
16 thru 17	Restriction Type (2)	5.201
18	Continuation Record No. (1)	5.16
19 thru 23	Start Fix Identifier (5)	5.13
24 thru 25	Start Fix ICAO Code (2)	5.14
26	Start Fix Section Code (1)	5.4
27	Start Fix Subsection Code (1)	5.5
28 thru 32	End Fix Identifier (5)	5.13
33 thru 34	End Fix ICAO Code (2)	5.14
35	End Fix Section Code (1)	5.4
36	End Fix Subsection Code (1)	5.5
37	Blank (Spacing) (1)	
38 thru 44	Start Date (7)	5.157
45 thru 51	End Date (7)	5.157
52 thru 120	Restriction Notes (69)	5.163
121 thru 123	Blank (Spacing) (3)	
124 thru 128	File Record Number (5)	5.31
129 thru 132	Cycle Date (4)	5.21

Note 1: The standard length for the Route Identifier is five characters. Some users envisage the need for a six-character field. This reserved column will permit this usage.

4.1.21A.2 Enroute Airways Restriction Note Restriction Continuation Records

Column	Field Name (Length)	Reference
1 thru 17	Fields as on Primary Records	
18	Continuation Record No. (1)	5.16
19	Application Type (1)	5.91
20 thru 51	Reserved (Expansion) (32)	
52 thru 120	Restriction Notes (69)	5.163
121 thru 123	Blank (Spacing) (3)	
124 thru 128	File Record Number (5)	5.31
129 thru 132	Cycle Date (4)	5.32

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4.1.21B.1 Enroute Airways Restriction Seasonal Closure Primary Records

Column	Field Name (Length)	Reference
1	Record Type (1)	5.2
2 thru 4	Customer/Area Code (3)	5.3
5	Section Code (1)	5.4
6	Subsection Code (1)	5.5
7 thru 11	Route Identifier (5)	5.8
12	Reserved (1)	Note 1
13 thru 15	Restriction Identifier (3)	5.154
16 thru 17	Restriction Type (2)	5.201
18	Continuation Record No. (1)	5.16
19 thru 23	Start Fix Identifier (5)	5.13
24 thru 25	Start Fix ICAO Code (2)	5.14
26	Start Fix Section Code (1)	5.4
27	Start Fix Subsection Code (1)	5.5
28 thru 32	End Fix Identifier (5)	5.13
33 thru 34	End Fix ICAO Code (2)	5.14
35	End Fix Section Code (1)	5.4
36	End Fix Subsection Code (1)	5.5
37	Blank (Spacing) (1)	
38 thru 44	Start Date (7)	5.157
45 thru 51	End Date (7)	5.157
52	Time Code (1)	5.131
53	Time Indicator (1)	5.138
54 thru 63	Time of Operation (10)	5.195
64 thru 73	Time of Operation (10)	5.195
74 thru 83	Time of Operation (10)	5.195
84 thru 93	Time of Operation (10)	5.195
94 thru 95	Cruise Table Ident (2)	5.134
96 thru 123	Blank (Spacing) (28)	
124 thru 128	File Record Number (5)	5.31
129 thru 132	Cycle Date (4)	5.32

Note 1: The standard length for the Route Identifier is five characters. Some users envisage the need for a six-character field. This reserved column will permit this usage.

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4.1.21C.1 Enroute Airways Restriction Cruising Table Replacement Primary Records

Column	Field Name (Length)	Reference
1	Record Type (1)	5.2
2 thru 4	Customer/Area Code (3)	5.3
5	Section Code (1)	5.4
6	Subsection Code (1)	5.5
7 thru 11	Route Identifier (5)	5.8
12	Reserved (1)	Note 1
13 thru 15	Restriction Identifier (3)	5.154
16 thru 17	Restriction Type (2)	5.201
18	Continuation Record No. (1)	5.16
19 thru 23	Start Fix Identifier (5)	5.13
24 thru 25	Start Fix ICAO Code (2)	5.14
26	Start Fix Section Code (1)	5.4
27	Start Fix Subsection Code (1)	5.5
28 thru 32	End Fix Identifier (5)	5.13
33 thru 34	End Fix ICAO Code (2)	5.14
35	End Fix Section Code (1)	5.4
36	End Fix Subsection Code (1)	5.5
37	Blank (Spacing) (1)	
38 thru 44	Start Date (7)	5.157
45 thru 51	End Date (7)	5.157
52	Time Code (1)	5.131
53	Time Indicator (1)	5.138
54 thru 63	Time of Operation (10)	5.195
64 thru 73	Time of Operation (10)	5.195
74 thru 83	Time of Operation (10)	5.195
84 thru 93	Time of Operation (10)	5.195
94 thru 95	Cruise Table Ident (2)	5.134
96 thru 123	Blank (Spacing) (28)	
124 thru 128	File Record Number (5)	5.31
129 thru 132	Cycle Date (4)	5.32

Note 1: The standard length for the Route Identifier is five characters. Some users envisage the need for a six-character field. This reserved column will permit this usage.

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4.1.21C.2 Enroute Airways Restriction Cruising Table Replacement Continuation Records

Column	Field Name (Length)	Reference
1 thru 17	Fields as on Primary Records	
18	Continuation Record No. (1)	5.16
19	Application Type (1)	5.91
20 thru 51	Reserved (Expansion) (32)	
52	Time Code (1)	5.131
53	Time Indicator (1)	5.138
54 thru 63	Time of Operation (10)	5.195
64 thru 73	Time of Operation (10)	5.195
74 thru 83	Time of Operation (10)	5.195
84 thru 93	Time of Operation (10)	5.195
94 thru 95	Cruise Table Ident (2)	5.134
96 thru 123	Blank (Spacing) (28)	
124 thru 128	File Record Number (5)	5.31
129 thru 132	Cycle Date (4)	5.32

4.1.21.2 Enroute Airways Restriction Altitude Exclusion Continuation Records

Column	Field Name (Length)	Reference
1 thru 17	Fields as on Primary Records	
18	Continuation Record No. (1)	5.16
19	Application Type (1)	5.91
20 thru 51	Reserved (Expansion) (32)	
52	Time Code (1)	5.131
53	Time Indicator (1)	5.138
54 thru 63	Time of Operation (10)	5.195
64 thru 73	Time of Operation (10)	5.195
74 thru 83	Time of Operation (10)	5.195
84 thru 93	Time of Operation (10)	5.195
94	Exclusion Indicator (1)	5.202
95	Units of Altitude (1)	5.160
96 thru 98	Restriction Altitude (3)	5.161
99	Block Indicator (1)	5.203
100 thru 102	Restriction Altitude (3)	5.161
103	Block Indicator (1)	5.203
104 thru 106	Restriction Altitude (3)	5.161
107	Block Indicator (1)	5.203
108 thru 110	Restriction Altitude (3)	5.161
111	Block Indicator (1)	5.203
112 thru 114	Restriction Altitude (3)	5.161
115	Block Indicator (1)	5.203
116 thru 118	Restriction Altitude (3)	5.161
119	Block Indicator (1)	5.203
120 thru 122	Restriction Altitude (3)	5.161
123	Block Indicator (1)	5.203
124 thru 128	File Record No. (5)	5.31
129 thru 132	Cycle Date (4)	5.32

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4.1.22 Airport and Heliport MLS (Azimuth, Elevation and Back Azimuth) Records (PL)

This file will contain a listing of all Microwave Landing Systems, including the Azimuth station, the Elevation station and the Back-Azimuth station if installed.

4.1.22.1 Airport and Heliport MLS Primary Records

Column	Field Name (Length)	Reference
1	Record Type (1)	5.2
2 thru 4	Customer/Area Code (3)	5.3
5	Section Code (1)	5.4
6	Blank (Spacing (1)	
7 thru 10	Airport Identifier (4)	5.6
11 thru 12	ICAO Code (2)	5.14
13	Subsection Code (1)	5.5
14 thru 17	MLS Identifier (4)	5.44
18	MLS Category (1)	5.80
19 thru 21	Blank (Spacing) (3)	
22	Continuation Record No. (1)	5.16
23 thru 25	Channel (3)	5.166
26 thru 27	Blank (Spacing) (2)	
28 thru 32	Runway Identifier (5)	5.46
33 thru 41	Azimuth Latitude (9)	5.36
42 thru 51	Azimuth Longitude (10)	5.37
52 thru 55	Azimuth Bearing (4)	5.167
56 thru 64	Elevation Latitude (9)	5.36
65 thru 74	Elevation Longitude (10)	5.37
75 thru 78	Azimuth Position (4)	5.48
79	Azimuth Position Reference (1)	5.49
80 thru 83	Elevation Position (4)	5.50
84 thru 86	Azimuth Proportional Angle Right (3)	5.168
87 thru 89	Azimuth Proportional Angle Left (3)	5.168
90 thru 92	Azimuth Coverage Right (3)	5.172
93 thru 95	Azimuth Coverage Left (3)	5.172
96 thru 98	Elevation Angle Span (3)	5.169
99 thru 103	Magnetic Variation (5)	5.39
104 thru 108	EL Elevation (5)	5.74
109 thru 112	Nominal Elevation Angle (4)	5.173
113 thru 115	Minimum Glide Path Angle (3)	5.52
116 thru 119	Supporting Facility Identifier (4)	5.33 Note 1
120 thru 121	Supporting Facility ICAO Code (2)	5.14 Note 1
122	Supporting Facility Section Code (1)	5.4 Note 1
123	Supporting Facility Subsection Code (1)	5.5 Note 1
124 thru 128	File Record No. (5)	5.31
129 thru 132	Cycle Date (4)	5.32

Note 1: Terminal Navaids used as Supporting Facilities must be located at the same airport as the MLS.

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4.1.22.2 Airport and Heliport MLS Continuation Records

Column	Field Name (Length)	Reference
1 thru 21	Field as on Primary Records	
22	Continuation Record No. (1)	5.16
23	Application Type (1)	5.91
24 thru 27	Blank (Spacing) (4)	
28 thru 32	Facility Characteristics (5)	5.93
33 thru 41	Back Azimuth Latitude (9)	5.36
42 thru 51	Back Azimuth Longitude (10)	5.37
52 thru 55	Back Azimuth Bearing (4)	5.167
56 thru 64	MLS Datum Point Latitude (9)	5.36
65 thru 74	MLS Datum Point Longitude (10)	5.37
75 thru 78	Back Azimuth Position (4)	5.48
79	Back Azimuth Position Reference (1)	5.49
80 thru 83	Blank (Spacing) (4)	
84 thru 86	Back Azimuth Proportional Sector Right (3)	5.168
87 thru 89	Back Azimuth Proportional Sector Left (3)	5.168
90 thru 92	Back Azimuth Coverage Right (3)	5.172
93 thru 95	Back Azimuth Coverage Left (3)	5.172
96 thru 100	Back Azimuth True Bearing (5)	5.94
101	Back Azimuth Bearing Source (1)	5.95
102 thru 106	Azimuth True Bearing (5)	5.94
107	Azimuth Bearing Source (1)	5.95
108 thru 110	Glide Path Height at Landing Threshold (3)	5.67
111 thru 123	Reserved (Expansion) (13)	
124 thru 128	File Record No. (5)	5.31
129 thru 132	Cycle Date (4)	5.32

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4.1.23 Enroute Communications Records (EV)

4.1.23.1 Enroute Communications Primary Records

Column	Field Name (Length)	Reference
1	Record Type (1)	5.2
2 thru 4	Customer/Area Code (3)	5.3
5	Section Code (1)	5.4
6	Subsection Code (1)	5.5
7 thru 10	FIR/RDO Ident (4)	5.190
11 thru 14	FIR/UIR Address (4)	5.151
15	Indicator (1)	5.117
16 thru 19	Communication Class (4)	5.283
20 thru 21	Sequence Number (2)	5.12
22	Continuation Record No. (1)	5.16
23 thru 25	Communications Type (3)	5.101
26 thru 32	Transmit Frequency (7)	5.103
33 thru 39	Receive Frequency (7)	5.103
40	Frequency Units (1)	5.104
41	Radar Service (1)	5.102
42	H24 Indicator (1)	5.181
43 thru 67	Call Sign (25)	5.105
68 thru 92	Position Narrative (25)	5.189
93 thru 101	Latitude (9)	5.36
102 thru 111	Longitude (10)	5.37
112 thru 114	Service Indicator (3)	5.106
115	Modulation (1)	5.198
116	Signal Emission (1)	5.199
117	Altitude Descript. (1)	5.29
118 thru 120	Communication Altitude 1 (3)	5.184
121 thru 123	Communication Altitude 2 (3)	5.184
124 thru 128	File Record No. (5)	5.31
129 thru 132	Cycle Date (4)	5.32

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4.1.23.2 Enroute Communications Primary Extension Continuation Records

Column	Field Name (Length)	Reference
1 thru 21	Fields as on Primary Records	
22	Continuation Record No. (1)	5.16
23	Application Type (1)	5.91
24 thru 27	Remote Facility (4)	5.200
28 thru 29	ICAO (2)	5.14
30	Section (1)	5.4
31	Subsection (1)	5.5
32 thru 36	Transmitter Site Mag Var (5)	5.39
37 thru 41	Transmitter Site Elevation (5)	5.92
42 thru 66	Assigned Sector Name (25)	5.284
67	Time Code (1)	5.131
68	NOTAM (1)	5.132
69	Time Indicator (1)	5.138
70 thru 79	Time of Operation (10)	5.195
80 thru 89	Time of Operation (10)	5.195
90 thru 99	Time of Operation (10)	5.195
100 thru 109	Time of Operation (10)	5.195
110 thru 119	Time of Operation (10)	5.195
120 thru 123	Blank (Spacing) 4	
124 thru 128	File Record No. (5)	5.31
129 thru 132	Cycle Date (4)	5.32

4.1.23.3 Enroute Communications Continuation Records

Column	Field Name (Length)	Reference
1 thru 21	Fields as on Primary Records	
22	Continuation Record No. (1)	5.16
23	Application Type (1)	5.91
24 thru 69	Blank (Spacing) (46)	
70 thru 79	Time of Operation (10)	5.195
80 thru 89	Time of Operation (10)	5.195
90 thru 99	Time of Operation (10)	5.195
100 thru 109	Time of Operation (10)	5.195
110 thru 119	Time of Operation (10)	5.195
120 thru 123	Reserved (Expansion) (4)	
124 thru 128	File Record No. (5)	5.31
129 thru 132	Cycle Date (4)	5.32

4.1.23.4 Enroute Communications Continuation Records

Column	Field Name (Length)	Reference
1 thru 21	Fields as on Primary Record	
22	Continuation Record No. (1)	5.16
23	Application Type (1)	5.91
24 thru 123	Time Narrative (100)	5.285
124 thru 128	File Record No. (5)	5.31
129 thru 132	Cycle Date (4)	5.32

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4.1.24 Preferred Routes Records (ET)

The Preferred Routes file contains details defining the Preferred Routes, North America Routes for North Atlantic Traffic, the Traffic Orientation System, and the similar predefined routings that do not meet the requirements of the Enroute Airway Record.

4.1.24.1 Preferred Route Primary Records

Columns	Field Name (Length)	Reference
1	Record Type (1)	5.2
2 thru 4	Customer/Area Code (3)	5.3
5	Section Code (1)	5.4
6	Subsection Code (1)	5.5
7 thru 13	Blank (Spacing) (7)	
14 thru 23	Route Identifier (10)	5.8
24 thru 25	Preferred Route Use Ind (2)	5.220
26 thru 29	Sequence Number (4)	5.12
30 thru 38	Blank (Spacing) (9)	
39	Continuation Record No. (1)	5.16
40 thru 44	To Fix Identifier (5)	5.83
45 thru 46	ICAO Code (2)	5.14
47	Section Code (1)	5.4
48	Subsection Code (1)	5.5
49 thru 51	VIA Code (3)	5.77
52 thru 57	SID/STAR/AWY Ident (6) Note 1	5.78
58 thru 60	AREA Code (3)	5.3
61	Level (1)	5.19
62	Route Type (1)	5.7
63 thru 67	Initial Airport/Fix (5)	5.194
68 thru 69	ICAO Code (2)	5.14
70	Section Code (1)	5.4
71	Subsection Code (1)	5.5
72 thru 76	Terminus Airport/Fix (5)	5.194
77 thru 78	ICAO Code (2)	5.14
79	Section Code (1)	5.4
80	Subsection Code (1)	5.5
81 thru 85	Minimum Altitude (5)	5.30
86 thru 90	Maximum Altitude (5)	5.127
91	Time Code (1)	5.131
92 thru 93	Aircraft Use Group (2)	5.221
94	Direction Restriction (1)	5.115
95	Altitude Description (1)	5.29
96 thru 100	Altitude One (5)	5.30
101 thru 105	Altitude Two (5)	5.30
106	SID/STAR/App/Awy Route Type (1)	5.7
107	S/S/A Route Type Qualifier 1 (1)	5.7
108	S/S/A Route Type Qualifier 2 (1)	5.7
109 thru 123	Reserved (Expansion) (15)	
124 thru 128	File Record Number (5)	5.31
129 thru 132	Cycle Date (4)	5.32

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Note 1: The Standard Enroute Airway Identifier is five characters. Some users envision the need for a sixth character. This field length will permit such coding; see Section 5.8.

4.1.24.2 Preferred Route Continuation Records

Column	Field Name (Length)	Reference
1 thru 38	Fields as on Primary Records	
39	Continuation Record No. (1)	5.16
40	Application Type (1)	5.91
41	Time Code (1)	5.131
42	Time Indicator (1)	5.138
43 thru 52	Time of Operation (10)	5.195
53 thru 62	Time of Operation (10)	5.195
63 thru 72	Time of Operation (10)	5.195
73 thru 82	Time of Operation (10)	5.195
83 thru 92	Time of Operation (10)	5.195
93 thru 102	Time of Operation (10)	5.195
103 thru 112	Time of Operation (10)	5.195
113 thru 123	Reserved (Expansion) (11)	
124 thru 128	File Record No. (5)	5.31
129 thru 132	Cycle Date (4)	5.32

4.1.24.3 Preferred Route Continuation Record (ET)

Columns	Field Name (Length)	Reference
1 thru 38	Fields as on Primary Records	
39	Continuation Record No. (1)	5.16
40	Application Type (1)	5.91
41 thru 109	Notes (69)	5.61
110 thru 123	Reserved (Expansion) (14)	
124 thru 128	File Record Number (5)	5.31
129 thru 132	Cycle Date (4)	5.32

Note: Section 5.221 describes the use of this record for Aircraft Use Groups.

4.1.25 Controlled Airspace Records (UC)

The Controlled Airspace Record file contains a sequential listing of vertical and lateral limits of all types and classifications of Controlled Airspace. It includes Controlled Airspace associated with Airports and Heliports.

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4.1.25.1 Controlled Airspace Primary Records

Column	Field Name (Length)	Reference
1	Record Type (1)	5.2
2 thru 4	Customer/Area Code (3)	5.3
5	Section Code (1)	5.4
6	Subsection Code (1)	5.5
7 thru 8	ICAO Code (2)	5.14
9	Airspace Type (1)	5.213
10 thru 14	Airspace Center (5)	5.214
15	Section Code (1)	5.4
16	Subsection Code (1)	5.5
17	Airspace Classification (1)	5.215
18 thru 19	Reserved (Spacing) (2)	
20	Multiple Code (1)	5.130
21 thru 24	Sequence Number (4)	5.12
25	Continuation Record Number (1)	5.16
26	Level (1)	5.19
27	Time Code (1)	5.131
28	NOTAM (1)	5.132
29 thru 30	Blank (Spacing) (2)	
31 thru 32	Boundary Via (2)	5.118
33 thru 41	Latitude (9)	5.36
42 thru 51	Longitude (10)	5.37
52 thru 60	Arc Origin Latitude (9)	5.36
61 thru 70	Arc Origin Longitude (10)	5.37
71 thru 74	Arc Distance (4)	5.119
75 thru 78	Arc Bearing (4)	5.120
79 thru 81	RNP (3)	5.211
82 thru 86	Lower Limit (5)	5.121
87	Unit Indicator (1)	5.133
88 thru 92	Upper Limit (5)	5.121
93	Unit Indicator (1)	5.133
94 thru 123	Controlled Airspace Name (30)	5.216
124 thru 128	File Record Number (5)	5.31
129 thru 132	Cycle Date (4)	5.32

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4.1.25.2 Controlled Airspace Continuation Records

Column	Filed Name (Length)	Reference
1 thru 24	Fields as on Primary Records	
25	Continuation Record Number (1)	5.16
26	Application Type (1)	5.91
27	Time Code (1)	5.131
28	NOTAM (1)	5.132
29	Time Indicator (1)	5.138
30 thru 39	Time of Operations (10)	5.195
40 thru 49	Time of Operations (10)	5.195
50 thru 59	Time of Operations (10)	5.195
60 thru 69	Time of Operations (10)	5.195
70 thru 79	Time of Operations (10)	5.195
80 thru 89	Time of Operations (10)	5.195
90 thru 99	Time of Operations (10)	5.195
100 thru 123	Controlling Agency (24)	5.140
124 thru 128	File Record Number (5)	5.31
129 thru 132	Cycle Date (4)	5.32

4.1.25.3 Controlled Airspace Primary Extension Record

When a government source provides a speed restriction(s) for an airspace, a single Primary Extension Continuation Record will be provided, associated to the first sequence of the Controlled Airspace record.

Column	Field Name (Length)	Reference
1 thru 24	Fields as on Primary Records	
25	Continuation Record Number (1)	5.16
26	Application Type (1)	5.91
27 thru 29	Speed Limit (3)	5.72
30 thru 34	Speed Limit Altitude (5)	5.73
35	Speed Limit Aircraft Category/Type (1)	5.301
36 thru 38	Speed Limit 2 (3)	5.72
39 thru 43	Speed Limit Altitude 2 (5)	5.73
44	Speed Limit Aircraft Category/Type 2 (1)	5.301
45 thru 123	Blank (79)	
124 thru 128	File Record Number (5)	5.31
129 thru 132	Cycle Date (4)	5.32

4.1.26 Geographical Reference Table Records (TG)

The Geographical Reference Table file contains information that permits the cross referencing of otherwise undefined geographical entities and Route Identifiers in the Preferred Route file. The contents are not standardized and may vary from data supplier to data supplier. The contents of such a file can only be used in conjunction with the Preferred Route file of the same database in which the file is presented.

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4.1.26.1 Geographical Reference Table Primary Records (TG)

Column	Field Name (Length)	Reference
1	Record Type (1)	5.2
2 thru 4	Customer/Area Code (3)	5.3
5	Section Code (1)	5.4
6	Subsection Code (1)	5.5
7 thru 8	Geographical Ref Table ID (2)	5.218
9	Sequence Number (1)	5.12
10 thru 38	Geographical Entity (29)	5.219
39	Continuation Record No (1)	5.16
40	Reserved (1)	
41 thru 50	Preferred Route Ident (10)	5.8
51 thru 52	Preferred Route Use Indicator (2)	5.220
53 thru 62	Preferred Route Ident (10)	5.8
63 thru 64	Preferred Route Use Indicator (2)	5.220
65 thru 74	Preferred Route Ident (10)	5.8
75 thru 76	Preferred Route Use Indicator (2)	5.220
77 thru 86	Preferred Route Ident (10)	5.8
87 thru 88	Preferred Route Use Indicator (2)	5.220
89 thru 98	Preferred Route Ident (10)	5.8
99 thru 100	Preferred Route Use Indicator (2)	5.220
101 thru 110	Preferred Route Ident (10)	5.8
111 thru 112	Preferred Route Use Indicator (2)	5.220
113 thru 123	Blank (Spacing) (11)	
124 thru 128	File Record Number (5)	5.31
129 thru 132	Cycle Date (4)	5.32

4.1.26.2 Geographical Reference Table Continuation Records

Column	Field Name (Length)	Reference
1 thru 38	Fields as on Primary Records	
39	Continuation Record No. (1)	5.16
40	Application Type (1)	5.91
41 thru 123	Reserved (Expansion) (83)	
124 thru 128	File Record No. (5)	5.31
129 thru 132	Cycle Date (4)	5.32

4.1.27 Flight Planning Arrival/Departure Data Records (PR)

The Flight Planning Arrival/Departure Data Record is used to provide the sub-set of data defining SIDs (PD), STARs (PE), and Approach Procedures (PF) from Section 4.1.9 required for the computer generation of Flight Plans which include Terminal Procedures. The file contains a sequential listing of published Arrival Procedures, Approach Procedures and Departure Procedures, the available Enroute and Runway Transitions for those procedures, the Transition waypoints, the appropriate along track distance fields, and the intermediate fixes along those routes.

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4.1.27.1 Flight Planning Primary Records

Column	Field Name (Length)	Reference
1	Record Type (1)	5.2
2 thru 4	Customer/Area Code (3)	5.3
5	Section Code (1)	5.4
6	Blank (Spacing) (1)	
7 thru 10	Airport Identifier (4)	5.6
11 thru 12	ICAO Code (2)	5.14
13	Subsection Code (1)	5.5
14 thru 19	SID/STAR/Approach Identifier (6)	5.9, 5.10
20	Procedure Type (1)	5.230
21 thru 25	Runway Transition Identifier (5)	5.11
26 thru 30	Runway Transition Fix (5)	5.13
31 thru 32	ICAO Code (2)	5.14
33	Section Code (1)	5.4
34	Subsection Code (1)	5.5
35 thru 37	Runway Transition Along Track Distance (3)	5.231
38 thru 42	Common Segment Transition Fix (5)	5.13
43 thru 44	ICAO Code (2)	5.14
45	Section Code (1)	5.4
46	Subsection Code (1)	5.5
47 thru 49	Common Segment Along Track Distance (3)	5.231
50 thru 54	Enroute Transition Identifier (5)	5.11
55 thru 59	Enroute Transition Fix (5)	5.13
60 thru 61	ICAO Code (2)	5.14
62	Section Code (1)	5.4
63	Subsection Code (1)	5.5
64 thru 66	Enroute Transition Along Track Distance (3)	5.231
67 thru 69	Sequence Number (3)	5.12
70	Continuation Number (1)	5.16
71 thru 74	Number of Engines (4)	5.232
75	Turboprop/Jet Indicator (1)	5.233
76	RNAV Flag (1)	5.234
77	ATC Weight Category (1)	5.235
78 thru 84	ATC Identifier (7)	5.236
85	Time Code (1)	5.131
86 thru 100	Procedure Description (15)	5.237
101 thru 102	Leg Type Code (2)	5.238
103	Reporting Code (1)	5.239
104 thru 107	Initial Departure Magnetic Course (4)	5.26
108	Altitude Description (1)	5.29
109 thru 111	Altitude (3)	5.240
112 thru 114	Altitude (3)	5.240
115 thru 117	Speed Limit (3)	5.72
118 thru 119	Initial Cruise Table (2)	5.134
120	Speed Limit Description (1)	5.261
121 thru 123	Blank (Spacing) (3)	
124 thru 128	File Record Number (5)	5.31
129 thru 132	Cycle Date (4)	5.32

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4.1.27.2 Flight Planning Continuation Records

This Flight Planning Arrival/Departure Data Continuation Record is provided when Intermediate Fix information is required for the procedure coded in the Primary Record.

Column	Field Name (Length)	Reference
1 thru 69	Fields as on Primary Records	
70	Continuation Number (1)	5.16
71	Application Type (1)	5.91
72 thru 76	Intermediate Fix Identifier (5)	5.13
77 thru 78	ICAO Code (2)	5.14
79	Section Code (1)	5.4
80	Subsection Code (1)	5.5
81 thru 83	Intermediate Distance (ATD) (3)	5.231
84	Fix Related Transition Code (1)	5.241
85 thru 89	Intermediate Fix Identifier (5)	5.13
90 thru 91	ICAO Code (2)	5.14
92	Section Code (1)	5.4
93	Subsection Code (1)	5.5
94 thru 96	Intermediate Distance (ATD) (3)	5.231
97	Fix Related Transition Code (1)	5.241
98 thru 102	Intermediate Fix Identifier (5)	5.13
103 thru 104	ICAO Code (2)	5.14
105	Section Code (1)	5.4
106	Subsection Code (1)	5.5
107 thru 109	Intermediate Distance (ATD) (3)	5.231
110	Fix Related Transition Code (1)	5.241
111 thru 115	Intermediate Fix Identifier (5)	5.13
116 thru 117	ICAO Code (2)	5.14
118	Section Code (1)	5.4
119	Subsection Code (1)	5.5
120 thru 122	Intermediate Distance (ATD) (3)	5.231
123	Fix Related Transition Code (1)	5.241
124 thru 128	File Record Number (5)	5.31
129 thru 132	Cycle Date (4)	5.32

4.1.27.3 Flight Planning Continuation Records

Column	Field Name (Length)	Reference
1 thru 69	Fields as on Primary Records	
70	Continuation Number (1)	5.16
71	Application Type (1)	5.91
72	Time Code (1)	5.131
73	Time Indicator (1)	5.138
74 thru 83	Time of Operation (10)	5.195
84 thru 93	Time of Operation (10)	5.195
94 thru 103	Time of Operation (10)	5.195
104 thru 113	Time of Operation (10)	5.195
114 thru 123	Time of Operation (10)	5.195
124 thru 128	File Record Number (5)	5.31
129 thru 132	Cycle Date (4)	5.32

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Note: Record 4.1.27.4 would carry Time of Operation in note form starting with column 74 and ending in column 123, where required.

4.1.28 Airport SBAS Path Point Records (PP)

This file will contain Path Point Records. See Section 5.7 for details.

4.1.28.1 Airport SBAS Path Point Primary Records

Column	Field Name (Length)	Reference
1	Record Type (1)	5.2
2 thru 4	Customer/Area Code (3)	5.3
5	Section Code (1)	5.4
6	Blank (1)	
7 thru 10	*Airport Identifier (4)	5.6
11 thru 12	ICAO Code (2)	5.14
13	Subsection Code (1)	5.5
14 thru 19	Approach Procedure Ident (6)	5.10
20 thru 24	*Runway Identifier or Final Approach Course as Runway (5)	5.46 or 5.300
25 thru 26	*Operation Type (2)	5.223
27	Continuation Record Number (1)	5.16
28	*Route Indicator (1)	5.224
29 thru 30	*SBAS Service Provider Identifier (2)	5.255
31 thru 32	*Reference Path Data Selector (2)	5.256
33 thru 36	*Reference Path Identifier (4)	5.257
37	*Approach Performance Designator (1)	5.258
38 thru 48	*Landing Threshold Point Latitude (11)	5.267
49 thru 60	*Landing Threshold Point Longitude (12)	5.268
61 thru 66	*(LTP) Ellipsoid Height (6)	5.225
67 thru 70	*Glide Path Angle (4)	5.226
71 thru 81	*Flight Path Alignment Point Latitude (11)	5.267
82 thru 93	*Flight Path Alignment Point Longitude (12)	5.268
94 thru 98	*Course Width at Threshold (5)	5.228
99 thru 102	*Length Offset (4)	5.259
103 thru 108	*Path Point TCH (6)	5.265
109	*TCH Units Indicator (1)	5.266
110 thru 112	*HAL (3)	5.263
113 thru 115	*VAL (3)	5.264
116 thru 123	SBAS FAS Data CRC Remainder (8)	5.229
124 thru 128	File Record Number (5)	5.31
129 thru 132	Cycle Date (4)	5.32

Note 1: In the Path Point Record description, the field prefixed with * in the Field Name are those columns that have been determined as required for the data wrap for CRC calculations

Note 2: In order to properly convert values and binary pack these fields for the CRC data wrap, refer to RTCA DO-229 Minimum Operational Performance Standards for Global Positioning System/Wide Area Augmentation System

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Airborne Equipment for Final Approach Segment (FAS) Data Block CRC standards.

4.1.28.2 Path Point Continuation Records

Column	Field Name (Length)	Reference
1 thru 26	Fields as on Primary Record Type	
27	Continuation Record Number (1)	5.16
28	Application Type (1)	5.91
29 thru 34	(FPAP) Ellipsoid Height (6)	5.225
35 thru 40	(FPAP) Orthometric Height (6)	5.227
41 thru 46	(LTP) Orthometric Height (6)	5.227
47 thru 56	Approach Type Identifier (10)	5.262
57 thru 61	GBAS/SBAS Channel Number (5)	5.244
62 thru 65	**SBAS Final Approach Course (4)**	**5.320**
66 thru 123	Blank (Spacing) (58)	
124 thru 128	File Record Number (5)	5.31
129 thru 132	Cycle Date (4)	5.32

4.1.29 GLS Record (PT)

This record contains a sequential listing of all GNSS Landing Systems (GLS) approaches, including the slope, course, and reference path idents of the GLS approach. A GLS approach is identified by its ident and channel. Note that several GLS approaches can be supported by a single differential **GBAS** ground station.

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4.1.29.1 GLS Primary Records

Column	Field Name (Length)	Reference
1	Record Type (1)	5.2
2 thru 4	Customer/Area Code (3)	5.3
5	Section Code (1)	5.4
6	Blank (1)	
7 thru 10	Airport or Heliport Identifier (4)	5.6
11 thru 12	ICAO Code (2)	5.14
13	Subsection code (1)	5.5
14 thru 17	GLS Ref Path Identifier (4)	5.44
18	GLS Category (1)	5.80
19 thru 21	Blank (3)	
22	Continuation Number (1)	5.16
23 thru 27	GBAS/SBAS Channel (5)	5.244
28 thru 32	Runway or Helipad Identifier (5)	5.46 or 5.180
33 thru 51	Blank (19)	
52 thru 55	GLS Approach Bearing (4)	5.47 Note 1
56 thru 64	Station Latitude (9)	5.36
65 thru 74	Station Longitude (10)	5.37
75 thru 78	GLS Station ident (4)	5.243
79 thru 83	Blank (5)	
84 thru 85	Service Volume Radius (2)	5.245
86 thru 87	TDMA Slots (2)	5.246
88 thru 90	GLS Approach Slope (3)	5.52
91 thru 95	Magnetic Variation (5)	5.39
96 thru 97	Reserved (2)	
98 thru 102	Station Elevation (5)	5.74
103 thru 105	Datum Code (3)	5.197
106 thru 108	Station Type (3)	5.247
109 thru 110	Blank (2)	
111 thru 115	Station Elevation WGS 84 (5)	5.248
116 thru 118	Glide Path TCH (3)	5.67
119 thru 123	Blank (4)	
124 thru 128	File Record Number (5)	5.31
129 thru 132	Cycle Date (4)	5.32

Note 1: GLS reference point should be equal to IFR landing threshold position, as it is the trajectory reference point.

Note 2: All the latitudes/longitudes of the record refer to the same datum code.

4.1.29.2 GLS Continuation Records

Column	Field Name (Length)	Reference
1 thru 21	Fields as on Primary Records	
22	Continuation Record No. (1)	5.16
23	Application Type (1)	5.91
24 thru 123	Reserved (Expansion) (100)	
124 thru 128	File Record No. (5)	5.31
129 thru 132	Cycle Date (4)	5.32

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4.1.30 Alternate Record (RA)

The Alternate Record file contains a listing of up to six Alternate Airport Identifiers or, up to six Alternate Company Route Identifiers or any combination of Alternate Airport or Alternate Route Identifiers for a given departure airport, destination airport or enroute fix. The data content of the record is customer defined.

4.1.30.1 Alternate Primary Records

Column	Field Name (Length)	Reference
1	Record Type (1)	5.2
2 thru 4	Customer/Area Code (3)	5.3
5	Section Code (1)	5.4
6	Subsection Code (1)	5.5
7 thru 11	Alternate Related Airport or Fix (5)	5.75
12 thru 13	Alternate Related ICAO Code (2)	5.14
14	Alternate Related Section Code (1)	5.4
15	Alternate Related Subsection Code (1)	5.5
16 thru 17	Alternate Record Type (2)	5.250
18 thru 19	Blank (Spacing) (2)	
20 thru 22	Distance to Alternate (3)	5.251
23	Alternate Type (1)	5.252
24 thru 33	Primary Alternate Identifier (10)	5.253
34 thru 35	Blank (Spacing) (2)	
36 thru 38	Distance to Alternate (3)	5.251
39	Alternate Type (1)	5.252
40 thru 49	Additional Alternate Identifier One (10)	5.253
50 thru 51	Blank (Spacing) (2)	
52 thru 54	Distance to Alternate (3)	5.251
55	Alternate Type (1)	5.252
56 thru 65	Additional Alternate Identifier Two (10)	5.253
66 thru 67	Blank (Spacing) (2)	
68 thru 70	Distance to Alternate (3)	5.251
71	Alternate Type (1)	5.252
72 thru 81	Additional Alternate Identifier Three (10)	5.253
82 thru 83	Blank (Spacing) (2)	
84 thru 86	Distance to Alternate (3)	5.251
87	Alternate Type (1)	5.252
88 thru 97	Additional Alternate Identifier Four (10)	5.253
98 thru 99	Blank (Spacing) (2)	
100 thru 102	Distance to Alternate (3)	5.251
103	Alternate Type (1)	5.252
104 thru 113	Additional Alternate Identifier Five (10)	5.253
114 thru 123	Reserved (expansion) (10)	
124 thru 128	File Record Number (5)	5.31
129 thru 132	Cycle Date (4)	5.32

4.1.31 Airport TAA (PK)

The Airport Terminal Arrival Altitude (TAA) file contains details relating to TAA sectorization and sector altitudes.

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4.1.31.1 Airport TAA Primary Records (PK)

Column	Field Name (Length)	Reference
1	Record Type (1)	5.2
2 thru 4	Customer/Area Code (3)	5.3
5	Section Code (1)	5.4
6	Blank (Spacing) (1)	
7 thru 10	Airport Identifier (4)	5.6
11 thru 12	ICAO Code (2)	5.14
13	Subsection Code (1)	5.5
14 thru 19	Approach Identifier (6)	5.10
20 thru 24	TAA Waypoint (5)	5.273
25 thru 26	ICAO Code (2)	5.14
27	Section Code (1)	5.4
28	Subsection Code (1)	5.5
29	TAA Fix Position Indicator (1)	5.272
30	Continuation Record No. (1)	5.16
31 thru 32	Blank (2)	
33 thru 38	Sector Bearing (6)	5.146
39 thru 41	Sector Minimum Altitude (3)	5.147
42 thru 45	Sector Radius 1 (4)	5.274
46	Procedure Turn Indicator (1)	5.271
47 thru 52	Sector Bearing (6)	5.146
53 thru 55	Sector Minimum Altitude (3)	5.147
56 thru 59	Sector Radius 1 (4)	5.274
60	Procedure Turn Indicator (1)	5.271
61 thru 66	Sector Bearing (6)	5.146
67 thru 69	Sector Minimum Altitude (3)	5.147
70 thru 73	Sector Radius 1 (4)	5.274
74	Procedure Turn Indicator (1)	5.271
75 thru 80	Sector Bearing (6)	5.146
81 thru 83	Sector Minimum Altitude (3)	5.147
84 thru 87	Sector Radius 1 (4)	5.274
88	Procedure Turn Indicator (1)	5.271
89 thru 94	Sector Bearing (6)	5.146
95 thru 101	Sector Radius 1 (4)	5.274
102	Procedure Turn Indicator (1)	5.271
103 thru 107	Sector Bearing Reference Waypoint (5)	5.304
108 thru 109	ICAO Code (2)	5.14
110	Section Code (1)	5.4
111	Subsection Code (1)	5.5
112 thru 116	Blank (5)	
117	Procedure Design Aircraft Category or Type (1)	5.301
118	Approach Route Qualifier 1 (1)	5.7
119	Approach Route Qualifier 2 (1)	5.7
120	Mag/True Indicator (1)	5.165
121 thru 123	Blank (Spacing) (3)	
124 thru 128	File Record No. (5)	5.31
129 thru 132	Cycle Date (4)	5.32

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4.1.31.2 Airport Terminal Arrival Altitude Continuation Records (PK)

Column	Field Name (Length)	Reference
1 thru 30	Fields as on Primary Records	
31	Application Type (1)	5.91
32	Blank (Spacing) (1)	
33 thru 38	Sector Bearing (6)	5.146
39 thru 41	Sector Minimum Altitude (3)	5.147
42 thru 45	Sector Radius 1 (4)	5.274
46	Procedure Turn Indicator (1)	5.271
47 thru 52	Sector Bearing (6)	5.146
53 thru 55	Sector Minimum Altitude (3)	5.147
56 thru 59	Sector Radius 1 (4)	5.274
60	Procedure Turn Indicator (1)	5.271
61 thru 66	Sector Bearing (6)	5.146
67 thru 69	Sector Minimum Altitude (3)	5.147
70 thru 73	Sector Radius 1 (4)	5.274
74	Procedure Turn Indicator (1)	5.271
75 thru 80	Sector Bearing (6)	5.146
81 thru 83	Sector Minimum Altitude (3)	5.147
84 thru 87	Sector Radius 1 (4)	5.274
88	Procedure Turn Indicator (1)	5.271
89 thru 109	Notes (21)	5.61
110 thru 116	Reserved (Expansion) (7)	
117	Procedure Design Aircraft Category or Type (1)	5.301
118	Approach Route Qualifier 1 (1)	5.7
119	Approach Route Qualifier 2 (1)	5.7
120 thru 123	Blank (4)	
124 thru 128	File Record No. (5)	5.31
129 thru 132	Cycle Date (4)	5.32

4.1.32 TACAN-Only NAVAID Record (DT)

The TACAN-only NAVAID file contains TACAN stations with a duplicate identifier (same ident and ICAO Code) navaid in the VHF Navaid (D) file.

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4.1.32.1 TACAN-Only NAVAID Primary Records

Column	Field Name (Length)	Reference
1	Record Type (1)	5.2
2 thru 4	Customer/Area Code (3)	5.3
5	Section Code (1)	5.4
6	Subsection Code (1)	5.5
7 thru 10	Airport Identifier (4)	5.6
11 thru 12	ICAO Code (2)	5.14
13	Blank (Spacing) (1)	
14 thru 17	VOR Identifier (4)	5.33
18 thru 21	Blank (Spacing) (4)	
22	Continuation Record No. (1)	5.16
23 thru 27	VOR Frequency (5)	5.34
28 thru 32	NAVAID Class (5)	5.35
33 thru 51	Blank (Spacing) (19)	
52 thru 55	TACAN Ident (4)	5.38
56 thru 64	TACAN Latitude (9)	5.36
65 thru 74	TACAN Longitude (10)	5.37
75 thru79	Station Declination (5)	5.66
80 thru 84	TACAN Elevation (5)	5.40
85	Figure of Merit (1)	5.149
86 thru 87	Blank (Spacing) (2)	
88 thru 90	Frequency Protection (3)	5.150
91 thru 93	Datum Code (3)	5.197
94 thru 123	TACAN Name (30)	5.71
124 thru 128	File Record No. (5)	5.31
129 thru 132	Cycle Date (4)	5.32

4.1.32.2 TACAN-Only NAVAID Continuation Records

Column	Field Name (Length)	Reference
1 thru 21	Fields as on Primary Records	
22	Continuation Record No. (1)	5.16
23	Application Type (1)	5.91
24 thru 92	Notes (69)	5.61
93 thru 123	Reserved (Expansion) (31)	
124 thru 128	File Record No. (5)	5.31
129 thru 132	Cycle Date (4)	5.32

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4.1.32.3 TACAN-Only NAVAID Simulation Continuation Records

Column	Field Name (Length)	Reference
1 thru 21	Fields as on Primary Records	
22	Continuation Record No. (1)	5.16
23	Application Type (1)	5.91
24 thru 27	Blank (Spacing) (4)	
28 thru 32	Facility Characteristics (5)	5.93
33 thru 74	Reserved (Spacing) (42)	
75 thru 79	Magnetic Variation (5)	5.39
80 thru 84	Facility Elevation (5)	5.92
85 thru 123	Reserved (Expansion) (39)	
124 thru 128	File Record No. (5)	5.31
129 thru 132	Cycle Date (4)	5.32

4.1.32.4 TACAN-Only NAVAID Flight Planning Continuation Records

This Continuation Record is used to indicate the FIR and UIR within which the VHF NAVAID defined in the Primary Record is located and the Start/End validity dates/times of the Primary Record.

Column	Field Name (Length)	Reference
1 thru 21	Fields as on Primary Records	
22	Continuation Record No. (1)	5.16
23	Application Type (1)	5.91
24 thru 27	FIR Identifier (4)	5.116
28 thru 31	UIR Identifier (4)	5.116
32	Start/End Indicator (1)	5.152
33 thru 43	Blank (Spacing) (11)	
44 thru 123	Reserved (Expansion) (80)	
124 thru 128	File Record No. (5)	5.31
129 thru 132	Cycle Date (4)	5.32

4.1.32.5 TACAN-Only NAVAID Limitation Continuation Record

This Continuation Record is used to provide details on signal limitations of the TACAN-Only Navaid contained in the Primary Record Section 4.1.32.1. Note that multiple records formatted as in Section 4.1.32.5 may be included for a single Primary Record. As Service Volume or Designated Operational Coverage may also be considered limitations, this information is also provided for each navaid listed in the Primary Records, where such information is available.

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Column	Field Name (Length)	Reference
1 thru 21	Fields as on Primary Records	
22	Continuation Record No. (1)	5.16
23	Application Type (1)	5.91
24	Navaid Limitation Code (1)	5.205
25	Component Affected Indicator (1)	5.206
26 thru 27	Sequence Number (2)	5.12
28 thru 29	Sector From/Sector To (2)	5.207
30	Distance Description (1)	5.187
31 thru 36	Distance Limitation (6)	5.208
37	Altitude Description (1)	5.29
38 thru 43	Altitude Limitation (6)	5.209
44 thru 45	Sector From/Sector To (2)	5.207
46	Distance Description (1)	5.187
47 thru 52	Distance Limitation (6)	5.208
53	Altitude Description (1)	5.29
54 thru 59	Altitude Limitation (6)	5.209
60 thru 61	Sector From/Sector To (2)	5.207
62	Distance Description (1)	5.187
63 thru 68	Distance Limitation (6)	5.208
69	Altitude Description (1)	5.29
70 thru 75	Altitude Limitation (6)	5.209
76 thru 77	Sector From/Sector To (2)	5.207
78	Distance Description (1)	5.187
79 thru 84	Distance Limitation (6)	5.208
85	Altitude Description (1)	5.29
86 thru 91	Altitude Limitation (6)	5.209
92 thru 93	Sector From/Sector To (2)	5.207
94	Distance Description (1)	5.187
95 thru 100	Distance Limitation (6)	5.208
101	Altitude Description (1)	5.29
102 thru 107	Altitude Limitation (6)	5.209
108	Sequence End Indicator (1)	5.210
109 thru 123	Blank (Spacing) (15)	
124 thru 128	File Record No. (5)	5.31
129 thru 132	Cycle Date (4)	5.32

4.1.33 Special Activity Area (ES)

The Special Activity Area (SAA) file contains details relating to operation that could be hazardous to aeronautical navigation around a specified location.

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4.1.33.1 Special Activity Area Primary Record

Column	Field Name (Length)	Reference
1	Record Type (1)	5.2
2 thru 4	Customer /Area Code (3)	5.3
5	Section Code (1)	5.4
6	Subsection Code (1)	5.5
7	SAA Type (1)	5.278
8 thru 13	SAA Identifier (6)	5.279
14 thru 15	ICAO Code (2)	5.14
16 thru19	Airport Identifier (4)	5.6
20 thru 21	ICAO Code (2)	5.14
22	Continuation Record No. (1)	5.16
23	Blank (Spacing) (1)	
24 thru 32	Latitude (9)	5.36
33 thru 42	Longitude (10)	5.37
43 thru 45	SAA Size (3)	5.280
46 thru 51	Upper Limit (5)	5.121
52	Unit Indicator (1)	5.133
53	SAA Volume (1)	5.281
54 thru 56	Operating Times (3)	5.282
57	Public or Military (1)	5.177
58	Blank (Spacing) (1)	
59 thru 83	Controlling Agency (25)	5.140
84 thru 86	Communicating Type (3)	5.101
87 thru 93	Communication Frequency (7)	5.103
94 thru 123	Special Activity Area Name (30)	5.126
124 thru 128	File Record No. (5)	5.31
129 thru 132	Cycle Date (4)	5.32

4.1.34 Communication Type Translation (TV)

Column	Field Name (Length)	Reference
1	Record Type (1)	5.3
2 thru 4	Reserved (3)	
5	Section (1)	5.4
6	Subsection (1)	5.5
7 thru 9	Communication Type (3)	5.101
10	Type Recognized By (1)	5.287
11 thru 90	Translation (80)	5.288
91	Used On (1)	5.289
92 thru 95	Communication Class (4)	5.283
96 thru 123	Blank (Spacing) (28)	
124 thru 128	File Record Number (1)	5.31
129 thru 132	Cycle Date (1)	5.32

4.1.35 GBAS Path Point Record (PQ)

This file will contain Path Point records for GLS Approach Procedures.

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4.1.35.1 GBAS Path Point Primary Records

Column	Field Name (Length)	Reference
1	Record Type (1)	5.2
2 thru 4	Customer/Area Code (3)	5.3
5	Section Code (1)	5.4
6	Blank (1)	
7 thru 10	*Airport or Heliport Identifier (4)	5.6
11 thru 12	ICAO Code (2)	5.14
13	Subsection Code (1)	5.5
14 thru 19	Approach Procedure Ident (6)	5.10
20 thru 24	*Runway Identifier or Final Approach Course as Runway (5)	5.46 or 5.300
25 thru 26	*Operations Type (2)	5.223
27	Continuation Record Number (1)	5.16
28	*Route Indicator (1)	5.224
29 thru 30	*SBAS Service Provider (2)	5.255 Note 3
31 thru 32	*Reference Path Data Selector (2)	5.256
33 thru 36	*Reference Path Identifier (4)	5.257
37	*Approach Performance Designator (1)	5.258
38 thru 48	*Landing Threshold Point Latitude (11)	5.267
49 thru 60	*Landing Threshold Point Longitude (12)	5.268
61 thru 66	*(LTP) Ellipsoid Height (6)	5.225
67 thru 70	*Glide Path Angle (4)	5.226
71 thru 81	*Flight Path Alignment Point Latitude (11)	5.267
82 thru 93	*Flight Path Alignment Point Longitude (12)	5.268
94 thru 98	*Course Width at Threshold (5)	5.228
99 thru 102	*Length Offset (4)	5.259
103 thru 108	*Path Point TCH (6)	5.265
109	*TCH Units Indicator (1)	5.266
110 thru 115	Blank (Spacing) (6)	
116 thru 123	GBAS FAS Data CRC Remainder (8)	5.229
124 thru 128	File Record Number (5)	5.31
129 thru 132	Cycle Date (4)	5.32

Note 1: In the GBAS Path Point Record description, the fields prefixed with * in the Field Name are those columns that have been determined as required for the data wrap for CRC calculations.

Note 2: In order to properly convert values and binary pack these fields for the CRC data wrap, refer to RTCA DO-246 GNSS Based Precision Approach Local Area Augmentation System (LAAS) – Signal-in-Space Interface Control Document (ICD) for Final Approach Segment (FAS) Data Block CRC standards.

Note 3: SBAS Service Provider: this field is used by SBAS equipment to associate the data with an SBAS service provider. This field has no application for GBAS and should be ignored – except for the CRC calculations – in a GBAS application.

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4.1.35.2 GBAS Path Point Continuation Records

Column	Field Name (Length)	Reference
1 thru 26	Fields as on Primary Record Type	
27	Continuation Record Number (1)	5.16
28	Application Type (1)	5.91
29 thru 34	(FPAP) Ellipsoid Height (6)	5.225
35 thru 40	(FPAP) Orthometric Height (6)	5.227
41 thru 46	(LTP) Orthometric Height (6)	5.227
47 thru 56	Approach Type Identifier (10)	5.262
57 thru 61	GBAS/SBAS Channel Number (5)	5.244
62 thru 123	Blank (Spacing) (65)	
124 thru 128	File Record Number (5)	5.31
129 thru 132	Cycle Date (4)	5.32

4.1.36 Airport Helipad Record (PH)

This file will contain a listing of all helipads associated with airports.

4.1.36.1 Airport Helipad Primary Records

Column	Field Name (Length)	Reference
1	Record Type (1)	5.2
2 thru 4	Customer/Area Code (3)	5.3
5	Section Code (1)	5.4
6	Blank (Spacing) (1)	
7 thru 10	Airport or Heliport Identifier (4)	5.6
11 thru 12	ICAO Code (2)	5.14
13	Subsection Code (1)	5.5
14 thru 18	Helipad Identifier (5)	5.180
19 thru 21	Blank (Spacing) (3)	
22	Continuation Record No. (1)	5.16
23	Helipad Shape (1)	5.303
24 thru 31	Helipad Dimension (8)	5.176
32	Reserved (Expansion) (1)	
33 thru 41	Helipad Latitude (9)	5.36
42 thru 51	Helipad Longitude (10)	5.37
52	Helipad Surface Code (1)	5.249
53 thru 56	Helipad Surface Type (4)	5.302
57 thru 59	Max Allowable Helicopter Weight (3)	5.309
60	Helicopter Performance Requirement (1)	5.310
61 thru 65	Reserved (Expansion) (5)	
66 thru 70	Helipad Elevation (5)	5.68
71 thru 123	Reserved (Expansion) (53)	
124 thru 128	File record No. (5)	5.31
129 thru 132	Cycle Date (4)	5.32

4.2 Master Helicopter User File (HA)

This section contains record information unique to helicopter operations. In addition to the records identified in this section, records identified in Section 4.1, Master Airline User File, are used in the Master Helicopter User File.

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4.2.1 Heliport Records (HA)

This file will contain heliport information.

4.2.1.1 Heliport Primary Records

Column	Field Name (Length)	Reference
1	Record Type (1)	5.2
2 thru 4	Customer/Area Code (3)	5.3
5	Section Code (1)	5.4
6	Blank (Spacing) (1)	
7 thru 10	Heliport Identifier (4)	5.6
11 thru 12	ICAO Code (2)	5.14
13	Subsection Code (1)	5.5
14 thru 16	ATA/IATA Designator (3)	5.107
17 thru 18	Reserved (Expansion) (2)	
19 thru 21	Blank (Spacing) (3)	
22	Continuation Record No. (1)	5.16
23 thru 27	Speed Limit Altitude (5)	5.73
28 thru 30	Datum Code (3)	5.197
31	IFR Capability (1)	5.108
32	Heliport Type	5.305
33 thru 41	Heliport Reference Point Latitude (9)	5.36
42 thru 51	Heliport Reference Point Longitude (10)	5.37
52 thru 56	Magnetic Variation (5)	5.39
57 thru 61	Heliport Elevation (5)	5.55
62 thru 64	Speed Limit (3)	5.72
65 thru 68	Recommended Navaid (4)	5.23
69 thru 70	ICAO Code (2)	5.14
71 thru 75	Transition Altitude (5)	5.53
76 thru 80	Transition Level (5)	5.53
81	Public Military Indicator (1)	5.177
82 thru 84	Time Zone (3)	5.178
85	Daylight Indicator (1)	5.179
86 thru 91	Reserved Expansion (6)	
92	Magnetic/True Indicator (1)	5.165
93	Reserved (Expansion) (1)	
94 thru 123	Heliport Name (30)	5.71
124 thru 128	File Record No. (5)	5.31
129 thru 132	Cycle Date (4)	5.32

4.2.1.2 Heliport Continuation Records

Column	Field Name (Length)	Reference
1 thru 21	Fields as on Primary Records	
22	Continuation Record No. (1)	5.16
23	Application Type (1)	5.91
24 thru 92	Notes (69)	5.61
93 thru 123	Reserved (Expansion) (31)	
124 thru 128	File Record No. (5)	5.31
129 thru 132	Cycle Date (4)	5.32

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4.2.1.3 Heliport Flight Planning Continuation Records

This Continuation Record is used to indicate the FIR and UIR within which the Heliport defined in the Primary Record is located, and to provide an indication if the Heliport defined in the Primary Record is associated with Controlled Airspace.

Column	Field Name (Length)	Reference
1 thru 21	Fields as on Primary Records	
22	Continuation Record Number (1)	5.16
23	Application Type (1)	5.91
24 thru 27	FIR Identifier (4)	5.116
28 thru 31	UIR Identifier (4)	5.116
32 thru 66	Blank (Spacing) (35)	
67	Controlled Airspace Indicator (1)	5.217
68 thru 71	Controlled Airspace Airport Identifier (4)	5.6
72 thru 73	Controlled Airspace Airport ICAO (2)	5.14
74	Heliport Type	5.305
73 thru 123	Blank (Spacing) (49)	
124 thru 128	File Record Number (5)	5.31
129 thru 132	Cycle Date (4)	5.32

4.2.1.4 Heliport Flight Planning Continuation Records

Deleted by Supplement 19.

4.2.2 Heliport Terminal Waypoint Records (HC)

The Heliport Terminal Waypoint file contains all terminal waypoints and VFR waypoint within the geographical area of each heliport. Heliport Terminal Waypoints utilized by two or more heliports will be stored in the Enroute Waypoint file to eliminate duplication. Terminal Waypoints used jointly by an airport and a heliport are also stored in the Enroute waypoint file.

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4.2.2.1 Heliport Terminal Waypoint Primary Records

Column	Field Name (Length)	Reference
1	Record Type (1)	5.2
2 thru 4	Customer/Area Code (3)	5.3
5	Section Code (1)	5.4
6	Blank (Spacing) (1)	
7 thru 10	Heliport Identifier (4)	5.6
11 thru 12	ICAO Code (2)	5.14
13	Subsection Code (1)	5.5
14 thru 18	Waypoint Identifier (5)	5.13
19	Blank (Spacing) (1)	
20 thru 21	ICAO Code (2)	5.14
22	Continuation Record Number (1)	5.16
23 thru 26	Blank (Spacing) (4)	
27 thru 29	Waypoint Type (3)	5.42
30	Reserved (1)	
31	Waypoint Usage (1)	5.82
32	Blank (Spacing) (1)	
33 thru 41	Waypoint Latitude (9)	5.36
42 thru 51	Waypoint Longitude (10)	5.37
52 thru 74	Blank (Spacing) (23)	
75 thru 79	Dynamic Magnetic Variation (5)	5.39
80 thru 84	Reserved (Expansion) (5)	
85 thru 87	Datum Code (3)	5.197
88 thru 95	Reserved (Expansion) (8)	
96 thru 98	Name Format Indicator (3)	5.196
99 thru 123	Waypoint Name/Description (25)	5.43
124 thru 128	File Record Number (5)	5.31
129 thru 132	Cycle Date (4)	5.32

4.2.2.2 Heliport Terminal Waypoint Continuation Records

Column	Field Name (Length)	Reference
1 thru 21	Fields as on Primary Records	
22	Continuation Record Number (1)	5.16
23	Application Type) (1)	5.91
24 thru 92	Notes (69)	5.61
93 thru 123	Reserved (Expansion) (31)	
124 thru 128	File Record Number (5)	5.31
129 thru 132	Cycle Date (4)	5.32

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4.2.2.3 Heliport Terminal Waypoint Flight Planning Continuation Records

This Continuation Record is used to indicate the FIR and UIR within which the Waypoint defined in the Primary Records is located.

Column	Field Name (Length)	Reference
1 thru 21	Fields as on Primary Records	
22	Continuation Record Number (1)	5.16
23	Application Type (1)	5.91
24 thru 27	FIR Identifier (4)	5.116
28 thru 31	UIR Identifier (4)	5.116
32 thru 43	Blank (Spacing) (12)	
44 thru 123	Reserved (Expansion) (80)	
124 thru 128	File Record Number (5)	5.31
129 thru 132	Cycle Date (4)	5.32

4.2.2.4 Heliport Terminal Waypoint Flight Planning Continuation Records

Deleted by Supplement 19.

4.2.3 Heliport SID/STAR/Approach (HD/HE/HF)

Heliport SIDs, STARs, and Approach Procedures are contained in three separate section/subsection groupings, using this single record format. Section/Subsection HD contains a sequential listing of those published Heliport Standard Instrument Departures that can be encoded according to this specification. Section/Subsection HE contains a sequential list of those published Heliport Standard Terminal Arrival Routes that can be encoded according to this specification. Section/Subsection HF contains a sequential listing of those published Heliport Standard Instrument Approach Procedures that can be encoded according to this specification.

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4.2.3.1 Heliport SID/STAR/Approach Primary Records

Column	Field Name (Length)	Reference
1	Record Type (1)	5.2
2 thru 4	Customer/Area Code (3)	5.3
5	Section Code (1)	5.4
6	Blank (Spacing) (1)	
7 thru 10	Heliport Identifier (4)	5.6
11 thru 12	ICAO Code (2)	5.14
13	Subsection Code (1)	5.5
14 thru 19	SID/STAR/APP Identifier (6)	5.9, 5.10 Note 1
20	Route Type (1)	5.7
21 thru 25	Transition Identifier (5)	5.11
26	Procedure Design Aircraft Category or Type	5.301
27 thru 29	Sequence Number (3)	5.12
30 thru 34	Fix Identifier (5)	5.13
35 thru 36	ICAO Code (2)	5.14
37	Section Code (1)	5.4
38	Subsection Code (1)	5.5
39	Continuation Record Number (1)	5.16
40 thru 43	Waypoint Description Code (4)	5.17
44	Turn Direction (1)	5.20
45 thru 47	RNP (3)	5.211 **Note 4**
48 thru 49	Path and Termination (2)	5.21
50	Turn Direction Valid (1)	5.22
51 thru 54	Recommended Navaid (4)	5.23
55 thru 56	ICAO Code (2)	5.14
57 thru 62	ARC Radius (6)	5.204
63 thru 66	Theta (4)	5.24
67 thru 70	Rho (4)	5.25
71 thru 74	Magnetic Course (4)	5.26
75 thru 78	Route Distance/Holding Distance or Time (4)	5.27
79	Recommended Navaid Section (1)	5.4
80	Recommended Navaid Subsection (1)	5.5
81	Inbound/Outbound Indicator (1)	5.298
82	Reserved (Spacing) (1)	
83	Altitude Description (1)	5.29
84	ATC Indicator (1)	5.81
85 thru 89	Altitude (5)	5.30
90 thru 94	Altitude (5)	5.30
95 thru 99	Transition Altitude (5)	5.53
100 thru 102	Speed Limit (3)	5.72
103 thru 106	Vertical Angle (4)	5.70
107 thru 111	Center Fix or TAA Procedure Turn Indicator (5)	5.144 or 5.271
112	Multiple Code or TAA, Sector Identifier (1)	5.130 or 5.272
113 thru 114	ICAO Code (2)	5.14 **Note 3**
115	Section Code (1)	5.4 **Note 3**
116	Subsection Code (1)	5.5 **Note 3**
117	GNSS/FMS Indicator (1)	5.222
118	Speed Limit Description (1)	5.261
119	Route Qualifier 1 (1)	5.7 **Note 2**
120	Route Qualifier 2 (1)	5.7 **Note 2**
121	**Route** Qualifier **3 (1)**	**5.7** **Note 2**
122	Preferred Multiple Approach Indicator (1)	5.306
123	Reserved (Expansion) (1)	
124 thru 128	File Record Number (5)	5.31
129 thru 132	Cycle Date (4)	5.32

Note 1: For approach route idents including Multiple Indicators, see Section 5.10.

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Note 2: Columns 119 **thru** 121 (Route Qualifier 1**, 2,** and **3**) are required to match the Primary Record to the Continuation Record(s). This non-standard column sorting sequence was selected to preserve the Primary Record Layout for SID/STAR/**Approach** Records as much as possible as these new fields were introduced in Supplement 14.

Note 3: When columns 107 thru 116 are providing a reference to a MSA or the center fix for an RF leg, all of the columns are used. When they are providing a reference to a TAA, only columns 107 thru 112 are used and 113 thru 116 are blank.

Note 4: If there is only one set of RNP criteria for the RNAV procedure, that criteria is provided in the RNP value field for Primary Record. Otherwise, the Primary Record contains one consistent set of RNP values for the least restrictive RNAV operating criteria and not a mix of RNP values for different RNP operating criteria.

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4.2.3.2 Heliport SID/STAR/Approach Primary Extension Continuation Records

Column	Field Name (Length)	Reference	
1 thru 38	Fields as on Primary Records		
39	Continuation Record Number (1)	5.16	
40	Application Type (1)	5.91	
41 thru 43	Procedure TCH (3)	5.67	
44 thru 60	Blank Spacing (17)		
61 thru 65	Procedure Design Mag Var (5)	5.39	Note 2
66	Procedure Design Mag Var Indicator (1)	5.291	Note 2
67 thru 71	Procedure Referenced Fix Ident (5)	5.299	Note 3
72 thru 73	ICAO Code (2)	5.14	
74	Section Code	5.4	
75	Subsection Code	5.5	
76 thru 80	Procedure Referenced Fix Ident (5)	5.299	Note 3
81 thru 82	ICAO Code (2)	5.14	
83	Section Code	5.4	
84	Subsection Code	5.5	
85 thru 89	Procedure Referenced Fix Ident (5)	5.299	Note 3
90 thru 91	ICAO Code (2)	5.14	
92	Section Code	5.4	
93	Subsection Code	5.5	
94 thru 98	Procedure Referenced Fix Ident (5)	5.299	Note 3
99 thru 100	ICAO Code (2)	5.14	
101	Section Code	5.4	
102	Subsection Code	5.5	
103 thru 104	CAT A Radii (2)	5.292	
105 thru 110	Reserved (6)		
111	Special Indicator	5.307	
112 thru 115	Reserved (4)		
116 thru 118	Vertical Scale Factor (3)	5.293	
119	Route Qualifier 1 (1)	5.7	Note 1
120	Route Qualifier 2 (1)	5.7	Note 1
121	**Route Qualifier 3 (1)**	**5.7**	**Note 1**
122 thru 123	Reserved (2)		
124 thru 128	File Record Number (5)	5.31	
129 thru 132	Cycle Date (4)	5.32	

Note 1: Columns 119 **thru** 121, (Approach Route Qualifier 1, **2,** and **3**) are required to match the Primary Record to the Continuation Record(s). This non-standard column sorting sequence was selected to preserve the Primary Record for SID/STAR/Approach Records as much as possible as these new fields were introduced in Supplement 14.

Note 2: When government source provides Procedure Design Mag Var at the procedure level, a single Primary Extension Continuation Record will be provided, associated to the first sequence in each transition and the Procedure Design Mag Var Indicator will be set to P. This is consistent with the intent of this continuation record. When government source provides Procedure Design Mag Var the leg level, a Primary

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Extension Continuation Record will be provided associated with each sequence of each transitions and the Procedure Design Mag Var Indicator will be set to L.

Note 3: When government source provided more than **four** Procedure Referenced Fix Ident, multiple Heliport SID/STAR/Approach Primary Extension Continuation Records will be provided.

4.2.3.3 Heliport SID/STAR/Approach Flight Planning Continuation Records

This Continuation Record is used to indicate the Leg Distance for each segment of the Route.

Column	Field Name (Length)	Reference
1 thru 38	Fields as on Primary Records	
39	Continuation Record Number (1)	5.16
40	Application Type (1)	5.91
41 thru 74	Blank (Spacing) (34)	
75 thru 78	Leg Distance (4)	5.260
79 thru **118**	Reserved (Expansion) (4**0**)	
119	**Route Qualifier 1 (1)**	**5.7 Note 1**
120	**Route Qualifier 2 (1)**	**5.7 Note 1**
121	**Route Qualifier 3 (1)**	**5.7 Note 1**
122 thru 123	**Blank (Spacing) (2)**	
124 thru 128	File Record Number (5)	5.31
129 thru 132	Cycle Date (4)	5.32

Note 1: Columns 119 thru 121 (Approach Route Qualifier 1, 2, and 3) are required to match the Primary Record to the Continuation Record(s). This non-standard column sorting sequence was selected to preserve the Primary Record for SID/STAR/Approach Records as much as possible as these new fields were introduced in Supplement 14.

4.2.3.4 Heliport SID/STAR/Approach Flight Planning Continuation Records

Deleted by Supplement 19.

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4.2.3.5 Heliport Procedure Data Continuation Record

The Heliport Procedure Data Continuation Record is used to provide Level of Service information for RNAV Approach Procedures. Level of Service and Authorization are based on source provided operating minimums as described in Sections 5.275, 5.276, and 5.296 of this document. This Continuation Record is provided once per procedure as a Continuation to Primary Approach Procedure Record that contains the encoding for Final Approach Fix (FAF) of the procedure.

Column	Field Name (Length)	Reference
1 thru 38	Fields as on Primary Record	
39	Continuation Record Number (1)	5.16
40	Application Type (1)	5.91
41	FAS Block Provided	5.276
42 thru 51	FAS Block Provided Level of Service Name (10)	5.275
52	LNAV/VNAV Authorized (1)	5.276
53 thru 62	LNAV/VNAV Level of Service Name (10)	5.275
63	LNAV Authorized (1)	5.276
64 thru 73	LNAV Level of Service Name (10)	5.275
74	Remote Altimeter Flag (1)	5.308
75 thru 88	Blank (Spacing) (14)	
89	RNP Authorized (1)	5.276
90 thru 92	RNP Level of Service value (3)	5.296
93	RNP Authorized (1)	5.276
94 thru 96	RNP Level of Service value (3)	5.296
97	RNP Authorized (1)	5.276
98 thru 100	RNP Level of Service value (3)	5.296
101	RNP Authorized (1)	5.276
102 thru 104	RNP Level of Service value (3)	5.296
105 thru 118	Blank (Spacing) (14)	
119	Route Qualifier 1 (1)	5.7 Note 1
120	Route Qualifier 2 (1)	5.7 Note 1
121	**Route Qualifier 3 (1)**	**5.7 Note 1**
122 thru 123	Blank (2)	
124 thru 128	File Record Number (5)	5.31
129 thru 132	Cycle Date (4)	5.32

Note 1: Columns 119 thru 121 (Approach Route Type Qualifiers 1, 2, and 3) are required to match the Primary Record to the Continuation Record(s). This non-standard column sorting sequence was selected to preserve the Primary Record for SID/STAR/Approach Records as much as possible as these new fields were introduced in Supplement 14.

4.2.4 Heliport MSA (HS)

The Heliport Minimum Sector Altitude (MSA) file contains details relating to available Sector Altitudes.

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4.2.4.1 Heliport MSA Primary Records

Column	Field Name (Length)	Reference
1	Record Type (1)	5.2
2 thru 4	Customer/Area Code (3)	5.3
5	Section Code (1)	5.4
6	Blank (Spacing) (1)	
7 thru 10	Heliport Identifier (4)	5.6
11 thru 12	ICAO Code (2)	5.14
13	Subsection Code (1)	5.5
14 thru 18	MSA Center (5)	5.144
19 thru 20	ICAO Code (2)	5.14
21	Section Code (1)	5.4
22	Subsection Code (1)	5.5
23	Multiple Code (1)	5.130
24 thru 38	Reserved (Expansion) (15)	
39	Continuation Record Number (1)	5.16
40 thru 42	Reserved (Spacing) (3)	
43 thru 48	Sector Bearing (6)	5.146
49 thru 51	Sector Altitude (3)	5.147
52 thru 53	Sector Radius (2)	5.145
54 thru 59	Sector Bearing (6)	5.146
60 thru 62	Sector Altitude (3)	5.147
63 thru 64	Sector Radius (2)	5.145
65 thru 70	Sector Bearing (6)	5.146
71 thru 73	Sector Altitude (3)	5.147
74 thru 75	Sector Radius (2)	5.145
76 thru 81	Sector Bearing (6)	5.146
82 thru 84	Sector Altitude (3)	5.147
85 thru 86	Sector Radius (2)	5.145
87 thru 92	Sector Bearing (6)	5.146
93 thru 95	Sector Altitude (3)	5.147
96 thru 97	Sector Radius (2)	5.145
98 thru103	Sector Bearing (6)	5.146
104 thru 106	Sector Altitude (3)	5.147
107 thru 108	Sector Radius (2)	5.145
109 thru 114	Sector Bearing (6)	5.146
115 thru 117	Sector Altitude (3)	5.147
118 thru119	Sector Radius (2)	5.145
120	Magnetic/True Indicator (1)	5.165
121 thru 123	Reserved (Expansion) (3)	
124 thru 128	File Record Number (5)	5.31
129 thru 132	Cycle Date (4)	5.32

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4.2.4.2 Heliport MSA Primary Record Extension

Column	Field Name (Length)	Reference
1 thru 38	Field as on Primary Records	
39	Continuation Record No. (1)	5.16
40	Application Type (1)	5.91
41 thru 42	Reserved (Spacing) (3)	
43 thru 48	Sector Bearing (6)	5.146
49 thru 51	Sector Altitude (3)	5.147
52 thru 53	Sector Radius (2)	5.145
54 thru 59	Sector Bearing (6)	5.146
60 thru 62	Sector Altitude (3)	5.147
63 thru 64	Sector Radius (2)	5.145
65 thru 70	Sector Bearing (6)	5.146
71 thru 73	Sector Altitude (3)	5.147
74 thru 75	Sector Radius (2)	5.145
76 thru 81	Sector Bearing (6)	5.146
82 thru 84	Sector Altitude (3)	5.147
85 thru 86	Sector Radius (2)	5.145
87 thru 92	Sector Bearing (6)	5.146
93 thru 95	Sector Altitude (3)	5.147
96 thru 97	Sector Radius (2)	5.145
98 thru 103	Sector Bearing (6)	5.146
104 thru 106	Sector Altitude (3)	5.147
107 thru 108	Sector Radius (2)	5.145
109 thru 114	Sector Bearing (6)	5.146
115 thru 117	Sector Altitude (3)	5.147
118 thru 119	Sector Radius (2)	5.145
120 thru 123	Field as on Primary Records	
124 thru 128	File Record No. (5)	5.31
129 thru 132	Cycle Date (4)	5.32

4.2.4.3 Heliport MSA Continuation Records

Column	Field Name (Length)	Reference
1 thru 38	Fields as on Primary Records	
39	Continuation Record Number (1)	5.16
40	Application Type (1)	5.91
41 thru 109	Notes (69)	5.61
110 thru 123	Reserved (Expansion) (14)	
124 thru 128	File Record Number (5)	5.31
129 thru 132	Cycle Date (4)	5.32

4.2.5 Heliport Communications Records (HV)

These files will contain Heliport Communications Facilities.

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4.2.5.1 Heliport Communications Primary Records

Column	Field Name (Length)	Reference
1	Record Type (1)	5.2
2 thru 4	Customer/Area Code (3)	5.3
5	Section Code (1)	5.4
6	Blank (Spacing) (1)	
7 thru 10	Heliport Identifier (4)	5.6
11 thru 12	ICAO Code (2)	5.14
13	Subsection Code (1)	5.5
14 thru 15	Blank (Spacing) (2)	
16 thru 19	Communication Class (4)	5.283
20 thru 21	Sequence Number (2)	5.12
22	Continuation Number (1)	5.16
23 thru 25	Communication Types (3)	5.101
26 thru 32	Transmit Frequency (7)	5.103
33 thru 39	Receive Frequency (7)	5.103
40	Frequency Units (1)	5.104
41	Radar Units (1)	5.102
42	H24 Indicator (1)	5.181
43 thru 67	Call Signs (25)	5.105
68	Multi-Sector Indicator (1)	5.286
69 thru 74	Sectorization (6)	5.183
75 thru 78	Sector Facility (4)	5.185
79 thru 80	ICAO (2)	5.14
81	Section Code (1)	5.4
82	Subsection Code (1)	5.5
83	Altitude Description Code (1)	5.29
84 thru 86	Communication Altitude 1 (3)	5.184
87 thru 89	Communication Altitude 2 (3)	5.184
90	Distance Description Code (1)	5.187
91 thru 92	Communication Distance (2)	5.188
93 thru 101	Transmitter Latitude (9)	5.36
102 thru 111	Transmitter Longitude (10)	5.37
112 thru 114	Service Indicator (3)	5.106
115	Modulation (1)	5.198
116	Signal Emission (2)	5.199
117 thru 123	Blank (Spacing) (7)	
124 thru 128	File Record Number (5)	5.31
129 thru 132	Cycle Date (4)	5.32

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4.2.5.2 Heliport Communications Continuation Records

Column	Field Name (Length)	Reference
1 thru 21	Fields as on Primary Records	
22	Continuation Record No. (1)	5.16
23	Application Type (1)	5.91
24 thru 27	Remote Facility	5.200
28 thru 29	ICAO (2)	5.14
30	Section (1)	5.4
31	Subsection (1)	5.5
32 thru 36	Transmitter Site Mag Var (5)	5.39
37 thru 41	Transmitter Site Elevation (5)	5.92
42 thru 47	Additional Sectorization 1 (6)	5.183
48	Additional Sectorization 1 Altitude Description (1)	5.29
49 thru 51	Additional Sectorization 1 Altitude 1 (3)	5.184
52 thru 54	Additional Sectorization 1 Altitude 2 (3)	5.184
55 thru 60	Additional Sectorization 2 (6)	5.183
61	Additional Sectorization 2 Altitude Description (1)	5.29
62 thru 64	Additional Sectorization 2 Altitude 1 (3)	5.184
65 thru 67	Additional Sectorization 2 Altitude 2 (3)	5.184
68	Time Code (1)	5.131
69	NOTAM (1)	5.132
70	Time Indicator (1)	5.138
71 thru 80	Time of Operation (10)	5.195
81 thru 90	Time of Operation (10)	5.195
91 thru 100	Time of Operation (10)	5.195
101 thru 110	Time of Operation (10)	5.195
111 thru 120	Time of Operation (10)	5.195
121 thru 123	Blank (Spacing) (3)	
124 thru 128	File Record No. (5)	5.31
129 thru 132	Cycle Date (4)	5.32

4.2.5.3 Heliport Communications Continuation Records

Column	Field Name (Length)	Reference
1 thru 21	Fields as on Primary Records	
22	Continuation Record No. (1)	5.16
23	Application Type (1)	5.91
24 thru 83	Sectorization Narrative (60)	5.186
84 thru 123	Reserved (Spacing) (40)	
124 thru 128	File Record No. (5)	5.31
129 thru 132	Cycle Date (4)	5.32

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4.2.5.4 Heliport Communications Continuation Records

Column	Field Name (Length)	Reference
1 thru 21	Fields as on Primary Records	
22	Continuation Record No. (1)	5.16
23	Application Type (1)	5.91
24 thru 69	Blank (Spacing) (46)	
70 thru 79	Time of Operation (10)	5.195
80 thru 89	Time of Operation (10)	5.195
90 thru 99	Time of Operation (10)	5.195
100 thru 109	Time of Operation (10)	5.195
110 thru 119	Time of Operation (10)	5.195
120 thru 123	Reserved (Expansion) (4)	
124 thru 128	File Record No. (5)	5.31
129 thru 132	Cycle Date (4)	5.32

4.2.5.5 Heliport Communications Continuation Records

Column	Field Name (Length)	Reference
1 thru 21	Field as on Primary Record	
22	Continuation Record Number (1)	5.16
23	Application Type (1)	5.91
24 thru 123	Time Narrative (100)	5.285
124 thru 128	File Record numbers (5)	5.31
129 thru 132	Cycle Date (4)	5.32

4.2.6 Heliport (TAA) (HK)

The Heliport Terminal Arrival Altitude (TAA) file contains details relating to TAA sectorization and sector altitudes.

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4.2.6.1 Heliport TAA Primary Records (HK)

Column	Field Name (Length)	Reference
1	Record Type (1)	5.2
2 thru 4	Customer/Area Code (3)	5.3
5	Section Code (1)	5.4
6	Blank (Spacing) (1)	
7 thru 10	Heliport Identifier (4)	5.6
11 thru 12	ICAO Code (2)	5.14
13	Subsection Code (1)	5.5
14 thru 19	Approach Identifier (6)	5.10
20 thru 24	TAA Waypoint (5)	5.273
25 thru 26	ICAO Code (2)	5.14
27	Section Code (1)	5.4
28	Subsection Code (1)	5.5
29	TAA Fix Position Indicator (1)	5.272
30	Continuation Record No. (1)	5.16
31 thru 32	Blank (Spacing) (2)	
33 thru 38	Sector Bearing (6)	5.146
39 thru 41	Sector Minimum Altitude (3)	5.147
42 thru 45	Sector Radius 1 (4)	5.274
46	Procedure Turn Indicator (1)	5.271
47 thru 52	Sector Bearing (6)	5.146
53 thru 55	Sector Minimum Altitude (3)	5.147
56 thru 59	Sector Radius 1 (4)	5.274
60	Procedure Turn Indicator (1)	5.271
61 thru 66	Sector Bearing (6)	5.146
67 thru 69	Sector Minimum Altitude (3)	5.147
70 thru 73	Sector Radius 1 (4)	5.274
74	Procedure Turn Indicator (1)	5.271
75 thru 80	Sector Bearing (6)	5.146
81 thru 83	Sector Minimum Altitude (3)	5.147
84 thru 87	Sector Radius 1 (4)	5.274
88	Procedure Turn Indicator (1)	5.271
89 thru 94	Sector Bearing (6)	5.146
95 thru 101	Sector Radius 1 (4)	5.274
102	Procedure Turn Indicator (1)	5.271
103 thru 107	Sector Bearing Reference Waypoint (5)	5.304
108 thru 109	ICAO Code (2)	5.14
110	Section Code (1)	5.4
111	Subsection Code (1)	5.5
112 thru 116	Blank (5)	
117	Procedure Design Aircraft Category or Type (1)	5.301
118	Approach Route Qualifier 1 (1)	5.7
119	Approach Route Qualifier 2 (1)	5.7
120	Mag/True Indicator (1)	5.165
121 thru 123	Blank (Spacing) (3)	
124 thru 128	File Record No. (5)	5.31
129 thru 132	Cycle Date (4)	5.32

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4.2.6.2 Heliport Terminal Arrival Altitude Continuation Records (HK)

Column	Field Name (Length)	Reference
1 thru 30	Fields as on Primary Records	
31	Users (1)	5.91
32	Blank (Spacing) (1)	
33 thru 38	Sector Bearing (6)	5.146
39 thru 41	Sector Minimum Altitude (3)	5.147
42 thru 45	Sector Radius 1 (4)	5.274
46	Procedure Turn Indicator (1)	5.271
47 thru 52	Sector Bearing (6)	5.146
53 thru 55	Sector Minimum Altitude (3)	5.147
56 thru 59	Sector Radius 1 (4)	5.274
60	Procedure Turn Indicator (1)	5.271
61 thru 66	Sector Bearing (6)	5.146
67 thru 69	Sector Minimum Altitude (3)	5.147
70 thru 73	Sector Radius 1 (4)	5.274
74	Procedure Turn Indicator (1)	5.271
75 thru 80	Sector Bearing (6)	5.146
81 thru 83	Sector Minimum Altitude (3)	5.147
84 thru 87	Sector Radius 1 (4)	5.274
88	Procedure Turn Indicator (1)	5.271
89 thru 109	Notes (21)	5.61
110 thru 116	Reserved (Expansion) (7)	
117	Procedure Design Aircraft Category or Type (1)	5.301
118	Approach Route Qualifier 1 (1)	5.7
119	Approach Route Qualifier 2 (1)	5.7
120 thru 123	Blank (4)	
124 thru 128	File Record No. (5)	5.31
129 thru 132	Cycle Date (4)	5.32

4.2.7 Helicopter Operations Company Route Records (RH)

This file contains company tailored route information for helicopter operations.

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4.2.7.1 Helicopter Operations Company Route Primary Records

Column	Field Name (Length)	Reference
1	Record Type (1)	5.2
2 thru 4	Customer (3)	5.3
5	Section Code (1)	5.4
6	Subsection Code (1)	5.5
7 thru 11	From Airport Heliport/Fix (5)	5.75
12 thru 16	Helipad Ident (5)	5.180
17	Blank (Spacing) (1)	
18 thru 19	ICAO Code (2)	5.14
20	Section Code (1)	5.4
21	Subsection Code (1)	5.5
22 thru 26	To Airport/Heliport/Fix (5)	5.75
27 thru 31	Helipad Ident (5)	5.180
32	Blank (Spacing) (1)	
33 thru 34	ICAO Code (2)	5.14
35	Section Code (1)	5.4
36	Subsection Code (1)	5.5
37 thru 46	Company Route ID (10)	5.76
47 thru 49	Sequence No. (3)	5.12
50 thru 52	VIA Code (3)	5.77
53 thru 58	SID/STAR/App/Awy (6)	5.78
59	Section Code (1)	5.4
60	Subsection Code (1)	5.5
61	SID/STAR/App/Awy Route Type (1)	5.7
62	S/S/A Route Type Qualifier 1 (1)	5.7
63	S/S/A Route Type Qualifier 2 (1)	5.7
64 thru 66	Area Code (3)	5.3
67 thru 72	To Fix (6)	5.83
73 thru 74	ICAO Code (2)	5.14
75	Section Code (1)	5.4
76	Subsection Code (1)	5.5
77 thru 81	Runway/Helipad Transition ID (5)	5.84
82 thru 86	Enroute Transition ID (5)	5.85
87	Reserved (1)	
88 thru 92	Cruise Altitude (5)	5.86
93 thru 96	Terminal/Alternate Heliport (4)	5.87
97 thru 98	ICAO Code (2)	5.14
99	Section Code (1)	5.4
100	Subsection Code (1)	5.5
101 thru 104	Alternate Distance (4)	5.88
105 thru 107	Cost Index (3)	5.89
108 thru 111	Enroute Alternate Heliport (4)	5.148
112 thru 123	Reserved (Expansion) (12)	
124 thru 128	File Record No. (5)	5.31
129 thru 132	Cycle Date (4)	5.32

Note 1: This Helicopter Operations Company Route Record is defined for use with rotor wing aircraft operating at airports using helicopter operations procedures to/from runways, at heliports and from/to helipads at airports. Heliports

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referenced will be in Section/Subsection HA. Terminal Procedures referenced will be in Section/Subsection PD/PE/PF for helicopter operations from/to runways at airports (Section/Subsection PG) or in Section/Subsection HD/HE/HF for helicopter operations from/to heliports or helipads at airports (Section/Subsection HA). For fixed wing Aircraft Company routes, see Section 4.1.12.

4.2.8 Helicopter Operations SBAS Path Point Records (HP)

This file will contain Helicopter Operations SBAS Path Point Records for RNAV GPS (SBAS) Approach Procedures.

4.2.8.1 Helicopter Operations SBAS Path Point Primary Records

Column	Field Name (Length)	Reference
1	Record Type (1)	5.2
2 thru 4	Customer/Area Code (3)	5.3
5	Section Code (1)	5.4
6	Blank (1)	
7 thru 10	*Airport or Heliport Identifier (4)	5.6
11 thru 12	ICAO Code (2)	5.14
13	Subsection Code (1)	5.5
14 thru 19	Approach Procedure Ident (6)	5.10
20 thru 24	*Final Approach Course As Runway (5)	5.300
25 thru 26	*Operation Type (2)	5.223
27	Continuation Record Number (1)	5.16
28	*Route Indicator (1)	5.224
29 thru 30	*SBAS Service Provider Identifier (2)	5.255
31 thru 32	*Reference Path Data Selector (2)	5.256
33 thru 36	*Reference Path Identifier (4)	5.257
37	*Approach Performance Designator (1)	5.258
38 thru 48	*Fictitious Threshold Point Latitude (11)	5.267
49 thru 60	*Fictitious Threshold Point Longitude (12)	5.268
61 thru 66	*(FTP) Ellipsoid Height (6)	5.225
67 thru 70	*Glide Path Angle (4)	5.226
71 thru 81	*Flight Path Alignment Point Latitude (11)	5.267
82 thru 93	*Flight Path Alignment Point Longitude (12)	5.268
94 thru 98	*Course Width at Threshold (5)	5.228
99 thru 102	*Length Offset (4)	5.259
103 thru 108	*Path Point TCH (6)	5.265
109	*Path Point TCH Units Indicator (1)	5.266
110 thru 112	*HAL (3)	5.263
113 thru 115	*VAL (3)	5.264
116 thru 123	SBAS FAS Data CRC Remainder (8)	5.229
124 thru 128	File Record Number (5)	5.31
129 thru 132	Cycle Date (4)	5.32

Note 1: In the Airport and Helicopter Operations SBAS Path Point Record description, the field prefixed with * in the Field Name are those columns that have been determined as required for the data wrap for CRC calculations.

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Note 2: In order to properly convert values and binary pack these fields for the CRC data wrap, refer to RTCA DO-229 Minimum Operational Performance Standards for Global Positioning System/Wide Area Augmentation System Airborne Equipment for Final Approach Segment (FAS) Data Block CRC standards.

4.2.8.2 Helicopter Operations SBAS Path Point Continuation Records

Column	Field Name (Length)	Reference
1 thru 26	Fields as on Primary Record Type	
27	Continuation Record Number (1)	5.16
28	Application Type (1)	5.91
29 thru 34	(FPAP) Ellipsoid Height (6)	5.225
35 thru 40	(FPAP) Orthometric Height (6)	5.227
41 thru 46	(FTP) Orthometric Height (6)	5.227
47 thru 56	Approach Type Identifier (10)	5.262
57 thru 61	GBAS/SBAS Channel Number (5)	5.244
62 thru 71	Blank (Spacing) (10)	
72 thru 74	Helicopter Procedure Course (3)	5.269
75 thru 123	Blank (Spacing) (49)	
124 thru 128	File Record Number (5)	5.31
129 thru 132	Cycle Date (4)	5.32

4.2.9 Heliport Helipad Record (HH)

This file will contain a listing of all helipads associated with heliports.

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4.2.9.1 Heliport Helipad Primary Records

Column	Field Name (Length)	Reference
1	Record Type (1)	5.2
2 thru 4	Customer/Area Code (3)	5.3
5	Section Code (1)	5.4
6	Blank (Spacing) (1)	
7 thru 10	Heliport Identifier (4)	5.6
11 thru 12	ICAO Code (2)	5.14
13	Subsection Code (1)	5.5
14 thru 18	Helipad Identifier (5)	5.180
19 thru 21	Blank (Spacing) (3)	
22	Continuation Record No. (1)	5.16
23	Helipad Shape (1)	5.303
24 thru 31	Helipad Dimension (8)	5.176
32	Reserved (Expansion) (1)	
33 thru 41	Helipad Latitude (9)	5.36
42 thru 51	Helipad Longitude (10)	5.37
52	Helipad Surface Code (1)	5.249
53 thru 56	Helipad Surface Type (4)	5.302
57 thru 59	Max Allowable Helicopter Weight (3)	5.309
60	Helicopter Performance Requirement (1)	5.310
61 thru 66	Reserved (Expansion) (6)	
67 thru 71	Helipad Elevation (5)	5.68
72 thru 123	Reserved (Expansion) (52)	
124 thru 128	File record No. (5)	5.31
129 thru 132	Cycle Date (4)	5.32

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4.0 NAVIGATION DATA - RECORD LAYOUT

ARINC 424 - 21 RECORD FORMAT

VHF NAVAID (D) 4.1.2.1 PRIMARY

Ref.	5.2	5.3	5.4	5.5	5.6	5.14		5.33		5.14	5.16	5.34	5.35	5.36	5.37	5.38	5.36	5.37	5.66	5.40	5.149	5.90	5.150	5.197	5.71		5.297	5.277	5.31	5.32
Field	S/T	CUST/ AREA	SEC CODE	SUB CODE	ARPT IDENT	ICAO CODE		VOR IDENT		ICAO CODE	CONT NR	VOR FREQ	NAVAID CLASS	VOR LATITUDE	VOR LONGITUDE	DME IDENT	DME LATITUDE	DME LONGITUDE	STA DECL	DME ELEV	MERIT	DME BIAS	FREQ PRO	DATUM CODE	VOR NAME (25)		INAPP DME	DME OP SERV VOL	FILE RECORD NUMBER	CYCLE

NOTES:

VHF NAVAID (D) 4.1.2.2 CONTINUATION

Ref.	SAME PARAGRAPH AS ABOVE	5.16	5.91	5.61		5.31	5.32
Field	CONTINUATION RECORD SAME AS ABOVE	CONT NR	APPL TYPE	NOTES ON CONTINUATION RECORD (69)	RESERVED (31)	FILE RECORD NUMBER	CYCLE

NOTES:

VHF NAVAID (D) 4.1.2.3 SIMULATION CONTINUATION

Ref.	SAME PARAGRAPH AS ABOVE	5.16	5.91		5.93		5.39	5.92		5.31	5.32
Field	CONTINUATION RECORD SAME AS ABOVE	CONT NR	APPL TYPE		FAC CHAR		D MAG VAR	FAC ELEV	RESERVED (39)	FILE RECORD NUMBER	CYCLE

NOTES:

VHF NAVAID (D) 4.1.2.4 FLIGHT PLANNING CONTINUATION

Ref.	SAME PARAGRAPH AS ABOVE	5.16	5.91	5.116	5.116			5.31	5.32
Field	CONTINUATION RECORD SAME AS ABOVE	CONT NR	APPL TYPE	FIR IDENT	UIR IDENT		RESERVED (80)	FILE RECORD NUMBER	CYCLE

NOTES:

VHF NAVAID (D) 4.1.2.6 LIMITATION CONTINUATION

Ref.	SAME PARAGRAPH AS ABOVE	5.16	5.91	5.205	5.206	5.12	5.207	5.187	5.208	5.29	5.209	5.207	5.187	5.208	5.29	5.209	5.207	5.187	5.208	5.29	5.209	5.207	5.187	5.208	5.29	5.209	5.207	5.187	5.208	5.29	5.209	5.210		5.31	5.32
Field	CONTINUATION RECORD SAME AS ABOVE	CONT NR	APPL TYPE	NLC	CAI	SEQ NR	SECTOR	DIST DESC	DIST LIMIT	ALT DESC	ALT LIMIT	SECTOR	DIST DESC	DIST LIMIT	ALT DESC	ALT LIMIT	SECTOR	DIST DESC	DIST LIMIT	ALT DESC	ALT LIMIT	SECTOR	DIST DESC	DIST LIMIT	ALT DESC	ALT LIMIT	SECTOR	DIST DESC	DIST LIMIT	ALT DESC	ALT LIMIT	SEQ IND		FILE RECORD NUMBER	CYCLE

NOTES:

NDB NAVAID (DB)(PN) 4.1.3.1 PRIMARY

Ref.	5.2	5.3	5.4	5.5	5.6	5.14		5.33		5.14	5.16	5.34	5.35	5.36	5.37		5.39			5.197	5.71	5.31	5.32
Field	S/T	CUST/ AREA	SEC CODE	SUB CODE	ARPT IDENT	ICAO CODE		NDB IDENT		ICAO CODE	CONT NR	NDB FREQ	NDB CLASS	NDB LATITUDE	NDB LONGITUDE		MAG VAR		RESERVED	DATUM CODE	NDB NAVAID NAME (30)	FILE RECORD NUMBER	CYCLE

NOTES:

NDB NAVAID (DB)(PN) 4.1.3.2 CONTINUATION

Ref.	SAME PARAGRAPH AS ABOVE	5.16	5.91	5.61		5.31	5.32
Field	CONTINUATION RECORD SAME AS ABOVE	CONT NR	APPL TYPE	NOTES ON CONTINUATION RECORD (69)	RESERVED (31)	FILE RECORD NUMBER	CYCLE

NOTES:

NDB NAVAID (DB)(PN) 4.1.3.3 SIMULATION CONTINUATION

Ref.	SAME PARAGRAPH AS ABOVE	5.16	5.91		5.93		5.92		5.31	5.32
Field	CONTINUATION RECORD SAME AS ABOVE	CONT NR	APPL TYPE		FAC CHAR		FAC ELEV	RESERVED (39)	FILE RECORD NUMBER	CYCLE

NOTES:

NDB NAVAID (DB)(PN) 4.1.3.4 FLIGHT PLANNING CONTINUATION

Ref.	SAME PARAGRAPH AS ABOVE	5.16	5.91	5.116	5.116			5.31	5.32
Field	CONTINUATION RECORD SAME AS ABOVE	CONT NR	APPL TYPE	FIR IDENT	UIR IDENT		RESERVED (80)	FILE RECORD NUMBER	CYCLE

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WAYPOINT (EA)(PC) 4.1.4.1 PRIMARY

Ref	Field
5.2	S/T
5.3	CUST/ AREA
5.4	SEC CODE
5.5	SUB CODE
5.41	REGN /ARPT CODE
5.14	ICAO CODE
5.5	SUB CODE
5.13	WAYPOINT IDENT
5.14	ICAO CODE
5.16	CONT NR
5.42	TYPE
5.82	USEAGE
5.36	LATITUDE
5.37	LONGITUDE
5.39	D MAG VAR
	RESERVED (5)
5.197	DATUM CODE
	RESERVED (8)
5.196	NAME IND
5.43	NAME/DESC (25)
5.31	FILE RECORD NUMBER
5.32	CYCLE

NOTES:

WAYPOINT (EA)(PC) 4.1.4.2 CONTINUATION

Ref	Field
SAME PARAGRAPH AS ABOVE	CONTINUATION RECORD SAME AS ABOVE
5.16	CONT NR
5.91	APPL TYPE
5.61	NOTES ON CONTINUATION RECORD (69)
	RESERVED (31)
5.31	FILE RECORD NUMBER
5.32	CYCLE

NOTES:

WAYPOINT (EA)(PC) 4.1.4.3 FLIGHT PLANNING CONTINUATION

Ref	Field
SAME PARAGRAPH AS ABOVE	CONTINUATION RECORD SAME AS ABOVE
5.16	CONT NR
5.91	APPL TYPE
5.116	FIR IDENT
5.116	UIR IDENT
5.311	FIR/FRA E/P
5.311	FIR/FRA Ext/P
5.311	FRA Arr T/P
5.311	FRA DEP T/P
5.311	FRA Inter P
5.311	FRA TERM H/F
	RESERVED (74)
5.31	FILE RECORD NUMBER
5.32	CYCLE

NOTES:

HOLDING PATTERN (EP) 4.1.5.1 PRIMARY

Ref	Field
5.2	S/T
5.3	CUST/ AREA
5.4	SEC CODE
5.5	SUB CODE
5.41	REGN CODE
5.14	ICAO CODE
5.114	DUP IDENT
5.13	FIX IDENT
5.14	ICAO CODE
5.4	SEC CODE
5.5	SUB CODE
5.16	CONT NR
5.62	IB HOLD CRS
5.63	TURN DIR
5.64	LEG LENGTH
5.65	LEG TIME
5.30	MINIMUM ALTITUDE
5.127	MAXIMUM ALTITUDE
5.175	HOLD SPEED
5.211	RNP
5.204	ARC RADIUS
5.293	VERT SCALE FACTOR
5.294	RVSM MIN
5.295	RVSM MAX
5.298	LEG IO IND
	RESERVED (17)
5.60	NAME (25)
5.31	FILE RECORD NUMBER
5.32	CYCLE

NOTES:

HOLDING PATTERN (EP) 4.1.5.2 CONTINUATION

Ref	Field
SAME PARAGRAPH AS ABOVE	CONTINUATION RECORD SAME AS ABOVE
5.16	CONT NR
5.91	APPL TYPE
5.61	NOTES ON CONTINUATION RECORD (69)
	RESERVED (14)
5.31	FILE RECORD NUMBER
5.32	CYCLE

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ARINC 424-21 RECORD FORMAT

ENROUTE AIRWAYS (ER) 4.1.6.1 PRIMARY

S/T	CUST/ AREA	SEC CODE	SUB CODE		ROUTE IDENT	Reserved		SEQ NR	FIX IDENT	ICAO CODE	SEC CODE	SUB CODE	CONT NR	DESC CODE	BDY CODE	RT TYPE	LEVEL	DIRECT	TC IND	EU IND	RECD VHF	ICAO CODE	RNP		THETA	RHO	OB MAG CRS	ROUTE FROM DIST	IB MAG CRS		MIN ALTITUDE	MIN ALTITUDE	MAX ALTITUDE	FIX RADIUS	VERT SCALE FACTOR	RVSM MIN	VSF RVSM MAX	RESERVED (4)		Route Qal 1	Route Qal 2	Route Qal 3	FILE RECORD NUMBER	CYCLE
5.2	5.3	5.4	5.5		5.8			5.12	5.13	5.14	5.4	5.5	5.16	5.17	5.18	5.7	5.19	5.115	5.134	5.164	5.23	5.14	5.211		5.24	5.25	5.26	5.27	5.28		5.30	5.30	5.127	5.254	5.293	5.294	5.295			5.7	5.7	5.7	5.31	5.32

NOTES:

ENROUTE AIRWAYS (ER) 4.1.6.2 CONTINUATION

CONTINUATION RECORD SAME AS ABOVE	CONT NR	APPL TYPE	NOTES ON CONTINUATION RECORD (69)	RESERVED (14)	FILE RECORD NUMBER	CYCLE
SAME PARAGRAPH AS ABOVE	5.16	5.91	5.61		5.31	5.32

NOTES:

ENROUTE AIRWAYS (ER) 4.1.6.3 FLIGHT PLANNING CONTINUATION

CONTINUATION RECORD SAME AS ABOVE	CONT NR	APPL TYPE		ICAO CODE	REST TYPE	RESTRICTIVE AIRSPACE DESIGNATION	MULTI CD	ICAO CODE	REST TYPE	RESTRICTIVE AIRSPACE DESIGNATION	MULTI CD	ICAO CODE	REST TYPE	RESTRICTIVE AIRSPACE DESIGNATION	MULTI CD	ICAO CODE	REST TYPE	RESTRICTIVE AIRSPACE DESIGNATION	MULTI CD	LK CONT	FILE RECORD NUMBER	CYCLE
SAME PARAGRAPH AS ABOVE	5.16	5.91		5.14	5.128	5.129	5.130	5.14	5.128	5.129	5.130	5.14	5.128	5.129	5.130	5.14	5.128	5.129	5.130	5.174	5.31	5.32

NOTES:

AIRPORT (PA) 4.1.7.1 PRIMARY

S/T	CUST/ AREA	SEC CODE		ARPT IDENT	ICAO CODE	SUB CODE	ATA/ IATA	RESERVED		CONT NR	SPEED LIMIT ALTITUDE	LONGEST RWY	IFR	LONG RWY	LATITUDE	LONGITUDE	MAG VAR	ELEV	SPEED LIMIT	RECD VHF	ICAO CODE	TRANS ALTITUDE	TRANS LEVEL	PUB/MIL	TIME ZONE	DAY TIME	M/T IND	DATUM CODE	RESVD (4)	AIRPORT NAME (30)	FILE RECORD NUMBER	CYCLE
5.2	5.3	5.4		5.6	5.14	5.5	5.107			5.16	5.73	5.54	5.108	5.249	5.36	5.37	5.39	5.55	5.72	5.23	5.14	5.53	5.53	5.177	5.178	5.179	5.165	5.197		5.71	5.31	5.32

NOTES:

AIRPORT (PA) 4.1.7.2 CONTINUATION

CONTINUATION RECORD SAME AS ABOVE	CONT NR	APPL TYPE	NOTES ON CONTINUATION RECORD (69)	RESERVED (59)	FILE RECORD NUMBER	CYCLE
SAME PARAGRAPH AS ABOVE	5.16	5.91	5.61		5.31	5.32

NOTES:

AIRPORT (PA) 4.1.7.3 FLIGHT PLANNING CONTINUATION

CONTINUATION RECORD SAME AS ABOVE	CONT NR	APPL TYPE	FIR IDENT	UIR IDENT		AS IND	AS ARPT IDENT	AS ICAO CODE	RESERVED (50)	FILE RECORD NUMBER	CYCLE
SAME PARAGRAPH AS ABOVE	5.16	5.91	5.116	5.116		5.217	5.6	5.14		5.31	5.32

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ARINC 424 - 21 RECORD FORMAT

AIRPORT GATE (PB) 4.1.8.1 PRIMARY

Field	Ref
S/T	5.2
CUST/AREA	5.3
SEC CODE	5.4
ARPT IDENT	5.6
ICAO CODE	5.14
SUB CODE	5.5
GATE IDENT	5.56
CONT NR	5.16
LATITUDE	5.36
LONGITUDE	5.37
RESERVED (47)	
NAME (25)	5.60
FILE RECORD NUMBER	5.31
CYCLE	5.32

NOTES:

AIRPORT GATE (PB) 4.1.8.2 CONTINUATION

Field	Ref
CONTINUATION RECORD SAME AS ABOVE	SAME PARAGRAPH AS ABOVE
CONT NR	5.16
APPL TYPE	5.91
NOTES ON CONTINUATION RECORD (69)	5.61
RESERVED (31)	
FILE RECORD NUMBER	5.31
CYCLE	5.32

NOTES:

AIRPORT SIDS/STARS/APPROACH (PD/PE/PF) 4.1.9.1 PRIMARY

Field	Ref
S/T	5.2
CUST/AREA	5.3
SEC CODE	5.4
ARPT IDENT	5.6
ICAO CODE	5.14
SUB CODE	5.5
SID/STAR/APP IDENT	5.9 & 5.10
RT TYPE	5.7
TRANS IDENT	5.11
PROC DES ACFT CATTYPE	5.301
SEQ NR	5.12
FIX IDENT	5.13
ICAO CODE	5.14
SEC CODE	5.4
SUB CODE	5.5
CONT NR	5.16
DESC CODE	5.17
TURN DR	5.20
RNP	5.211
PATH TERM	5.21
TDV	5.22
RECD NAVAID	5.23
ICAO CODE	5.14
ARC RADIUS	5.204
THETA	5.24
RHO	5.25
MAG CRS	5.26
RTE DIST HOLD DIST/TIME	5.27
SEC CODE	5.4
SUB CODE	5.5
LEG I/O IND	5.298
RESERVED	
ALT DESC	5.29
ATC	5.81
ALTITUDE	5.30
ALTITUDE	5.30
TRANS ALTITUDE	5.53
SPEED LIMIT	5.72
VERT ANGLE	5.70
CENTER FIX OR TAA PT	5.144 or 5.271
MULTI CD	5.130 or 5.272
ICAO CODE	5.14
SEC CODE	5.4
SUB CODE	5.5
GNSS/FMS IND	5.222
SPD LMT	5.261
RTE QUAL1	5.7
RTE QUAL2	5.7
RTE QUAL 3	5.7
P MULT APP IN	5.306
RSVED	
FILE RECORD NUMBER	5.31
CYCLE	5.32

NOTES:

AIRPORT SIDS/STARS/APPROACH (PD/PE/PF) 4.1.9.2 CONTINUATION

Field	Ref
CONTINUATION RECORD SAME AS ABOVE	SAME PARAGRAPH AS ABOVE
CONT NR	5.16
APPL TYPE	5.91
PROC TCH	5.67
PROC DES MAR VAR	5.290
MAR VAR IND	5.291
PROC REF FIX IDENT	5.299
ICAO CODE	5.14
SEC CODE	5.4
SUB CODE	5.5
PROC REF FIX IDENT	5.299
ICAO CODE	5.14
SEC CODE	5.4
SUB CODE	5.5
PROC REF FIX IDENT	5.299
ICAO CODE	5.14
SEC CODE	5.4
SUB CODE	5.5
PROC REF FIX IDENT	5.299
ICAO CODE	5.14
SEC CODE	5.4
SUB CODE	5.5
CAT A RADII	5.292
CAT B RADII	5.292
CAT C RADII	5.292
CAT D RADII	5.292
SPEC IND	5.307
RESERVED (4)	
VERT SCALE FACTOR	5.293
RTE QUAL1	5.7
RTE QUAL2	5.7
RTE QUAL3	5.7
FILE RECORD NUMBER	5.31
CYCLE	5.32

NOTES:

AIRPORT SIDS/STARS/APPROACH (PD/PE/PF) 4.1.9.3 FLIGHT PLANNING CONTINUATION

Field	Ref
CONTINUATION RECORD SAME AS ABOVE	SAME PARAGRAPH AS ABOVE
CONT NR	5.16
APPL TYPE	5.91
LEG DISTANCE	5.260
RESERVED (40)	
RTE QUAL1	5.7
RTE QUAL2	5.7
RTE QUAL3	5.7
FILE RECORD NUMBER	5.31
CYCLE	5.32

NOTES:

AIRPORT PROCEDURE DATA CONTINUATION RECORD 4.1.9.5 PROCEDURE DATA CONTINUATION

Field	Ref
CONTINUATION RECORD SAME AS ABOVE	SAME PARAGRAPH AS ABOVE
CONT NR	5.16
APPL TYPE	5.91
FAS BLOCK	5.276
FAS BLOCK PROVIDED LEVEL OF SERVICE NAME	5.275
LNAV/VNAV	5.276
LNAV/VNAV LEVEL OF SERVICE NAME	5.275
LNAV FOR SBAS	5.276
LNAV LEVEL OF SERVICE NAME	5.275
Remote Alt Flag	5.308
RNP AUTH	5.276
RNP LEV OF SERV VALUE	5.296
RNP AUTH	5.276
RNP LEV OF SERV VALUE	5.296
RNP AUTH	5.276
RNP LEV OF SERV VALUE	5.296
RNP AUTH	5.276
RNP LEV OF SERV VALUE	5.296
RTE TYPE Q1	5.7
RTE TYPE Q2	5.7
RTE TYPE Q3	5.7
FILE RECORD NUMBER	5.31
CYCLE	5.32

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RUNWAY (PG) 4.1.10.1 PRIMARY

Ref	5.2	5.3	5.4		5.6	5.14	5.5	5.46		5.16	5.57	5.58		5.36	5.37	5.212		5.225	5.68	5.69		5.109	5.270		5.79		5.67	5.318	5.319		5.59	5.31	5.32
Field	S/T	CUST/ AREA	SEC CODE		ARPT IDENT	ICAO CODE	SUB CODE	RUNWAY IDENT		CONT NR	RUNWAY LENGTH	RUNWAY BEARING		LATITUDE	LONGITUDE	RWY GRAD		(LTP) ELLIPSOID HEIGHT	LNDG THRES ELEV	DSPLCD THR		WIDTH	TCH		STOPWAY		THRES CROSS HGHT	Rwy Flag	LTEAC Flag	RESERVED	RUNWAY DESCRIPTION (22)	FILE RECORD NUMBER	CYCLE

NOTES:

RUNWAY (PG) 4.1.10.2 CONTINUATION

Ref	SAME PARAGRAPH AS ABOVE	5.16	5.91	5.61	5.302	5.249	5.312	5.313	5.314	5.315	5.316	5.317		5.31	5.32
Field	CONTINUATION RECORD SAME AS ABOVE	CONT NR	APPL TYPE	NOTES ON CONTINUATION RECORD (69)	Runway Surface	RW Surface Code	Starter Extension	TORA	TODA	ASDA	LDA	RW Usage Ind	RESERVED	FILE RECORD NUMBER	CYCLE

NOTES:

RUNWAY (PG) 4.1.10.3 SIMULATION CONTINUATION

Ref	SAME PARAGRAPH AS ABOVE	5.16	5.91		5.94	5.95		5.98	5.97		5.31	5.32
Field	CONTINUATION RECORD SAME AS ABOVE	CONT NR	APPL TYPE	RESERVED (28)	TRUE BEARING	SOURCE	RESERVED (8)	LOCATION	TDZ ELEV	RESERVED (52)	FILE RECORD NUMBER	CYCLE

NOTES:

AIRPORT & HELIPORT LOCALIZER & G.S. (PI) 4.1.11.1 PRIMARY

Ref	5.2	5.3	5.4		5.6	5.14	5.5	5.44	5.80		5.16	5.45	5.46 or 5.180	5.36	5.37	5.47	5.36	5.37	5.48	5.49	5.50	5.51	5.52	5.66		5.74	5.33	5.14	5.4	5.5	5.67		5.31	5.32
Field	S/T	CUST/ AREA	SEC CODE		ARPT IDENT/ HELI	ICAO CODE	SUB CODE	LOC IDENT	CAT		CONT NR	FREQ	RUNWAY IDENT	LOC LATITUDE	LOC LONGITUDE	LOC BRG	G.S. LATITUDE	G.S. LONGITUDE	LOC FR RW END	+/-/@	G.S. FR RW THRES	LOC WIDTH	G.S. ANGLE	STA DECL		G.S. ELEV	SUPPORT FACILITY	ICAO CODE	SEC CODE	SUB CODE	G.S. H LNDING THRES	RESERVED (10)	FILE RECORD NUMBER	CYCLE

NOTES:

AIRPORT & HELIPORT LOCALIZER & G.S. (PI) 4.1.11.2 CONTINUATION

Ref	SAME PARAGRAPH AS ABOVE	5.16	5.91	5.61		5.31	5.32
Field	CONTINUATION RECORD SAME AS ABOVE	CONT NR	APPL TYPE	NOTES ON CONTINUATION RECORD (69)	RESERVED (31)	FILE RECORD NUMBER	CYCLE

NOTES:

AIRPORT & HELIPORT LOCALIZER & G.S. (PI) 4.1.11.3 SIMULATION CONTINUATION

Ref	SAME PARAGRAPH AS ABOVE	5.16	5.91		5.93		5.94	5.95	5.97	5.96	5.10	5.10	5.10	5.10	5.10		5.31	5.32
Field	CONTINUATION RECORD SAME AS ABOVE	CONT NR	APPL TYPE		FAC CHAR		TRUE BEARING	SOURCE	RESERVED (30)	G.S. BEAM WIDTH	APP IDENT 1	APP IDENT 2	APP IDENT 3	APP IDENT 4	APP IDENT 5		FILE RECORD NUMBER	CYCLE

NOTES:

COMPANY ROUTE (R) 4.1.12.1 PRIMARY

Ref	5.2	5.3	5.4	5.5	5.75		5.14	5.4	5.5	5.75		5.14	5.4	5.5	5.76	5.12	5.77	5.78	5.3	5.83	5.14	5.4	5.5	5.84	5.85		5.86	5.87	5.14	5.88	5.89	5.148	5.7	5.7	5.7		5.31	5.32
Field	S/T	CUST/ AREA	SEC CODE	SUB CODE	FROM ARPT/FIX		ICAO CODE	SEC CODE	SUB CODE	FROM ARPT/FIX		ICAO CODE	SEC CODE	SUB CODE	COMPANY ROUTE ID	SEQ NO.	VIA	S/S/A AWY	AREA	TO FIX	ICAO CODE	SEC CODE	SUB CODE	RUNWAY TRANS	ENRT TRANS	RESERVED	CRUISE ALTITUDE	TERM/ ALT ARPT	ICAO CODE	ALT DIST	COST INDEX	ENRT ALT ARPT	SID/STAR/APP	SID/STAR/APP	SID/STAR/APP	RESERVED (26)	FILE RECORD NUMBER	CYCLE

NOTES:

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ARINC 424 - 21 RECORD FORMAT

AIRPORT & HELIPORT LOCALIZER MARKERS/ LOCATORS (PM) 4.1.13.1 PRIMARY

Reference	Field
5.2	S/T
5.3	CUST/ AREA
5.4	SEC CODE
	(hatched)
5.6	ARPT IDENT
5.14	ICAO CODE
5.5	SUB CODE
5.44	LOC IDENT
5.99	MKR TYPE
	(hatched)
5.16	CONT NR
5.34	LCTR FREQ
5.46 or 5.180	RUNWAY IDENT
5.36	MKR LATITUDE
5.37	MKR LONGITUDE
5.100	MINOR AXIS TRUE BRG
5.36	LOCATOR LATITUDE
5.37	LOCATOR LONGITUDE
5.35	LOCATOR CLASS
5.93	LOCATOR FAC CHAR
5.33	LOCATOR IDENT
	(hatched)
5.39	MAG VAR
	(hatched)
5.92	FAC ELEV
	RESERVED (21)
5.31	FILE RECORD NUMBER
5.32	CYCLE

NOTES:

AIRPORT & HELIPORT LOCALIZER (PM) 4.1.13.2 CONTINUATION

Reference	Field
SAME PARAGRAPH AS ABOVE	CONTINUATION RECORD SAME AS ABOVE
5.16	CONT NR
5.91	APPL TYPE
	RESERVED (100)
5.31	FILE RECORD NUMBER
5.32	CYCLE

NOTES:

AIRPORT COMM (PV) 4.1.14.1 PRIMARY

Reference	Field
5.2	S/T
5.3	CUST/ AREA
5.4	SEC CODE
	(hatched)
5.6	ARPT IDENT
5.14	ICAO CODE
5.5	SUB CODE
	(hatched)
5.283	COMM CLASS
5.12	SEQ NR
5.16	CONT NR
5.101	COMM TYPES
5.103	TRANSMIT FREQ
5.103	RECEIVE FREQ
5.104	FREQ UNITS
5.102	RAD UNITS
5.181	H24 IND
5.105	CALL SIGNS
5.286	MUL SEC IND
5.183	SECTORIZATION
5.185	SEC FAC
5.14	ICAO
5.4	SEC CODE
5.5	SUB CODE
5.29	ALT DESC CODE
5.184	COMM ALT 1
5.184	COMM ALT 2
5.187	DIST DESC CODE
5.188	COMM DIST
5.36	TRANSMITTER LAT
5.37	TRANSMITTER LONG
5.106	SERV IND
5.198	MOD
5.199	SIGNAL EM
	(hatched)
5.31	FILE RECORD NUMBER
5.32	CYCLE

NOTES:

AIRPORT COMM (PV) 4.1.14.2 PRIMARY EXTENSION

Reference	Field
SAME PARAGRAPH AS ABOVE	FIELD AS ON PRIMARY RECORD
5.16	CONT REC
5.91	APPL TYPE
5.200	REMOTE FAC
5.14	ICAO
5.4	SEC
5.5	SUB
5.39	TRANS SITE MAG VAR
5.92	TRANS SITE ELEV
5.183	ADD SECTOR 1
5.29	ADD SEC 1 ALT DESC
5.184	ADD SEC 1 ALT 1
5.184	ADD SEC 1 ALT 2
5.183	ADD SEC 2
5.29	ADD SEC 2 ALT DESC
5.184	ADD SEC 2 ALT 1
5.184	ADD SEC 2 ALT 2
5.131	TIME CODE
5.132	NOTAM
5.138	TIME IND
5.195	TIME OF OP
5.195	TIME OF OP
5.195	TIME OF OP
5.195	TIME OF OP
5.195	TIME OF OP
	(hatched)
5.31	FILE RECORD NUMBER
5.32	CYCLE

NOTES:

AIRPORT COMM (PV) 4.1.14.3 CONTINUATION

Reference	Field
SAME PARAGRAPH AS ABOVE	FIELDS AS ON PRIMARY RECORD
5.16	CONT REC
5.91	APPL TYPE
5.186	SECTORIZATION NARRATIVE
	RESERVED (SPACING)
5.31	FILE RECORD NUMBER
5.32	CYCLE

NOTES:

AIRPORT COMM (PV) 4.1.14.4 CONTINUATION

Reference	Field
SAME PARAGRAPH AS ABOVE	FIELDS AS ON PRIMARY RECORD
5.16	CONT REC
5.91	APPL TYPE
	(hatched)
5.195	TIME OF OP
5.195	TIME OF OP
5.195	TIME OF OP
5.195	TIME OF OP
5.195	TIME OF OP
	(hatched)
5.31	FILE RECORD NUMBER
5.32	CYCLE

NOTES:

AIRPORT COMM (PV) 4.1.14.5 CONTINUATION

Reference	Field
SAME PARAGRAPH AS ABOVE	FIELDS AS ON PRIMARY RECORD
5.16	CONT REC
5.91	APPL TYPE
5.285	TIME NARRATIVE
5.31	FILE RECORD NUMBER
5.32	CYCLE

NOTES:

AIRWAY MARKERS (EM) 4.1.15.1 PRIMARY

Reference	Field
5.2	S/T
5.3	CUST/ AREA
5.4	SEC CODE
5.5	SUB CODE
	(hatched)
5.110	MARKER IDENT
	(hatched)
5.14	ICAO CODE
5.16	CONT NR
5.111	MARKER CODE
	RESERVED
5.112	SHAPE
5.113	HI LOW
	(hatched)
5.36	LATITUDE
5.37	LONGITUDE
5.100	MINOR AXIS TRUE BRG
	(hatched)
5.39	MAG VAR
5.92	FAC ELEV
5.197	DATUM CODE
	(hatched)
5.71	MARKER NAME (30)
5.31	FILE RECORD NUMBER
5.32	CYCLE

NOTES:

AIRWAYS MARKER 4.1.15.2 (EM) CONTINUATION

Reference	Field
SAME PARAGRAPH AS ABOVE	CONTINUATION RECORD SAME AS ABOVE
5.16	CONT NR
5.91	APPL TYPE
	RESERVED (100)
5.31	FILE RECORD NUMBER
5.32	CYCLE

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ARINC 424 - 21 RECORD FORMAT

CRUISING TABLES (TC) 4.1.16.1 PRIMARY

5.2	5.4	5.5	5.134	5.12	5.135	5.135	5.165	5.136	5.137	5.136	5.136	5.137	5.136	5.136	5.137	5.136	5.136	5.137	5.136		5.31	5.32
S/T	SEC CODE	SUB CODE	CRSE TBL IDENT	SEQ number	COURSE FROM	COURSE TO	M/T IND	CRUISE LEVEL FROM	VERTICAL SEPARATION	CRUISE LEVEL TO	CRUISE LEVEL FROM	VERTICAL SEPARATION	CRUISE LEVEL TO	CRUISE LEVEL FROM	VERTICAL SEPARATION	CRUISE LEVEL TO	CRUISE LEVEL FROM	VERTICAL SEPARATION	CRUISE LEVEL TO	RESERVED (24)	FILE RECORD NUMBER	CYCLE

NOTES:

FIR/UIR (UF) 4.1.17.1 PRIMARY

5.2	5.3	5.4	5.5	5.116	5.151	5.117	5.12	5.16	5.116	5.116	5.122	5.123	5.124	5.118	5.36	5.37	5.36	5.37	5.119	5.120	5.121	5.121	5.121	5.134		5.125	5.31	5.32
S/T	CUST/ AREA	SEC CODE	SUB CODE	FIR/UIR IDENT	FIR/UIR ADDRESS	IND	SEQ NR	CONT NR	ADJ FIR IDENT	ADJ UIR IDENT	RUS	RUA	ENTRY	BDRY VIA	FIR/UIR LATITUDE	FIR/UIR LONGITUDE	ARC ORIGIN LATITUDE	ARC ORIGIN LONGITUDE	ARC DIST	ARC BNG	FIR UPPER LIMIT	UIR LOWER LIMIT	UIR UPPER LIMIT	TC IND	RESERVED	FIR/UIR NAME (25)	FILE RECORD NUMBER	CYCLE

NOTES:

FIR/UIR (UF) 4.1.17.2 CONTINUATION

SAME PARAGRAPH AS ABOVE	5.16	5.91		5.31	5.32
CONTINUATION RECORD SAME AS ABOVE	CONT NR	APPL TYPE	RESERVED (102)	FILE RECORD NUMBER	CYCLE

NOTES:

RESTRICTIVE AIRSPACE (UR) 4.1.18.1 PRIMARY

5.2	5.3	5.4	5.5	5.14	5.128	5.129	5.130	5.12	5.16	5.19	5.131	5.132	5.118	5.36	5.37	5.36	5.37	5.119	5.120	5.121	5.133	5.121	5.133	5.126	5.31	5.32
S/T	CUST/ AREA	SEC CODE	SUB CODE	ICAO CODE	REST TYPE	RESTRICTIVE AIRSPACE DESIGNATION	MULTI CD	SEQ NR	CONT NR	LEVEL	TIME CD	NOTAM	BDRY VIA	LATITUDE	LONGITUDE	ARC ORIGIN LATITUDE	ARC ORIGIN LONGITUDE	ARC DIST	ARC BNG	LOWER LIMIT	UNIT IND	UPPER LIMIT	UNIT IND	RESTRICTIVE AIRSPACE NAME (30)	FILE RECORD NUMBER	CYCLE

NOTES:

RESTRICTIVE AIRSPACE (UR) 4.1.18.2 CONTINUATION

SAME PARAGRAPH AS ABOVE	5.16	5.91	5.131	5.132	5.138	5.195	5.195	5.195	5.195	5.195	5.195	5.195	5.140	5.31	5.32
CONTINUATION RECORD SAME AS ABOVE	CONT NR	APPL TYPE	TIME CD	NOTAM	TIME IND	TIME OF OPERATION	TIME OF OPERATION	TIME OF OPERATION	TIME OF OPERATION	TIME OF OPERATION	TIME OF OPERATION	TIME OF OPERATION	CONTROLLING AGENCY (24)	FILE RECORD NUMBER	CYCLE

NOTES:

GRID MINIMUM OFF ROUTE ALTITUDE (MORA) RECORDS (AS) 4.1.19.1 PRIMARY

5.2	5.4	5.5	5.141	5.142	5.143	5.143	5.143	5.143	5.143	5.143	5.143	5.143	5.143	5.143	5.143	5.143	5.143	5.143	5.143	5.143	5.143	5.143	5.143	5.143	5.143	5.143	5.143	5.143	5.143	5.143	5.143	5.143	5.143	5.143		5.31	5.32
S/T	SEC CODE	SUB CODE	START LAT	START LONG	MORA	MORA	MORA	MORA	MORA	MORA	MORA	MORA	MORA	MORA	MORA	MORA	MORA	MORA	MORA	MORA	MORA	MORA	MORA	MORA	MORA	MORA	MORA	MORA	MORA	MORA	MORA	MORA	MORA	MORA	RESVD (3)	FILE RECORD NUMBER	CYCLE

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ARINC 424 - 21 RECORD FORMAT

AIRPORT MINIMUM SECTOR ALTITUDE (MSA) (PS) 4.1.20.1 PRIMARY

Field	Reference
S/T	5.2
CUST/AREA	5.3
SEC CODE	5.4
ARPT IDENT	5.6
ICAO CODE	5.14
SUB CODE	5.5
MSA CENTER	5.144
ICAO CODE	5.14
SEC CODE	5.4
SUB CODE	5.5
MULTI CD	5.130
RESERVED (15)	
CONT NR	5.16
RESERVED (3)	
SEC BRG	5.146
SEC ALT	5.147
SEC RAD	5.145
SEC BRG	5.146
SEC ALT	5.147
SEC RAD	5.145
SEC BRG	5.146
SEC ALT	5.147
SEC RAD	5.145
SEC BRG	5.146
SEC ALT	5.147
SEC RAD	5.145
SEC BRG	5.146
SEC ALT	5.147
SEC RAD	5.145
SEC BRG	5.146
SEC ALT	5.147
SEC RAD	5.145
SEC BRG	5.146
SEC ALT	5.147
SEC RAD	5.145
MAG IND	5.165
RESERVED (3)	
FILE RECORD NUMBER	5.31
CYCLE	5.32

NOTES:

AIRPORT MINIMUM SECTOR ALTITUDE (MSA) (PS) 4.1.20.2 PRIMARY EXTENSION

Field	Reference
CONTINUATION RECORD SAME AS ABOVE	SAME PARAGRAPH AS ABOVE
CONT NR	5.16
APPL TYPE	5.91
RESERVED	
SEC BRG	5.146
SEC ALT	5.147
SEC RAD	5.145
SEC BRG	5.146
SEC ALT	5.147
SEC RAD	5.145
SEC BRG	5.146
SEC ALT	5.147
SEC RAD	5.145
SEC BRG	5.146
SEC ALT	5.147
SEC RAD	5.145
SEC BRG	5.146
SEC ALT	5.147
SEC RAD	5.145
SEC BRG	5.146
SEC ALT	5.147
SEC RAD	5.145
SEC BRG	5.146
SEC ALT	5.147
SEC RAD	5.145
FIELD AS ON PRIMARY RECORD	
FILE RECORD NUMBER	5.31
CYCLE	5.32

NOTES:

AIRPORT MINIMUM SECTOR ALTITUDE (MSA) 4.1.20.3 CONTINUATION

Field	Reference
CONTINUATION RECORD SAME AS ABOVE	SAME PARAGRAPH AS ABOVE
CONT NR	5.16
APPL TYPE	5.91
NOTES (69)	5.61
RESERVED (14)	
FILE RECORD NUMBER	5.31
CYCLE	5.32

NOTES:

ENROUTE AIRWAYS RESTRICTION RECORDS (EU) 4.1.21.1 ALTITUDE EXCLUSION PRIMARY

Field	Reference
S/T	5.2
CUST/AREA	5.3
SEC CODE	5.4
SUB CODE	5.5
ROUTE IDENT	5.8
RESERVED	
REST IDENT	5.154
REST TYPE	5.201
CONT NR	5.16
START FIX IDENT	5.13
ICAO CODE	5.14
SEC CODE	5.4
SUB CODE	5.5
END FIX IDENT	5.13
ICAO CODE	5.14
SEC CODE	5.4
SUB CODE	5.5
START DATE	5.157
END DATE	5.157
TIME CD	5.131
TIME IND	5.138
TIME OF OPERATION	5.195
TIME OF OPERATION	5.195
TIME OF OPERATION	5.195
TIME OF OPERATION	5.195
EXC IND	5.202
UNITS ALT	5.160
REST ALT	5.161
BLCK IND	5.203
REST ALT	5.161
BLCK IND	5.203
REST ALT	5.161
BLCK IND	5.203
REST ALT	5.161
BLCK IND	5.203
REST ALT	5.161
BLCK IND	5.203
REST ALT	5.161
BLCK IND	5.203
REST ALT	5.161
BLCK IND	5.203
FILE RECORD NUMBER	5.31
CYCLE	5.32

NOTES:

ENROUTE AIRWAYS RESTRICTION RECORDS (EU) 4.1.21A.1 NOTE RESTRICTION PRIMARY

Field	Reference
S/T	5.2
CUST/AREA	5.3
SEC CODE	5.4
SUB CODE	5.5
ROUTE IDENT	5.8
RESERVED	
REST IDENT	5.154
REST TYPE	5.201
CONT NR	5.16
START FIX IDENT	5.13
ICAO CODE	5.14
SEC CODE	5.4
SUB CODE	5.5
END FIX IDENT	5.13
ICAO CODE	5.14
SEC CODE	5.4
SUB CODE	5.5
START DATE	5.157
END DATE	5.157
RESTRICTION NOTES (69)	5.163
FILE RECORD NUMBER	5.31
CYCLE	5.32

NOTES:

ENROUTE AIRWAYS RESTRICTION RECORDS (EU) 4.1.21A.2 NOTE RESTRICTION CONTINUATION

Field	Reference
CONTINUATION RECORD SAME AS ABOVE	SAME PARAGRAPH AS ABOVE
CONT NR	5.16
APPL TYPE	5.91
RESERVED (32)	
RESTRICTION NOTES (69)	5.163
FILE RECORD NUMBER	5.31
CYCLE	5.32

NOTES:

ENROUTE AIRWAYS RESTRICTION RECORDS (EU) 4.1.21B.1 SEASONAL CLOSURE PRIMARY

Field	Reference
S/T	5.2
CUST/AREA	5.3
SEC CODE	5.4
SUB CODE	5.5
ROUTE IDENT	5.8
RESERVED	
REST IDENT	5.154
REST TYPE	5.201
CONT NR	5.16
START FIX IDENT	5.13
ICAO CODE	5.14
SEC CODE	5.4
SUB CODE	5.5
END FIX IDENT	5.13
ICAO CODE	5.14
SEC CODE	5.4
SUB CODE	5.5
START DATE	5.157
END DATE	5.157
TIME CD	5.131
TIME IND	5.138
TIME OF OPERATION	5.195
TIME OF OPERATION	5.195
TIME OF OPERATION	5.195
TIME OF OPERATION	5.195
CRSE TBL IDENT	5.134
FILE RECORD NUMBER	5.31
CYCLE	5.32

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ARINC 424 - 21 RECORD FORMAT

4.0 NAVIGATION DATA - RECORD LAYOUT

ENROUTE AIRWAYS RESTRICTION RECORDS (EU) 4.1.21C.1 CRUISE TABLE REPLACEMENT PRIMARY

Field	Reference
S/T	5.2
CUST/ AREA	5.3
SEC CODE	5.4
SUB CODE	5.5
ROUTE IDENT	5.8
RESERVED	
REST IDENT	5.154
REST TYPE	5.201
CONT NR	5.16
START FIX IDENT	5.13
ICAO CODE	5.14
SEC CODE	5.4
SUB CODE	5.5
END FIX IDENT	5.13
ICAO CODE	5.14
SEC CODE	5.4
SUB CODE	5.5
START DATE	5.157
END DATE	5.157
TIME CD	5.131
TIME IND	5.138
TIME OF OPERATION	5.195
TIME OF OPERATION	5.195
TIME OF OPERATION	5.195
TIME OF OPERATION	5.195
CRSE TBL IDENT	5.134
FILE RECORD NUMBER	5.31
CYCLE	5.32

NOTES:

ENROUTE AIRWAYS RESTRICTION RECORDS (EU) 4.1.21C.2 CRUISE TABLE REPLACEMENT CONTINUATION

Field	Reference
CONTINUATION RECORD SAME AS ABOVE	SAME PARAGRAPH AS ABOVE
CONT NR	5.16
APPL TYPE	5.91
RESERVED (32)	
TIME CD	5.131
TIME IND	5.138
TIME OF OPERATION	5.195
TIME OF OPERATION	5.195
TIME OF OPERATION	5.195
TIME OF OPERATION	5.195
CRSE TBL IDENT	5.134
FILE RECORD NUMBER	5.31
CYCLE	5.32

NOTES:

ENROUTE AIRWAYS RESTRICTION RECORDS (EU) 4.1.21.2 ALTITUDE EXCLUSION CONTINUATION

Field	Reference
CONTINUATION RECORD SAME AS ABOVE	SAME PARAGRAPH AS ABOVE
CONT NR	5.16
APPL TYPE	5.91
RESERVED (32)	
TIME CD	5.131
TIME IND	5.138
TIME OF OPERATION	5.195
TIME OF OPERATION	5.195
TIME OF OPERATION	5.195
TIME OF OPERATION	5.195
EXC IND	5.202
UNITS ALT	5.160
REST ALT	5.161
BLCK IND	5.203
REST ALT	5.161
BLCK IND	5.203
REST ALT	5.161
BLCK IND	5.203
REST ALT	5.161
BLCK IND	5.203
REST ALT	5.161
BLCK IND	5.203
REST ALT	5.161
BLCK IND	5.203
REST ALT	5.161
BLCK IND	5.203
FILE RECORD NUMBER	5.31
CYCLE	5.32

NOTES:

AIRPORT & HELIPORT MLS (PL) 4.1.22.1 PRIMARY

Field	Reference
S/T	5.2
CUST/ AREA	5.3
SEC CODE	5.4
ARPT IDENT	5.6
ICAO CODE	5.14
SUB CODE	5.5
MLS IDENT	5.44
CAT	5.80
CONT NR	5.16
CHANNEL	5.166
RUNWAY IDENT	5.46
AZ LATITUDE	5.36
AZ LONGITUDE	5.37
MLS AZ BRG	5.167
EL LATITUDE	5.36
EL LONGITUDE	5.37
AZ FR RWY END	5.48
+/-@	5.49
EL FR RWY THR	5.50
AZ PRO RIGHT	5.168
AZ PRO LEFT	5.168
AZ COV RIGHT	5.172
AZ COV LEFT	5.172
EL ANGLE SPAN	5.169
MAG VAR	5.39
EL ELEV	5.74
NOM ELEV ANGLE	5.173
MIN ELEV ANGLE	5.52
FAC IDEN	5.33
ICAO CODE	5.14
SEC CODE	5.4
SUB CODE	5.5
FILE RECORD NUMBER	5.31
CYCLE	5.32

NOTES:

AIRPORT & HELIPORT MLS (PL) 4.1.22.2 CONTINUATION

Field	Reference
CONTINUATION RECORD SAME AS ABOVE	SAME PARAGRAPH AS ABOVE
CONT NR	5.16
APPL TYPE	5.91
FAC CHAR	5.93
BAZ LATITUDE	5.36
BAZ LONGITUDE	5.37
MLS BAZ BRG	5.167
MLS DP LATITUDE	5.36
MLS DP LONGITUDE	5.37
BAZ FR RWY END	5.48
+/-@	5.49
BAZ PRO RIGHT	5.168
BAZ PRO LEFT	5.168
BAZ COV RIGHT	5.172
BAZ COV LEFT	5.172
BAZ TRUE BRG	5.94
SOURCE	5.95
AZ TRUE BRG	5.94
SOURCE	5.95
TCH	5.67
RESERVED (14)	
FILE RECORD NUMBER	5.31
CYCLE	5.32

NOTES:

ENROUTE COMM (EV) 4.1.23.1 PRIMARY

Field	Reference
S/T	5.2
CUST/ AREA	5.3
SEC CODE	5.4
SUB CODE	5.5
FIR/RDO IDENT	5.190
FIR/UIR ADDRESS	5.151
IND	5.117
COMM CLASS	5.283
SEQ NBR	5.12
CONT REC NBR	5.16
COMM TYPE	5.101
TRANSMIT FREQ	5.103
RECEIVE FREQ	5.103
FREQ UNITS	5.104
RAD SERV	5.102
H24 IND	5.181
CALL SIGN	5.105
POSITION NARRATIVE	5.189
LATITUDE	5.36
LONGITUDE	5.37
SERV IND	5.106
MOD	5.198
SIG EMIS	5.199
ALT DESC	5.29
COMM ALT 1	5.184
COMM ALT 2	5.184
FILE RECORD NUMBER	5.31
CYCLE	5.32

NOTES:

ENROUTE COMM (EV) 4.1.23.2 PRIMARY EXTENSION

Field	Reference
CONTINUATION RECORD SAME AS ABOVE	SAME PARAGRAPH AS ABOVE
CONT REC NBR	5.16
APP TYPE	5.91
REM FAC	5.200
ICAO	5.14
SECTION	5.4
SUB	5.5
TRANS SITE MAG VAR	5.39
TRANS SITE ELEV	5.92
ASSIGNED SECTOR NAME	5.284
TIME CODE	5.131
NOTAM	5.132
TIME IND	5.138
TIME OF OP	5.195
TIME OF OP	5.195
TIME OF OP	5.195
TIME OF OP	5.195
TIME OF OP	5.195
FILE RECORD NUMBER	5.31
CYCLE	5.32

NOTES:

ENROUTE COMM (EV) 4.1.23.3 CONTINUATION

Field	Reference
CONTINUATION RECORD SAME AS ABOVE	SAME PARAGRAPH AS ABOVE
CONT REC NBR	5.16
APP TYPE	5.91
TIME OF OPERATION	5.195
TIME OF OPERATION	5.195
TIME OF OPERATION	5.195
TIME OF OPERATION	5.195
TIME OF OPERATION	5.195
RESERVED (4)	
FILE RECORD NUMBER	5.31
CYCLE	5.32

NOTES:

ENROUTE COMM (EV) 4.1.23.4 CONTINUATION

Field	Reference
CONTINUATION RECORD SAME AS ABOVE	SAME PARAGRAPH AS ABOVE
CONT REC NBR	5.16
APP TYPE	5.91
TIME NARRATIVE (100)	5.285
FILE RECORD NUMBER	5.31
CYCLE	5.32

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PREFERRED ROUTES (ET) 4.1.24.1 PRIMARY

5.2	5.3	5.4	5.5		5.8	5.220	5.12		5.16	5.83	5.14	5.4	5.5	5.77	5.78	5.3	5.19	5.7	5.194	5.14	5.4	5.5	5.194	5.14	5.4	5.5	5.30	5.127	5.131	5.221	5.115	5.29	5.30	5.30	5.7	5.7	5.7		5.31	5.32
S/T	CUST/ AREA	SEC CODE	SUB CODE		ROUTE IDENT	USE IND	SEQ NR		CONT NR	TO FIX IDENT	ICAO CODE	SEC CODE	SUB CODE	VIA	SID/STAR/AWY IDENT	CUST/ AREA	LEVEL	RTE TYPE	INT APT/ FIX	ICAO CODE	SEC CODE	SUB CODE	TERM APT/ FIX	ICAO CODE	SEC CODE	SUB CODE	MIN ALTITUDE	MAX ALTITUDE	TIME CD	ACFT USE GROUP	DIRECT	ALT DESC	ALTITUDE ONE	ALTITUDE TWO	S/S/A AWY ROUTE TYPE	S/S/A ROUTE TYPE QUAL 1	S/S/A ROUTE TYPE QUAL 2	RESERVED (15)	FILE RECORD NUMBER	CYCLE

NOTES:

PREFERRED ROUTES (ET) 4.1.24.2 CONTINUATION

SAME PARAGRAPH AS ABOVE	5.16	5.91	5.131	5.138	5.195	5.195	5.195	5.195	5.195	5.195	5.195		5.31	5.32
CONTINUATION RECORD SAME AS ABOVE	CONT NR	APPL TYPE	TIME CD	TIME IND	TIME OF OPERATION	TIME OF OPERATION	TIME OF OPERATION	TIME OF OPERATION	TIME OF OPERATION	TIME OF OPERATION	TIME OF OPERATION	RESERVED (11)	FILE RECORD NUMBER	CYCLE

NOTES:

PREFERRED ROUTES (ET) 4.1.24.3 CONTINUATION

SAME PARAGRAPH AS ABOVE	5.16	5.91	5.61		5.31	5.32
CONTINUATION RECORD SAME AS ABOVE	CONT NR	APPL TYPE	NOTES ON CONTINUATION RECORD (69)	RESERVED (14)	FILE RECORD NUMBER	CYCLE

NOTES:

CONTROLLED AIRSPACE (UC) 4.1.25.1 PRIMARY

5.2	5.3	5.4	5.5	5.14	5.213	5.214	5.4	5.5	5.215		5.130	5.12	5.16	5.19	5.131	5.132		5.118	5.36	5.37	5.36	5.37	5.119	5.120	5.211	5.121	5.133	5.121	5.133	5.216	5.31	5.32
S/T	CUST/ AREA	SEC CODE	SUB CODE	ICAO CODE	ARSP TYPE	AIRSPACE CENTER	SEC CODE	SUB CODE	AS CLASS	RESERVED (2)	MULTI CD	SEQ NR	CONT NR	LEVEL	TIME CD	NOTAM		BDRY VIA	LATITUDE	LONGITUDE	ARC ORIGIN LATITUDE	ARC ORIGIN LONGITUDE	ARC DIST	ARC BRG	RNP	LOWER LIMIT	UNIT IND	UPPER LIMIT	UNIT IND	CONTROLLED AIRSPACE NAME (30)	FILE RECORD NUMBER	CYCLE

NOTES:

CONTROLLED AIRSPACE (UC) 4.1.25.2 CONTINUATION

SAME PARAGRAPH AS ABOVE	5.16	5.91	5.131	5.132	5.138	5.195	5.195	5.195	5.195	5.195	5.195	5.195	5.140	5.31	5.32
CONTINUATION RECORD SAME AS ABOVE	CONT NR	APPL TYPE	TIME CD	NOTAM	TIME IND	TIME OF OPERATIONS	TIME OF OPERATIONS	TIME OF OPERATIONS	TIME OF OPERATIONS	TIME OF OPERATIONS	TIME OF OPERATIONS	TIME OF OPERATIONS	CONTROLLING AGENCY (24)	FILE RECORD NUMBER	CYCLE

NOTES:

CONTROLLED AIRSPACE (UC) 4.1.25.3 Primary Extension

SAME PARAGRAPH AS ABOVE	5.16	5.91	5.72	5.73	5.301	5.72	5.73	5.301		5.31	5.32
CONTINUATION RECORD SAME AS ABOVE	CONT NR	APPL TYPE	SPEED LIMIT	SPEED LIMIT ALTITUDE	SL AC TYP	SPEED LIMIT 2	SPEED LIMIT ALTITUDE 2	SL AC TYP 2		FILE RECORD NUMBER	CYCLE

NOTES:

GEOGRAPHICAL REFERENCE TABLE RECORDS (TG) 4.1.26.1 PRIMARY

5.2	5.3	5.4	5.5	5.218	5.12	5.219	5.16	5.8	5.220	5.8	5.220	5.8	5.220	5.8	5.220	5.8	5.220	5.8	5.220		5.31	5.32
S/T	CUST/ AREA	SEC CODE	SUB CODE	TABLE IDENT	SEQ NUM	GEOGRAPHICAL ENTITY	CONT NR RESERVED	PREFERRED ROUTE IDENT	ET IND	PREFERRED ROUTE IDENT	ET IND	PREFERRED ROUTE IDENT	ET IND	PREFERRED ROUTE IDENT	ET IND	PREFERRED ROUTE IDENT	ET IND	PREFERRED ROUTE IDENT	ET IND		FILE RECORD NUMBER	CYCLE

NOTES:

GEOGRAPHICAL REFERENCE TABLE RECORDS (TG) 4.1.26.2 CONTINUATION

SAME PARAGRAPH AS ABOVE	5.16	5.91		5.31	5.32
CONTINUATION RECORD SAME AS ABOVE	CONT NR	APPL TYPE	RESERVED (83)	FILE RECORD NUMBER	CYCLE

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4.0 NAVIGATION DATA - RECORD LAYOUT

ARINC 424 - 21 RECORD FORMAT

FLIGHT PLANNING ARRIVAL/DEPARTURE (PR) 4.1.27.1 PRIMARY

5.2	5.3	5.4	////	5.6	5.14	5.5	5.9, 5.10	5.230	5.11	5.13	5.14	5.4	5.5	5.231	5.13	5.14	5.4	5.5	5.231	5.11	5.13	5.14	5.4	5.5	5.231	5.12	5.16	5.232	5.233	5.234	5.235	5.236	5.131	5.237	5.238	5.239	5.26	5.29	5.240	5.240	5.72	5.134	5.261	////	5.31	5.32
S/T	CUST/ AREA	SEC CODE	////	ARPT IDENT	ICAO CODE	SUB CODE	SID/STAR/APRCH IDENT	PROC TYPE	RUNWAY TRANS IDENT	RUNWAY TRANS FIX	ICAO CODE	SEC CODE	SUB CODE	RUNWAY TRANS ATD	COMMON SEGMENT FIX	ICAO CODE	SEC CODE	SUB CODE	COMN SEG ATD	ENROUTE TRANS IDENT	ENROUTE TRANS FIX	ICAO CODE	SEC CODE	SUB CODE	ENRTE TRANS ATD	SEQ NR	CONT NR	NOE	TURBO	RNAV	ATC WC	ATC IDENT	TIME CD	PROCEDURE DESCRIPTION	LTC	RPT	OB MAG CRS	ALT DESC	ALT	ALT	SPEED LIMIT	CRS TBL IDENT	SPD LMT	////	FILE RECORD NUMBER	CYCLE

NOTES:

FLIGHT PLANNING ARRIVAL/DEPARTURE (PR) 4.1.27.2 CONTINUATION

SAME PARAGRAPH AS ABOVE	5.16	5.91	5.13	5.14	5.4	5.5	5.231	5.241	5.13	5.14	5.4	5.5	5.231	5.241	5.13	5.14	5.4	5.5	5.231	5.241	5.13	5.14	5.4	5.5	5.231	5.241	5.31	5.32
CONTINUATION RECORD SAME AS ABOVE	CONT NR	APPL	INTER FIX IDENT	ICAO CODE	SEC CODE	SUB CODE	ATD	FRT CODE	INTER FIX IDENT	ICAO CODE	SEC CODE	SUB CODE	ATD	FRT CODE	INTER FIX IDENT	ICAO CODE	SEC CODE	SUB CODE	ATD	FRT CODE	INTER FIX IDENT	ICAO CODE	SEC CODE	SUB CODE	ATD	FRT CODE	FILE RECORD NUMBER	CYCLE

NOTES:

FLIGHT PLANNING ARRIVAL/DEPARTURE (PR) 4.1.27.3 CONTINUATION

SAME PARAGRAPH AS ABOVE	5.16	5.91	5.131	5.138	5.195	5.195	5.195	5.195	5.195	5.31	5.32
CONTINUATION RECORD SAME AS ABOVE	CONT NR	APPL TYPE	TIME CD	TIME IND	TIME OF OPERATION	TIME OF OPERATION	TIME OF OPERATION	TIME OF OPERATION	TIME OF OPERATION	FILE RECORD NUMBER	CYCLE

NOTES:

ARPT SBAS PATH POINT (PP) 4.1.28.1 PRIMARY

5.2	5.3	5.4	////	5.6	5.14	5.5	5.10	5.46 or 5.300	5.223	5.16	5.224	5.255	5.256	5.257	5.258	5.267	5.268	5.225	5.226	5.267	5.268	5.228	5.259	5.265	5.266	5.263	5.264	5.229	5.31	5.32
S/T	CUST/ AREA	SEC CODE	////	ARPT IDENT	ICAO CODE	SUB CODE	APPROACH IDENT	RUNWAY IDENT OR FINAL APP	OPS TYPE	CONT NR	RTE IND	SBAS SPI	REF PATH DATA SEL	REF PATH DATA IDENTIFIER	APP PD	LTP LATITUDE	LTP LONGITUDE	LTP ELLIPSOID HEIGHT	GPA	FPAP LATITUDE	FPAP LONGITUDE	COURSE WIDTH AT THRESHOLD	LENGTH OFFSET	PATH POINT TCH	TCH IND	HAL	VAL	CRC	FILE RECORD NUMBER	CYCLE

NOTES:

PATH POINT (PP) 4.1.28.2 CONTINUATION

SAME PARAGRAPH AS ABOVE	5.16	5.91	5.225	5.227	5.227	5.262	5.244	5.320	////	5.31	5.32
CONTINUATION RECORD SAME AS ABOVE	CONT NR	APPL TYPE	FPAP ELLIPSOID HEIGHT	FPAP ORTHOMETRIC HEIGHT	LTP ORTHOMETRIC HEIGHT	APPROACH TYPE IDENT	GBAS/SBAS CHANNEL NO.	SBAS FINAL APP COURSE	////	FILE RECORD NUMBER	CYCLE

NOTES:

GLS (PT) 4.1.29.1 PRIMARY

5.2	5.3	5.4	////	5.6	5.14	5.5	5.44	5.80	////	5.16	5.244	5.46	////	5.47	5.36	5.37	5.243	////	5.245	5.246	5.52	5.39		5.74	5.197	5.247	////	5.248	5.67	////	5.31	5.32
S/T	CUST/ AREA	SEC CODE	////	ARPT OR IDENT HRPT	ICAO CODE	SUB CODE	GLS REF PATH IDENT	GLS CAT	////	CONT NR	GBAS/SBAS CHANNEL	RUNWAY OR HELI IDENT	////	GLS APP BEARING	STATION LATITUDE	STATION LONGITUDE	GLS IDENT	////	SVC VOL RADIUS	TDMA SLOTS	MIN ELEV ANG	MAG VAR	RESERVED	STATION ELEVATION	DATUM CODE	STATION TYPE	////	STATION ELEVATION (WGS-84)	GLIDEPATH TCH	////	FILE RECORD NUMBER	CYCLE

NOTES:

GLS (PT) 4.1.29.2 CONTINUATION

SAME PARAGRAPH AS ABOVE	5.16	5.91		5.31	5.32
CONTINUATION RECORD SAME AS ABOVE	CONT NR	APPL TYPE	RESERVED (100)	FILE RECORD NUMBER	CYCLE

NOTES:

ALTERNATE RECORD (RA) 4.1.30.1 PRIMARY

5.2	5.3	5.4	5.5	5.75	5.14	5.4	5.5	5.250	////	5.251	5.252	5.253	////	5.251	5.252	5.253	////	5.251	5.252	5.253	////	5.251	5.252	5.253	////	5.251	5.252	5.253	////	5.251	5.252	5.253		5.31	5.32
S/T	CUST/ AREA	SEC CODE	SUB CODE	ALTERNATE/ RELATED ARPT OR FIX	ICAO CODE	SEC CODE	SUB CODE	ART	////	DTA	ALT TYPE	ALT IDENT	////	DTA	ALT TYPE	ALT IDENT ONE	////	DTA	ALT TYPE	ALT IDENT TWO	////	DTA	ALT TYPE	ALT IDENT THREE	////	DTA	ALT TYPE	ALT IDENT FOUR	////	DTA	ALT TYPE	ALT IDENT FIVE	RESERVED EXPANSION	FILE RECORD NUMBER	CYCLE

NOTES:

AIRPORT TAA (PK) 4.1.31.1 PRIMARY

5.2	5.3	5.4	////	5.6	5.14	5.5	5.10	5.273	5.14	5.4	5.5	5.272	5.16	////	5.146	5.147	5.274	5.271	5.146	5.147	5.274	5.271	5.146	5.147	5.274	5.271	5.146	5.147	5.274	5.271	5.146	5.274	5.271	5.304	5.14	5.4	5.5	////	5.301	5.7	5.7	5.165	////	5.31	5.32
S/T	CUST/ AREA	SEC CODE	////	ARPT IDENT	ICAO CODE	SUB CODE	APPROACH IDENT	TAA IAF WAYPOINT	ICAO CODE	SEC CODE	SUB CODE	TAA FIX POS IND	CONT REC NO.	////	SECTOR BEARING	SECTOR MIN ALT	SECTOR RAD 1	PROC TURN IND	SECTOR BEARING	SECTOR MIN ALT	SECTOR RAD 1	PROC TURN IND	SECTOR BEARING	SECTOR MIN ALT	SECTOR RAD 1	PROC TURN IND	SECTOR BEARING	SECTOR MIN ALT	SECTOR RAD 1	PROC TURN IND	SECTOR BEARING	SECTOR RADIUS 1	PROC TURN IND	SECTOR BEARING REF WAYPOINT	ICAO CODE	SEC CODE	SUB CODE	////	A/C TYPE	APP RT Q1	APP RT Q2	MAG TRUE IND	////	FILE RECORD NUMBER	CYCLE

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ARINC 424 - 21 RECORD FORMAT

AIRPORT TAA (PK) 4.1.31.2 CONTINUATION

Field	Reference
CONTINUATION RECORD SAME AS ABOVE	SAME PARAGRAPH AS ABOVE
APP TYPE	5.91
SECTOR BRG	5.146
SECTOR MIN ALT	5.147
SECTOR RAD 1	5.274
PROC TURN IND	5.271
SECTOR BEARING	5.146
SECTOR MIN ALT	5.147
SECTOR RAD 1	5.274
PROC TURN IND	5.271
SECTOR BEARING	5.146
SECTOR MIN ALT	5.147
SECTOR RAD 1	5.274
PROC TURN IND	5.271
SECTOR BEARING	5.146
SECTOR MIN ALT	5.147
SECTOR RAD 1	5.274
PROC TURN IND	5.271
NOTES (21)	5.61
RESERVED (7) EXPANSION	
A/C TYPE	5.301
APP RT Q1	5.7
APP RT Q2	5.7
FILE RECORD NUMBER	5.31
CYCLE	5.32

NOTES:

TACAN-ONLY NAVAID (DT) 4.1.32.1 PRIMARY

Field	Reference
S/T	5.2
CUST AREA CODE	5.3
SEC CODE	5.4
SUB CODE	5.5
AIRPORT ID	5.6
ICAO CODE	5.14
VOR ID	5.33
CONT REC NO.	5.16
VOR FREQ	5.34
NAVAID CLASS	5.35
TACAN ID	5.38
TACAN LATITUDE	5.36
TACAN LONGITUDE	5.37
STATION DECL	5.66
TACAN ELEVATION	5.40
FIG OF MERIT	5.149
FREQ PROTECT	5.150
DATUM CODE	5.197
TACAN NAME	5.71
FILE RECORD NUMBER	5.31
CYCLE	5.32

NOTES:

TACAN-ONLY NAVAID (DT) 4.1.32.2 CONTINUATION

Field	Reference
CONTINUATION RECORD SAME AS ABOVE	SAME PARAGRAPH AS ABOVE
CONT NR	5.16
APP TYPE	5.91
NOTES (69)	
RESERVED (31) EXPANSION	5.61
FILE RECORD NUMBER	5.31
CYCLE	5.32

NOTES:

TACAN-ONLY NAVAID (DT) 4.1.32.3 SIMULATION CONTINUATION

Field	Reference
CONTINUATION RECORD SAME AS ABOVE	SAME PARAGRAPH AS ABOVE
CONT NR	5.16
APP TYPE	5.91
FACILITY CHARAC	5.93
RESERVED (42)	
MAG VAR	5.39
FACILITY ELEVATION	5.92
RESERVED EXPANSION (39)	5.61
FILE RECORD NUMBER	5.31
CYCLE	5.32

NOTES:

TACAN-ONLY NAVAID (DT) 4.1.32.4 FLIGHT PLANNING CONTINUATION

Field	Reference
CONTINUATION RECORD SAME AS ABOVE	SAME PARAGRAPH AS ABOVE
CONT NR	5.16
APP TYPE	5.91
FIR IDENT	5.116
UIR IDENT	5.93
S/E IND	5.2
RESERVED EXPANSION (80)	5.61
FILE RECORD NUMBER	5.31
CYCLE	5.32

NOTES:

TACAN-ONLY NAVAID LIMITATION (DT) 4.1.32.5 CONTINUATION

Field	Reference
CONTINUATION RECORD SAME AS ABOVE	SAME PARAGRAPH AS ABOVE
CONT NR	5.16
APP TYPE	5.91
NAV LIM CDE	5.202
CMPT AFF IND	5.206
SEQ NR	5.12
SECTOR	5.207
DIST DESC	5.187
DISTANCE LIMITATION	5.208
ALT DESC	5.29
ALTITUDE LIMITATION	5.209
SECTOR	5.207
DIST DESC	5.187
DISTANCE LIMITATION	5.208
ALT DESC	5.29
ALTITUDE LIMITATION	5.209
SECTOR	5.207
DIST DESC	5.187
DISTANCE LIMITATION	5.208
ALT DESC	5.29
ALTITUDE LIMITATION	5.209
SECTOR	5.207
DIST DESC	5.187
DISTANCE LIMITATION	5.208
ALT DESC	5.29
ALTITUDE LIMITATION	5.209
SECTOR	5.207
DIST DESC	5.187
DISTANCE LIMITATION	5.208
ALT DESC	5.29
ALTITUDE LIMITATION	5.209
SEQ END IND	5.210
FILE RECORD NUMBER	5.31
CYCLE	5.32

NOTES:

SPECIAL ACTIVITY AREA (ES) 4.1.33.1 PRIMARY

Field	Reference
S/T	5.2
CUST AREA CODE	5.3
SEC CODE	5.4
SUB CODE	5.5
SAA TYPE	5.278
SAA IDENT	5.279
ICAO CODE	5.14
AIRPORT ID	5.6
ICAO CODE	5.14
CONT REC NO.	5.16
LATITUDE	5.36
LONGITUDE	5.37
SAA SIZE	5.280
UPPER LIMIT	5.121
UNIT IND	5.133
SAA VOL	5.281
OP TIMES	5.282
PUB OR MIL	5.177
CONTROLLING AGENCY	5.140
COMM TYPE	5.101
COMM FREQ	5.103
SPECIAL ACTIVITY AREA NAME	5.126
FILE RECORD NUMBER	5.31
CYCLE	5.32

NOTES:

COMMUNICATION TYPE TRANSLATION (TV) 4.1.34 PRIMARY

Field	Reference
S/T	5.3
RES	
SEC CODE	5.4
SUB CODE	5.5
COMM TYPE	5.101
TYPE REC BY	5.287
TRANSLATION	5.288
USED ON	5.289
COMM CLASS	5.283
FILE RECORD NUMBER	5.31
CYCLE	5.32

NOTES:

GBAS PATH POINT PRIMARY RECORDS (PQ) 4.1.35.1 PRIMARY

Field	Reference
S/T	5.2
CUST/ AREA	5.3
SEC CODE	5.4
APRT IDENT	5.6
ICAO CODE	5.14
SUB CODE	5.5
APPROACH PROCEDURE IDENT	5.10
RUNWAY IDENT	5.46 or 5.300
OPERATIONS TYPES	5.223
CONT RCRD	5.16
RTE IND	5.224
SBAS SERV PRVD	5.255
REF PATH DATA SELECT	5.256
REF PATH IDENT	5.257
APP PER DES	5.258
LANDING THRESHOLD POINT LATITUDE	5.267
LANDING THRESHOLD POINT LONGITUDE	5.268
(LTP) ELLIPSOID HEIGHT	5.225
GLIDE PATH ANGLE	5.226
FLIGHT PAT ALIGNMENT POINT LATITUDE	5.267
FLIGHT PAT ALIGNMENT POINT LONGITUDE	5.268
COURSE WIDTH AT THRES	5.228
LENGTH OFFSET	5.259
PATH POINT TCH	5.265
TCH UNITS IND	5.266
GBAS FAS DATA CRC REMAINDER	5.229
FILE RECORD NUMBER	5.31
CYCLE	5.32

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GBAS PATH POINT CONTINUATION RECORDS 4.1.35.2

CONTINUATION

SAME PARAGRAPH AS ABOVE	5.16	5.91	5.225	5.227	5.227	5.262	5.244		5.31	5.32
CONTINUATION RECORD SAME AS ABOVE	CONT RCRD	APP TYPE	(FPAP) ELLIPSIOD HEIGHT	(FPAP) ORTHOMETRIC HEIGHT	(LTP) ORTHOMETRIC HEIGHT	APPROACH TYPE IDENTIFIER	GBAS/SBAS CHANNEL NUMBER		FILE RECORD NUMBER	CYCLE

NOTES:

AIRPORT HELIPAD 4.1.36.1

PRIMARY

5.2	5.3	5.4		5.6	5.14	5.5	5.180		5.16	5.303	5.176		5.36	5.37	5.249	5.302	5.309	5.310		5.68		5.31	5.32
S/T	CUST/ AREA	SEC CODE		AIRPORT/ HELI IDENT	ICAO CODE	SUB CODE	HELIPAD IDENT		CONT NR	HELI SHAPE	HELIPAD DIMENSION	RSRVD	HELIPAD LATITUDE	HELIPAD LONGITUDE	H/SURF CODE	HELIPAD SURFACE CODE	HELIPAD SURFACE TYPE	H PERF REQ		HELIPAD ELEVATION	RESERVED (EXPANSION)	FILE RECORD NUMBER	CYCLE

NOTES:

HELIPORT (HA) 4.2.1.1

PRIMARY

5.2	5.3	5.4		5.6	5.14	5.5	5.107			5.16	5.73	5.197	5.108	5.308	5.36	5.37	5.39	5.55	5.72	5.23	5.14	5.53	5.53	5.177	5.178	5.179		5.165		5.71	5.31	5.32
S/T	CUST/ AREA	SEC CODE		HELIPORT IDENT	ICAO CODE	SUB CODE	ATA/ IATA	RSVD EXP		CONT NR	SPEED LIMIT ALTITUDE	DATUM CODE	IFR CAP	HELI TYPE	HELIPORT REFERENCE POINT LATITUDE	HELIPORT REFERENCE POINT LONGITUDE	MAG VAR	ELEV	SPEED LIMIT	RECD VHF	ICAO CODE	TRANS ALTITUDE	TRANS LEVEL	PUB/MIL	TIME ZONE	DAY TIME	RESERVED EXPANSION	M/T IND	RESERVED	HELIPORT NAME (30)	FILE RECORD NUMBER	CYCLE

NOTES:

HELIPORT (HA) 4.2.1.2

CONTINUATION

SAME PARAGRAPH AS ABOVE	5.16	5.91	5.61		5.31	5.32
CONTINUATION RECORD SAME AS ABOVE	CONT NR	APPL TYPE	NOTES ON CONTINUATION RECORD (69)	RESERVED (31)	FILE RECORD NUMBER	CYCLE

NOTES:

HELIPORT (HA) 4.2.1.3

FLIGHT PLANNING CONTINUATION

SAME PARAGRAPH AS ABOVE	5.16	5.91	5.116	5.116		5.217	5.6	5.14		5.31	5.32
CONTINUATION RECORD SAME AS ABOVE	CONT NR	APPL TYPE	FIR IDENT	UIR IDENT		AS IND	AS ARPT IND	AS ICAO CODE		FILE RECORD NUMBER	CYCLE

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ARINC 424 - 19 RECORD FORMAT

HELICOPTER TERMINAL WAYPOINT (HC) 4.2.2.1 PRIMARY

Field	S/T	CUST/ AREA	SEC CODE		HELIPORT IDENT	ICAO CODE	SUB CODE	WAYPOINT IDENT		ICAO CODE	CONT NR		TYPE	RSVD	WAY USAGE		LATITUDE	LONGITUDE		D MAG VAR	RESERVED (5)	DATUM CODE		NAME IND	NAME/DESC (25)	FILE RECORD NUMBER	CYCLE
Reference	5.2	5.3	5.4		5.6	5.14	5.5	5.13		5.14	5.16		5.42		5.82		5.36	5.37		5.39		5.197		5.196	5.43	5.31	5.32

NOTES:

HELICOPTER TERMINAL WAYPOINT (HC) 4.2.2.2 CONTINUATION

Field	CONTINUATION RECORD SAME AS ABOVE	CONT NR	APPL TYPE	NOTES ON CONTINUATION RECORD (69)	RESERVED (31)	FILE RECORD NUMBER	CYCLE
Reference	SAME PARAGRAPH AS ABOVE	5.16	5.91	5.61		5.31	5.32

NOTES:

HELICOPTER TERMINAL WAYPOINT (HC) 4.2.2.3 FLIGHT PLANNING CONTINUATION

Field	CONTINUATION RECORD SAME AS ABOVE	CONT NR	APPL TYPE	FIR IDENT	UIR IDENT		RESERVED (80)	FILE RECORD NUMBER	CYCLE
Reference	SAME PARAGRAPH AS ABOVE	5.16	5.91	5.116	5.116			5.31	5.32

NOTES:

HELIPORT SIDS/STARS/APPROACH (HD/HE/HF) 4.2.3.1 PRIMARY

Field	S/T	CUST/ AREA	SEC CODE		HELIPORT IDENT	ICAO CODE	SUB CODE	SID/STAR/APP IDENT	RT TYPE	TRANS IDENT	PROD DES ACFT CAT/TYPE	SEQ NR	FIX IDENT	ICAO CODE	SEC CODE	SUB CODE	CONT NR	DESC CODE	TURN DR	RNP	PATH TERM	TDV	RECD NAVAID	ICAO CODE	ARC RADIUS
Reference	5.2	5.3	5.4		5.6	5.14	5.5	5.9 & 5.10	5.7	5.11	5.301	5.12	5.13	5.14	5.4	5.5	5.16	5.17	5.20	5.211	5.21	5.22	5.23	5.14	5.204

Field	THETA	RHO	MAG CRS	RTE DIST HOLD DIST/TIME	SEC CODE	SUB CODE	IN/OUT IND	RESERVED	ALT DESC	ATC	ALTITUDE	ALTITUDE	TRANS ALTITUDE	SPEED LIMIT	VERT ANGLE	CENTER FIX or TAA PROC TURN IND	MULTI CD	ICAO CODE	SEC CODE	SUB CODE	GNSS/FMS	SPD LMT	RTE QUAL1	RTE QUAL2	RTE QUAL 3	PREF MULT APP IND	RSVD EXP	FILE RECORD NUMBER	CYCLE
Reference	5.24	5.25	5.26	5.27	5.4	5.5	5.298		5.29	5.81	5.30	5.30	5.53	5.72	5.70	5.271 or 5.144	5.130 or 5.272	5.14	5.4	5.5	5.222	5.261	5.7	5.7	5.7	5.306		5.31	5.32

NOTES:

HELIPORT SIDS/STAR/APPROACH (HD/HE/HF) 4.2.3.2 CONTINUATION

Field	CONTINUATION RECORD SAME AS ABOVE	CONT NR	APPL TYPE	PROC TCH		PROC DESIGN MAG VAR	PROC DES MAG VAR IND	PROC REF FIX IDENT	ICAO CODE	SEC CODE	SUB CODE	PROC REF FIX IDENT	ICAO CODE	SEC CODE	SUB CODE	PROC REF FIX IDENT	ICAO CODE	SEC CODE	SUB CODE
Reference	SAME PARAGRAPH AS ABOVE	5.16	5.91	5.67		5.39	5.291	5.299	5.14	5.4	5.5	5.299	5.14	5.4	5.5	5.299	5.14	5.4	5.5

Field	PROC REF FIX IDENT	ICAO CODE	SEC CODE	SUB CODE	CAT A RADII	RESERVED (6)	SPECIAL IND	RESERVED (5)	VSF	RTE QUAL1	RTE QUAL2	RTE QUAL 3		FILE RECORD NUMBER	CYCLE
Reference	5.299	5.14	5.4	5.5	5.292		5.307		5.293	5.7	5.7	5.7		5.31	5.32

NOTES:

HELIPORT SIDS/STARS/APPROACH (HD/HE/HF) 4.2.3.3 FLIGHT PLANNING CONTINUATION

Field	CONTINUATION RECORD SAME AS ABOVE	CONT NR	APPL TYPE		LEG DIST	RESERVED (40)	RTE QUAL 1	RTE QUAL 2	RTE QUAL 3		FILE RECORD NUMBER	CYCLE
Reference	SAME PARAGRAPH AS ABOVE	5.16	5.91		5.260		5.7	5.7	5.7		5.31	5.32

NOTES:

HELIPORT PROCEDURE DATA CONTINUATION RECORD 4.2.3.5 FLIGHT PLANNING CONTINUATION

Field	CONTINUATION RECORD SAME AS ABOVE	CONT NR	APPL TYPE	FAS BLOCK	FAS BLOCK PROVIDED LEVEL OF SERVICE NAME	LNAV/VNAV	LNAV/VNAV LEVEL OF SERVICE NAME	LNAV AUTH	LNAV LEVEL OF SERVICE NAME	R ALT FLAG		RNP AUTH	RNP LEV OF SER VAL	RNP AUTH	RNP LEV OF SER VAL	RNP AUTH	RNP LEV OF SER VAL	RNP AUTH	RNP LEV OF SER VAL		RTE QUAL 1	RTE QUAL 2	RTE QUAL 3		FILE RECORD NUMBER	CYCLE
Reference	SAME PARAGRAPH AS ABOVE	5.16	5.91	5.276	5.275	5.276	5.275	5.276	5.275	5.308		5.276	5.296	5.276	5.296	5.276	5.296	5.276	5.296		5.7	5.7	5.7		5.31	5.32

NOTES:

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ARINC 424 - 19 RECORD FORMAT

HELIPORT MINIMUM SECTOR ALTITUDE (MSA) (HS) 4.2.4.1 PRIMARY

Field	Reference
S/T	5.2
CUST/ AREA	5.3
SEC CODE	5.4
ARPT IDENT	5.6
ICAO CODE	5.14
SUB CODE	5.5
MSA CENTER	5.144
ICAO CODE	5.14
SEC CODE	5.4
SUB CODE	5.5
MULTI CD	5.130
RESERVED (15)	
CONT NR	5.16
SEC BRG	5.146
SEC ALT	5.147
SEC RAD	5.145
SEC BRG	5.146
SEC ALT	5.147
SEC RAD	5.145
SEC BRG	5.146
SEC ALT	5.147
SEC RAD	5.145
SEC BRG	5.146
SEC ALT	5.147
SEC RAD	5.145
SEC BRG	5.146
SEC ALT	5.147
SEC RAD	5.145
SEC BRG	5.146
SEC ALT	5.147
SEC RAD	5.145
SEC BRG	5.146
SEC ALT	5.147
SEC RAD	5.145
MAG IND	5.165
RESRVD EXP (3)	
FILE RECORD NUMBER	5.31
CYCLE	5.32

NOTES:

HELIPORT MINIMUM SECTOR ALTITUDE (MSA) (HS) 4.2.4.2 PRIMARY EXTENSION

Field	Reference
CONTINUATION RECORD SAME AS ABOVE	SAME PARAGRAPH AS ABOVE
CONT NR	5.16
APPL TYPE	5.91
RES	
SEC BRG	5.146
SEC ALT	5.147
SEC RAD	5.145
SEC BRG	5.146
SEC ALT	5.147
SEC RAD	5.145
SEC BRG	5.146
SEC ALT	5.147
SEC RAD	5.145
SEC BRG	5.146
SEC ALT	5.147
SEC RAD	5.145
SEC BRG	5.146
SEC ALT	5.147
SEC RAD	5.145
SEC BRG	5.146
SEC ALT	5.147
SEC RAD	5.145
SEC BRG	5.146
SEC ALT	5.147
SEC RAD	5.145
FIELD AS ON PRIMARY	
FILE RECORD NUMBER	5.31
CYCLE	5.32

NOTES:

HELIPORT MINIMUM SECTOR ALTITUDE (MSA) (HS) 4.2.4.3 CONTINUATION

Field	Reference
CONTINUATION RECORD SAME AS ABOVE	SAME PARAGRAPH AS ABOVE
CONT NR	5.16
APPL TYPE	5.91
NOTES ON CONTINUATION RECORD (69)	5.61
RESERVED (14)	
FILE RECORD NUMBER	5.31
CYCLE	5.32

NOTES:

HELIPORT COMM (HV) 4.2.5.1 PRIMARY

Field	Reference
S/T	5.2
CUST/ AREA	5.3
SEC CODE	5.4
HELIPORT IDENT	5.6
ICAO CODE	5.14
SUB CODE	5.5
COMM CLASS	5.283
SEQ NO.	5.12
CONT NO.	5.16
COMM TYPES	5.101
TRANSMIT FREQ	5.103
RECEIVE FREQ	5.103
FREQ UNITS	5.104
RAD UNITS	5.102
H24 IND	5.181
CALL SIGNS	5.105
M-S IND	5.286
SECTORI- ZATION	5.183
SECTOR FAC	5.185
ICAO	5.14
SEC CODE	5.4
SUB CODE	5.5
ALT DESC CODE	5.29
COMM ALT 1	5.184
COMM ALT 2	5.184
DIST DESC CODE	5.187
COMM DIST	5.188
TRANSMITTER LAT	5.36
TRANSMITTER LONG	5.37
SERV IND	5.106
MOD	5.198
SIG EMIS	5.199
FILE RECORD NUMBER	5.31
CYCLE	5.32

NOTES:

HELIPORT COMM (HV) 4.2.5.2 CONTINUATION

Field	Reference
CONTINUATION RECORD SAME AS ABOVE	SAME PARAGRAPH AS ABOVE
CONT REC NBR	5.16
APP TYPE	5.91
REMOTE FAC	5.200
ICAO	5.14
SECTION	5.4
SUB	5.5
TRANS SITE MAG VAR	5.39
TRANS SITE ELEV	5.92
ADD'L SECTORIZATION 1	5.183
ADD SEC 1 ALT DESC	5.29
ADD SEC 1 ALT 1	5.184
ADD SEC 1 ALT 2	5.184
ADD'L SECTORIZATION 2	5.183
ADD SEC 2 ALT DESC	5.29
ADD SEC 2 ALT 1	5.184
ADD SEC 2 ALT 2	5.184
TIME CODE	5.132
NOTAM	5.131
TIME IND	5.138
TIME OF OPERATION	5.195
TIME OF OPERATION	5.195
TIME OF OPERATION	5.195
TIME OF OPERATION	5.195
TIME OF OPERATION	5.195
FILE RECORD NUMBER	5.31
CYCLE	5.32

NOTES:

HELIPORT COMM (HV) 4.2.5.3 CONTINUATION

Field	Reference
CONTINUATION RECORD SAME AS ABOVE	SAME PARAGRAPH AS ABOVE
CONT REC NBR	5.16
APP TYPE	5.91
SECTORIZATION NARRATIVE (60)	5.186
RESERVED (SPACING) (40)	
FILE RECORD NUMBER	5.31
CYCLE	5.32

NOTES:

HELIPORT COMM (HV) 4.2.5.4 CONTINUATION

Field	Reference
CONTINUATION RECORD SAME AS ABOVE	SAME PARAGRAPH AS ABOVE
CONT REC NBR	5.16
APP TYPE	5.91
TIME OF OPERATION	5.195
TIME OF OPERATION	5.195
TIME OF OPERATION	5.195
TIME OF OPERATION	5.195
TIME OF OPERATION	5.195
RESERVED (EXP)	
FILE RECORD NUMBER	5.31
CYCLE	5.32

NOTES:

HELIPORT COMM (HV) 4.2.5.5 CONTINUATION

Field	Reference
CONTINUATION RECORD SAME AS ABOVE	SAME PARAGRAPH AS ABOVE
CONT REC NBR	5.16
APP TYPE	5.91
TIME NARRATIVE (100)	5.285
FILE RECORD NUMBER	5.31
CYCLE	5.32

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4.0 NAVIGATION DATA - RECORD LAYOUT

ARINC 424 - 19 RECORD FORMAT

HELIPORT TAA (HK) 4.2.6.1 PRIMARY

Field Ref.	Field
5.2	S/T
5.3	CUST/AREA
5.4	SEC CODE
5.6	HELIPORT IDENT
5.14	ICAO CODE
5.5	SUB CODE
5.10	APPROACH IDENT
5.273	TAA IAF WAYPOINT
5.14	ICAO CODE
5.4	SEC CODE
5.5	SUB CODE
5.272	TAA FIX POS IND
5.16	CONT REC NO.
5.146	SECTOR BEARING
5.147	SECTOR MIN ALT
5.274	SECTOR RAD 1
5.271	PROC TURN IND
5.146	SECTOR BEARING
5.147	SECTOR MIN ALT
5.274	SECTOR RAD 1
5.271	PROC TURN IND
5.146	SECTOR BEARING
5.147	SECTOR MIN ALT
5.274	SECTOR RAD 1
5.271	PROC TURN IND
5.146	SECTOR BEARING
5.147	SECTOR MIN ALT
5.274	SECTOR RAD 1
5.271	PROC TURN IND
5.146	SECTOR BEARING
5.274	SECTOR RAD 1
5.271	PROC TURN IND
5.304	SECTOR BEARING REFERENCE WAYPOINT
5.14	ICAO CODE
5.4	SECTION CODE
5.5	SUB CODE
5.301	PROC A/C TYPE
5.7	APP ROUTE Q1
5.7	APP ROUTE Q2
5.165	MAG/TRUE IND
5.31	FILE RECORD NUMBER
5.32	CYCLE

NOTES:

HELIPORT TAA (HK) 4.2.6.2 CONTINUATION

Field Ref.	Field
SAME PARAGRAPH AS ABOVE	CONTINUATION RECORD SAME AS ABOVE
5.91	USERS
5.146	SECTOR BEARING
5.147	SECTOR MIN ALT
5.274	SECTOR RAD 1
5.271	POC TURN IND
5.146	SECTOR BEARING
5.147	SECTOR MIN ALT
5.274	SECTOR RAD 1
5.271	POC TURN IND
5.146	SECTOR BEARING
5.147	SECTOR MIN ALT
5.274	SECTOR RAD 1
5.271	POC TURN IND
5.146	SECTOR BEARING
5.147	SECTOR MIN ALT
5.274	SECTOR RAD 1
5.271	POC TURN IND
5.61	NOTES (21)
	RESERVED (7)
5.301	PROC A/C TYPE
5.7	APP ROUTE Q1
5.7	APP ROUTE Q2
5.31	FILE RECORD NUMBER
5.32	CYCLE

NOTES:

HELICOPTER OPERATIONS COMPANY ROUTE 4.2.7.1 PRIMARY

Field Ref.	Field
5.2	S/T
5.3	CUST/AREA
5.4	SEC CODE
5.5	SUB CODE
5.75	FROM AIRPORT HELIPORT/FIX
5.180	HELIPAD ID
5.14	ICAO CODE
5.4	SEC CODE
5.5	SUB CODE
5.75	TO AIRPORT/HELIPORT/FIX
5.180	HELIPAD ID
5.14	ICAO CODE
5.4	SEC CODE
5.5	SUB CODE
5.76	COMPANY ROUTE ID
5.12	SEQ NO.
5.77	VIA CODE
5.78	SID/STAR/APP/AWY
5.4	SEC CODE
5.5	SUB CODE
5.7	S/S/A/A RT TYPE
5.7	S/S/A/A RT Q 1
5.7	S/S/A/A RT Q 2
5.3	AREA CODE
5.83	TO FIX
5.14	ICAO CODE
5.4	SEC CODE
5.5	SUB CODE
5.84	RWY/HELIPAD TRANS ID
5.85	ENROUTE TRANS ID
	RESERVED
5.86	CRUISE ALT
5.87	TERM/ALT HELIPORT
5.14	ICAO CODE
5.4	SEC CODE
5.5	SUB CODE
5.88	ALT DISTANCE
5.89	COST INDEX
5.148	ENROUTE ALT HELIPORT
	RESERVED (EXP)
5.31	FILE RECORD NUMBER
5.32	CYCLE

NOTES:

HELICOPTER OPERATIONS SBAS PATH POINT (HP) 4.2.8.1 PRIMARY

Field Ref.	Field
5.2	S/T
5.3	CUST/AREA
5.4	SEC CODE
5.6	ARPT / HELIO IDENT
5.14	ICAO CODE
5.5	SUB CODE
5.10	APP PROC IDENT
5.300	FINAL APP COURSE AS RUNWAY
5.223	OP TYPE
5.16	CONT REC NO.
5.224	RTE IND
5.255	SBAS SPI
5.256	REF PATH DATA SEL
5.257	REF PATH IDENT
5.258	APP PD
5.267	FICTITIOUS THRESHOLD POINT LATITUDE
5.268	FICTITIOUS THRESHOLD POINT LONGITUDE
5.225	(FTP) ELLIPSOID HEIGHT
5.226	GLIDE PATH ANGLE
5.267	FLIGHT PATH ALIGNMENT POINT LATITUDE
5.268	FLIGHT PATH ALIGNMENT POINT LONGITUDE
5.228	COURSE WIDTH AT THRESHOLD
5.259	LENGTH OFFSET
5.265	PATH POINT TCH
5.266	TCH IND
5.263	HAL
5.264	VAL
5.229	SBAS FAS DATA CRC REMAINDER
5.31	FILE RECORD NUMBER
5.32	CYCLE

NOTES:

HELICOPTER OPERATIONS SBAS PATH POINT 4.2.8.2 CONTINUATION

Field Ref.	Field
SAME PARAGRAPH AS ABOVE	CONTINUATION RECORD SAME AS ABOVE
5.16	CONT REC NO.
5.91	APP TYPE
5.255	(FPAP) ELLIPSOID HEIGHT
5.227	(FPAP) ORTHOMETRIC HEIGHT
5.227	(FTP) ORTHOMETRIC HEIGHT
5.262	APPROACH TYPE IDENTIFIER
5.244	GNSS CHANNEL NUMBER
5.269	HRPT PROC COURSE
5.31	FILE RECORD NUMBER
5.32	CYCLE

NOTES:

HELICOPTER HELIPAD (HH) 4.2.9.1 PRIMARY

Field Ref.	Field
5.2	S/T
5.3	CUST/AREA
5.4	SEC CODE
5.6	ARPT / HELIO IDENT
5.14	ICAO CODE
5.5	SUB CODE
5.180	HELIPAD IDENTIFIER
5.16	CONT REC NO.
5.303	HELI SHAPE
5.176	HELIPAD DIMENSION
	RVSD
5.36	HELIPAD LATITUDE
5.37	HELIPAD LONGITUDE
5.249	SURFACE
5.302	HELIPAD SURFACE TYPE
5.309	MAX ALLOW HELI WGHT
5.310	PERF REQ
5.68	HELIPAD ELEVATION
5.31	FILE RECORD NUMBER
5.32	CYCLE

NOTES:

5.0 NAVIGATION DATA – FIELD DEFINITIONS

5.1 General

Section sets forth definitions/descriptions and content for each type of field employed in the records discussed in Chapter 4. The following information is presented for each field:

a. Field Name (section heading)
b. Abbreviation used in proportional record layouts (Chapter 4) when different than Field Name (follows section heading)
c. Field Definition/Description
d. Source/Content of each field
e. Length of field, expressed in number of characters
f. Type of character allowed in each field, alpha or numeric or alpha/numeric
g. Examples of field content when appropriate and/or necessary

The following general rules apply to the format of all the fields:

a. All numeric fields and the numeric parts of latitude, longitude, magnetic variation, negative elevation, and station declination fields will be right justified and filled with leading zeros.
b. All alpha and alpha/numeric fields will be left justified.
c. Allowable field content of blank is defined as alpha/numeric content.

5.2 Record Type (S/T)

Definition/Description: The Record Type field content indicates whether the record data are standard, i.e., suitable for universal application, or tailored, i.e., included on the master file for a single user's specific purpose (Section 1.2 of this specification refers).

Source/Content: The field contains the letter S when the field data are standard and the letter T when they are tailored.

Used On:	All records
Length:	1 character
Character Type:	Alpha

5.3 Customer/Area Code (CUST/AREA)

Definition/Description: The Customer Area Code field permits the categorization of standard records by geographical area and of tailored records by the airlines**, airline subsets, or other customer code** for whom they are provided in the master file. Several record types do not adhere to the established geographical boundaries. There is no AREA in such records.

Source/Content: AREA Codes should be derived from Figure 5-1. Airline codes should be derived from **ICAO Doc 8585 for the three-letter code or** the IATA Airline Coding Directory **for the two-character code. If no code is defined in these documents for an entity, a unique code may be established.** On Company Route and Preferred Route Records, an additional AREA field is used as a pointer to the AREA in which the Route Segment is located. For records, which do not follow geographical boundaries, the field is blank. For Preferred Routes, the field content is PDR.

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Used On:	All records with content as defined above.
Length:	3 characters max
Character Type:	Alpha**/numeric**
Examples:	Areas - USA, CAN, EUR
	Customer - UAL, DAL, **DLH, AA8, DL3, LH8**
	Preferred Routes - PDR

5.4 Section Code (SEC CODE)

Definition/Description: The Section Code field defines the major section of the navigation system database in which the record resides.

Source/Content: Table 5-1 shows the database section encoding scheme.

Used On:	All records
Length:	1 character
Character Type:	Alpha

5.5 Subsection Code (SUB CODE)

Definition/Description: The Subsection Code field defines the specific part of the database major section in which the record resides.

Additionally, records that reference other records within the database use Section/Subsection Codes to make the reference, together with the record identifier. This is true for fix information in Holdings, Enroute Airways, Airport and Heliport SID/STAR/APPROACH, all kinds of Communications, Airport and Heliport MSA, Airport and Heliport TAA, Company Routes, Enroute Airway Restrictions, Preferred Routes and Alternate Records. The Section Code will define the major database section, the Subsection Code permits the exact section (file) to be identified and the fix (record) can then be located within this file.

Source/Content: Table 5-1 shows the database Subsection Encoding Scheme.

Used On:	All records
Length:	1 character
Character Type:	Alpha

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Table 5-1 – Section and Subsection Encoding Scheme

Section Code	Section Name	Subsection Code	Subsection Name
A	MORA	S	Grid MORA
D	Navaid	Blank	VHF Navaid
		B	NDB Navaid
		T	TACAN Duplicates
E	Enroute	A	Waypoints
		M	Airway Markers
		P	Holding Patterns
		R	Airways and Routes
		S	Special Activity Areas
		T	Preferred Routes
		U	Airway Restrictions
		V	Communications
H	Heliport	A	Reference Points
		C	Terminal Waypoints
		D	SIDs
		E	STARs
		F	Approach Procedures
		H	Helipads
		K	TAA
		S	MSA
		P	SBAS Path Point
		V	Communications
P	Airport	A	Reference Points
		B	Gates
		C	Terminal Waypoints
		D	SIDs
		E	STARs
		F	Approach Procedures
		G	Runways
		H	Helipads
		I	Localizer/Glideslope
		K	TAA
		L	MLS
		M	Localizer Marker
		N	Terminal NDB
		P	SBAS Path Point
		Q	GBAS Path Point
		R	Flt Planning ARR/DEP
		S	MSA
		T	GLS Station
		V	Communications
R	Company Routes	Blank	Company Routes (Master Airline File)
		A	Alternate Records
		H	Helicopter operation Routes (Master Helicopter File)
T	Tables	C	Cruising Tables
		G	Geographical Reference
		V	Communication Type
U	Airspace	C	Controlled Airspace
		F	FIR/UIR
		R	Restrictive Airspace

5.6 Airport/Heliport Identifier (ARPT/HELI IDENT)

Definition/Description: The Airport Identifier and the Heliport Identifier fields contain the identification of the airport or heliport to which the data contained in the record relates.

Source/Content: The content of this field is derived from official government sources. It will be the four-character ICAO Location Identifier of the airport or heliport when such is published. It will be the three or four-character Domestic

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Identifier when published and no ICAO Location Identifier is available for the airport or heliport. It will be the supplied procedure location identifier for Point in Space procedures that are not designated to an Airport or Heliport. When used on Airport or Heliport Flight Planning Continuation Records, it will be the Airport or Heliport Identifier owning the terminal controlled airspace referenced in that record.

Note: Within the continental United States, in addition to using the published four character ICAO Location Identifiers, data suppliers append the character K for the USA to certain Domestic Identifiers to present an ICAO look-alike four character identifier.

COMMENTARY

Where no officially published identifier is available, a data supplier may create a unique, temporary and unofficial identifier. Airports or Heliports within such identifiers may supply Tailored Data only and with full knowledge and concurrence of the data user. Whenever possible, such temporary identifiers should be coordinated among the various data suppliers prior to its release. In cases where a Point in Space procedure is to be provided to a location that is not an Airport or a Heliport, procedure design provided identifiers will be used.

The content of this Airport/Heliport Identifier should not be confused with the perhaps more familiar ATA/IATA two or three-character identifiers often user by airlines for other than navigation purposes. These ATA/IATA identifiers are included in the ARINC 424 database in accordance with Section 5.107 of this specification.

Used On: <u>Airport Identifier</u> - VHF Navaid, NDB Navaid, Airport Terminal Waypoint, Airport, Airport Gate, Airport SID/STAR/Approach, Runway, Airport and Heliport Localizer, Airport and Heliport Localizer Marker, Holding Pattern, Airport Communications, Airport and Heliport MLS, GLS Airport MSA, Airport TAA, Path Point Flight Planning Arrival Departure Data, GLS Record, Airport Helipad Records, and Enroute Airway Restriction and Company Route to the Airport Identifier.

<u>Heliport Identifier</u> - VHF Navaid, NDB Navaid, Heliport Terminal Waypoint, Heliport, Heliport SID/STAR/Approach, Airport and Heliport Localizer, Airport and Heliport Localizer Marker, Holding Pattern, Heliport Communications, Airport and MLS, GLS Heliport MSA, Heliport TAA, Path Point Flight Planning Arrival/Departure Data, GLS Records, Airport Helipad Records, and Enroute Airway Restriction and Company Route to the Airport Identifier.

<u>Point in Space Procedure Location Identifier</u> – Heliport Records when used to provide Point in Space Procedure Location, Heliport Terminal Waypoint Records when used to provide Point in Space Procedures, Heliport SID/STAR/Approach Records when used to provide Point in Space Procedures, Heliport MSA Records when used for Point

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in Space Procedures, Heliport Path Point Records for Point in Space Procedures, Heliport Helipad Records for Point in Space Procedures.

Length: 4 characters maximum
Character Type: Alpha/numeric
Examples: KJFK, DMIA, 9Y9, CYUL, EDDF, 53Y, CA14

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5.0 NAVIGATION DATA – FIELD DEFINITIONS

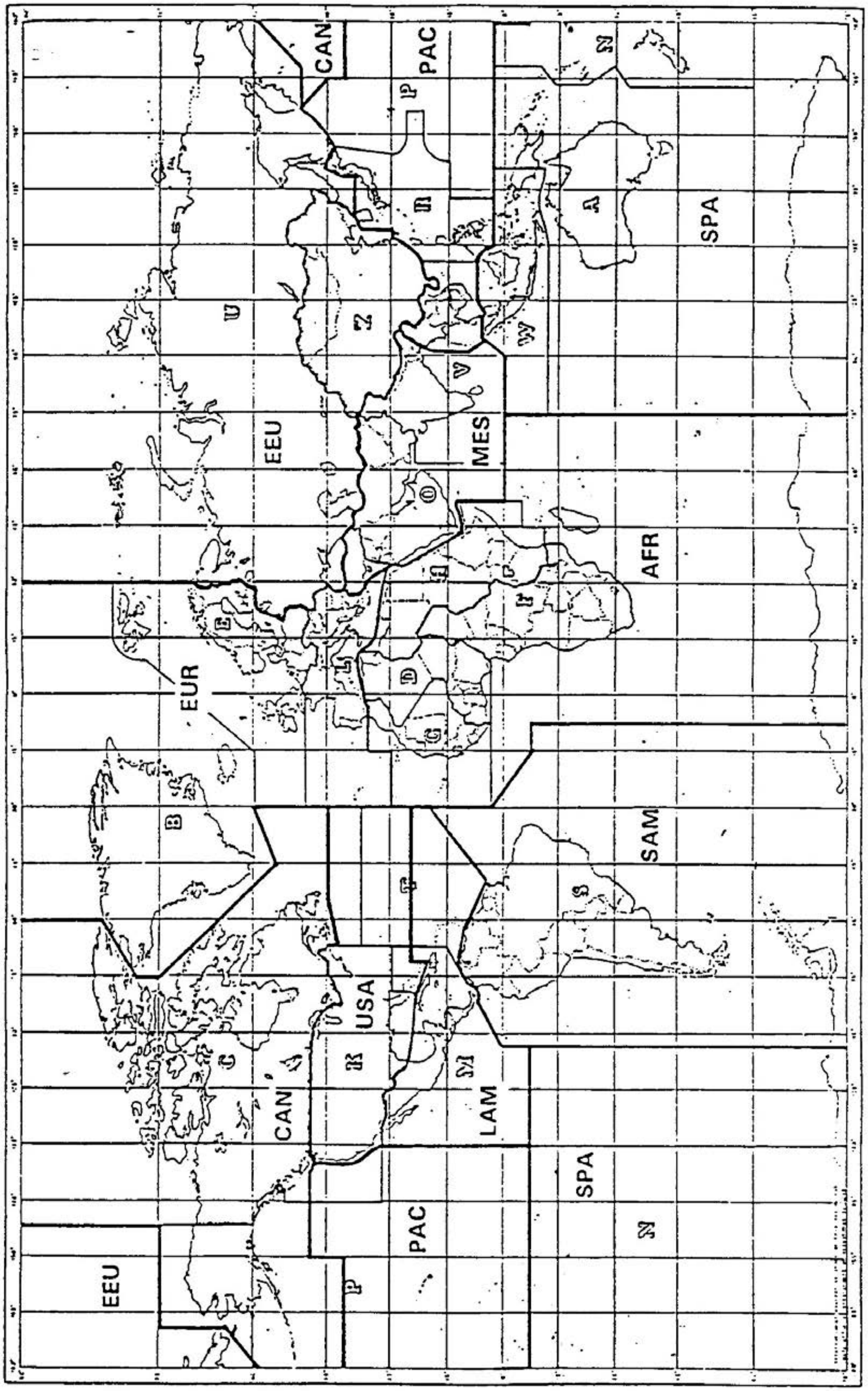

Figure 5-1 – Geographical Area Codes

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5.7 Route Type (RT TYPE)

Definition/Description: The Route Type field defines the type of Enroute Airway, Preferred Route, Airport and Heliport SID/STAR/Approach Routes of which the record is an element. For Airport and Heliport SID/STAR/Approach Routes, Route Type includes a primary route type, and up to two route type qualifiers.

Source/Content: The content of this field (for approach procedures) will be as indicated in the following tables:

Table 5-2 – Enroute Airway Records (ER)

Airway Type	Field Content
Airline Airway (Tailored Data)	A
Control	C
Direct Route	D
Helicopter Airways	H
Officially Designated Airways, except RNAV, **RNP or** Helicopter Airways	O
RNAV **or RNP** Airways **(ICAO PBN Nav Spec)**	R
Undesignated ATS Route	S
TACAN Airway	T

Table 5-3 – Route Qualifier Content

Qualifier Description	Qualifier 1 Field Content	Qualifier 2 Field Content	Qualifier 3 Field Content
GNSS Required	G		
GNSS or DME/DME/IRU Required	F		
GNSS, DME/DME/IRU or DME/DME Required	A		
Equipment requirements unspecified	U		
FRT Required		R	
Parallel Offset Required		P	
TOAC Required		T	
RNAV 10 PBN Nav Spec			W
RNAV 5 PBN Nav Spec			Z
RNAV 2 PBN Nav Spec			Y
RNAV 1 PBN Nav Spec			X
B RNAV			B
P RNAV			P
RNP 4 PBN Nav Spec			C
RNP 2 PBN Nav Spec			D
RNP 1 PBN Nav Spec			E
A-RNP (Advanced RNP) PBN Nav Spec			A
RNP 0.3 PBN Nav Spec			G
PBN Nav Spec unspecified			U
VOR/DME RNAV			V
Non RNAV/RNP segment in a RNAV/RNP airway			N (Note 1)

Note 1: The N will be coded if an airway is coded with Route Type R but includes non PBN segments. In these cases, Qualifier 1 and 2 will be blank.

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Table 5-4 – Preferred Route Records (ET)

Route Type Description	Field Content
North American Routes for North Atlantic Traffic	C
Common Portion	
Preferential Routes	D
Pacific Oceanic Transition Routes (PACOTS)	J
TACAN Routes – Australia	M
North American Routes for North Atlantic Traffic – Non-common Portion	N
Preferred/Preferential Overflight Routes	O
Preferred Routes	P
Traffic Orientation System Routes (TOS)	S
Tower Enroute Control Routes (TEC)	T

Table 5-5 – Airport SID (PD) and Heliport SID (HD) Records

SID Route Type Description	Field Content
Engine Out SID	0
SID Runway Transition	1
SID or SID Common Route	2
SID Enroute Transition	3
Vector SID Runway Transition	T
Vector SID Enroute Transition	V

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Table 5-6 – Airport and Heliport SID Record

Qualifier Description	Qualifier 1 Field Content	Qualifier 2 Field Content	Qualifier 3 Field Content
DME Required	D		
GNSS Required	G		
Radar Required	R		
Helicopter SID from Runway	H		
Point-in-Space (PinS) SID	P		
RNAV PBN Nav Spec		D (Note 2)	
RNP PBN Nav Spec		E (Note 1)	
FMS Required		F (Note 3)	
Conventional Departures		G	
PinS Departure - Proceed Visually		W (Note 5)	
PinS Departure - Proceed VFR		X (Note 5)	
RNAV 5 PBN Nav Spec			Z
RNAV 2 PBN Nav Spec			Y
RNAV 1 PBN Nav Spec			X
B RNAV			B
P RNAV			P
RNP 2 PBN Nav Spec			D
RNP 1 PBN Nav Spec			E
RNP AR PBN Nav Spec			F (Note 4)
A-RNP (Advanced RNP) PBN Nav Spec			A
RNP 0.3 PBN Nav Spec			G
RNP 1 or RNAV 1 PBN Nav Spec			**M**
PBN Nav Spec unspecified			U
VOR/DME RNAV			V

Note 1: Departure Procedures designed and published based upon an ICAO PBN RNP Navigation Specification. Qualifier 3 must be coded with D, E, F, A, G, or U.

Note 2: RNAV Departures designed and published based upon an ICAO PBN RNAV Navigation Specification will be coded with a qualifier 3 Z, Y, X, B, P, **M,** or U. RNAV Departures not based upon PBN will be coded with a qualifier 3 U or V.

Note 3: Used when the government authority has designated a Departure as FMS.

Note 4: The Qualifier F indicates that the departure is an RNP AR procedure. Implied GNSS required. Qualifier F used with SID route type 0 will designate an RNP AR Engine Out SID. Qualifier F can be used in conjunction with SID route type 1, 2 or 3, provided the corresponding SID transition is AR.

Note 5: Implied that Database Supported RNAV is required. Qualifier W and X can be used in conjunction with Qualifier 1 set to P and SID route type 1, 2, or 3. Qualifier 2 to be set to D when procedure chart is not annotated with Proceed Visually or Proceed VFR.

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Table 5-7 – Airport STAR (PE) and Heliport STAR (HE) Records

STAR Route Type Description	Field Content
STAR Enroute Transition	1
STAR or STAR Common Route	2
STAR Runway Transition	3

Qualifier Description	Qualifier 1 Field Content	Qualifier 2 Field Content	Qualifier 3 Field Content
DME Required	D		
Radar Required	R		
GNSS Required	G		
Helicopter STAR to Runway	H		
Continuous Descent STAR	P		
RNAV PBN Nav Spec		D **(Note 2)**	
RNP PBN Nav Spec		**E (Note 3)**	
FMS Required		F (Note 1)	
Conventional Arrivals		G	
RNAV 5 PBN Nav Spec			Z
RNAV 2 PBN Nav Spec			Y
RNAV 1 PBN Nav Spec			X
B RNAV			B
P RNAV			P
RNP 2 PBN Nav Spec			D
RNP 1 PBN Nav Spec			E
RNP AR PBN Nav Spec			F
A-RNP (Advanced RNP) PBN Nav Spec			A
RNP 0.3 PBN Nav Spec			G
RNP 1 or RNAV 1 PBN Nav Spec			**M**
PBN Nav Spec unspecified			U
VOR/DME RNAV			V

Note 1: Used when the government authority has designated an Arrival as FMS.

Note 2: RNAV Arrivals designed and published based upon an ICAO PBN RNAV Navigation Specification will be coded with a qualifier 3 Z, Y, X, B, P**, M**, or U. RNAV Arrivals not based upon PBN will be coded with a qualifier 3 U or V.

Note 3: Arrival Procedure designed and published based upon an ICAO PBN RNP Navigation Specification. Qualifier 3 must be coded with D, E, F, A, G, or U.

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Table 5-8 – Airport Approach (PF) and Heliport Approach (HF) Records

Approach Route Type Description	Route Type Field Content
Approach Transition	A
Localizer/Backcourse Approach	B
VORDME Approach	D
Flight Management System (FMS) Approach	F
Instrument Guidance System (IGS) Approach	G
Area Navigation (RNAV) Approach with Required Navigation Performance (RNP) Approach (Note 1)	H
Instrument Landing System (ILS) Approach	I
GNSS Landing System (GLS)Approach	J
Localizer Only (LOC) Approach	L
Microwave Landing System (MLS) Approach	M
Non-Directional Beacon (NDB) Approach	N
Global Positioning System (GPS) Approach	P
Non-Directional Beacon + DME (NDB+DME) Approach	Q
Area Navigation (RNAV) Approach (Note 1)	R
VOR Approach using VORDME/VORTAC	S
TACAN Approach	T
Simplified Directional Facility (SDF) Approach	U
VOR Approach	V
Localizer Directional Aid (LDA) Approach	X
Missed Approach	Z

The listing above for Approach Route Type is alphabetical and does not represent any kind of priority.

Note 1: Route Type R indicates a procedure titled RNAV, e.g., RNAV (GPS) or RNAV (RNP). Route Type H indicates a procedure titled RNP.

COMMENTARY:

The Route Types H and R are coded to differentiate between the approach procedure titles published in state source. The words in brackets will not be considered for the coding of the Route Type. While according to the PBN manual there is no RNAV approach specification, many approaches are still published using an RNAV title. Additionally, there are still non PBN RNAV approaches published, e.g., VOR/DME RNAV.

The following old titles will be coded with a Route Type R:
RNAV (GPS) RWY 09
RNAV (GNSS) RWY 09
RNAV (RNP) RWY 09

The following new titles will be coded with Route Type H:
RNP RWY 09
RNP RWY 09 (AR)

The following new titles will be coded with Route Type R:
RNAV RWY 09
RNAV RWY 09 (AR)

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Table 5-9 – Airport Approach (PF) and Heliport (HF) Records

Qualifier Description	Qualifier 1 Field Content (Note 1)	Qualifier 2 Field Content Note 1	Qualifier 3 Field Content (Note1)
RNAV 1 PBN Nav Spec			X (Note 8)
RNP 1 PBN Nav Spec			E (Note 8)
RNP APCH PBN Nav Spec			H (Note 8)
RNP 0.3 PBN Nav Spec			G (Note 8)
A-RNP (Advance RNP) PBN Nav Spec			A (Note 8)
RNP AR PBN Nav Spec			F (Note 8)
RNAV Visual Procedure			B (Note 2)
DME Required for Procedure	D (Note 5)		
GPS (GNSS) required, DME/DME to RNP xx.x not authorized	J (Note 2)		
DME Not Required for Procedure	N (Note 5)		
GNSS Required	P (Note 2)		
GPS (GNSS) or DME/DME to RNP xx.x required	R (Note 2)		
DME/DME Required for Procedure	T (Note 2)		
RNAV or RNP, Sensor Not Specified	U (Note 2)		
VOR/DME RNAV	V (Note 2)		
Procedure that Requires SBAS FAS Data Block	W (Note 4)		
Primary Missed Approach		A (Note 6)	
Secondary Missed Approach		B (Note 6)	
Engine Out Missed Approach		E (Note 6)	
Procedure with Circle-to-land Minimums		C (Note 3)	
Helicopter with Straight-in Minimums		H (Note 6, 7)	
Helicopter with Circle-to-land Minimums		I (Note 7)	
Helicopter with Helicopter Landing Minimums		L (Note 6, 9)	
Procedure with Straight-in Minimums		S	
Procedure with VMC minimums		V (Note 10)	
PinS Procedure - Proceed Visually		W (Note 11)	
PinS Procedure - Proceed VFR		X (Note 11)	

Not all Qualifiers will apply to all Route Types, see notes below. Qualifier fields may be blank where their use is not required by source documentation.

Note 1: Qualifier 1 and 2 are carried on each sequence of every transition for Approach Procedure Coding (Approach Transition, Final Approach and Missed Approach) and will be identical for each sequence in a specific transition. Qualifier 2 will be different between Approach Transitions/Final approach coding where S or C will be used and Missed Approach where A, B, or E will be used (See Note 6). Qualifier 3 will be coded where applicable and will be identical for each sequence in a specific transition but may be different between transitions.

Note 2: Route Type R is used for all procedures titled RNAV. Route Type H is used for all types of RNP procedure coding titled RNP. The type of RNAV or RNP procedure is further defined through the content of Qualifier 1.

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a. Conventional Area Navigation Approach Procedures using RHO-RHO or RHO-THETA equipment are coded as Route Type H or R and Qualifier 1 of T or V.
b. GNSS based RNP Approach Procedures are coded as Route Type H or R with Qualifier 1 set to J, R, P, or U as required by source publications and mapped to this table.

Note 3: In Approach Transition and Final Approach Coding, Qualifier 2 is set to indicate the type of minimums applicable to the coding as indicated in the table. A Qualifier 2 of S or H means the procedure has been coded as straight-in. There may also be circle-to-land minimums for the same procedure. Qualifier 2 is required for all Route Types and is independent of the content of Qualifier 1.

Note 4: A Qualifier 1 value of W is used to indicate that the Procedure is authorized for SBAS navigation (vertical and lateral, or lateral-only) and requires the ARINC 424 Path Point with the Final approach Segment (FAS) Data Block. No other navigation sensors are authorized for these procedures.

Examples:

Note 4, An Approach Procedure is authorized for SBAS navigation only (vertical and lateral, or lateral-only) and requires the FAS Data Block. The Route Type would be coded as H or R and Qualifier 1 would be coded as W. The associated GNSS/FMS Indicator (Section 5.222) would be set to indicate that SBAS-based vertical navigation is authorized. A Path Point Record carrying the FAS Data Block would be provided for the procedure. A Procedure Data Continuation Record would be provided and would be used to define the Levels of Service authorized and the official government source documentation Names for these Services.

Note 2, An Approach Procedure is authorized for SBAS navigation (lateral and/or vertical) and for single or multiple sensors other than SBAS. The Route Type would be coded as H or R and Qualifier 1 would be coded as J, P, or R, as appropriate. The setting of the GNSS/FMS Indicator would be appropriate to the level of authorization. A Path Point Record would or would not be provided, according to government source publications. A Procedure Data Continuation Record would be provided and would be used to define the Levels of Services authorized for SBAS and the official government source documentation Names for these Services.

Note 2, An Approach Procedure is authorized for a single or multiple sensors other than SBAS; SBAS-based vertical navigation is not authorized. The Route Type would be coded as H or R and Qualifier 1 would be coded as J, R L, U, or P as appropriate. The setting of the GNSS/FMS Indicator would be appropriate to the level of authorization. No Path Point Record

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would be provided. No Procedure Data Continuation Record would be provided.

Note 5: The Qualifier 1 codes of D and N are not used on RNAV and RNP Procedures (Route Type H and R) of any kind. Additionally, these codes are not used in conjunction with Route Types that provide a DME Option of a procedure; specifically, they are not used in conjunction with the Route Types D and Q.

Note 6: The Qualifier 2 codes of A, B and E can only be used in conjunction with a Route Type of Z = Missed Approach Coding. Qualifier 2 codes of C, S, H, I, and L can be used in conjunction with any Route Type except Z.

Note 7: The Qualifier 2 code of H or I is only used with Airport Approach (PF) Records.

Note 8: The Qualifier F indicates that the approach is an RNP AR (Authorization Required) procedure. Qualifier A indicates an A-RNP procedure without an AR requirement. Qualifier H indicates that the approach procedure is a basic RNP procedure not requiring any further capabilities. Qualifiers E and X maybe coded on transitions for any non RNAV/RNP approaches.

Note 9: The Qualifier 2 code of L is used with Airport Procedure (PF) Records and Heliport Procedure (HF) Records and only for those government sources that provide Helicopter Minimums without specifying Straight-In or Circle-To-Land.

Note 10: The Qualifier 2 code of V is used only in conjunction with a Qualifier 1 of B.

Note 11: The Qualifier 2 code W and X are used only in conjunction with a Qualifier 1 set to J, P, R, U, V, or W. Qualifier 2 to be set to H, I, or L when procedure chart is not annotated with Proceed Visually or Proceed VFR.

Used On:	Enroute Airways, Airport and Heliport SID/STAR/Approach, Preferred Route and Company Route Records and Helicopter Operations Company Route Records.	
Length:	1 character for Enroute Airways and Preferred Routes. 1 character for Airport and Heliport SID/STAR/Approach Records; however, only complete when read in conjunction with Qualifier 1, 2, and 3 of the same record, which are in a different location in the Records.	
Character Type:	Alpha/numeric	
Approach Examples:	LDC =	A Localizer-based procedure, for localizer only, no glideslope, with DME required, Circle-To-Land Minimums.
	LNC=	A Localizer-based procedure, for localizer only, no glideslope, DME not required, Circle-To-Land Minimums

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SNS =	A VOR procedure, using VORDME or VORTAC Navaid, the DME is not required for the procedure, the minimums are straight-in.
SDC =	A VOR procedure, using VORDME or VORTAC Navaid, the with a DME required note for the procedure, the minimums are Circle-To-Land
D S =	A VOR/DME procedure, using a VORDME or VORTAC Navaid, the DME is required for the procedure, the minimums are straight-in.
VNS =	A VOR procedure using VOR Navaid with only NAVAID, no DME installed, minimums are straight-in.
VDC =	A VOR procedure, using a VOR Navaid with a DME required note, the minimums are Circle-To-Land
N S =	An NDB procedure, minimums are straight-in.
Q S =	An NDB + DME procedure, the DME is required, the minimums are straight-in.
I_H =	ILS procedure, no DME requirements, procedure is designed for Helicopter operations to a runway at an airport, records are contents in Airport Approach (PF) file section.
I_ _=	ILS Procedure, no DME requirements, procedure is designed for Helicopter operations to a helipad at a heliport, records are contents in Heliport Approach (HF) file section.

5.8 Route Identifier (ROUTE IDENT)

Definition/Description: The Route Identifier field identifies a route of flight or traffic orientation, using the coding employed on aeronautical navigation charts and related publications.

Source/Content: For Enroute Airways, Route Identifier codes should be derived from official government publications. For Preferred Routes, Route Identifiers may or may not be provided in government publications. Where they are available, they will be used.

For North American Routes for North Atlantic Traffic, Common Portion and other similar route system, route identifier code shall be those published in government sources. For the European Traffic Orientation System or other similar route systems such as North American Routes for North Atlantic Traffic, Non-common Portion, Preferred Routes, and Preferential Routes published without official and/or flight plan identifiers, but published as between specific airports or other navigation fixes, route identifiers define the initial fix and the terminus fix idents according to the naming rules in Chapter 7. For routings which do not include a unique initial or terminus fix, rules on creating unique Route Identifiers are also contained in Chapter 7. Those rules have been developed with use of the Geographical Reference Tables (TG). Refer to Chapter 3, Section 3.2.7.2 and Chapter 4, Section 4.1.26 for more detail.

Used On:	Enroute Airway, Preferred Route Records and Geographical Reference Table
Length:	Enroute Airway - 5 characters maximum Preferred Route - 10 characters maximum

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Character Type: Alpha/numeric
Examples: Enroute Airway - V216, C1150, J380, UA16, UB414
Preferred Routes - N111B, TOS13, TOS14WK, CYYLCYYC, ARTCOLAR, KZTLKSAV, SCNDICANRY

Refer to Chapter 7 for specific examples and their meaning.

5.9 SID/STAR Route Identifier (SID/STAR IDENT)

Definition/Description: The SID/STAR Route Identifier field contains the name of the SID or STAR, using the basic indicator, validity indicator and route indicator abbreviated to six characters with the naming rules in Chapter 7 of this document.

Source/Content: SID/STAR route identifier codes should be derived from official government publications describing the terminal procedures structure.

Used On: Airport SID/STAR, Heliport SID/STAR and Flight Planning Arrival/Departure Data Records
Length: 6 characters max
Character Type: Alpha/numeric
Examples: DEPU2, SCK4, TRP7, 41M3, MONTH6

5.10 Approach Route Identifier (APPROACH IDENT)

Definition/Description: The Approach Route Identifier field contains the identifier of the approach route to be flown. To facilitate the provision of multiple approach procedures of the same type to a given runway, the field also is used to provide a multiple indicator.

Source/Content:

Table 5-10 – Runway Dependent Procedure Ident

<table>
<tr><th>Column</th><th colspan="2">Contents</th></tr>
<tr><td>1</td><td colspan="2">Type of Approach-Alpha Character, the same as field 5.7 Route Type</td></tr>
<tr><td>2-3</td><td colspan="2">Runway Identification- Numeric in tens of degrees, valid range 01-36</td></tr>
<tr><td rowspan="6">4</td><td colspan="2">Runway Designation</td></tr>
<tr><td>- (dash)</td><td>Place holder if other runway designation codes are not present and multiple indicators required.</td></tr>
<tr><td>L</td><td>Left</td></tr>
<tr><td>R</td><td>Right</td></tr>
<tr><td>C</td><td>Center</td></tr>
<tr><td>Blank</td><td>Position 5 and 6 must also be Blank</td></tr>
<tr><td>5</td><td colspan="2">Multiple Indicator Alphanumeric or Blank</td></tr>
<tr><td>6</td><td colspan="2">Blank</td></tr>
</table>

Table 5-11 – Circle-to-Land Procedures Identifier

<table>
<tr><th>Column</th><th colspan="2">Contents</th></tr>
<tr><td>1-3</td><td colspan="2">Circling Procedure Ident (See below).</td></tr>
<tr><td rowspan="2">4</td><td></td><td></td></tr>
<tr><td>A thru Z
or
1 thru 9</td><td>A government source provided procedure suffix or a multiple indicator</td></tr>
<tr><td>5-6</td><td colspan="2">Blank</td></tr>
</table>

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Table 5-12 – Circle-to-Land Route Type Identifier

Route Type Field Content (5.7)	1ST Three Characters of Circling Procedure Identifier
A	(Approach Transitions)
B	LBC
D	VDM
F	FMS
G	IGS
H	RNP
I	(No Circling ILS)
J	GLS
L	LOC
M	MLS
N	NDB
P	GPS
Q	NDM
R	RNV
S	VOR
T	TAC
U	SDF
V	VOR
W	MLS
X	LDA
Y	MLS
Z	(Missed Approach)

Table 5-13 – Helicopter Approach Procedures to Runways or Final Approach Course Procedure Identifier

Column	Contents
1	Type of Approach-Alpha Character, the same as the field 5.7 Route Type.
2-4	Three-digit numeric character representing the runway designation or procedure final approach course, expressed in full degrees
5	Multiple Indicator Alphanumeric or Blank
6	Blank

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Table 5-14 – Helicopter Approach Procedures to Heliports and Coded to a Specific Pad Identifier

Column	Contents
1	Type of Approach-Alpha Character, the same as the field 5.7 Route Type.
2-6	Pad Identification

Used On:	Airport and Heliport Approach Route Records, Flight Planning Arrival/Departure Data, Airport and Helicopter Operations, SBAS Path Point, GBAS Path Point, and Airport, Heliport Localizer, Airport and Heliport TAA, and Simulation Continuation Records.
Length:	6 characters max.
Character Type:	Alpha/numeric
Examples:	
Runway Dependent	I26L, B08R, R29, V01L, N35 L16RA, L16RB, V08-A, V08-B I18L1, I18L2, R35-Y, R35-Z
Circle-To-Land or Point in Space	VOR, VDM, LOC VORA, VORB, NDB1, NDB2 (These are multiple indicators) NDBB, VDMA, LOCD, BI, P168, NDAT (These are source provided procedure suffixes)
Helicopter to Runway	I13L, L040, V175, N175B
Helicopter to Helipad	IA127 = ILS Procedure to a pad designated A127 VBRAVO =VOR Procedure to a Pad designated BRAVO N23 =NDB Procedure to a Pad designated 23 RWESTA RNAV Procedure to a Pad designated West Alpha

5.11 Transition Identifier (TRANS IDENT)

Definition/Description: The Transition Identifier field describes the type of transition to be made from the enroute environment into the terminal area and vice versa, and from the terminal area to the approach or from the runway or helipad to the terminal area.

Source Content: The content of the transition identifier field should be determined from the content of the Route Type field (See Section 5.7) in accordance with the rules set forth in Table 5-15.

Table 5-15 – Transition Identifier Field Content

Record	Route Type	Field Content
Engine Out SID	0	Runway (RWY) or Pad Identifier
SID/RNAV SID	1	Runway (RWY) or Pad Identifier
	2	Blank/RWY/PAD/ALL (Note 1 and 3)
	3	SID Enroute Transition Identifier (Note 5)
Vector SID	T	Runway (RWY) or Pad Identifier
	V	Vector SID Enroute Transition Identifier
STAR/ RNAV STAR	1	STAR Enroute Transition Identifier (Note 5)
	2	Blank RWY/PAD/ALL/ (Note 3)

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Record	Route Type	Field Content
	3	Runway (RWY) or Pad Identifier (Note 2)
Approach Transitions	A	Approach Transition Identifier
Missed Approach	Z	Missed Approach Transition Identifier (Note 4)
Approach Procedure	All Other Codes Except A and Z (see Section 5.7)	Blank

Note 1: If there is no Route Type 1 for the SID, then the SID Records with the Route Type of 2 will have an entry in the Transition Identifier field. If there is a Route Type of 1 for the procedure, then the records with the Route Type of 2 will carry a blank transition identifier.

Note 2: If there is no Route Type 3 for the STAR, then the STAR record with the Route Type of 2 will have an entry in the Transition Identifier field. If there is a Route Type 3 for the procedure, then the Transition Identifier in the Route Type 2 will carry a blank transition identifier.

Note 3: The use of ALL in the Transition Identifier field indicates that the procedure is valid for all runways at an airport or all helipads at a heliport. If the procedure is not valid for all the runways at an airport or all the helipads at a heliport, individual runway transitions should be coded. In the coding of individual runway transitions, the use of the character B along with the runway designation, such as RW08B, indicates that a single runway transition has been coded for all available parallel runways. This can be RW08L and RW08R or RW08L, RW08C, and RW08R. If there are parallel runways and the single transition cannot be coded for all instances, individual runway transitions must be coded for each individual runway.

Note 4: It will be the identifier of the Missed Approach Holding Fix or the last fix in the missed approach procedure coding if there is no missed approach holding fix. In cases where there are multiple instances for a given approach procedure, the Missed Approach Transition Identifier will be modified according to the rules in Attachment 5 and Section 8.6 of this specification.

Note 5: Enroute Transition Identifiers are normally the identifier of the navaid or waypoint.

Transition Identifiers should be derived from official government sources, where provided.

Used On: Airport and Heliport SID/STAR/ Approach, Flight Planning Arrival/Departure Data and Company Route Records
Length: 5 characters max.
Character Type: Alpha/numeric
Examples: 9TU, ETX, KEENE, DEN, RW08R, Blank

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5.12 Sequence Number (SEQ NR)

Definition/Description: For Route Type Records – A route of flight is defined by a series of records taken in order. The Sequence Number field defines the location of the record in the sequence defining the route of flight identified in the route identifier field. For Boundary Type Records – A boundary is defined by a series of records taken in order. The Sequence Number field defines the location of the record in the sequence defining a boundary. For Record Types requiring more than one primary record to define the complete content – In a series of records used to define a complete condition, the Sequence Number is used to define each primary record in the sequence. For Airport and Heliport TAA Records – Sequence Number 1 will always be assigned to the record based on the Center Fix upon which the Straight-In Area is predicated, Sequence Number 2 will always be assigned to the record based on the Center Fix upon which the Left Base Area is predicated, and Sequence Number 3 will always be assigned to the record based on the Center Fix upon which the Right Base Area is predicated. Therefore, if a TAA Record has a Straight-In Area and a Right Base Area, but no Left Base Area, only Sequence Numbers 1 and 3 will be used. If a TAA Record has a Straight-In Area and a Left Base Area but no Right Base Area, only Sequence Numbers 1 and 2 will be used.

Source/Content: Sequence numbers are assigned during the route, boundary or sequence definition phase of the data file assembly. Sequence numbers are assigned so as not to be duplicated within the route, boundary or sequence assigned a unique identification/designation. For three or four-digit Sequence Numbers, initially, an increment of ten should be maintained between the sequence numbers assigned to consecutive records. For one or two-digit Sequence Numbers, the initial increment is one. In route or boundary records, should subsequent maintenance of the file necessitate the addition of a record or records, the new record(s) should be located in the correct position in the sequence and assigned a sequence number whose most significant characters are identical to those in the sequence number of the preceding record in sequence. The unit character should be assigned a value midway between the units character values of the preceding and following record sequence numbers. For example, if it is desired to add one record to the sequence and the units characters of both the preceding and following records at the desired location are zeros (indicating no previous modification at this point), the units character or the inserted record’s sequence number should be five (5). For records taken in sequence with one or two-digit sequence numbers, additional data must be entered in the proper sequence and all subsequent records will be up numbered accordingly.

When an enroute airway crosses the boundary separating two geographical areas (Section 5.3), the airway fix lying on or closest to the boundary shall be coded twice, once for each geographical area, and should be assigned the same sequence number in each case. Record uniqueness in such cases is maintained through the Boundary Code (Section 5.18). Enroute airway record sequence numbers should be assigned in a manner which permits them to be arranged into continuous airway routes in flight sequence order when sorted according to the Route Identifier and Sequence Number only, without regard to their applicable Geographical Area Code.

When used on Enroute, Airport and Heliport Communications Primary and Continuation records, the Sequence Number is used as a record counter within a given Identifier and Communications Class for providing output file record uniqueness.

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Used On:	Enroute Airways, Airport and Heliport MSA Records, Airport and Heliport TAA Records, Airport and Heliport SID/STAR/Approach, Company Route, Cruise Tables, FIR/UIR, Restrictive Airspace, Controlled Airspace, Preferred Routes, Flight Planning Arrival/Departure Data and VHF Navaid Limitation Continuation Records, Helicopter Operations Company Routes, TACAN-Only NAVAID Limitation Continuation Record
Length:	4 characters - Enroute Airways, Preferred Routes, FIR/UIR, and Restrictive Airspace 3 characters - SID/STAR/Approach and Company Routes 2 characters - VHF Navaid Limitation Continuation Records and TACAN-Only NAVAID Limitation Continuation Record 1 character - MSA Table, TAA Table, Cruise Table
Character Type:	Numeric
Examples:	0010, 0135, 2076, 120, 030, 01, 84, 3

5.13 Fix Identifier (FIX IDENT)

Definition/Description: The Fix Identifier field contains the five-character-name-code, or other series of characters, with which the fix is identified. This includes Waypoint Identifiers, VHF NAVAID Identifiers, NDB NAVAID identifier, Airport Identifiers, and Runway Identifiers.

Source/Content: Officially published identifiers or identifiers derived in accordance with Chapter 7, Naming Conventions, of this document.

Used On:	Holding Patterns, Enroute Airways, Airport and Heliport SID/STAR/Approach, Enroute Airway Restrictions, and Enroute Waypoints, Airport and Heliport Terminal Waypoints (Waypoint Ident) and Flight Planning Arrival/Departure Data Records.
Length:	5 characters max
Character Type:	Alpha/numeric (no embedded blanks)
Examples:	SHARP, DEN43, BHM, RW27L, KGRR

5.14 ICAO Code (ICAO CODE)

Definition/Description: The ICAO Code field permits records to be categorized geographically within the limits of the categorization performed by the Area Code field.

Source/Content: The code is to be employed in the ICAO code field may be found in ICAO Document No. 7910, Location Indicators.

In order to permit sub-division of the United States into more easily manageable regions, the ICAO code for the USA (K) is followed by a numeric character obtained from Figure 5-2.

Used On:	All records except Cruising Tables and Grid MORA
Length:	2 characters max
Character Type:	Alpha/numeric
Examples:	K1, K7, PA, MM, EG, UT

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5.15 Intentionally Left Blank

5.16 Continuation Record Number (CONT NR)

Definition/Description: When it is not possible to store all the information needed on a record within the 132 columns of the record itself, the so-called Primary Record; one or more continuation records may be used. The Continuation Record Number identifies the position of a continuation record in a sequence of such records.

Source/Content: Primary records contain the numeric 0 when no Continuation Records are included in the file for that Primary. The numeric 1 in this field of the Primary Record indicates that one or more Continuation Records follow the Primary Record. Continuation Records are numbered sequentially starting with the numeric 2 in the first continuation. If the information requirement goes beyond a Continuation Record with the numeric 9, the sequence is continued with alpha characters, starting with A and continuing through to Z as required.

Used On:	All records except Company Route, Airport Localizer Marker/Locator, Enroute Markers, Cruising Tables, FIR/UIR and Grid MORA
Length:	1 character
Character Type:	Alpha/numeric
Examples:	0, 1, 2 (through 9) A, B, C (through Z)

5.17 Waypoint Description Code (DESC CODE)

Definition/Description: The Waypoint Description field facilitates the designation of the type, function, and attributes of a specific waypoint in Enroute Airway or Terminal Procedure segment coding.

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Source/Content: Valid contents for the Waypoint Description Code are contained in the following table:

Table 5-16 – Waypoint Description

Waypoint Description Type/ Function/ Attribute	Used On Enroute, SID, STAR, APCH	Column 40	Column 41	Column 42	Column 43	Remarks
Airport as Fix	SID, STAR, APCH	A				Note 6
Essential Waypoint	Enroute, SID, STAR, APCH	E				Note 1
Off Airway Floating Waypoint	Enroute	F				Note 1
Runway as Fix, Helipad as Fix	SID, STAR, APCH	G				
Heliport as Waypoint	SID, STAR, APCH	H				Note 6
NDB Navaid as Waypoint	Enroute, SID, STAR, APCH	N				
Phantom Waypoint	SID, STAR, APCH	P				Note 1
Non-Essential Waypoint	Enroute	R				Note 1
Transition Essential Waypoint	Enroute	T				Note 1
VHF Navaid As Fix	Enroute, SID, STAR, APCH	V				
Flyover Waypoint, Ending Leg	SID, STAR, APCH		B			Note 2
End of Continuous Segment	Enroute, SID, STAR, APCH		E			Note 2
Uncharted Airway Intersection	Enroute		U			Note 1
Fly-Over Waypoint	APCH, SID, STAR,		Y			Note 2
Unnamed Stepdown Fix Final Approach Segment	APCH			A		
Unnamed Stepdown Fix Intermediate Approach Segment	APCH			B		
ATC Compulsory Reporting Point	SID, STAR, APCH Enroute			C		Note 1
Oceanic Gateway Waypoint	Enroute			G		Note 1
First Leg of Missed Approach Procedure	APCH			M		Note 3
Fix used for turning final approach	APCH			R		Note 4
Named Stepdown Fix	APCH			S		
Initial Approach Fix	APCH				A	Note 1
Intermediate Approach Fix	APCH				B	Note 1
Holding at Initial Approach Fix	APCH				C	
Initial Approach Fix at FACF	APCH				D	
Final End Point	APCH				E	Note 1
Final Approach Fix	APCH				F	Note 1
Source provided Enroute Waypoint without Holding	Enroute				G	
Source provided Enroute Waypoint with Holding	Enroute SID, STAR, APCH				H	
Final Approach Course Fix	APCH				I	Note 1
Missed Approach Point	APCH				M	Note 1
Engine Out SID Missed Approach Disarm Point	SID (Engine Out), APCH				N	Note 5
Initial Departure Fix	SID				P	Note 7

Generic Note: There is a Waypoint Description field for each coding segment of an Enroute Airway or Terminal Procedure. For Enroute Airways, Column 40 will never be blank. For Terminal Procedures, Column 40 may be blank when the path terminator for that segment does not reference a fix. For details on path terminators and more information on sequence coding, refer to Attachments 5.

Note 1: For a definition of the waypoint type, function or attributes, refer to Section Two, Special Navigation Terms, of this specification.

Note 2: The basic method of indicating that the government source has designated a specific fix as an Overfly Waypoint, meaning the fix must be overflown before commencing the maneuver defined in the subsequent leg, is to code a Y in Column 41. End of Continuous Segment indications are not source provided data, but rather an implementation of the translation of that source data based on this specification.

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Column 41 End of Continuous indications of E will be provided in the last segment of an individual Terminal Procedure Transition and at the end of a specific airway. The indication is also provided in airway coding when the basic route designation continues beyond the fix, but there is a gap in the route definition. And the indication is provided in airway coding when there is a change in ARINC Area Code (Section 5.3) in the subsequent leg. In Terminal Procedure coding, when both conditions exist, i.e., the fix has been designated as an Overfly Waypoint and the End of Continuous Segment indication is required by the rules in this specification, Column 41 is set to B.

Note 3: The First Leg of Missed indication, M in column 42 is coded on the first leg of approach procedure coding that follows the designation of the Missed Approach Point (MAP) in Column 43.

Note 4: Step-down fix on the final approach coding indicating a segment course change that is greater than or equal to one degree different than the next leg. All RF non-procedure fixes on the final approach coding meet this requirement. This code will take precedence over a step-down fix code at the same fix.

Notes 5: An N in column 43 of an engine out SID or missed approach record designates the waypoint as the engine out SID (or missed approach) disarm point. For example if an engine failure is detected before this point, the engine out procedure is automatically loaded. If the engine failure is detected after this point, the engine out SID is not automatically loaded.

Note 6: The column 40 value of A or H will only be used on SIDs when it is a Vector SID which consists of Enroute Transitions only (Attachment 5, Rule 4.11). The Column 40 value of A or H will only be used on STARs when the STAR ends in vectors to a final approach (Attachment 5, Rule 5.1).

Note 7: The Initial Departure Fix indication, P in column 43, is coded for the first published fix/waypoint of an RNAV departure.

Used On Airport and Heliport SID/STAR/Approach, Enroute Airway Records
Length: 4 Characters
Character Type: Alpha

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Figure 5-2 – 7 Subdivisions for United States

5.18 Boundary Code (BDY CODE)

Definition/Description: Routes of flight frequently cross geographical boundaries. The Boundary Code field identifies the area into, or from which a continuous route passes when such a crossing occurs.

Source/Content: See Table 5-17.

Used On: Enroute Airways records
Length: 1 character
Character Type: Alpha/numeric

Table 5-17 - Boundary Codes

Area	Area Code*	Boundary Code
USA	USA	U
Canada and Alaska	CAN	C
Pacific	PAC	P
Latin America	LAM	L
South America	SAM	S
South Pacific	SPA	1
Europe	EUR	E
Eastern Europe	EEU	2
Middle East South Asia	MES	M
Africa	AFR	A

*From Figure 5-1 – Geographical Area Codes

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5.19 Level (LEVEL)

Definition/Description: The Level field defines the airway structure of which the record is an element.

Source/Content:

B	All Altitudes
H	High level Airways
L	Low Level Airways

Used On: Enroute Airway, Preferred Routes, Restrictive Airspace, and Controlled Airspace records
Length: 1 character
Character Type: Alpha

5.20 Turn Direction (TURN DIR)

Definition/Description: The Turn Direction field specifies the direction in which Terminal Procedure turns are to be made. It is also used to indicate direction on course reversals, see Attachment 5 Path and Termination.

Source/Content: The field contains the alpha character L for Left turns, R for Right turns, and E for turns in either direction.

Used On: Airport and Heliport SID/STAR/Approach records
Length: 1 character
Character Type: Alpha

5.21 Path and Termination (PATH TERM)

Definition/Description: The Path and Termination defines the path geometry for a single record of an ATC terminal procedure.

Source/Content: Attachment 5 to this document, Path and Terminator, contains the various Path Term codes available for coding an ATC terminal procedure.

Used On: Airport and Heliport SID/STAR/Approach records
Length: 2 characters
Character Type: Alpha

5.22 Turn Direction Valid (TDV)

Definition/Description: This field is used in conjunction with Turn direction to indicate that a turn is required prior to capturing the path defined in a terminal procedure.

Source/Content: The field contains the alpha character Y when a turn is required prior to beginning the leg defined by the Path Term. The direction of the turn is specified in Section 5.20.

Used On: Airport and Heliport SID/STAR/Approach Records
Length: 1 character
Character Type: Alpha

5.23 Recommended NAVAID (RECD NAV)

Definition/Description: The Recommended Navaid field allows the reference facility for the waypoint in a given record Fix Ident field or for an Airport or Heliport to be

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specified. VHF, NDB (Enroute and Terminal), Localizer, TACAN, GLS, and MLS Navaids may be referenced.

Source/Content: The 1, 2, 3, or 4-character identification of the Navaid appears in this field. Navaids recommended for waypoint reference in official government publications will be used when available. The following general rules on field content apply:

Procedures that use coding which require leg types referenced to specific navaids are covered by the procedure coding rules in Attachment 5 to this specification.

a. A VHF Navaid may be any VOR, DME, VORDME, VORTAC, TACAN, Un-Biased ILSDME or MLSDME available in the database following the specific rules in Table 5-18.
b. An NDB Navaid may be any NDB or Locator available in the Enroute or Terminal NDB files in the database.
c. Localizers and MLS Azimuth are used as Recommended Navaids for procedures that reference those navaids, including RNAV Transitions to these types of procedures.
d. The Recommended Navaid in final approach coding will be the procedure reference facility. As not all Final Approach Procedure reference a Navaid, i.e., RNAV and GPS, the Recommended Navaid is not provided in these types of procedure, see Attachment 5 for specific rules.
e. The Recommended Navaid in Airport and Heliport Records will be any VOR, VORDME, or VORTAC available in the database.
f. The Recommended Navaid in any Enroute Airway Record, when provided, will be any VORDME or VORTAC available in the database.
g. The Recommended Navaid in any Terminal Procedure Record other than the final approach coding will be the procedure reference facility of a type from the Definition/Description paragraph above and will be in accordance with the rules governing Recommended Navaids for Path Terminators and coding rule as defined in Attachment 5 of this specification.
h. The rules for Recommended Navaids for Converging ILS Approach Procedures are the same as for ILS Approach Procedures.
i. The Recommended Navaid used in a GLS Approach Procedure will be the GLS Reference Path identifier appropriate to the runway and approach.
j. The use of non-collocated facilities of the types VORDME, VORTAC, and Localizer/ILSDME or ILSTACAN as the recommended navaid in terminal procedure coding is limited to defined circumstances only. For a definition of non-collocated, refer to Section 5.35 of this specification. For the defined circumstances, refer to Table 5-18 of this specification.

Used On:	Enroute Airway Record, Airport and Heliport SID/STAR/Approach Records, Airport and Heliport Record
Length:	4 characters max.
Character Type:	Alpha/numeric
Examples:	P, PP, DEN, LAX, ILAX, MJFK

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Table 5-18 – Procedure Use

Facility Type	Procedure User														
	SID/STAR	Approach Transition	Missed Approach Procedure	Path Terminator - AF	Path Terminator - CR, VR	Path Terminator - CD, VD, FD	Localizer Final Approach & Transitions of Course or Heading to Intercept Localizer	VORDME/VORTAC Final Approach	VOR Only Final Approach Coding	NDB Only Final Approach Coding	NDB + DME Final Approach Coding	TACAN Final Approach Coding	GLS Final Approach Coding	MLS Final Approach Coding & Transitions of Course or Heading to Intercept MLS	Airports
Collocated VORDME/ VORTAC	X	X	X	X	X	X		X			2				X
Non-collocated VORDME/ VORTAC		X	X					X			2				X
Localizer		X	X		X		X								
VOR		X	X		X				X						X
DME			X			X					2				
TACAN	X	X	X	X	X	X					2	X			X
NDB		X	X							X	1				
ILSDME or ILSTACAN			3			3					2 & 3				
GLS		X											X		
MLS		X												X	

1 On FACF and FAF Records

2 On Runway/MAP Records Only

3 ILSDMEs and ILSTACANs must be unbiased for use as a recommended navaid. They do not have to be collocated with the frequency paired localizer for use as a recommended navaid in the instances allowed.

5.24 Theta (THETA)

Definition/Description: Theta is defined as the magnetic bearing to the waypoint identified in the record's FIX Ident field from the Navaid in the Recommended Navaid field.

Source/Content: Theta values are derived from official government sources when available. They are provided in degrees and tenths of a degree, with the decimal point suppressed. The content is controlled through requirements of the Path Terminator and coding rules contained in Attachment 5 of this specification.

Used On: Airport and Heliport SID/STAR/Approach, Enroute Airway Records
Length: 4 characters

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Character Type: Alpha/numeric
Examples: 0000, 0756, 1217, 1800

5.25 Rho (RHO)

Definition/Description: RHO is defined as the geodesic distance in nautical miles to the waypoint identified in the record's Fix Ident field from the NAVAID in the Recommended NAVAID field.

Source/Content: Rho values derived from official government sources will be used when available. They are entered into the field in nautical miles and tenths of a nautical mile, with the decimal point suppressed. The content is controlled through requirements of the Path Terminator and coding rules contained in Attachment 5 of this specification.

Used On: Airport and Heliport SID/STAR/Approach, Enroute Airway Records
Length: 4 characters
Character Type: Alpha/numeric
Examples: 0000, 0216, 0142, 1074

5.26 Outbound Magnetic Course (OB MAG CRS)

Definition/Description: Outbound Magnetic Course is the published outbound magnetic course from the waypoint identified in the record's Fix Ident field. In addition, this field is used for Course/Heading/Radials on SID/STAR Approach Records through requirements of the Path Terminator and coding rules contained in Attachment 5 of this specification.

Source/Content: Values from official government sources will be used when available. The field contains magnetic information expressed in degrees and tenths of a degree, with the decimal point suppressed. For route and procedure segments published in degrees true, the last character (tenths position) of the field will contain the character T. See Section 5.165 of this document for more information on degrees true information.

Used On: Airport and Heliport SID/STAR/Approach, Enroute Airway and Flight Planning Arrival/ Departure Data Records
Length: 4 characters
Character Type: Alpha/numeric
Examples: 2760, 0231, 194T

5.27 Route Distance From, Holding Distance/Time (RTE DIST FROM, HOLD DIST/TIME)

Definition/Description: An expression of the length of the path defined in the record in either distance in nautical miles or time in minutes.

In Enroute Airways, Route Distance From will contain the distance from the waypoint identified in the records' Fix Ident field to the next waypoint in the route.

In SID, STAR, and Approach Procedure Records, the field will contain one of the following: segment distance, along track distance, excursion distance, DME distance, holding pattern leg distance, or time. The actual content is dependent on the Path and Termination. For more information on the content, refer to Table Three, Leg Data Fields, in Attachment 5 of this document.

Source/Content: The field contains distances or time, from official government source where available. Distances are expressed in nautical miles and tenths of with

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the decimal point suppressed. When the expression is time, the first character in the field will be "T," followed by the minutes and tenths of minutes with the decimal point suppressed. For data in Holding Pattern Records, refer to Section 5.64 or 5.65 of this specification.

Used On:	Airport and Heliport SID/STAR/Approach, Enroute Airway Records
Length:	4 characters
Character Type:	Distance - Numeric; Time - Alpha/numeric
Examples:	1076, 2822, T010, 0208, 0016

5.28 Inbound Magnetic Course (IB MAG CRS)

Definition/Description: Inbound Magnetic Course is the published inbound magnetic course to the waypoint in the Fix Ident field of the records in which it is employed.

The HX group of Path Terminator codes is used to provide racetrack type course reversal flight paths. Government publications for these course reversals include an inbound magnetic bearing. The SID/STAR/Approach Procedures records do not include a dedicated field for this inbound course. Instead, the information is included in the Outbound Magnetic Course field of such records.

Source/Content: Values from official government sources will be used when available. The field contains magnetic bearing in degrees and tenths of a degree, with the decimal point suppressed. For routes published with true courses, the last character of this field will contain a T in place of tenths of a degree.

Used On:	Enroute Airways records
Length:	4 characters
Character Type:	Alpha/numeric
Examples:	2760, 0231, 194T

5.29 Altitude Description (ALT DESC)

Definition/Description: The Altitude Description field will designate whether a waypoint should be crossed at, at or above, at or below or at or above to at or below specified altitudes. The field is also used to designate recommended altitudes and cases where two distinct altitudes are provided at a single fix.

Source/Content: A code from the following table, selected based on official government source or coding rules in Attachment 5 to this document.

Field Content	Waypoint Crossing Description
+ (plus)	At or above altitude specified in first Altitude field.
- (minus)	At or below altitude specified in first Altitude field.
@ (blank)	At altitude specified in first Altitude field.
B	At or above to at or below altitudes specified in the first and second Altitude fields. Not used on FAF or MAP Waypoint Records in Precision Approach Coding with Electronic Glideslope.
C	At or above altitude specified in second Altitude field. Condition is whichever is earlier.
D	At or above altitude specified in second Altitude field. Condition is whichever is later, which is operationally equivalent to the condition of not before.

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Field Content	Waypoint Crossing Description
G	Glideslope Altitude (MSL) At Fix, specified in the first Altitude field on the FAF Waypoint and Glideslope Intercept Altitude (MSL) in second altitude of FAF Waypoint in Precision Approach Coding with electronic Glideslope.
O	At or above altitude specified in second Altitude field applicable until established inbound on the racetrack pattern. Optional at or above altitude specified in first Altitude field applicable at the Fix.

Note: The B entry may appear on any record type that includes altitude and altitude description data. The higher value will always appear first in the records with two altitudes or as the first three digits of the Altitude Limitation field. When used on approach, the B entry may not be used on the missed approach point or final end point.

Note: The C or D entry is used to indicate that the leg has a conditional altitude termination, meaning the leg ends as specified in the Path and Terminator or at the altitude specified, under the condition indicated. These codes are limited to SID and Missed Approach Coding as the potential for an altitude termination exists and such a termination is only valid for ascending terminal procedure segments. See Attachment 5 of this specification.

Note: The O entry may only be coded on HF Path Terminator. It is used in these cases where an altitude is specified at the outbound position of a racetrack procedure that is different than the altitude specified at the HF fix.

Used On: Airport and Heliport SID/STAR/Approach, Primary and Continuation Records, Airport, Heliport and Enroute Communications, VHF NAVAID Limitation Continuation, Preferred Routes and Flight Planning Arrival/Departure Data Records, TACAN-Only NAVAID Limitation Continuation Record.
Length: 1 character
Character Type: Alpha

5.30 Altitude/Minimum Altitude

Definition/Description: The Altitude/Minimum Altitude field indicates the reference altitude associated with (1) Enroute Airways (MEA, MFA or other minimum altitudes as defined by source), (2) holding pattern path of Holding Pattern record, (3) altitudes at fixes in terminal procedures and terminal procedure path termination defined by the Path Terminator in the Airport or Heliport SID/STAR/Approach Record and (4) lowest altitude of the blocked altitudes for a Preferred Route.

Source/Content: Reference altitudes are determined during route definition. The values are derived from official government source when available. This specification includes specific rules for altitude provision and when those altitudes are not provided by source documents, they will be included by data suppliers according to those rules. The field may contain altitudes (all numeric) or flight level (alpha/numeric). The all-numeric fields will contain altitudes in feet with a resolution of one foot. The alpha/numeric fields will contain the alpha characters FL followed

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by the altitude expressed in hundreds of feet (three digits) or a code as indicated below.

On Airport and Heliport SID, STAR, and Approach Route records, the first Altitude field will contain an altitude when Altitude Description field contains a plus (+), a minus (-), or one of the following characters: B **or** G. The second Altitude field will contain an altitude when the Altitude Description field contains one of the following characters: B, C, D, **or** G. In approach procedure coding, some fix Altitudes may be below sea level, in the case of altitudes at runway fixes when the runway threshold elevation is below sea level. In these cases, the Altitude will be expressed in feet with a minus (-) sign in the first character of the five-character field, see examples.

On Enroute Airway records, the first Minimum Altitude field will contain the MEA or MFA if the altitude is the same for both directions of flight and the second minimum Altitude will be blank. If the airway segment has directional MEAs/MFAs, the first Minimum Altitude field will contain the value for the direction of flight in which the airway is coded and the second Minimum Altitude field will contain the value for the opposite route coding. When the official government authority provides different MEA/MFA values for a given airway segment that are based on the navigation sensor, e.g., Convention and RNAV, the MEA/MFA provided will be that value appropriate to the Route Type (Section 5.7) coded in that segment. The first Minimum Altitude field may contain the alpha characters UNKNN when the MEA/MFA is unknown or the alpha characters NESTB when the MEA/MFA has not been established by the appropriate authority.

On Preferred Routes, the Minimum Altitude and the Maximum Altitude apply to the entire route and is a minimum and maximum block. Altitude 1 and Altitude 2 are fix related apply only to the fix in the sequence in which they occur and are defined by the Altitude Description field.

Used On:	Airport and Heliport SID/STAR/Approach, Primary and Continuation Records, Holding Pattern, Enroute Airway, Preferred Routes.
Length:	5 characters
Character Type:	Alpha/numeric
Examples:	05000, FL050, 18000, FL180, 00600, -0012, 29000, FL290, UNKNN or NESTB (the last two on Enroute Airways only)

5.31 File Record Number (FRN)

Definition/Description: The File Record Number is a reference number assigned to the record for housekeeping purposes. Records are numbered consecutively, the first record on the file being assigned the number 00001, the second the number 00002, and so on through the final record on the file. File record numbers are subject to change at each file update.

Source/Content: File record numbers are assigned to records during the assembly of the data file. If the file reaches 99999, the next record number will start over with 00000.

Used On:	All records
Length:	5 characters
Character Type:	Numeric
Examples:	10640, 00420, 31462

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5.32 Cycle Date (CYCLE)

Definition/Description: The Cycle Date field identifies the calendar period in which the record was added to the file or last revised. A change in any ARINC 424 field, except Dynamic Magnetic Variation, Frequency Protection, Continuation Record Number, and File Record Number, requires a cycle date change. The cycle date will not change if there is no change in the data.

Source/Content: The first two digits of the field contain the last two digits of the year in which the addition or revision was made. The last two digits contain the numeric identity of the 28-day data update cycle during which the change occurred. Each calendar year contains 13 such cycles; however, on rare occasions 14 cycles will be encountered.

Used On:	All records
Length:	4 characters
Character Type:	Numeric

5.33 VOR/NDB Identifier (VOR IDENT/NDB IDENT)

Definition/Description: The VOR/NDB Identifier field identifies the VHF/MF/LF facility defined in the record.

Source/Content: When used on VHF NAVAIDs, NDB NAVAIDs, Airport Localizer Marker Records, the field contains the official government 1, 2, 3, and 4-character navigation facility identification codes. When used on Airport and Heliport Localizer, and Airport and Heliport MLS Records, the field contains the official 1, 2, 3, or 4-character navigation facility identifier of any DME or TACAN Navaid contained in the data file, including ILSDMEs, MLSDME/N, and MLSDME/P facilities as long as they are at the same airport.

Used On:	VHF NAVAIDs, NDB NAVAIDs, Airport Localizer Marker records, Airport and Heliport Localizer, and Airport and Heliport MLS records.
Length:	4 characters max
Character Type:	Alpha/numeric
Examples:	DEN, 6YA, PPI, TIKX

5.34 VOR/NDB Frequency (VOR/NDB FREQ)

Definition/Description: The VOR/NDB Frequency field specifies the frequency of the NAVAID identified in the VOR/NDB Identifier field of the record.

Source/Content: Frequencies are derived from official government sources. VHF NAVAID frequencies contain characters for hundreds, tens, units, tenths and hundredths of megahertz. NDB frequencies contain characters for thousands, hundreds, tens, units and tenths of kilohertz. The decimal point following the unit entry is suppressed in both cases.

Used On:	VHF NAVAID, NDB NAVAID, Airport Localizer Marker records
Length:	5 characters
Character Type:	Numeric
Examples:	VHF 11630, 11795 NDB 03620, 17040

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5.35 NAVAID Class (CLASS)

Definition/Description: The Navaid Class field provides information in coded format on the type of navaid, the coverage of the navaid, information carried on the navaid signal and collocation of navaids in both an electronic and aeronautical sense. The field is made up of five columns of codes that define this information.

Source/Content: The information for the five columns is transformed from official government source. The mapping of the information codes to the output record columns for the various types of navaids is contained in the tables in this section.

Used On:	Navaid Records (VHF, NDB and Airport/Heliport Localizer/Markers/Locators)
Length:	5 characters (including blanks)
Character Type:	Alpha

VHF Navaid Record – Includes VOR, VORDME, VORTAC, TACAN, ILSDME, and MLSDME type navaids, Output Record Section/Subsection D

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5.0 NAVIGATION DATA – FIELD DEFINITIONS

	Col 28	Col 29	Col 30	Col 31	Col 32	
Facility	Navaid Type 1	Navaid Type 2	Range/ Power	Add Info	Collocation	Explanation
VOR	V					
DME		D				
TACAN (channels 17-59 & 70-126)		T				
MIL TACAN (channels 1-16 & 60-69)		M				
ILS/DME		I				
ILS/TACAN		I				
MLS/DME/N		N				
MLS/DME/P		P				
Coverage						
Terminal			T			Generally usable within 25NM of the facility and below 12000 feet
Low Altitude			L			Generally usable within 40NM of the facility and up to 18000 feet
High Altitude			H			Generally usable within 130NM of the facility and up to 60000 feet
Undefined			U			Coverage not defined by government source
ILS/TACAN			C			Full TACAN facility frequency-paired and operating with the same identifier as an ILS Localizer. Coverage is Terminal
Additional Information						
Biased ILSDME or ILSTACAN				D		The zero-range reading of the DME facility is not at the transmitting antenna site.
Automatic Transcribed Weather Broadcast				A		The frequency of this Navaid is used for the continuous broadcast of some sort of automated weather system such as AWOS, ASOS, TWEB, AWIB, AWIS.
Scheduled Weather Broadcast				B		The frequency of this Navaid is used for the scheduled, non-continuous broadcast of some sort of automated weather system such as VOLMET.
No Voice on Frequency				W		The frequency of this Navaid is not used to support two-way communication between a ground station and aircraft.
Voice on Frequency				Blank		The frequency of this Navaid is used to support two-way communication between a ground station and aircraft.
Collocation						
Collocated Navaids					Blank	The latitude/longitude position of the VOR or Localizer portion and the DME or TACAN portion of a VORDME, VORTAC, ILSDME or ILSTACAN are identical. See also Note 1
Non-Collocated Navaids					Note 1	The latitude/longitude position of the VOR or Localizer portion and the DME or TACAN portion of a VORDME, VORTAC, ILSDME or ILSTACAN are not identical. See also Note 1

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NDB Navaid Record –NDBs and Terminal NDBs, Output Record
Section/Subsection DB and PN

	Col 28	Col 29	Col 30	Col 31	Col 32	
Facility	Navaid Type 1	Navaid Type 2	Range/ Power	Add/ Info	Collocation	Explanation
NDB	H					
SABH	S					
Marine Beacon	M					
Inner Marker		I				There is an Inner Marker beacon at this location.
Middle Marker		M				There is a Middle Marker beacon at this location.
Outer Marker		O				There is an Outer Marker beacon at this location.
Back Marker		C				There is a Backcourse Marker at this location.
Coverage						
High-powered NDB			H			Generally usable within 75NM of the facility at all altitudes
NDB			Blank			Generally usable within 50NM of the facility at all altitude
Low-powered NDB			M			Generally usable within 25NM of the facility at all altitude
Locator			L			Generally usable within 15NM of the facility at all altitudes
Additional Information						
Automatic Transcribed Weather Broadcast				A		The frequency of this Navaid is used for the continuous broadcast of some sort of automated weather system such as AWOS, ASOS, TWEB, AWIB, AWIS.
Scheduled Weather Broadcast				B		The frequency of this Navaid is used for the scheduled, non-continuous broadcast of some sort of automated weather system such as VOLMET.
No Voice on Frequency				W		The frequency of this Navaid is not used to support two-way communication between a ground station and aircraft.
Voice on Frequency				Blank		The frequency of this Navaid is used to support two-way communication between a ground station and aircraft.
Collocation						
BFO Operation					B	Use of Beat Frequency Oscillator type of equipment is required to receive an aural identification signal.

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Airport/Heliport Localizer Marker/Locator Record –NDB Locator and Marker Navaids, Output Record Section/Subsection PM

	Col. 75	Col. 76	Col. 77	Col. 78	Col. 79	
Facility	Navaid Type 1	Navaid Type 2	Range/ Power	Add Info	Collocation	
NDB	H					
SABH	S					
Marine Beacon	M					
Inner Marker		I				
Middle Marker		M				
Outer Marker		O				
Back Marker		C				
Coverage						
High-powered NDB			H			Generally usable within 75NM of the facility at all altitudes
NDB			Blank			Generally usable within 50NM of the facility at all altitude
Low-powered NDB			M			Generally usable within 25NM of the facility at all altitude
Locator			L			Generally usable within 15NM of the facility at all altitudes
Additional Information						
Automatic Transcribed Weather Broadcast				A		The frequency of this Navaid is used for the continuous broadcast of some sort of automated weather system such as AWOS, ASOS, TWEB, AWIB, AWIS.
Scheduled Weather Broadcast				B		The frequency of this Navaid is used for the scheduled, non-continuous broadcast of some sort of automated weather system such as VOLMET.
No Voice on Frequency				W		The frequency of this Navaid is not used to support two-way communication between a ground station and aircraft.
Voice on Frequency				Blank		The frequency of this Navaid is used to support two-way communication between a ground station and aircraft.
Collocation						
BFO Operation					B	Use of Beat Frequency Oscillator type of equipment is required to receive an aural identification signal. See also Note 2
Locator/Marker Collocated					A	The latitude/longitude position of the Locator and Marker are identical. See also Note 1
Locator/Middle Marker Not Collocated					N	The latitude/longitude position of Locator and Marker are not identical. See also Note 1

Note 1: Collocations:

For VHF Navaid records, the character N in column 32 is entered if either the latitude and/or the longitude of the VOR and the Collocated DME or TACAN of a frequency paired VORDME or VORTAC differ by 1/10 arc minutes or more. Column 32 is blank on VHF Navaids where the difference in latitude or longitude is less than the 1/10-arc minutes. Column 32 of the VHF Navaid will also carry the N or blank meaning listed above for frequency paired ILSDMEs and ILSTACANs. Note that in this later case, the character is carried on the ILSDME or ILSTACAN record as the Localizer record is not part of the VHF Navaid Section.

For Airport/Heliport Localizer Marker/Locator records, the character N in column 79 is entered if either the latitude or longitude of a Marker and it aeronautically associated Locator differ by 1/10-arc minutes or more. The character A in column 79 is entered if the latitude or longitude of a Marker and its aeronautically associated Locator differ by less than 1/10-arc minutes. Column 79 is left blank when the latitude and longitude of the Marker and Locator are exactly the same.

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Note 2: Airport/Heliport Localizer Marker/Locator Navaids, Operations/Collocation. Should both a collocation and a BFO operations requirement exist for one and the same Navaid Record, preference is given to the collocation characters.

5.36 Latitude (LATITUDE)

Definition/Description: The Latitude field contains the latitude of the navigational feature identified in the record.

Source/Content: Geographic positions whose latitudes must be included in the database are defined during route design, many of them in official government publications. The field is constructed as follows. The first character position contains the alpha character N or S indicating whether the latitude is north or south of the equator. N is entered for latitudes falling on the equator. The following eight numeric characters define the latitude in degrees, minutes, seconds, tenths of seconds and hundredths of seconds. Degree, minute and second symbols and the decimal point are suppressed.

Note: Some RNAV system users may elect to round off latitude values to resolutions of less than one hundredth of a second prior to the entry of these data into the airborne computer.

The navigation reference points to be defined by latitude and longitude coordinates are listed in Table 5-19.

Used On:	NAVAID, Waypoint, Airport Heliport, Airport and Heliport ILS, Airport, Gate, Runway, Airport and Heliport Localizer Marker, Airport and Heliport MLS and GLS, Airport and Heliport MLS Continuation, Airway Marker, Airport and Heliport Communications, Enroute Communications, Heliport, Airport and Heliport Helipads, Restrictive Airspace, FIR/UIR, Controlled Airspace, Path Point and GLS Records.
Length:	9 characters
Character Type:	Alpha/numeric
Examples:	N39513881

5.37 Longitude (LONGITUDE)

Definition/Description: The Longitude field contains the longitude of the geographic position of the navigational feature identified in the record.

Source/Content: Geographic positions whose longitudes must be included in the database are defined during route design, many of them in official government publications. The field is constructed as follows: The first character position will contain the alpha character E or W, indicating whether the longitude is east or west of the prime (zero degree) meridian. For longitudes falling on the 0 or 180-degree meridians, E is entered. The following nine numeric characters define the longitude in degrees, minutes, seconds, tenths of seconds and hundredths of seconds. Degree, minute and second symbols, and the decimal point are suppressed.

Note: Some RNAV system users may elect to round off longitude values to resolutions of less than one hundredth of a second prior to the entry of these data into the airborne computer.

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The navigation reference points to be defined by latitude and longitude coordinates are listed in Table 5-19.

Used On: NAVAID, Waypoint, Airport, Heliport, Airport and Heliport ILS, Airport Gate, Runway, Helipad, Airport and Heliport Localizer Marker, Airport and Heliport MLS, GLS Airports and Heliport MLS Continuation, Airway Marker, Airport and Heliport Communications, Enroute Communications, Heliport, Airport and Heliport Helipads, Restrictive Airspace, FIR/UIR, Controlled Airspace, Path Point and GLS Records.
Length: 10 characters
Character Type: Alpha/numeric
Examples: W104450794

Table 5-19

Record File	Lat/Long Field	Location Defined
Airport	Airport	Aerodrome Reference Point
Airport Comm	Comm (Note 7)	Antenna Reference
Enroute Comm	Comm (Note 8)	Antenna or Sector Reference
Enroute Marker	Marker	Marker Antenna
FIR/UIR	FIR/UIR	Boundary Position
FIR/UIR	Arc Origin	Center of Arc
Gate	Gate	Gate
Heliport	Heliport	Heliport Reference Point
Heliport Comm	Comm (Note 7)	Antenna Reference
Localizer	Localizer	Localizer Antenna
Localizer	Glideslope (Note 6)	Glideslope Antenna
Marker/Locator	Marker Beacon	Marker Antenna
Marker/Locator	Locator	Locator Antenna
NDB Navaid	NDB	NDB Antenna
Restr. Airspace	Restr. Airspace	Boundary Position
Restr. Airspace	Arc Origin	Center of Arc
VHF Navaid	VOR (Note 1)	VOR Antenna
VHF Navaid	DME or TACAN (Note 2)	DME or TACAN Antenna
Runway	Runway (Note 5)	Runway Landing Threshold
Helipad	Helipad (Note 9)	Helipad Reference Point
Waypoint	Waypoint	Waypoint
MLS	Azimuth	Azimuth Antenna
MLS	Elevation	Elevation Antenna
MLS	Back Azimuth (Note 3)	Back Azimuth Antenna
MLS	Datum (Note 4)	MLS Reference Datum Point
GLS	GLS	GLS Reference Point

Note 1: The VOR latitude and longitude fields are filled when the NAVAID Class field contains the letter V in column 28 of the record. If column 28 is blank, these fields are blank also.

Note 2: The DME or TACAN latitude and longitude fields are filled when the NAVAID Class field contains the letters D, I, M, N, P or T in column 29 of the record. If column 29 is blank, these fields are blank also.

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Note 3: The MLS Back Azimuth latitude and longitude fields are to be left blank where no such facility exists.

Note 4: MLS Datum is the point on the runway center line closest to the phase center of the approach elevation antenna.

Note 5: The Runway latitude and longitude fields define the Runway Landing Threshold. This threshold can be the beginning of the landing runway pavement. It will be the displaced threshold (inward from the beginning of the landing runway pavement) when such is published by official government documentation.

Note 6: Localizer Glideslope latitude and longitude may be blank when detail is not available through source documentation.

Note 7: On Airport and Heliport Communications Records, the Latitude/Longitude defines the physical location of the transmitting antenna when this is provided in official government source. This may be a navaid or independent transmitter location. In cases where the physical location of the transmitting antenna is not provided in source, the Latitude/Longitude of the Aerodrome Reference Point will be provided. When the Latitude/Longitude provided are those of a navaid or the ARP, the content of the Remote Facility (5.200) will provide an indication of the reference made. In cases where the communications record is defining a digital service capability, the latitude/longitude will be blank.

Note 8: On Enroute Communications Records, the Latitude/Longitude defines the physical location of the transmitting antenna when this is provided in official government source. This may be a navaid or independent transmitter location. In cases where the physical location of the transmitting antenna is not provided in source but it is known to be at a specific airport, the Latitude/Longitude of the Aerodrome Reference Point will be provided. When the Latitude/Longitude provided are those of a navaid or the ARP, the content of the Remote Facility (5.200) will provide an indication of the reference made. In cases where the physical location of the transmitter is provided in source but the service/frequency contained in the record is assigned to a specific Enroute Communications Sector, the Latitude/Longitude defines the geographical center of that sector and not the physical transmitter location. In cases where none of the information defined above can be derived from official government sources, the Latitude/Longitude fields will be left blank to indicate the unknown position information. In these cases, the Position Narrative field will contain any such information available in the government sources. In cases where the communications record is defining a digital service capability, the latitude/longitude will be blank.

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Note 9: The Helipad latitude and longitude fields are filled when the reference point or defining geographic coordinates of a particular helipad are provided by official government source. When no coordinates are provided, the field will be populated with the latitude and longitude of the airport or heliport reference point.

5.38 DME Identifier (DME IDENT)

Definition/Description: The identification of a DME facility, a TACAN facility or the DME (or TACAN) component of a VORDME or VORTAC facility.

Source/Content: The DME Identifier field will contain the officially published 2-, 3-, or 4-character DME facility identifier. For VOR/DME and VORTAC facilities, if the identification codes of the VOR and DME components of the NAVAID defined in the record are the same, the field will be blank. If they are not the same, the VOR Identification will be as defined in Section 5.33 and the DME Identifier field will carry the identification of the DME component. The field is blank when the VHF Navaid facility in the reference record has no DME component. The field will always contain the DME Identifier for TACANs, DME Only NAVAIDS and Localizer or MLS DME facilities.

Used On:	VHF NAVAID records
Length:	4 characters max
Character Type:	Alpha/numeric
Examples:	MCR, DEN, IDVR, DN, (Blank)

5.39 Magnetic Variation (MAG VAR, D MAG VAR)

Definition/Description: The Magnetic Variation field specifies the angular difference between True North and Magnetic North at the location defined in the record. Dynamic Magnetic Variation is a computer model derived value and takes location and date into consideration. For the Station Declination used in some record types, refer to Section 5.66.

Source/Content: Magnetic variations are obtained from official government data sources and other geographical magnetic variation source. A number of different terms are used in government documentation that have specific connotations for the information provided by that government. The most common is Epoch Year Variation. In theory, this is a value determined by a government agency once every five years and published for general use. Along with Epoch Year Variation, some governments also publish an annual drift value. Data suppliers do not include annual drift derived figures in their databases but rather stay with the Epoch Year value. Another term encountered in source documentation is Magnetic Variation of Record. This is generally an Epoch Year value. The difference here is that the government authority has established the value as valid for everything associated with a given location. For example, if a Magnetic Variation of Record is established for an airport location, everything referenced to that airport will use the same value. This is of interest as it means that Terminal Procedure design is also based on that value. Obvious differences can occur between a database supplied, semi-static value, and a value derived dynamically, either by the airborne systems or supplier ground systems. Dynamic Magnetic Variation, contained in the VHF Navaid Simulation Continuation Record, TACAN-Only Navaid Simulation Continuation Record, and Enroute/Terminal

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Waypoint Primary Records, is a computed, earth model derived figure, and is updated dynamically on a schedule established by the database supplier.

When used on Enroute, Airport, and Heliport Communication Records, the field contains the magnetic variation of the latitude/longitude position defined in the record. If that latitude/longitude represents the position of a navaid or airport (Table 5-19 and Notes 7 and 8 of Section 5.37) the value provided will be identical to magnetic variation provided in the referenced record. If the latitude/longitude represents a stand-alone communications transmitter, the field will contain a government source provided value or the derived Dynamic Magnetic Variation when no source information is provided. If the latitude/longitude fields of the record are blank, the magnetic variation field will also be blank.

Position one of the field contains an alpha character taken from the table below followed by the value of magnetic variation expressed in degrees and tenths of a degree, with the decimal point suppressed. When the first position is coded with the character T, the value provided in position 2 through 5 will be all zeros.

Field Content	Description
E	Magnetic variation is East of TRUE North
W	Magnetic variation is West of TRUE North
T	The element defined in the current record is provided TRUE.

Used On: Airport, NDB Navaid, Airport Localizer Marker, MLS, GLS, Airway Marker, Enroute/ Airport/ Heliport Communication, Heliport, Enroute Waypoint, Airport and Heliport Terminal Waypoint and GLS Primary Records and VHF Navaid Continuation Records.
Length: 5 characters
Character Type: Alpha/numeric
Examples: E0140, E0000, T0000

5.40 DME Elevation (DME ELEV)

Definition/Description: The DME Elevation field defines the elevation of the DME component of the NAVAID described in the record.

Source/Content: DME elevations specified in official government publications are entered into this field in feet with respect to MSL. When the elevation is below MSL, the first column of the field contains a minus (-) sign.

Used On: VHF NAVAID records
Length: 5 characters
Character Type: Alpha/numeric
Examples: 00530, -0140

5.41 Region Code (REGN CODE)

Definition/Description: The Region Code permits the categorization of waypoints and holding patterns as either enroute or terminal area waypoints. In the latter case, the terminal area airport is identified in the field.

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Source/Content: The field contains the alpha characters ENRT for enroute waypoints and airport identification code (Airport Ident) for terminal waypoints. In the holding pattern file, the content will match that of the holding fix, e.g., if the holding fix is an enroute waypoint or enroute Navaid, the content with be ENRT; if the holding fix is a terminal waypoint or terminal NDB, the content will be the airport identification.

Used On:	Waypoint and Holding Pattern records
Length:	4 characters
Character Type:	Alpha/numeric
Examples:	ENRT, KLAX, 9V9

5.42 Waypoint Type (TYPE)

Definition/Description: The Waypoint Type field identifies a number of data conditions.

1. The first is whether or not the waypoint has been published in an official government source or created during database coding of routes or procedures.
2. The second is whether or not the waypoint is an intersection and/or DME fix formed with reference to ground based navaids or is an RNAV Waypoint formed by the latitude and longitude.
3. The third is an indication of one or more functions assigned to that waypoint in terminal procedure coding.
4. The fourth is an indication of location of the waypoint with reference to airspace boundaries and/or grid lines.
5. The fifth is an indication of how ATC might be using the waypoint in operational clearances.
6. The sixth is an indication that the waypoint has been published for VFR use only.
7. Lastly, there is an indication of whether the waypoint is published for use in terminal procedure coding of a specific type, multiple types or not published at all.

COMMENTARY

Users of this specification should be aware that this section is intended for use in applications that do not use airway and terminal procedure records and that there is partial duplication of the information between this section and Section 5.17.

Source/Content: Valid contents for Waypoint type are contained in the table below. Unless specifically prohibited, all combinations of data from the three columns are valid.

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ENROUTE AND TERMINAL WAYPOINTS				
Waypoint Type	**Column 27**	**Column 28**	**Column 29**	**Use**
ARC Center Fix	A	Note 3	Note 3	PC
Combined Named Intersection and/or named DME Fix and RNAV Waypoint	C			EA, PC
Unnamed, Charted Intersection and/or Unnamed DME Fix	I			EA, PC
Middle or Inner Marker as Waypoint	M			PC
NDB or Terminal NDB Navaid as Waypoint	N	Note 1	Note 2	EA, PC
Outer or Back Marker as Waypoint	O			PC
Named Intersection and/or Named DME Fix	R			EA, PC
Uncharted Airway Intersection	U			EA
VFR Waypoint	V	Note 4		EA, PC
RNAV Waypoint	W			EA, PC
Final Approach Fix		A		EA, PC
Initial Approach Fix and Final Approach Fix		B		EA, PC
Final Approach Course Fix		C		EA, PC
Intermediate Approach Fix		D		EA, PC
Off-Route Waypoint, Intersection or DME Fix		F (Note 6)		EA
Initial Departure Fix		G		EA, HC, PC
Helicopter Only Airway Fix		H		EA
Initial Approach Fix		I		EA, PC
Required Off-Route Waypoint		J (Note 8)		EA
Final Approach Course Fix and Initial Approach Fix		K		EA, PC
Final Approach Course Fix and Intermediate Approach Fix		L		EA, PC
Missed Approach Fix		M		EA, PC
Initial Approach Fix and Missed Approach Fix		N		EA, PC
Oceanic Gateway Fix		O		EA
Unnamed Stepdown Fix		P		PC
RF Leg Fix Not at Procedure Fix		R	Note 5	PC
Named Stepdown Fix		S		PC
FIR/UIR or Controlled Airspace Intersection		U		EA
Latitude/Longitude Fix, Full Degree of Latitude		V		EA
Latitude/Longitude Fix, Half Degree of Latitude		W		EA
Published for Use in SID			D	EA, PC
Published for Use in STAR			E	EA, PC
Published for Use in Approach Procedures			F	EA, PC
Published for Use in Multiple Terminal Procedure Types			Z	EA, PC
Source Provided Enroute Waypoint			G (Note 7)	EA

Used On: Enroute Waypoints, Airport and Heliport Terminal Waypoints.
Length: 3 characters
Character Type: Alpha

Note 1: Column 28 of the Enroute and Terminal Waypoint Types will always be blank when column 27 carries the N for NDB or Terminal NDB produced as Waypoints.

Note 2: Possible codes for column 29 are identical for both Enroute and Terminal Waypoints and are those carried in the third

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portion of the table. Column 29 will always be blank when column 27 carries the N for NDB or Terminal NDB produced as Waypoints.

Note 3: When column 27 equals A for ARC Center Fix Waypoint, columns 28 and 29 will always be blank.

Note 4: The code V in column 27 for VFR Waypoints is not used in conjunction with any codes from column 28 and 29.

Note 5 Column 28 content of R used only in conjunction with column 27 set to C, R, or W.

Note 6: Off-Route Waypoints, Intersections, or DME fixes can be source provided or created by the data supplier to ensure referential integrity within a data file. The only specific meaning of the option is that the fix in not used on any route coded as part of the Enroute Airway File (ER Section).

Note 7: The coding option G for Source Provided Enroute Waypoint is in support of ADS-C and is intended to facilitate the application providing ADS-C Reports when and only when the waypoint has been established by the relevant ANSP. This permits the data supplier to create on-route fixes that are not published by the ANSP for referential integrity purposes such as the coding of Company Routes.

Note 8: The coding of option J for Required Off-Route Waypoint is in support of programs such as FRA in Europe .

5.43 Waypoint Name/Description (NAME/DESC)

Definition/Description: The Waypoint Name/Description field sets the unabbreviated name of a named waypoint or a definition of an unnamed waypoint.

Source/Content: The name of a named waypoint is spelled out in full. Definitions for unnamed waypoints are described in Chapter 7 of this specification.

Used On:	Enroute Waypoints, Airport and Heliport Terminal Waypoints.
Length:	25 characters max
Character Type:	Alpha/numeric
Examples:	FORT SMITH, LAX04026, LOS235/110, 6100N01234W (OCTA), OM RW26L ALTUR

5.44 Localizer/MLS/GLS Identifier (LOC, MLS, GLS IDENT)

Definition/Description: The Localizer/MLS/GLS Identifier field identifies the localizer, MLS facility or GLS Ref Path defined in the record.

Source/Content: The field contains the identification code of the Localizer or MLS facility or GLS Reference Path derived from official government sources.

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Used On:	Localizer, Localizer Marker, MLS, MLS Continuation, and GLS Record.
Length:	4 characters max
Character Type:	Alpha/numeric
Examples:	Localizer - IDEN, ISTX, IDU, PP MLS - MDEN, MSTX, MLAX GLS - LFBL, EGLC, KSAN

5.45 Localizer Frequency (FREQ)

Definition/Description: The Localizer Frequency field specifies the VHF frequency of the facility identified in the Localizer Identifier field.

Source/Content: The official government-source localizer frequency is entered into the field with a resolution of 50 kHz. The decimal point following the unit MHz entry is suppressed.

Used On:	Airport and Heliport ILS Localizer records
Length:	5 characters
Character Type:	Numeric
Examples:	11030, 11195

5.46 Runway Identifier (RUNWAY ID)

Definition/Description: The Runway Identifier field identifies the runways described in runway records and runways served by the ILS/MLS described in ILS/MLS records.

Source/Content: Runway identifiers are derived from official government sources and are shown in the following format:

The two letters RW are followed by two numeric, 01 thru 36, and may contain a fifth character designation of one of the following:

C	Center (Runway of three parallel runways)
L	Left (Runway of two or three parallel runways)
R	Right (Runway of two or three parallel runways)

Any other designations (suffixes), such as North, South, East, West, True, or STOL will not be included in the ARINC 424 database file.

Used On:	Airport and Heliport ILS and MLS, GLS Runway, Airport and Heliport Localizer Marker, Path Point, and GLS Records.
Length:	5 characters max
Character Type:	Alpha/numeric
Examples:	RW26L, RW08R, RW26C, RW05,

5.47 Localizer Bearing (LOC BRG)

Definition/Description: The Localizer Bearing field defines the magnetic bearing of the localizer course of the ILS facility/GLS approach described in the record.

Source/Content: Localizer courses, derived from official government sources, are entered into the field in degrees and tenths of a degree, with the decimal point suppressed. For localizer courses published with the intent to be used as true courses, the last character of this field will contain a T in place of tenths of a degree.

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Used On: ILS, GLS records
Length: 4 characters
Character Type: Alpha/numeric
Examples: 2570, 0147, 2910, 347T

5.48 Localizer Position (LOC FR RW END) Azimuth/Back Azimuth Position (AZ/BAZ FR RW END)

Definition/Description: The Localizer/Azimuth Position field defines the location of the facility antenna relative to one end of the runway.

Source/Content: The field contains the official government source distance, in feet, from the antenna to the runway end. The resolution is one foot.

Used On: ILS, MLS and MLS Continuation records
Length: 4 characters
Character Type: Numeric
Examples: 0950, 1000

5.49 Localizer/Azimuth Position Reference (@, +, -)

Definition/Description: The Localizer/Azimuth Position Reference field indicates whether the antenna is situated beyond the stop end of the runway, ahead of or beyond the approach end of the runway. The Back-Azimuth Position Reference field indicates whether the antenna is situated ahead of the approach end of the runway, ahead of or beyond the stop end of the runway.

Source/Content: For Localizer and Azimuth positions the field is blank (@) when the antenna is situated beyond the stop end of the runway, it contains a plus (+) sign when the antenna is situated ahead of the approach end of the runway or a minus (-) sign when it is located off to one side of the runway. For Back Azimuth positions the field is blank (@) when the antenna is situated ahead of the approach end of the runway, it contains a plus (+) sign when the antenna is situated beyond the stop end of the runway or a minus (-) sign when it is located off to one side of the runway.

Used On: ILS, MLS and MLS Continuation records
Length: 1 character
Character Type: Alpha

5.50 Glideslope Position (GS FR RW THRES) Elevation Position (EL FR RW THRES)

Definition/Description: The Glideslope/Elevation Position field defines the location of the antenna with respect to the approach end of the runway.

Source/Content: The field contains four numeric characters indicating the distance in feet (to a resolution of one foot) from a line drawn at right angles to the runway at the antenna position to the threshold of the runway.

Used On: ILS and MLS records
Length: 4 characters max
Character Type: Numeric
Examples: 0980, 1417

5.51 Localizer Width (LOC WIDTH)

Definition/Description: The Localizer Width field specifies the localizer course width of the ILS facility defined in the record.

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Source/Content: Localizer course widths from official government sources are entered into the field in degrees, tenths of a degree and hundredths of a degree with the decimal point suppressed.

Used On:	ILS records
Length:	4 characters
Character Type:	Numeric
Examples:	0500, 0400, 0350

5.52 Glideslope Angle (GS ANGLE) Minimum Elevation Angle (MIN ELEV ANGLE)

Definition/Description: The Glideslope Angle field defines the glideslope angle of an ILS facility/GLS approach. The Minimum Elevation Angle field defines the lowest elevation angle authorized for the MLS procedure.

Source/Content: Glideslope and Elevation angles from official government sources are entered into the fields in degrees, tenths of a degree and hundredths of a degree with the decimal point suppressed.

Used On:	ILS, GLS and MLS records
Length:	3 characters
Character Type:	Numeric
Example:	275, 300

5.53 Transition Altitude/Level (TRANS ALTITUDE/LEVEL)

Definition/Description: The Transition Altitude field defines the altitude in the vicinity of an airport or heliport at or below which the vertical position of an aircraft is controlled by reference to altitudes (MSL). The Transition Level field defines the lowest flight level available for use above the transition altitude. Aircraft descending through the transition layer will use altimeters set to local station pressure, while departing aircraft climbing through the layer will be using standard altimeter setting (QNE) of 29.92 inches of mercury, 1013.2 millibars, or 1013.2 hectopascals.

Source/Content: Transition Altitudes/Levels are derived from official government sources.

For STAR and Approach records, the field defines the level, expressed in feet, at which the altimeter barometric setting is changed from standard to local values for **that particular procedure**. For SID records, the field **should** contain the Transition Altitude expressed in feet**, for that particular SID**. The first leg of each Airport and Heliport SID procedure shall contain the appropriate transition altitude**/level** with a resolution of one foot. **The first leg of each Airport and Heliport STAR/Approach procedure shall contain the appropriate transition level with a resolution of one foot.** If the transition altitude**/level** is unknown**, or assinged** by ATC, the field will be blank in procedure records.

For Airport and Heliport records, the Transition Altitude and Transition Level **should** be entered into the appropriate fields, in feet with a resolution of one foot. If the Transition Altitude or Level is unknown, **or assigned** by ATC, the field **on the airport/heliport record should** be blank.

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Used On:	Airport and Heliport SID/STAR/Approach, Airport and Heliport Records
Length:	5 characters
Character Type:	Numeric
Examples:	05000, 23000, 18000

5.54 Longest Runway (LONGEST RWY)

Definition/Description: The Longest Runway field permits airport to be classified on the basis of the longest operational hard-surface runway.

Source/Content: The longest runway will be derived from official government sources and entered in the field in hundreds of feet. This value will represent the longest hard-surfaced operational runway available without restriction at the airport. The value reflects overall pavement length declared suitable and available for the ground operations of aircraft. Where no hard-surfaced runway is available or those available do not meet criteria, the value will represent the longest operational runway at the airport.

Used On:	Airport Records
Length:	3 characters
Character Type:	Numeric
Examples:	040, 055, 098, 111

5.55 Airport/Heliport Elevation (ELEV)

Definition/Description: The elevation of the Airport/Heliport specified in the record is defined in the Airport Elevation and Heliport Elevation field.

Source/Content: Airport/Heliport elevations are to be derived from official government sources and entered into the field in feet to a resolution of one foot. For elevations above MSL, the field contains the numeric characters of the elevation only. For the below MSL elevations, the first character of the field is a minus (-) sign. Airport elevation is defined as the highest elevation of any landing surface on the airport.

Used On:	Airport and Heliport records
Length:	5 characters
Character Type:	Alpha/numeric
Examples:	02171, -0142, 05230

5.56 Gate Identifier (GATE IDENT)

Definition/Description: The airport gate defined in the record is identified in the Gate Identifier field.

Source/Content: Coded gate identity information is derived from official government sources and navigation system users.

Used On:	Gate records
Length:	5 characters max
Character Type	Alpha/numeric
Examples:	C134B, 23, 30A, B12A

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5.57 Runway Length (RUNWAY LENGTH)

Definition/Description: The Runway Length field defines the total length of the runway surface for the runway identified in the records' Runway Identifier field.

Source/Content: Runway lengths are derived from official government sources and are entered in feet with a resolution of one foot. The value represents the overall length of the runway, with no regard for displaced thresholds, starter extensions, stopways, overruns, or clearways. Available landing lengths and take-off runs are not necessarily identical to this runway length. **These distances are provided in the Runway Continuation Records.** As the latitude/longitude information in the runway record reflects the Landing Threshold Point of the runway identified in the record, which may or may not be displaced, there is no direct correlation between the Runway Length provided in the record and a value calculated based on these latitude/longitude values.

Used On:	Runway Records
Length:	5 characters
Character Type:	Numeric
Examples:	05000, 07000, 11480

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5.0 NAVIGATION DATA – FIELD DEFINITIONS

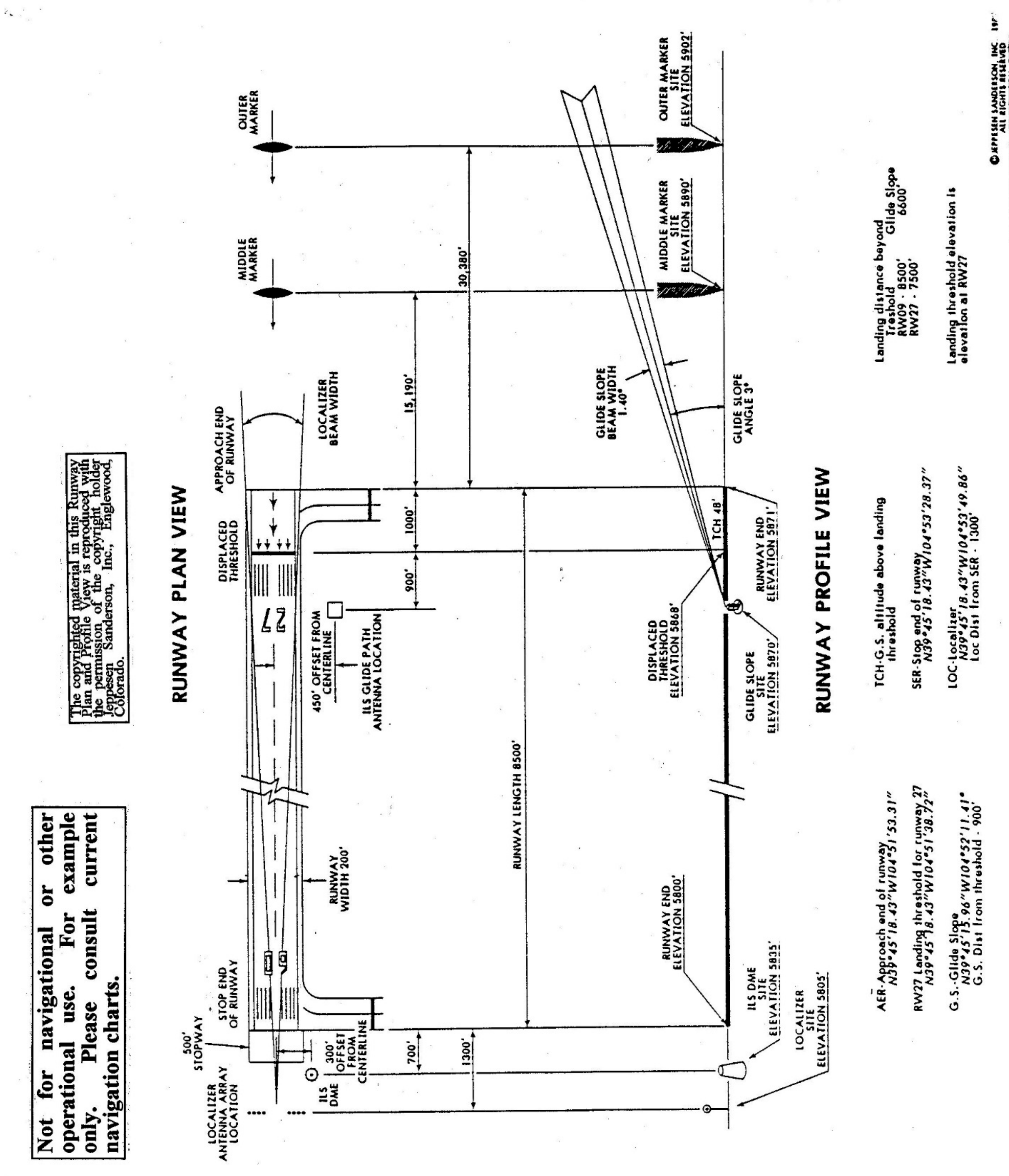

Figure 5-3 – Runway Profile View

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5.58 Runway Magnetic Bearing (RWY BRG)

Definition/Description: The magnetic bearing of the runway identified in the runway identifier or pad ident field of the record is specified in the Runway Magnetic Bearing field.

Source/Content: Runway magnetic bearings derived from official government sources are entered into the field in degrees and tenths of a degree, with the decimal point suppressed. For runway bearings published with the intent to be used as true bearings, the last character of this field will contain a T in place of tenths of a degree. When used on helipad records, it usually will contain the bearing of a former fixed-wing runway that has been converted to helicopter use only or when a specific bearing to approach a particular helipad has been provided by government source.

Used On:	Runway and Helipad Records
Length:	4 characters
Character Type:	Alpha/numeric
Examples:	1800, 2302, 0605, 347T

5.59 Runway Description (RUNWAY DESCRIPTION)

Definition/Description: If required, additional information concerning a runway can be included in a record in the Runway Description field.

Source/Content: Appropriate contents for the field will be determined when the record is assembled.

Used On:	Runway records
Length:	22 characters max
Character Type:	Alpha/numeric
Examples:	GROOVED, SINGLE ENG. ONLY

5.60 Name (NAME)

Definition/Description: The Name field defines the name commonly applied to the navigation entity defined in the record.

Source/Content: Appropriate contents for the field will be determined from official government or customer sources.

Used On:	Gate and Holding Pattern records
Length:	25 characters max
Character Type:	Alpha/numeric
Examples:	HOLDING JIMEE MIAMI

5.61 Notes (Continuation Records) (NOTES)

Definition/Description: The Notes field (continuation record) is provided to accommodate any information that cannot be entered in the primary record.

Source/Content: Appropriate contents for the field will be determined at the time the primary record is assembled.

Used On:	All except Company route records
Length:	70 characters max
Character Type:	Alpha/numeric
Examples:	EASTBOUND PREFERRED 090/0Z/230/0Z

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5.62 Inbound Holding Course (IB HOLD CRS)

Definition/Description: The Inbound Holding Course field defines the inbound course to the holding waypoint.

Source/Content: Inbound holding courses derived from official government sources are entered into the field in degrees and tenths of a degree, with the decimal point suppressed. For holding courses published with true bearings, the last character of this field contains a T in place of tenths of a degree.

Used On:	Holding Pattern records
Length:	4 characters
Character Type:	Alpha/numeric
Examples:	0456, 1800, 3034, 347T

5.63 Turn (TURN)

Definition/Description: The Turn field specifies the direction in which holding pattern turns are to be made.

Source/Content: The Turn field will always contain either L or R.

Used On:	Holding Pattern records
Length:	1 character
Character Type:	Alpha

5.64 Leg Length (LEG LENGTH)

Definition/Description: The Leg Length field specifies the distance of either the inbound leg or the outbound leg of the holding pattern. The determination of inbound or outbound is identified by the content of Section 5.298 of the applicable record. Inbound is defined as the distance between the point at which the aircraft rolls out on the inbound leg of the holding pattern and the fix at which the holding pattern is defined. Outbound is defined as the distance from a point abeam the holding fix to the beginning of the inbound turn (Figure 5-4).

Source/Content: Leg length derived from official government sources is entered into the field in nautical miles and tenths of a nautical mile, with the decimal point suppressed.

Used On:	Holding Pattern records
Length:	3 characters
Character Type:	Numeric
Examples:	108, 055

5.65 Leg Time (LEG TIME)

Definition/Description: The Leg Time field specifies the length of the inbound leg or outbound of a holding pattern in units of time. The determination of inbound or outbound is identified by the content of Section 5.298 of the applicable record. Inbound is defined as the timing between the point at which the aircraft rolls out on the inbound leg of the holding pattern and the fix at which the holding pattern is defined. Outbound is defined as the timing from a point abeam the holding fix to the beginning of the inbound turn (Figure 5-4).

Source/Content: Leg time, derived from official government sources, is entered into this field in minutes and tenths of a minute, with the decimal point suppressed.

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Used On: Holding Pattern records
Length: 2 characters
Character Type: Numeric
Examples: 10, 15, 20

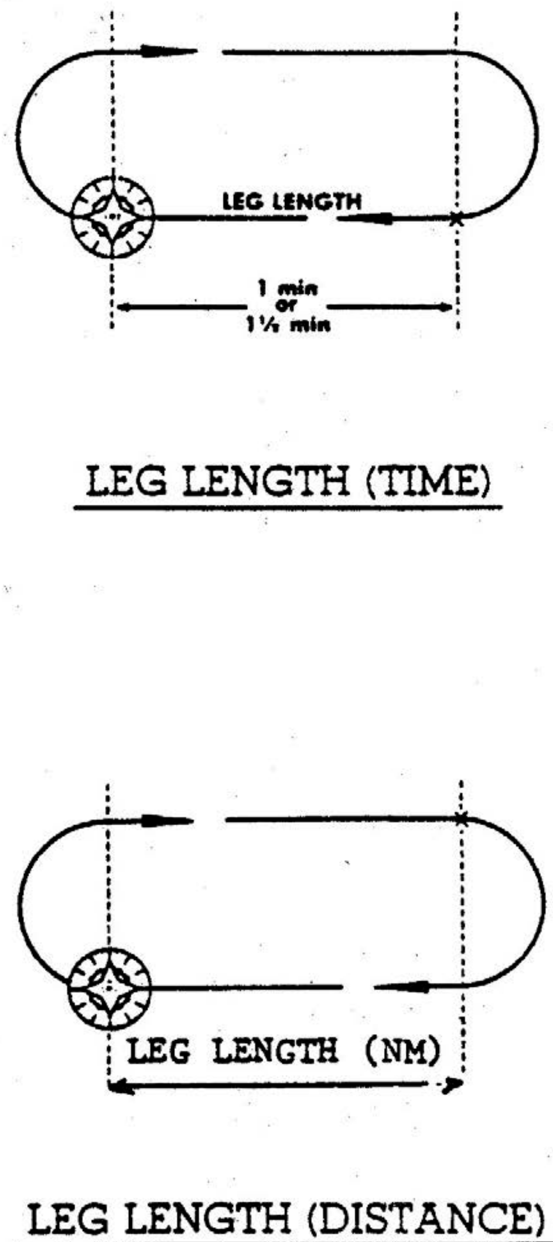

Figure 5-4 – Holding Pattern Leg Length

5.66 Station Declination (STN DEC)

Definition/Description: For VHF NAVAIDS, the Station Declination field contains the angular difference between true north and the zero-degree radial of the NAVAID at the time the NAVAID was last site checked. For ILS localizers, the field contains the

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angular difference between true north and magnetic north at the localizer antenna site at the time the magnetic bearing of the localizer course was established.

Source/Content: Station declinations are derived from official government sources. The field contains one of the alpha characters shown in the following table followed by the value of the declination in degrees and tenths of a degree, with the decimal point suppressed. When the first column of the Station Declination field is coded T or G, the remainder of the field should be coded all zeros.

Column 1 Character	Declination Description
E	Declination is East of True North
W	Declination is West of True North
T	Station is oriented to True North in an area in which the local variation is not zero.
G	Station is oriented to Grid North

Used On: VHF NAVAID and ILS records
Length: 5 characters
Character Type: Alpha/numeric
Examples: E0072, E0000, T0000, G0000

COMMENTARY

The appearance of the character G in column 1 of this field will alert users that although a NAVAID declination may not be zero, the fact that the grid reference is unknown prevents a value from being defined.

5.67 Threshold Crossing Height (TCH)

Definition/Description: The Threshold Crossing Height specifies the height above the landing threshold on a normal glide path.

Source/Content: The Threshold Crossing Height will be derived from official government sources when available. As provided on Runway Records, the TCH value will be the Glideslope Height at the landing threshold for runways with ILS or MLS approaches. If an ILS or MLS is not available and an RNAV approach is available, it will be the published TCH for that procedure. If none of these values are available, it will be 40 or 50 feet based on the table below. When used on Approach Continuation Records, the field will contain the published TCH for that procedure. When used on ILS or MLS Records, it will be the height of the glideslope at the landing threshold. When used on a GLS record, it will be the height of the glide path at the landing threshold.

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Content	Description
40 (feet)	On Runway records for which all approach procedures are published for Category A and B aircraft only.
	On Runway records with a length of less than 6000 feet and no published approach procedure.
50 (feet)	On Runway records for which there is at least one approach procedure published for Category C or D aircraft.
	On Runway records with a length of 6000 feet or greater and no published approach procedure.

COMMENTARY

Based on the information contained in the Source/Content paragraph, it should be noted that the single TCH value provided on the Runway Record may be different than the TCH value provided on the Approach Continuation Record for a procedure to that same runway. These differences may be significant. A comparison of procedure altitude data to threshold elevation and threshold crossing heights should only be made to the Approach Continuation Record and GLS Record.

Used On: Airport and Heliport ILS and MLS Runway, Airport, and Heliport Approach Continuation Records.
Length: 3
Character Type: Numeric
Example 037, 050, 109, 101

5.68 Landing Threshold Elevation (LANDING THRES ELEV)

Definition/Description: The elevation of the landing threshold of the runway/helipad described in a runway/helipad record is defined in the Landing Threshold Elevation field.

Source/Content: Landing threshold elevations derived from official government sources are entered into this field in feet, to a resolution of 1 foot. For elevations above MSL, the field contains the numeric characters of the elevation only. For below MSL elevations, the first character of the field is a minus (-) sign.

Used On: Runway Airport and Heliport Helipad records
Length: 5 characters
Character Type: Alpha/numeric
Examples: 01250, -0150

5.69 Threshold Displacement Distance (DSPLCD THR)

Definition/Description: The distance from the extremity of a runway to a threshold not located at that extremity of that runway.

Source/Content: Threshold displacement distances derived from official government sources are entered into this field in feet.

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Used On:	Runway records
Length:	4 characters
Character Type:	Numeric
Examples:	0485, 1260

5.70 Vertical Angle (VERT ANGLE)

Definition/Description: The Vertical Angle field defines the angular portion of vertical navigation path in STAR Route and Approach Procedure Route records. The Vertical Angle should cause the aircraft to fly at the last coded altitude and then descend on the VNAV path, projected back from the fix and altitude contained in the route sequence that contains the Vertical Angle.

Source/Content: Values from official government source documents will be used when available. In the coding of Precision Approach Procedures, the Vertical Angle is the angle assigned to the glideslope. In the coding of non-precision procedures, it will be the VNAV Path angular definition provided by the government source or a value computed based on the rules for such a computation documented in Attachment 5 of this specification. Values greater than zero will be preceded by the minus sign (-) to indicate descending flight. When no government source value is available and none can be computed based on the rules in Attachment 5 of this specification, the field is populated with all zeros, no minus sign. Vertical Angles are expressed in degrees, tenths and hundredths of degrees with the decimal point suppressed. The maximum value is 9.99 degrees.

Used On:	Airport and Heliport STAR and Approach Route Records
Length:	4 characters (first character either (-) or blank)
Character Type:	Alpha/numeric
Examples:	-300, -275, -542, 000

5.71 Name Field

Definition/Description: This field will be used to further define the record by name.

Source/Content: Facility name will be derived from official government sources. A parenthetical name following the official name may be used to identify the location of the facility.

Used On:	Navaid, Airport, Heliport and Enroute Marker records
Length:	30 characters
Character Type:	Alpha/numeric

5.72 Speed Limit (SPEED LIMIT)

Definition/Description: The Speed Limit field defines a minimum, maximum, or mandatory indicated air speed, (KIAS) for a fix, a leg or multiple legs in a terminal procedure**,** maximum allowed airspeed for an airport or heliport terminal environment**, or a maximum airspeed with an airspace**.

Source/Content: The speed limit will be derived from official government source documentation and shown in Knots. When used on an Airport or Heliport Record, the field is an indication of the maximum allowed speed and applies to all flight segments departing or arriving that airport's or heliport's terminal area, at and below the specified Speed Limit Altitude (5.73). When used on Airport and Heliport SID/STAR/Approach Records, the field is an indication of a speed for a fix, a leg, or multiple legs in the procedure description, used in conjunction with Speed Limit

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Description (5.261). **When used on a Controlled Airspace record, the field is used to describe the speed restriction within the Airspace.**

Used On:	Airport and Heliport SID/STAR/Approach, Airport and Heliport, Flight Planning Arr/Dep Data**, and Controlled Airspace** Records
Length:	3 characters
Character Type:	**Alpha/**Numeric
Examples:	250

5.73 Speed Limit Altitude

Definition/Description: Speed Limit Altitude is the altitude below which speed limits may be imposed.

Source/Content: The Speed Limit Altitude will be derived from official government sources in feet MSL or FLs.

Used On:	Airport and Heliport**, and Controlled Airspace** records
Length:	5 characters
Character Type:	Alpha/numeric
Examples:	10000, F**L1**25

5.74 Component Elevation (GS ELEV, EL ELEV, AZ ELEV, BAZ ELEV)

Definition/Description: The Component Elevation field defines the elevation of a given component in the Localizer, GLS and MLS records. The Glideslope Elevation (GS ELEV) defines the elevation of the Glideslope component in the Localizer Records. The EL Elevation (EL ELEV) defines the elevation of the Elevation component of the MLS Record, the Azimuth Elevation (AZ ELEV) defines the elevation of the Azimuth component of the MLS Record and the Back-Azimuth Elevation (BAZ ELEV) defines the elevation of the Back-Azimuth component of the MLS Record. The GLS station elevation (GLS ELEV) defines the elevation of the GLS ground station in the GLS record.

Source/Content: Elevations specified in official government publications are entered in this field with respect to MSL. When the elevation is below MSL, the first column of the field contains a minus (-) sign.

Used On:	Localizer, MLS and GLS Records and MLS Continuation Records
Length:	5 characters
Character Type:	Alpha/numeric
Examples:	00235, 01265, -0011

5.75 From/To – Airport/Heliport/Fix

Definition/Description: When used on Company Routes and Helicopter Operations Company Routes, the From Airport/Heliport/Fix is the fix from which the company route originates. The To Airport/Heliport/Fix is the fix at which the company route terminates. When used on Alternate Records, it is the Departure, Destination or Enroute Airport/Fix for which the alternate information is being provided.

Source/Content: The customer is responsible for defining points at which company routes originate and terminate and for defining which departure, destination or enroute points are to have alternate information. On Company Routes and Helicopter Operations Company Routes, may reference airport, heliport, navaid or

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waypoint records which will be further defined by ICAO, Section, and Subsection data.

Used On:	Company Route, Helicopter Operations Company Route and Alternate Records
Length:	5 characters max.
Character Type:	Alpha/numeric

5.76 Company Route Ident

Definition/Description: The Company Route Ident field identifies each unique route between origination and destination.

Source/Content: This field is determined by the customer.

Used On:	Company Route Records Helicopter Operations Company Routes
Length:	10 characters
Character Type:	Alpha/numeric

5.77 VIA Code

Definition/Description: The VIA Code field is used to define the type of route used in the SID/STAR/Approach/Airways field (Section 5.78) on Company Route records and defines the type of route used in the AWY Identifier on Preferred Route records. On the Preferred Route records, some codes define the use, or restriction to use, of a fix or routing.

Source/Content: The code to be entered must be selected from the tables below:

Company Route Record (R)

VIA Field	Description
ALT	Alternate Airport
APP	Approach Route
APT	Approach Transition
AWY	Designated Airway
DIR	Direct to Fix
INT	Initial Fix
PRE	Preferred Route
SID	Standard Instrument Departure
SDE	Standard Instrument Departure - Enroute Transition
SDY	Standard Instrument Departure - Runway Transition
STR	Standard Terminal Arrival and Profile Descent
STE	Standard Terminal Arrival and Profile Descent - Enroute Transition
STY	Standard Terminal Arrival and Profile Descent - Runway Transition

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Preferred Route Record (ET)

VIA Field	Description
AWY	Designated Airway
DIR	Direct to Fix
INT	Initial Fix
RVF	Route via Fix
RNF	Route via Fix not permitted
SID	Standard Instrument Departure
STR	Standard Terminal Arrival and Profile Descent

Current	Next Via										
Via	INT	DIR	SDY	SID	SDE	AWY	STE	STR	STY	APT	APP	ALT
INT	N											
DIR	N											
SDY	N		N									
SID	N		N	N								
SDE	N		N	N	N							
AWY	N		N	N	N							
STE	N		N	N	N	N	N					
STR	N		N	N	N	N	N	N				
STY	N		N	N	N	N	N	N	N			
APT	N		N	N	N	N	N	N	N	N		
APP	N		N	N	N	N	N	N	N	N	N	
ALT	N	N	N	N	N	N	N	N	N	N	N	N

Note 1: N means sequence not allowed, blank means sequence is allowed.

Note 2: The To Fix must match the beginning fix of the following Via.

Used On: Company Route and Preferred Route records and Helicopter Operations Company Routes
Length: 3 characters
Character Type: Alpha/numeric

Note: Table 5-20 illustrates how various fields are to be completed in the Company Route Record based on the various VIA Codes defined in this section.

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Table 5-20 – Company Route Record (R) Field Content

VIA	S/S/A AIRWAY	AREA	TO FIX	RWY TRANS	ENRT TRANS	CRUISE ALT	TERM/ALT ARPT	ALT DIST
ALT	Blank	Area	Blank	Blank	Blank	ALT or Blank	Arpt or Heliport Ident	Dist in NM
APP	Apch Ident	Area	Optional	Blank	Tml Rte Ident or Blank	Blank	Arpt or Heliport Ident if TO FIX Ident is Terminal	Blank
APT	Apch Ident	Area	Fix Ident	Blank	Trans Ident	Blank	Airport or Heliport ident if TO FIX Ident is Terminal	Blank
AWY	Awy Ident	Area	Fix Ident	Blank	Blank	ALT or Blank	Blank	Blank
DIR, INT	Blank	Area	Fix Ident	Blank	Blank	ALT or Blank	Airport or Heliport Ident if TO FIX Ident is Terminal	Blank
SID	SID Ident	Area	Fix Ident	Rwy Ident/All or Blank	Trans Ident or Blank	ALT or Blank	Airport or Heliport if TO FIX Ident is Terminal	Blank
SDE	SID Ident	Area	Fix Ident	Blank	Trans Ident	ALT or Blank	Airport or Heliport Ident if TO FIX Ident is Terminal	Blank
SDY	SID Ident	Area	Fix Ident	Rwy Ident	Blank	ALT or Blank	Airport or Heliport Ident if TO FIX Ident is Terminal	Blank
STR	STAR Ident	Area	Fix Ident of Blank	Rwy Ident/All	Trans Ident or Blank	ALT or Blank	Airport or Heliport Ident if TO FIX Ident is Terminal	Blank
STE	STAR Ident	Area	Fix Ident	Blank	Trans Ident	ALT or Blank	Airport or Heliport Ident if TO FIX Ident is Terminal	Blank
STY	STAR Ident	Area	Fix Ident	Rwy Ident	Blank	ALT or Blank	Airport or Heliport Ident if TO FIX Ident is Terminal	Blank
PRE	Pref Rte Ident	Area	Fix Ident	Blank	Blank	ALT or Blank	Airport or Heliport Ident if TO FIX Ident is Terminal	Blank

5.78 SID/STAR/APP/AWY (S/S/A/AWY) SID/STAR/AWY (S/S/AWY)

Definition/Description: This field is used to provide the identifier of the particular enroute airway or terminal route to be flown as referenced by the VIA field (Section 5.77). The identifier is further defined by the content of columns 95/96/97 of the Company Route or 106/107/108 of the Preferred Route which contain the Route Type and Route Type Qualifier data of the specific route or procedure.

Source/Content: For Company Route records this field can contain the SID/STAR, Approach, Enroute Airway, or Preferred Route Identifier (Sections 5.8, 5.9, and 5.10). For Preferred Route records this field can contain the SID/STAR or Enroute Airway Route Identifier (Section 5.8). This field will be blank for certain records depending on the VIA field content (Section 5.77).

Used On: Company Route and Preferred Route Records, and Helicopter Operations Company Routes
Length: 6 characters
Character Type: Alpha/numeric
Examples:

VIA Code	S/S/A/AWY Content
SID	CUIT8
STR	LOCKE9
APP	I19L, R35-Z
AWY	J501

5.79 Stopway

Definition/Description: Stopway means the length of an area beyond the take-off runway, no less wide than the runway and centered upon the extended centerline of the runway, and designated for use in decelerating the airplane during an aborted takeoff.

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Source/Content: The Stopway will be derived from official government sources and shown in feet (See Table 5-15).

Used On:	Runway records
Length:	4 characters
Character Type:	Numeric
Examples:	0900, 1000

5.80 ILS/MLS/GLS Category (CAT)

Definition/Description: For ILS/MLS/GLS stations, this field defines the Facility Performance Category, defined as Category I, II, and III, up to which the station is operating as a minimum. The level of Facility Performance Category does neither imply that permission exists to use the facility for landing guidance to that level nor limit the minimal use to the designated classification.

This field is also used to define the classification for other than ILS/MLS/GLS installations such as LOC, IGS, LDA, or SDF.

Source/Content: The ILS/MLS/GLS Category/Classification will be derived from official government sources and will be indicated by a value from the table below.

Definition	Category/ Classification
Localizer only, no Glideslope	0
ILS /MLS/GLS Category I	1
ILS /MLS/GLS Category II	2
ILS /MLS/GLS Category III	3
IGS Facility	I
LDA Facility with Glideslope	L
LDA Facility, no Glideslope	A
SDF Facility with Glideslope	S
SDF Facility, no Glideslope	F

Used On:	Localizer, MLS and MLS Continuation Records, GLS Record.
Length:	1 character
Character Type:	Alpha/numeric

5.81 ATC Indicator (ATC)

Definition/Description: The ATC Indicator field will be used to indicate that the altitudes shown in the altitude fields can be modified by ATC or the altitude will be assigned by ATC.

Source/Content: This field will contain the alpha character A when the official government source states that the altitude can be modified or assigned by ATC. This field will contain the alpha character S when the official government source states that the altitude will be assigned by ATC or if no altitude is supplied.

Used On:	Airport and Heliport SID/STAR/ Approach Records
Length:	1 character
Character Type:	Alpha

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5.82 Waypoint Usage

Definition/Description: The waypoint usage field is employed to indicate the structure in which the waypoint is utilized.

Source/Content:

Usage	Record Column Content
	31
HI and LO Altitude	B
HI Altitude	H
LO Altitude	L
Terminal Use Only (not used enroute)	Blank

Used On: Waypoint (EA/PC) and Heliport Terminal Waypoint (HC) records

Length: 1 character

Character Type: Alpha

5.83 To FIX

Definition/Description: The Company Route, Helicopter Operation Company Route, and Preferred Route To Fix field is used to terminate the route referenced in the SID/STAR/APCH/AWY field (Section 5.78), or terminate a Direct segment or start an Initial segment when no SID/STAR/APCH/AWY is referenced.

Source/Content: For Company Route records the field will contain Enroute Waypoint, Airport Terminal Waypoint, VHF NAVAID, NDB NAVAID, Terminal NDB NAVAID, Airport or Runway Identifier. For Helicopter Operations Company Route records the field will contain Enroute Waypoint, Helicopter Terminal Waypoint, VHF NAVAID, NDB NAVAID, Terminal NDB NAVAID, Airport, Heliport, Runway Identifier or Helipad Identifier. The customer will define where a particular route segment is to terminate. Terminal Fixes, Runway Identifiers or Helipad Identifiers must be for the From Airport/Heliport or To Airport/Heliport which must be consistent with the VIA Code. For Preferred Route records, the field will contain Enroute Waypoint, Terminal Waypoint, VHF NAVAID, NDB NAVAID or Terminal NDB NAVID, Airport Identifier.

Used On: Company Route, Helicopter Operations Company Route, and Preferred Route Records

Length: Company Route/Helicopter Operations Company Route - 6 characters max.
Preferred Route - 5 characters max.

Character Type: Alpha/numeric

Examples: SHARP, BHM, DEN43, KDEN, RW35R

5.84 RUNWAY TRANS

Definition/Description: This field is used to identify the desired runway transition of the applicable SID or STAR. Together with the Section/Subsection identified for the SID/STAR/App/AWY field, it is used to link directly to the SID/STAR procedure records depending on the Company Route/Helicopter Operations Company Route

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record VIA field (Section 5.77) and whether or not the SID/STAR has explicit runway transitions.

Source/Content:

VIA field contains SID or STR:

If the applicable SID/STAR has explicit runway transitions as indicated by the Procedure Route Type, then this field uniquely identifies the desired runway transition. If the applicable SID/STAR has explicit runway transitions as indicated by the Procedure Route Type but no runway transition is desired in the Company Route, the field is blank. If the applicable SID/STAR does not have explicit runway transitions as indicated by the Procedure Route Type, this field is always non-blank and exactly matches the TRANS IDENT field of the SID/STAR procedure records. This is the case when a SID starts with Route Type 2 or a STAR ends with Route Type 2.

VIA field contains SDY or STY:

In this situation, the field contents are defined exactly as stated above (VIA field = SID or STR) except that the field is always non-blank. This field is blank for all other contents of the VIA field.

Used On:	Company Route, Helicopter Operations Company Route Records
Length:	5 characters
Character Type:	Alpha/numeric
Examples:	RW08L, ALL, Blank PADA1, NWPAD

5.85 ENRT TRANS

Definition/Description: Together with the Section/Subsection identified for the SID/STAR/App/AWY field, this field is used to identify the desired enroute transition of the applicable SID or STAR. It can also be used to identify the desired approach transition of an approach.

Source/Content:

VIA field contains SID or STR:

This field uniquely identifies the desired SID/STAR enroute transition. If no enroute transition is desired, the field is blank.

VIA field contains SDE or STE:

In this situation, the field contents are defined exactly as stated above (VIA field - SID or STR) except that the field is always non-blank.

VIA field contain APP:

This field uniquely identifies the desired approach transition. If no approach transition is desired, the field is blank.

The field is blank for all other contents of the VIA field.

Used On:	Company Route, Helicopter Operations Company Route Records
Length:	5 characters
Character Type:	Alpha/numeric

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Examples:	ETS, KEENE, DEN

5.86 Cruise Altitude

Definition/Description: This field will be used to establish an Enroute Cruise Altitude. It will be entered on Company Route records as specified by the customer.

Source/Content: The customer will supply the Cruise Attitude in feet or flight level.

Used On:	Company Route, Helicopter Operations Company Route Records
Length:	5 characters
Character Type:	Alpha/numeric
Examples:	10000, 15000, FL090, FL240

5.87 TERMINAL/ALTERNATE Airport (TERM/ALT ARPT)

Definition/Description: This field has two uses depending on the VIA field and File Code for To Fix. For VIA field content of ALT this field will contain the Alternate Airport Ident or Heliport Ident for this Company Route. If the file code for To Fix contains P, this field will contain the Airport Ident for REGN CODE (Section 5.41) of Terminal Waypoints (PC records) and Runway (PG records). If the file code for To Fix contains H, this field will contain the Heliport Ident for REGN CODE (Section 5.41) of Helicopter Terminal Waypoints (HC records).

Source/Content: See Section 5.6, Airport/Heliport Identifier.

Used On:	Company Route, Helicopter Operations Company Route Records
Length:	4 characters
Character Type:	Alpha/numeric
Examples:	KDEN, EDDF

5.88 Alternate Distance (ALT DIST)

Definition/Description: This field is used to supply the distance in nautical miles from the To Airport/Heliport/Fix to the Alternate Airport/Heliport.

Source/Content: Values for this field will be supplied by the customer and must be equal to or greater than the great circle distance from the destination airport/fix to the alternate airport/heliport.

Used On:	Company Route, Helicopter Operations Company Route Records
Length:	4 characters
Character Type:	Numeric
Examples:	052, 0011, 0123

5.89 Cost Index

Definition/Description: The Cost Index field is used to define the relative value of fuel-related costs and time-related costs for a particular route.

Source/Content: Source will be by customer airline.

Used On:	Company Route, Helicopter Operations Company Route Records
Length:	3 characters
Character Type:	Numeric

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Examples: 001, 011, 999

5.90 ILS/DME Bias

Definition/Description: This field is used to specify the DME offset.

Source/Content: The field contains a 2-digit bias term in nautical miles and tenths of a nautical mile with the decimal point suppressed. Field is blank for unbiased DMEs.

Used On: VHF NAVAID Records containing ILS/DME or MLS/DME Facilities
Length: 2 characters
Character Type: Numeric
Examples: 13, 91

5.91 Continuation Record Application Type (APPL)

Definition/Description: This field indicates specific application of this continuation record.

Source/Content: The field will contain one of the following type codes:

Field Content	Description
A	A standard ARINC 424 Continuation containing Notes or other formatted data not covered by a define Continuation
B	Combined Controlling Agency/Call Sign and formatted Time of Operation
C	Call Sign/Controlling Agency Continuation
E	Primary Record Extension
L	VHF Navaid/TACAN Only Navaid Limitation Continuation
N	A Sector Narrative Continuation
T	A Time of Operations Continuation, formatted time data
U	A Time of Operations Continuation Narrative time data
V	A Time of Operations Continuation, Start/End Date
P	A Flight Planning Application Continuation
S	Simulation Application Continuation
W	An Airport or Heliport Procedure Data Continuation

Used On: Continuation Records
Length: 1 character
Character Type: Alpha

5.92 Facility Elevation (FAC ELEV)

Definition/Description: The Facility Elevation field provides the elevation of navaids and communications transmitters.

Source/Content: Facility Elevation data is derived from official government source. It is provided in feet with a resolution of one foot. It is referenced to MSL. When the elevation is below MSL, the first character of the field will be a minus sign (-) indicating below sea level.

Used On: ILS Marker, Airway Marker Primary Records Enroute, Airport, and Heliport Primary Extension Continuation Records, VHF Navaids and NDB Navaids Simulation Continuation Records
Length: 5 characters
Character Type: Alpha/numeric
Examples: 00530, -0014

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5.93 Facility Characteristics (FAC CHAR)

Definition/Description: The Facility Characteristics field identifies the characteristics of the NAVAID facility.

Source/Content:

Facility	28	29	30	31	32
VHF NAVAID, ILS & MLS					
Synchronous	S				
Asynchronous	A				
Unknown	U				
VHF NAVAID, NDB NAVAID and Locator					
Voice Ident		Y			
No Voice Ident		N			
Undefined		U			
NDB NAVAID					
Type of emission			Note1		
400H				4	
1020H				1	
Repetition Rate					Note 2
ILS DME Location					
Collocated with Localizer Note 3					L
Collocated with Glideslope					G
Not collocated with Localizer or Glideslope					Blank
ILS Back Course					
Usable				Y	
Unusable				N	
Restricted				R	
Undefined				U	
MLS, DME or DME/P Location					
Collocated with Azimuth					A
Collocated with Elevation					E
Not Collocated with Azimuth or Elevation					N
MLS Approach Azimuth Scan Rate				Note 4	

Used On: ILS Marker Primary records, VHF Navaid, NDB Navaid and ILS/MLS continuation records
Length: 5 characters
Character Type: Alpha/numeric

Note 1: 0=A0, 1=A1, 2=A2

Note 2: Enter number of occurrences per minute if known. Leave blank if not known.

Note 3: Collocated means that the latitudes and longitudes of the two facilities differ by no more than 1 arc second.

Note 4: Where a high-rate approach azimuth guidance is available, enter H, otherwise leave blank.

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COMMENTARY

The NDB emission designators set forth in Note 1 above are being replaced with the new designators shown in the equivalency table below as the result of action taken at the 1979 ITU World Administrative Radio Conference.

Present Designator	New Designator	Description
A0	NON	Unmodulated Carrier
A1	A1A	Carrier keyed, bandwidth less than 0.1 kHz
A1	A1B	Carrier keyed, bandwidth greater than 0.1 kHz
A2	A2A	Tone keyed modulation

5.94 True Bearing (TRUE BRG)

Definition/Description: The Magnetic Bearing for ILS localizer, MLS Azimuth, MLS Back Azimuth and Runway records is given in the primary record. This field allows the true bearing to be provided independently of the magnetic bearing data.

Source/Content: True Bearings are entered into the field in degrees, tenths of a degree and hundredths of a degree, with the decimal point suppressed. When the source magnetic bearing data is provided as true with the intent for it to be used as true, the Magnetic Bearing and the True Bearing values will be identical. See Section 5.95 for source description.

Used On: ILS Continuation, MLS Continuation and Runway Continuation records
Length: 5 characters
Character Type: Numeric
Examples: 19000, 23021, 06050

5.95 Government Source (SOURCE)

Definition/Description: The content of the source field indicates whether the True Bearing is derived from official government sources or from other sources.

Source/Content: The field contains Y when the True Bearing is derived from official government sources and N when it is derived from other sources. The field contains T when the source Magnetic and True bearing are provided only in True.

Used On: ILS, MLS, MLS continuation and runway continuation records
Length: 1 character
Character Type: Alpha

5.96 Glideslope Beam Width (GS BEAM WIDTH)

Definition/Description: The Glideslope Beam Width field specifies the glide path beam width of the Glideslope defined in the record.

Source/Content: Glideslope beam widths from official government sources are entered into this field in degrees, tenths of a degree and hundredths of a degree with the decimal point suppressed.

Used On: ILS continuation records
Length: 3 characters
Character Type: Numeric
Examples: 140, 180, 200

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5.97 Touchdown Zone Elevation (TDZE)

Definition/Description: The Touchdown Zone Elevation is the highest elevation in the first 3,000 feet of the landing surface beginning at the threshold.

Source/Content: Touchdown zone elevations from official government sources will be used when available. If official source is not available, the runway threshold elevation will be entered. If the runway threshold elevation is not available, the Airport reference point elevation will be entered. (See TDZE Location, Section 5.98) The elevation will be entered in feet, to a resolution of 1 foot, with respect to MSL. For below MSL elevations, the first character of the field is a minus (-) sign.

Used On: Runway continuation records
Length: 5 characters
Character Type: Alpha/numeric
Examples: 02171, 05230, -0142

5.98 TDZE Location (LOCATION)

Definition/Description: The content of the TDZE Location field indicates whether the TDZ elevation was obtained from official government sources or from other sources.

Source/Content: The field will contain a T for official source or an L if the landing threshold elevation is used, or an A if the airport elevation is used.

Used On: Runway continuation records
Length: 1 character
Character Type: Alpha

5.99 Marker Type (MKR TYPE)

Definition/Description: The Marker Type field defines the type of marker.

Source/Content: The field contains the following information.

Type of Facility	Record Column Content		
	18	19	20
Inner Marker		I	M
Middle Marker		M	M
Outer Marker		O	M
Back Marker		B	M
Locator at Marker	L		

Used On: Airport Localizer Marker records
Length: 3 characters
Character Type: Alpha

5.100 Minor Axis Bearing (MINOR AXIS TRUE BRG)

Definition/Description: The Minor Axis Bearing field indicates the true bearing of the minor axis of marker beacons.

Source/Content: This field will contain the true bearing in degrees and tenths of a degree, with the decimal point suppressed.

Used On: Airport Localizer Marker records
Length: 4 characters
Character Type: Numeric

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Examples: 0900, 2715

5.101 Communications Type (COMM TYPE)

Definition/Description: The Communications Type is a three-character code indicating the type of communications service available on the frequency contained in the record. Decoding is available in the Communications Type Translation Table.

Source/Content: The field will be derived from official source or created by the data supplier. An indication of the origination of the code is contained in the Communications Type Translation Table.

Field Content	Description	Airport Heliport Comm Only	Enroute Comm Only	Both Comm Type
ACC	Area Control Center			X
ACP	Airlift Command Post	X		
AIR	Air to Air	X		
APP	Approach Control	X		
ARR	Arrival Control	X		
ASO	Automatic Surface Observing System (ASOS)	X		
ATI	Automatic Terminal Info Service (ATIS)	X		
AWI	Airport Weather Information Broadcast (AWIB)	X		
AWO	Automatic Weather Observing Service (AWOS)			X
AWS	Aerodrome Weather Information Services (AWIS)	X		
CBA	Class B Airspace	X		
CCA	Class C Airspace	X		
CLD	Clearance Delivery	X		
CPT	Clearance, Pre-Taxi	X		
CTA	Control Area (Terminal)	X		
CTF	Common Traffic Advisory Frequencies Note 2	X		
CTL	Control			X
DEP	Departure Control	X		
DIR	Director (Approach Control Radar)	X		
EFS	Enroute Flight Advisory Service (EFAS)		X	
EMR	Emergency			X
FSS	Flight Service Station			X
GCO	Ground Comm Outlet	X		
GND	Ground Control	X		
GTE	Gate Control	X		
HEL	Helicopter Frequency	X		
INF	Information			X
MBZ	Mandatory Broadcast Zone Note 2	X		
MIL	Military Frequency			X
MUL	Multicom			X
OPS	Operations	X		
PAL	Pilot Activated Lighting Note 1	X		
RDO	Radio			X
RDR	Radar			X
RFS	Remote Flight Service Station (RFSS)			X
RMP	Ramp/Taxi Control	X		
RSA	Airport Radar Service Area (ARSA)	X		
TCA	Terminal Control Area (TCA)	X		

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Field Content	Description	Airport Heliport Comm Only	Enroute Comm Only	Both Comm Type
TMA	Terminal Control Area (TMA)	X		
TML	Terminal	X		
TRS	Terminal Radar Service Area (TRSA)	X		
TWE	Transcriber Weather Broadcast (TWEB)		X	
TWR	Tower, Air Traffic Control	X		
UAC	Upper Area Control		X	
UNI	Unicom	X		
VOL	Volmet		X	

Note 1: The Comm Type PAL is used only when the frequency(s) published are used exclusively for the activation of airport lighting. If the pilot activation of airport lighting is accomplished on a frequency that is also used for voice communications, the Pilot Controlled Lighting parameter of the Service Indicator is used.

Note 2: The Comm Types CTF and MBZ are used in Australia, New Zealand and East Timor only.

Used On: Enroute, Airport and Heliport Communications
Length: 3 characters
Character Type: Alpha

5.102 Radar (RADAR)

Definition/Description: The Radar field indicates whether or not the communications unit identified in the record has access to and uses information derived from primary or secondary radars while performing the communications service indicated by the Communications Type. It is not an indication of an operational radar frequency.

Source/Content: The availability of radar information to a communications service provider is derived from official government sources. The field will be set to the character R if primary or secondary radar information is available to the service, the character N if the source documentation specifically states that the service does not have access to primary or secondary radar information or the character U if the source documentation does not provide details on radar information access for the service.

Used On: Enroute, Airport and Heliport Communications records
Length: 1 character
Character Type: Alpha

5.103 Communications Frequency (COMM FREQ)

Definition/Description: The Communications Frequency field specifies either transmit or receive frequency of the communications service, dependent on in which column the frequency is located. Each communications record will contain both transmit and receive frequencies unless the service is published as a Transmit Only or Receive Only service. The content will be identical if the service transmits and receives on the same frequency. The fields will be left blank when the service provided is a digital service.

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Source/Content: Content is derived from official government sources. The following details apply:

HF frequencies are provided as five significant digits and one decimal in kilohertz for 10 thousand, thousands, hundreds, tens and units, and tenths. The remaining position of the seven-character field is zero filled.

Example: The HF frequency of 17955 kHz would be expressed as 1795500. The HF frequency of 8965 kHz would be expressed as 0896500.

VHF frequencies with 100, 50 or 25 kilohertz spacing are provided as three significant digits and three decimals in megahertz for hundreds, tens, units, tenths, hundredths and thousandths. The remainder of the seven-character field is zero filled.

Example: The VHF frequency of 118.50 MHz would be expressed as 0118500. The VHF frequency of 131.275 MHz would be expressed as 0131275.

UHF frequencies are provided as three significant digits and two decimals in megahertz for hundreds, tens, units, tenths and hundredths. The remainder of the seven-character field is zero filled.

Example: The UHF frequency of 267 MHz would be expressed as 0026700. The UHF frequency of 287.5 MHz would be expressed as 0028750.

VHF frequencies with 8.33 kHz spacing are provided as four significant digits and three decimals for the assigned channel number. The actual frequency (which would be three significant digits and four decimal places) is not provided.

Example: The VHF frequency of 132.0583 MHz will be provided as the channel number 132.060, expressed in seven digits as 0132060.

The decimal point is always suppressed. As all of these numeric expressions look alike, the Frequency Units field (Section 5.104) is provided to assist in actual frequency determination.

Used On:	Enroute, Airport and Heliport Communications Records
Length:	7 characters
Character Type:	Numeric

5.104 Frequency Units (FREQ UNIT)

Definition/Description: The Frequency Units field will designate the frequency spectrum area for the frequency in the Communications Frequency (Section 5.103) field as indicated in the table or will designate the content of the Communications Frequency field as a channel. For VHF based units, the field will also designate the established frequency spacing required of the frequency for unambiguous use.

Source/Content: This field contains the following information.

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Field Content	Description	
L	Low Frequency	Note 1
M	Medium Frequency	Note 1
H	High Frequency (2800 kHz to 30,000 kHz)	
K	Very High Frequency 100 kHz spacing	
F	Very High Frequency 50 kHz spacing	
T	Very High Frequency 25 kHz spacing	
V	Very High Frequency (30,000 kHz to 200 MHz) Non-standard spacing	
U	Ultra-High Frequency (200 MHz to 3000 MHz)	
C	Very High Frequency Communication Channel for 8.33kHz spacing	
D	Digital Service	Note 2

Note 1: The Codes L and M will only be used when the transmitting frequency is that of a LF/MF Navaid (NDB). If a receiving frequency is provided in the same communications record, it will be a VHF frequency.

Note 2: The Code D for Digital Service will be provided when the communications record contains a data link type service. In these cases, transmit and receive frequency columns will be blank.

Used On: Enroute, Airport, and Heliport Communications records
Length: 1 character
Character Type: Alpha

5.105 Call Sign (CALL SIGN)

Definition/Description: The Call Sign field contains the name of a communications service provider that is to be used when contacting that service/used by the service to identify itself when contacting aircraft on the frequencies contained in the record. The field is also used to provide the broadcast identification name of automated services.

Source/Content: Call Signs and broadcast service identification names are derived from official government sources. The type of service may be omitted from the Call Sign field when it is the same as the service identified in the Communications Type (5.101).

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Used On:	Airport, Enroute, and Heliport Communications Records
Length:	25 characters
Character Type:	Alpha/numeric
Examples:	COMM TYPE CALL NAME
	APP LION (APPROACH is omitted)
	TWR LION (TOWER is omitted)
	DEP LONDON APPROACH
	ACC DENVER CENTER

5.106 Service Indicator (SERV IND)

Definition/Description: The Service Indicator field is used to further define the use of the frequency for the specified Communication Type (5.101).

Source/Content: The field may contain the following information:

Table 5-21 – Airport Heliport Communications Records

Description	Column Contents		
	112	113	114
Airport Advisory Service (AAS)	A		
Community Aerodrome Radio Station (CARS)	C		
Departure Service (Other than Departure Control Unit)	D		
Flight Information Service (FIS)	F		
Initial Contact (IC)	I		
Arrival Service (Other than Arrival Control Unit)	L		
Aerodrome Flight Information Service (AFIS)	S		
Terminal Area Control (Other than dedicated Terminal Control Unit)	T		
Aerodrome Traffic Frequency (ATF)		A	
Common Traffic Advisory Frequency (CTAF)		C	
Mandatory Frequency (MF)		M	
Secondary Frequency		S	
VHF Direction Finding Service (VDF)			D
Language other than English			L
Military Use Frequency			M
Pilot Controlled Light (PCL)			P

Table 5-22 – Enroute Communications Records

Description	Column Contents		
	112	113	114
Aeronautical Enroute Information Service (AEIS)	A		
Flight Information Service (FIS)	F		
Air/Ground		A	
Discrete Frequency		D	
Mandatory Frequency		M	
Secondary Frequency		S	
VHF Direction Finding Service (VDF)			D
Language other than English			L
Military Use Frequency			M

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Used On:	Enroute, Airport, and Helicopter Communications records
Length:	3 characters
Character Type:	Alpha

5.107 ATA/IATA Designator (ATA/IATA)

Definition/Description: The ATA/IATA field contains the Airport/Heliport ATA/IATA designator code to which the data contained in the record relates.

Source/Content: The content of this field should be derived from IATA Reservations Manual Part II, IATA Resolution 763/Location Identifiers.

Used On:	Airport and Heliport records
Length:	3 characters
Character Type:	Alpha
Examples:	DEN, LHR, JFK

5.108 IFR Capability (IFR)

Definition/Description: The IFR Capability field indicates if the Airport/Heliport has any published Instrument Approach Procedures.

Source/Content: The field contains Y if there is an Official Government Instrument Approach Procedure published, otherwise the field will contain N. (Note: The presence of Y in this field does not necessarily imply that the published instrument approach is coded in the database.)

Used On:	Airport and Heliport records
Length:	1 character
Character Type:	Alpha

5.109 Runway Width (WIDTH)

Definition/Description: The width of the runway identified in the Runway Identifier field is specified in the Runway Width field.

Source/Content: Runway widths derived from Official Government Sources are entered into the field in feet, with a resolution of one foot. For runways of variable width, the minimum width encountered over the runway length will be entered.

Used On:	Runway records
Length:	3 characters
Character Type:	Numeric
Examples:	150, 300, 075

5.110 Marker Ident (MARKER IDENT)

Definition/Description: The Marker Ident field contains a unique computer ident assigned to each enroute marker.

Source/Content: A unique identifier will be created for each enroute marker since such idents are not designated by official sources. Marker idents will be established using the 2-character ICAO code followed by two numeric digits assigned to keep markers unique within a given ICAO region.

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Used On: Enroute marker records
Length: 4 characters
Character Type: Alpha/numeric
Examples: EG01, EG02, K101, K102

5.111 Marker Code (MARKER CODE)

Definition/Description: The Marker Code field contains the coded ident that provides an aural and visual indication of station passage in the cockpit. The code shall be keyed so as to transmit dots or dashes, or both, in an appropriate sequence on a radio frequency of 75 MHz. The frequency of the modulating tone is 3000 Hz.

Source/Content: The field contains the Morse code ident (dots and dashes) derived from official government sources.

Used On: Enroute marker records
Length: 4 characters
Character Type: Alpha
Examples: -.-., ..., - - - -

5.112 Marker Shape (SHAPE)

Definition/Description: The Shape field defines the radiation pattern of an airways marker as being either bone or elliptical.

Source/Content: The field contains the shape of the marker derived from official government sources when available. The character B will designate the bone shape and the character E will designate the elliptical shape. E will be entered when the source does not supply shape information.

Used On: Enroute airways marker records
Length: 1 character
Character Type: Alpha

5.113 High/Low (HIGH/LOW)

Definition/Description: The High/Low field indicates the power of the enroute marker.

Source/Content: The field contains the power derived from official government sources. The character L indicates low power for use at low altitudes. The character H indicates high power for general use.

Used On: Enroute marker records
Length: 1 character
Character Type: Alpha

5.114 Duplicate Indicator (DUP IND)

Definition/Description: The Duplicate Identifier field is used to further define holding patterns when official government source has designated more than one Holding Pattern on a Navaid or Waypoint.

Source/Content: Holding Patterns are derived from official government sources documents. That documentation will normally specify the airspace structure in which the holding is to be used. That documentation may also designate more than one Holding Pattern for a single Navaid or Waypoint. This field will contain details on airspace structure and multiple designations. More than one holding is designated on a single fix when one or more of the following elements are different for holdings

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within the same airspace structure. Inbound Holding Course, Turn Direction, Altitude, Leg Length or Leg Time, and Holding Speed.

If only one Holding Pattern is designated for a fix and the airspace structure in which that holding is to be used is not defined, the field will contain 00. If only one Holding Pattern is designated for a fix and the airspace structure in which that holding is to be used is defined or if the same holding is designated for more than one airspace structure, the first position of the Duplicate Indicator will contain a digit of 1 through 6 and the second position will contain a zero. If more than one holding is designated for a single fix in one type of airspace structure, the first position will contain a digit of 1 through 6 and the second position will contain a digit of 0 through 9, depending on the number of holdings on that fix within that airspace structure.

If multiple holdings are designated in official source documents for a single fix and some of those holding are not associated with a defined airspace structure, then those with undefined airspace structure will carry the digit 7 in position one and a digit of 0 through 9 in position two.

Table 5-23 – Multiple Holding Patterns

Holding Pattern	Duplicate Indicator	
	Position One Airspace	Position Two Multiple
Undefined (None Defined)	0	See Note 1
High Altitude	1	See Note 1
Low Altitude	2	See Note 1
SID	3	See Note 1
STAR	4	See Note 1
Approach	5	See Note 1
Missed Approach	6	See Note 1
Undefined (with other defined)	7	See Note 1
All Altitude	8	See Note 1

Note 1: If there is only one holding pattern on a given fix within an airspace structure, position 2 will contain a 0. For additional holdings on that same fix within the same airspace structure, position 2 will be incremented by 1.

Used On: Holding Pattern Records
Length: 2 characters
Character Type: Numeric
Examples: 00, 10, 61, 32

5.115 Directional Restriction

Definition/Description: The Direction Restriction field, when used on Enroute Airway records, will indicate the direction an Enroute Airway is to be flown. The Direction Restriction field, when used on Preferred Route records, will indicate whether the routing is available only in the direction of from initial fix to terminus fix or in both directions.

Source/Content: Direction Restrictions should be derived from official government sources. They will be coded and supplied as follows:

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Enroute Airway Records

F	One way in direction route is coded (Forward).
B	One way in opposite direction route is coded (backward).
Blank	No restrictions on direction.

Preferred Route Records

F	Uni-directional Preferred Route, usable only from Initial Fix to Terminus Fix.
B	Bi-directional Preferred Route, usable from Initial Fix to Terminus Fix or from Terminus Fix to Initial Fix.

Used On: Enroute Airway and Preferred Route Records
Length: 1 character
Character Type: Alpha

5.116 FIR/UIR Identifier (FIR/UIR IDENT)

Definition/Description: The FIR/UIR Identifier field identifies the Flight Information Region and Upper Information Region of airspace with defined dimensions within which Flight Information Service and Alerting Service are provided. The Identifier is for the controlling Area Control Center or Flight Information Center.

Source/Content: FIR/UIR Identifiers will be derived from official government sources. This field contains the four-character identifier assigned to the airspace. For those areas charted as NO FIR, the identifier field will contain XX plus a two-digit numeric.

When used on Flight Planning Continuation records, the entry will be related to the altitude structure. For records that are classed or designated as high altitude, the FIR field will be blank. For areas assigned a FIR identifier only that is valid for both the low altitude and the high-altitude structure, the UIR field will be blank. For detail records classed or designated as low altitude and high altitude, both the FIR and the UIR identifier will be entered.

Used On: FIR/UIR, VHF NAVAID, NDB NAVAID, Enroute, Terminal Waypoint, Airport Flight Planning Continuation and Heliport records
Length: 4 characters
Character Type: Alpha
Examples: DAAG, SGAS, XX02

5.117 FIR/UIR Indicator (IND)

Definition/Description: When used on Enroute Communications Records, the content definition above for the FIR/UIR Record is to be applied whenever the FIR/RDO (5.190) field of the Enroute Communications Record contains an Information Region Identifier. In all other cases, the Indicator field of the Enroute Communications Record will be blank.

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Source/Content:

Type	Field Content
FIR	F
UIR	U
Combined FIR/UIR	B

Used On: FIR/UIR and Enroute Communications records
Length: 1 character
Character Type: Alpha

5.118 Boundary Via (BDRY VIA)

Definition/Description: The Boundary VIA defines the path of the boundary from the position identified in the record to the next defined position.

Source/Content: The path of the boundary will be determined from official government sources or the rule listed below and the Boundary VIA will be selected from the table below.

Field	Content	Description
Position 1	Position 2	
C		Circle
G		Great Circle
H		Rhumb Line
L		Counter Clockwise ARC
R		Clockwise ARC
	E	End of description, return to origin point

Application Rules:

1. Special Use Airspace designated as following rivers, country, state or other political boundaries will be averaged in coding by using a series of straight lines so that no path will be greater than two miles from the actual boundary. The Boundary VIA will be G.
2. If there is a named waypoint on an airway which crossed an irregular FIR/UIR boundary, the waypoint coordinates will be used to define a point in the path defining that FIR/UIR boundary. The Boundary VIA will appropriate to the path definition.
3. Paths that follow lines of latitude will be coded with a Boundary Via of H. Paths that follow lines of longitude may be coded with a Boundary Via of G or H. Consistent use of one or the other with a single airspace is desired.
4. Other than for lines of latitude and longitude, the Boundary VIA of H shall only be used when specifically stated in the official government source. If not stated as Rhumb Line or not along latitude/longitude, all straight lines will be coded as G.

   Note: Refer to Figure 5-5 for sample coding of Boundary VIA Codes.

Used On: Controlled Airspace, FIR/UIR, and Restrictive Airspace records
Length: 2 characters
Character Type: Alpha

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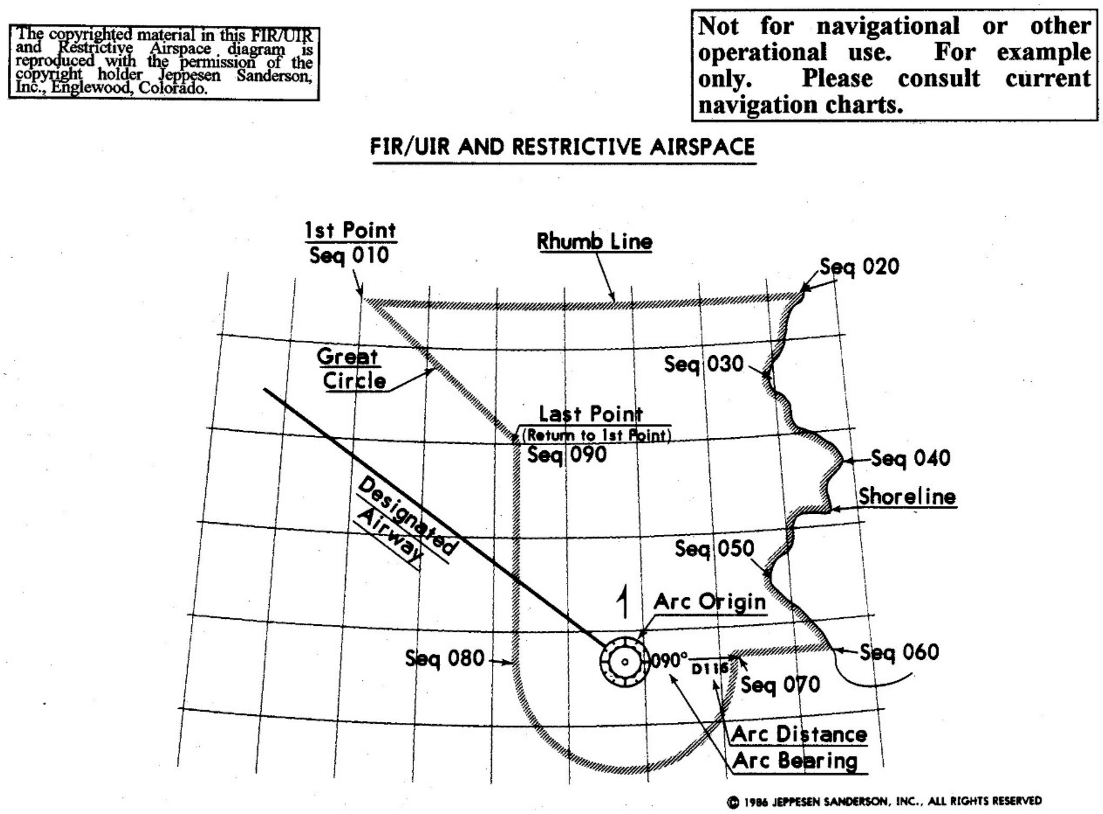

Seq No.	Boundary Via	Latitude	Longitude	Arc Origin Latitude	Arc Origin Longitude	Arc Dist	Arc Brg
010	H	N45-00-00	W060-00-00				
020	G	N45-00-00	W047-00-00				
030	G	N43-12-45	W048-05-00				
040	G	N41-18-24	W046-16-12				
050	G	N38-58-54	W048-30-36				
060	H	N37-20-15	W047-00-00				
070	R	N37-20-15	W049-31-00	N37-20-18	W052-30-30	115	090
080	H	N37-20-15	W055-30-00				
090	G	N42-00-00	W055-30-00				

Figure 5-5 – Controlled and Restrictive Airspace and FIR/UIR Boundaries

5.119 Arc Distance (ARC DIST)

Definition/Description: The Arc Distance field is used to define the distance in nautical miles from the Arc Origin position to the arc defining the lateral boundary of a FIR/UIR or Restrictive Airspace.

Source/Content: ARC distances should be derived from official government sources when available, in nautical miles and tenths of nautical mile, with the decimal point suppressed. The field will be entered only when Boundary Via is A, C, L, or R.

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Used On:	FIR/UIR, Restrictive Airspace, and Controlled Airspace records
Length:	4 characters
Character Type:	Numeric
Examples:	0080, 0150, 1000

5.120 Arc Bearing (ARC BRG)

Definition/Description: The Arc Bearing field contains the true bearing from the Arc Origin position to the beginning of the arc.

Source/Content: Arc bearings should be derived from official government sources when available. The field contains true bearing in degrees and tenths of degree, with the decimal point suppressed. The field will only be entered when Boundary Via is A, C, L, or R.

Used On:	FIR/UIR, Restrictive Airspace, and Controlled Airspace records
Length:	4 characters
Character Type:	Numeric
Examples:	0900, 1800, 3450

5.121 Lower/Upper Limit

Definition/Description: Special Use Airspace is described by both lateral and vertical boundaries. The Lower/Upper Limit fields contain the lower and upper limits of the FIR/UIR or Restrictive Airspace being described.

Source/Content: Limits for the special use airspace should be derived from official government sources. The field may contain altitude (all numerics), flight levels (alpha/numerics) or an all alpha entry (see examples). The flight level entry will contain the alpha characters FL followed by the altitude in hundreds of feet. These fields will be entered on the first record only of each FIR/UIR or Restrictive Airspace being described.

Used On:	FIR/UIR, Restrictive Airspace, and Controlled Airspace records	
Length:	5 characters	
Character Type:	Alpha/numeric	
Examples:	All numeric:	05000, 25000
	Alpha/numeric:	FL245, FL450
	All alpha:	NOTSP (for Not Specified)
		UNLTD (for unlimited)
		GND (for Ground)
		MSL (for Mean Sea Level)
		NOTAM (for Restrictive Airspace only)

5.122 FIR/UIR ATC Reporting Units Speed (RUS)

Definition/Description: The FIR/UIR ATC Reporting Units Speed is used to indicate the units of measurement concerning True Air Speed used in the specific FIR/UIR to fulfill the requirements of ICAO flight plan.

Source/Content: FIR/UIR Reporting Units should be derived from official government publications. The field will be entered on the first record only for each FIR/UIR identifier.

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Reporting Units	Field Entry
Not specified	0
TAS in Knots	1
TAS in Mach	2
TAS in Kilometers/hr	3

Used On: FIR/UIR records
Length: 1 character
Character Type: Numeric

5.123 FIR/UIR ATC Reporting Units Altitude (RUA)

Definition/Description: The FIR/UIR ATC Reporting Units Altitude field is used to indicate the units of measurement concerning the altitude used in the specific FIR/UIR to fulfill the requirements of ICAO flight plan.

Source/Content: FIR/UIR Reporting Units should be derived from official government publications. The field will be entered on the first record only for each FIR/UIR identifier.

Reporting Units	Field Entry
Not specified	0
ALT in Flight Level	1
ALT in Meters	2
ALT in Feet	3

Used On: FIR/UIR records
Length: 1 character
Character Type: Numeric

5.124 FIR/UIR Entry Report (ENTRY)

Definition/Description: The FIR/UIR Entry Report field is used to indicate whether an entry report on ICAO flight plan is required for that specific FIR/UIR.

Source/Content: FIR/UIR Entry Report should be derived from official government publications. Y in this field indicates Entry Report is required, N in this field indicates no Entry Report is required. The field will be entered on the first record only for each FIR/UIR identifier.

Used On: FIR/UIR records
Length: 1 character
Character Type: Alpha

5.125 FIR/UIR Name

Definition/Description: The FIR/UIR Name field contains the official name of the controlling agency of the FIR/UIR of which this record is an element.

Source/Content: The FIR/UIR name will be derived from official publications. The areas without a specific FIR/UIR designation will be labeled NO FIR.

Used On: FIR/UIR records
Length: 25 characters
Character Type: Alpha/numeric
Examples: ACCRA, FIR, ASUNCION FIR/UIR, NO FIR

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5.126 Restrictive Airspace Name

Definition/Description: The Restrictive Airspace Name field will contain the name of the restrictive airspace when assigned.

Source/Content: Names will be derived from official government sources. The name, if assigned, will be entered in the first record only. If source does not assign a name, this field may be blank.

Used On:	Restrictive Airspace records
Length:	30 characters
Character Type:	Alpha/numeric
Examples:	RANDOLPH ONE MOA, SAMBURU GAME RESERVE

5.127 Maximum Altitude (MAX ALT)

Definition/Description: The Maximum Altitude field is used to indicate the Maximum Altitude Allowed (MAA).

Source/Content: When used on Enroute Airway Records, the Maximum Altitude will be derived from official government publications describing a maximum allowable flight altitude, or the upper limit of the airway when no MAA is provided, expressed in feet or flight level.

When used on Holding Pattern Records, the Maximum Altitude will be a value provided in source documentation that restricts the use of the Holding, expressed in feet or flight level. In all other cases, the field will be left blank.

When used on Preferred Route Records, the Maximum Altitude will be the maximum flight altitude at which the preferred route is established or the upper limit of the airspace in which the route is published.

Used On:	Enroute Airway, Holding Pattern, and Preferred Route records	
Length:	5 characters	
Character Type:	Alpha/numeric	
Examples:	All numeric:	17999, 08000
	Alpha/numeric:	FL100, FL450
	All alpha:	UNLTD (for unlimited)

5.128 Restrictive Airspace Type (REST TYPE)

Definition/Description: The Restrictive Airspace Type field is used to indicate the type of Airspace in which the flight of aircraft is prohibited or restricted. The restriction may be continuous or specified for certain times.

Source/Content: The Restrictive Airspace Type should be derived from official government publications.

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Type	Field
Alert	A
Caution	C
Danger	D
Military Operations Area	M
National Security Area	N
Prohibited	P
Restricted	R
Training	T
Warning	W
Unspecified or Unknown	U

Used On: Restrictive Airspace and Enroute Airway Flight Planning Continuation records
Length: 1 character
Character Type: Alpha

5.129 Restrictive Airspace Designation

Definition/Description: The Restrictive Airspace Designation field contains the number or name that uniquely identifies the restrictive airspace.

Source/Content: The identifiers will be derived from official government sources. The field will contain a numeric number, or when designation is by name this field will contain the name up to 10 characters. When name is longer than 10 characters, the 10th position will contain an asterisk indicating the name field should be used for the full designator.

Used On: Restrictive Airspace and Enroute Airway Flight Planning Continuation records
Length: 10 characters
Character Type: Alpha/numeric

Field Content			
Charted Designator	**ICAO**	**Type**	**Rest. Desig.**
RJ(R)-116	RJ	R	116
R-2524	K2	R	2524
Crystal MOA	K4	M	Crystal
Randolph MOA One B	K4	M	Randolph*

5.130 Multiple Code (MULTI CD)

Definition/Description: The Multiple Code field will be used to indicate Restrictive Airspace Areas or MSA Centers having the same designator but subdivided or differently divided by lateral and/or vertical detail.

Source/Content: This field will be used when official government publications for Restrictive Airspace divides an area with the same designator into different areas of Activation, altitude or other defining characteristics. For MSA Centers, this provides different sectorization and altitudes for the MSA published with the same center. The field will contain an alpha/numeric character uniquely identifying each area or MSA. The first record affected could contain the character A and multiple primary records could contain the character B, C, D, 0, 1, etc., as required.

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Used On:	Controlled Airspace, Restrictive Airspace, Airport and Heliport MSA Center, Airport and Heliport SID/STAR/Approach, and Enroute Airway Flight Planning Continuation Records.
Length:	1 character
Character Type:	Alpha/numeric

5.131 Time Code (TIME CD)

Definition/Description: When used on the Primary or Primary Extension Continuation Record of the possible record types, with the exception of the Airway Restriction Records, the Time Code field is used to indicate that the data contained in the record is either available continuously or not continuously. When Time Code is used in a Time of Operations Continuation Record, other that Airway Restriction Records, the field is used to indicate how to interpret Time of Operations Continuation Records. On Airway Restriction Primary and Continuation Records, the Time Code indicated either a continuous or non-continuous operation, the details of which are contained in the same record.

Source/Content: Active times are derived from official government source. The field will contain an alpha character for which an associated description has been defined as indicated in the tables below.

Used On:	Primary Records: Restrictive Airspace, Preferred Route, Controlled Airspace – Use Primary Record Table portion.
Primary Extension Continuation Records:	Airport, Heliport and Enroute Communications Records – Use Primary Record Table portion.
Time of Operations Continuation Records:	Restrictive Airspace, Preferred Route, Controlled Airspace, Airport, Heliport, Enroute Communications Records – Use Continuation Records Table portion.

PRIMARY RECORDS	
Field Content	**Description**
C	Active Continuously, including holidays
H	Active Continuously, excluding holidays
N	Active Non-Continuously, Refer to Continuation Record
P	Active times announced by NOTAM
U	Active times are not specified in source documentation

	CONTINUATION RECORDS
H	Active times are provided in Time of Operation format and exclude holidays
N	Activation Times are too complex for Time of Operation format and are provided in Note Form
T	Active times are provided in Time of Operation format and include holidays

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PRIMARY AND CONTINUATION RECORDS	
Field Content	**Description**
C	Active Continuously, including holidays
H	Active Continuously, excluding holidays
S	Active times are provided in Time of Operation format and exclude holidays
T	Active times are provided in Time of Operation format and include holidays

Used On: Enroute Airway Restriction Primary and Continuation Records
Length: 1 character
Character Type: Alpha

5.132 NOTAM

Definition/Description: Restrictive Airspace areas may not have established active times and are activated by NOTAM or may be active by NOTAM in addition to established times.

Source/Content: Active times by NOTAM will be derived from official government source. When used on primary records, the area is active only by NOTAM and there will be no continuation record. When used on continuation records, the area is active by NOTAM in addition to the established times. The field will contain the alpha character N to indicate either condition, otherwise the field will be blank.

Used On: Controlled Airspace, Restrictive Airspace, and Restrictive Airspace Continuation records
Length: 1 character
Character Type: Alpha

5.133 Unit Indicator (UNIT IND)

Definition/Description: Restrictive Airspace lower and upper limits are specified as above Mean Sea Level (MSL) or Above Ground Level (AGL). This field permits the unit of measurement to be indicated.

Source/Content: The units of lower and upper limits are derived from official government source. The alpha character M will indicate MSL and the alpha character A will indicate AGL.

Used On: Controlled Airspace, Restrictive Airspace records
Length: 1 character
Character Type: Alpha

5.134 Cruise Table Identifier (CRSE TBL IDENT)

Definition/Description: A standard cruising level table is established by ICAO and is to be observed except when, on the basis of regional air navigation agreements, a modified table of cruising levels is prescribed for use. This field permits the enroute airway record to identify the Cruise Table record that is to be used for cruise levels.

Source/Content: Cruise Levels will be derived from official government sources. For the standard ICAO cruise table, this field will contain the alpha characters AA. For

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those countries not using the standard ICAO table and having a modified table this field will contain the alpha characters BB, CC, etc. If a country uses the standard ICAO table or a Modified table but indicates that an airway or portion of an airway is to be flown opposite of the cruise table, the field will contain alpha/numeric characters that identify the table to be used.

Used On: Enroute Airway, FIR/UIR, Cruise Table, and Flight Planning Arrival/Departure Data Records
Length: 2 characters
Character Type: Alpha/numeric
Example:

Field Content	Description
AA	ICAO standard cruise table
AO	Exception to ICAO cruise table
BB - ZZ	Modified cruise table
BO - ZO	Exception to modified cruise table

5.135 Course FROM/TO

Definition/Description: The Course From field is used to indicate the lowest course for which a block of cruising levels is prescribed. The Course To field is used to indicate the highest course for which a block of cruising levels is prescribed.

Source/Content: The Courses will be derived from official government sources in degrees and tenths of degree with the decimal point suppressed. The Magnetic/True indicator field will be used to indicate True (T) or Magnetic (M) courses.

Used On: Cruising Table records
Length: 4 characters
Character Type: Numeric
Examples: 0000, 1790, 3590

5.136 Cruise Level From/To

Definition/Description: The Cruise Level From field is used to indicate the lowest cruising level prescribed for use within the Course From/To fields. The Cruise Level To field is used to indicate the highest cruising level prescribed for use within the Course From/To fields.

Source/Content: Cruise Levels will be derived from official government sources. When the level is entered in feet the field will be all numeric. When the level is entered in meters, the first column will contain the alpha character M followed by all numeric. If the Level To is unlimited, the field will contain the alpha characters UNLTD.

Used On: Cruising Table records
Length: 5 characters
Character Type: Alpha/numeric
Examples: 0200, M0600, M1585

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5.137 Vertical Separation

Definition/Description: The Vertical Separation field is used to indicate the minimum separation prescribed to be maintained between the cruising levels.

Source/Content: Vertical Separation Values will be derived from official government sources and entered in feet or tens of meters with M in the first column.

Used On:	Cruising Table records
Length:	5 characters
Character Type:	Alpha/numeric
Examples:	01000, 02000, M0030, M0060

5.138 Time Indicator (TIME IND)

Definition/Description: The Time Indicator field is used to indicate whether the times shown in the Time of Operations field(s) are Local Time, Daylight Savings Time or Universal Coordinated Time.

Source/Content: Time contained in the affected record(s) is derived from official government sources. The Time Indicator will qualify those source derived times as indicated in the following table:

Field Content	Description
T	Times codes are Local Time
S	Times codes are to be adjusted for Daylight Savings Time
Blank	Times shown are Universal Coordinated Time (UTC)

Used On:	Controlled Airspace, Restrictive Airspace Continuation, Referred Route Continuation, Enroute Airway Restriction, Airport and Heliport Communication Continuation, and Enroute Communications Continuation Records
Length:	1 character
Character Type:	Alpha

5.139 Intentionally Left Blank

5.140 Controlling Agency

Definition/Description: Some Restrictive Airspace areas are designated joint use and IFR operations in the area may be authorized by the controlling agency when it is not being utilized by the using agency.

Source/Content: The name of the Controlling Agency should be derived from official government sources and will be shown on the first record only. If no Controlling Agency is specified, the field may be blank.

Used On:	Controlled Airspace, Restrictive Airspace Continuation record
Length:	25 characters
Character Type:	Alpha/numeric
Examples:	LAX, ARTCC, Lumpur ACC, Butterworth APP

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5.141 Starting Latitude

Definition/Description: The Grid MORA Table will contain records describing the MORA for each Latitude and Longitude block. Each record will contain thirty blocks and the Starting Latitude field defines the lower left corner for the first block of each record.

Source/Content: The Starting Latitude will be determined when the record is assembled.

Used On:	Grid Mora record
Length:	3 characters
Character Type:	Alpha/numeric
Examples:	N00, N42, S20, S90

5.142 Starting Longitude

Definition/Description: The Grid MORA table will contain records describing the MORA for each Latitude and Longitude block. Each record will contain thirty blocks and the Starting Longitude field defines the lower left corner for the first block of each record.

Source/Content: The Starting Longitude will be determined when the record is assembled.

Used On:	Grid Mora records
Length:	4 characters
Character Type:	Alpha/numeric
Examples:	E000, W150, E090, W180

5.143 Grid MORA

Definition/Description: Grid MORA Minimum Off-route Altitude (MORA) provides terrain and obstruction clearance within the section outlined by latitude and longitude blocks provided in the Starting Latitude and Starting Longitude fields.

Source/Content: Grid MORA values clear all terrain and obstructions by 1000 feet in areas where the highest elevations are 5000 feet MSL or lower. MORA values clear all terrain by 2000 feet in areas where the highest elevations are 5001 feet MSL or higher. The field will contain values expressed in hundreds of feet, for example, the value of 6000 feet is expressed as 060 and the value of 7100 feet is expressed as 071. For geographical sections that are not surveyed, the field will contain the alpha characters UNK for Unknown.

COMMENTARY

MORA values are generally not provided in government source and are calculated by the data supplier using the formula indicated in the Source/Content paragraph. There are, however, some governments that do provide off route altitude data and a data supplier may elect to use the government source values in their data services.

Used On:	Grid MORA Records
Length:	3 characters
Character Type:	Alpha/numeric
Examples:	010, 071, 100, 123, UNK

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5.144 Center Fix (CENTER FIX)

Definition/Description: When used on Airport and Heliport MSA Records, the Center Fix field represents the MSA Center; that point on which the MSA is predicated. When used on Terminal Procedure Records, it can be used in three ways:

1. When the terminal procedure has an MSA defined, the field will contain the identifier of the fix on which the MSA is predicated. This will serve as a pointer to the specific MSA Record. **For Approach Procedures, this** pointer will be populated on the **first leg of the final approach coding** unless the government source MSA is "by transition" in which case the pointer is populated on the first leg of each transition. For SIDs and STARs, this pointer will be populated on the first leg of each transition which it applies.
2. When the terminal procedure has a TAA defined, the field will contain the identifier of the fix on which the TAA Sector is predicated. This will serve as a pointer to the specific TAA Record. This will be populated on the first record for each approach transition.
3. When used in a terminal procedure record defined by an RF Path Terminator, the field will contain the fix that defines the center of the constant **radius arc.**

Source/Content: When used as MSA Center, the field will contain the identification of the navigation facility, Enroute Waypoint, Terminal Waypoint, Runway, Airport Reference Point or Heliport Reference Point, upon which the MSA coverage radius is predicated. Such content will be derived from official government sources. When used as a TAA IAF Waypoint, the field contains the official identifier of the waypoint for which the TAA Sector is defined. They will be derived from official government sources. When used as Radius Center, the field will contain the identification of the **navigation facility, Enroute Waypoint, or** Terminal Waypoint used to define the center point of the RF turn.

Used On:	Airport and Heliport MSA Records, Airport and Heliport TAA Records, Airport and Heliport SID/STAR Approach Procedure Records
Length:	5 characters max
Character Type:	Alpha/numeric

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Table 5-24 – GRID MORA Sample

SEC CODE	SUB CODE	START LAT	START LONG	MORA	MORA	MORA	MORA	MORA	MORA	MORA	MORA
A	S	N00	E000	010	010	010	010	010	010	090	191
A	S	N01	E000	010	010	010	010	010	010	010	082
A	S	N02	E000	010	010	010	010	010	010	010	073
A	S	N03	E000	010	010	010	010	010	010	010	073
A	S	N04	E000	010	010	010	010	010	015	UNK	049
A	S	N05	E000	026	014	010	010	014	020	UNK	042
A	S	N06	E000	049	024	020	019	026	029	029	042
A	S	N07	E000	UNK	040	033	031	038	043	035	040
A	S	N08	E000	041	037	033	035	035	034	035	UNK
A	S	N09	E000	029	045	030	035	027	032	033	UNK
A	S	N10	E000	030	034	029	028	028	032	043	UNK
A	S	N11	E000	030	034	031	032	025	041	046	UNK
A	S	N12	E000	026	029	029	022	024	028	043	UNK
A	S	N13	E000	026	030	030	030	026	026	030	UNK
A	S	N14	E000	031	031	024	030	023	040	034	UNK
				E000	E001	E002	E003	E004	E005	E006	E029

Table 5-24 shows a sample of the Grid Mora Table as it would appear in the file. The table starts at N00/E000 and ends at N14/E029, and is blocked at intervals of sixty minutes. The values shown in the Start Lat and Start Long fields are the lower left corner of a one-degree Lat/Long box. The values shown at the bottom of the table are for illustration purpose only and show the Longitude of the lower corner for the MORA values in the table. The values from longitude E007 thru E028 have been omitted from this illustration.

5.145 Radius Limit

Definition/Description: The altitude shown in the Sector Altitude field provides a 1000-foot obstacle clearance with a specified radius from the navigational facility/fix. The Radius Limit, field allows the radius to be specified.

Source/Content: Radius limits will be derived from official government sources. Values will be shown in whole nautical miles.

Used On: Airport and Heliport MSA Records
Length: 2 characters
Character Type: Numeric
Examples: 25, 30

5.146 Sector Bearing (SEC BRG)

Definition/Description: When used on MSA Records, the Sector Bearing contains beginning and ending bearing values, referenced to the MSA Center, for each sector of the MSA. When used on TAA records, the Sector Bearing contains the beginning and ending bearings that define a TAA Area and are referenced to the Sector Bearing Reference Waypoint.

Source/Content: Sector Bearing information will be derived from official government source. Each Sector Bearing field is made up of the start of sector bearing and the end of sector bearing. The values are provided in whole degrees. The first three

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digits define the start of the sector, the last three digits the end of the sector. For MSA, the values are sector dividing values and the end value of one sector is used as the start value of the next sector. For TAA, the values are inclusive. When multiple Sector Bearings are included in the same MSA or TAA record, they are provide starting with the lowest numbered values and in clockwise order. For MSA that include multiple radii and sector altitudes for the same sector, the Sector Bearings are repeated with the additional radius and altitude data before defining the next sector. For an MSA that is a provided in official government source as an un sectorized circle, both the start and the end sector bearing values are set to 180. Sector Bearing values may be magnetic or true bearings. The Mag/True Indicator in the MSA or TAA will provide this information. See Figure 5-7.

Used On:	Airport and Heliport MSA and TAA Primary Records
Length:	6 characters
Character Type:	Numeric
Examples:	060140, a Sector that starts at 060 degrees and continues clockwise to end at 140 degrees. 140060, a Sector that starts at 140 degrees and continues clockwise to end at 060 degrees 180180, a sector that starts at 180 degrees and continues clockwise to end at 180, a full circle MSA, no sectorization

5.147 Sector Altitude (SEC ALT)

Definition/Description: When used on MSA records, the Sector Altitude provides a 1000-foot obstacle clearance within the specified sector. When used on TAA records, the Sector Minimum Altitude is the minimum altitude for that sector, providing obstacle clearance compatible with the instrument procedures with which the TAA is associated, generally 1000 feet or more as necessary in mountainous areas. Flight crews are expected to fly direct to the initial approach fix in the record at the appropriate sector altitude unless otherwise instructed by ATC.

Source/Content: Sector Altitude values are derived from official government source and are provided in hundreds of feet. When the official government source does not provide a Sector Altitude for one or more sectors of an MSA, the value is provided as 999. See Figure 5-7.

Used On:	Airport and Heliport MSA Records and TAA Primary Records
Length:	3 characters
Character Type:	Numeric
Examples:	010 = 1000ft, 025 = 2500, 100= 10,000 999 = no sector altitude

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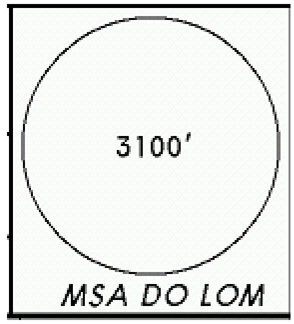
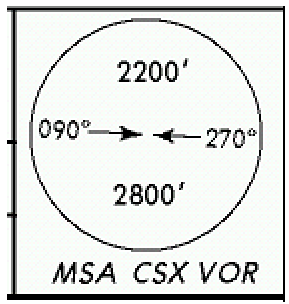
Un-Sectorized MSA:



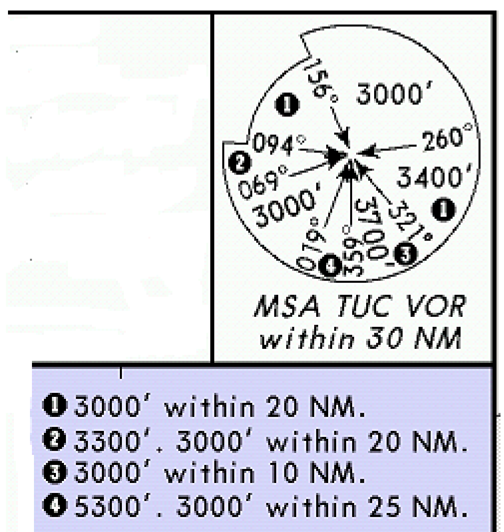
Output Data: 18018003125, where 180180 represents the Sector Bearings, 031 the Sector Altitude, and 25 the Sector Radius

Sectorized MSA, Single Radius:



Output Data: 0902700222527009002825

Sectorized MSA, Multiple Radius:



Output Data:
0190690303006909403020069094033300941560302015626003030260321030202
603210343032135903010321359037303590190302535901905330

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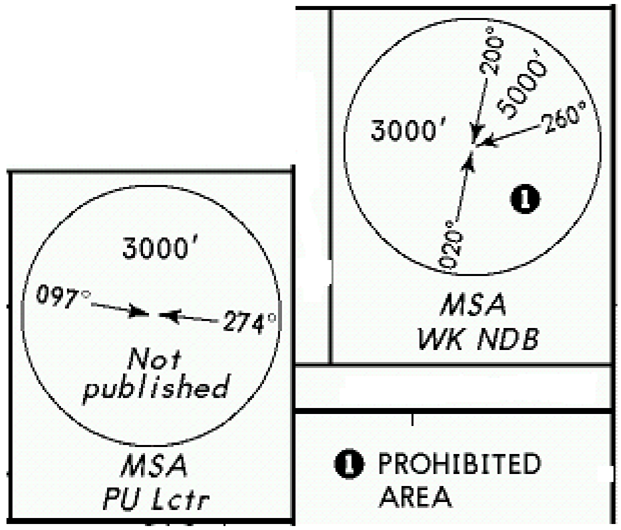
No Data Sectors:



Output Data:

09727403025274097999 25

0202000302520026005025260020999 25

Figure 5-7 – MSA Data Examples

Note 1: The MSA example requires a total of 11 data sets of Bearing/Altitude/Radius to provide all of the information. The current MSA Primary Record only allows for 7 sets. The additional data sets would be provided in a continuation record that is formatted exactly the same as the Primary.

5.148 Enroute Alternate Airport/Heliport (EAA)

Definition/Description: The Enroute Alternate Airport/Heliport field identifies the most suitable emergency airport or heliport along a Company Route or Helicopter Operations Company Route.

Source/Content: This field is determined by the user airline and will contain the Airport or Heliport Ident.

Used On:	Company Route, Helicopter Operations Company Route records
Length:	4 characters
Character Type:	Alpha/numeric
Examples:	KDEN, EGKK, EDFF

5.149 Figure of Merit (MERIT)

Definition/Description: The Figure of Merit field is used to denote those situations where information has been made available that indicate a VHF Navaid facility is usable beyond the range value that is specified through the Class field. It is also used to denote when a VHF Navaid contained in the database is not available for operational use, i.e., is out of service and to flag a VHF Navaid that is not included in a civilian international NOTAM system.

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Source/Content: Actual Field Entry Values are not contained in official government source but rather are derived values based on usage, class, availability, etc. These may be further adjusted by input from actual users. When the field content is equal to the information in the VHF Navaid Class field (Section 5.35), this is an indication that no information has been received indicating usable ranges beyond the Class specification

The content will be as defined in the table below.

Field Content	Description
0	Terminal Use (generally within 25NM)
1	Low Altitude Use (generally within 40NM)
2	High Altitude Use (generally within 130NM)
3	Extended High-Altitude Use (generally beyond 130NM)
7	Navaid not included in a civil international NOTAM system
9	Navaid Out of Service

Used On: VHF Navaid Records
Length: 1 character
Character Type: Numeric

5.150 Frequency Protection Distance (FREQ PRD)

Definition/Description: The Frequency Protection Distance field provides an indication of the distance to the next nearest NAVAID on the same frequency.

Source/Content: The distance to the next NAVAID will be computer generated values. Values will be entered on NAVAID with DME or TACAN equipped facilities only and will indicate the distance, in nautical miles, to the next nearest DME or TACAN equipped facility. Maximum relevant value will be 600 nautical miles.

Used On: VHF Navaid records
Length: 3 characters
Character Type: Alpha/numeric
Examples: 030, 150, 600

5.151 FIR/UIR Address (ADDRESS)

Definition/Description: The FIR/UIR Address field contains the four-character communications address of the FIR/UIR to supplement the FIR/UIR Ident.

Source/Content: When addressing ATS messages to the ATS Center in charge of a FIR or UIR, a three-letter designator followed by a filler of X or by a letter representing a department or division within the organization addressed should be used. The three-letter designators are to be those defined in ICAO Document 8585, Designators for Aircraft Operating Agencies, Aeronautical Authorities 2 and Services. ICAO Document 7910, Location Indicators, Address of Centers in charge of FIR/UIR, states that when addressing ATS messages to the ATS Center in change of a FIR or a UIR, one of the following designators should be added to the location indicator to complete the addressee indicator:

If the message is related to an IFR Flight—ZQZX

If the message is related to a VFR Flight—ZFZX

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To satisfy this requirement, unless otherwise stipulated by the user, the following address codes will be used:

ZOZX if related to an Oceanic FIR/UIR.

ZRZX if related to all other FIR/UIRs.

When used on Enroute Communications Records, the content definition above for the FIR/UIR Record is to be applied whenever the FIR/RDO (Section 5.190) field of the Enroute Communications Record contains an Information Region Identifier. In all other cases, the Address field of the Enroute Communications Record will be blank.

Used On:	FIR/UIR and Enroute Communications records
Length:	4 characters
Character Type:	Alpha
Examples:	ZOZX, ZRZX

5.152 Start/End Indicator (S/E IND)

This section deleted by Supplement 21.

5.153 Start/End Date

This section deleted by Supplement 21.

5.154 Restriction Identifier (REST IDENT)

Definition/Description: The Restriction Identifier is used to assign a unique identifier to a restriction record and to multiple restrictions records for a particular route or route segment.

Source/Content: Restriction Identifiers are assigned during the data file assembly. Initially the identifier will be assigned in sequence with the first restriction assigned the numeric value 001, the second 002, the third 003, etc. If a restriction record is removed, only that record is deleted and there will be no effect on the other identifiers for that airway; i.e., if record 002 is deleted, records 001 and 003 will retain their identifiers. If a new restriction is added, within a few cycles of the deletion of 002, it will use the next higher number even if there are gaps in the sequence of identifiers.

Used On:	Airway Restriction and Airway Restriction Continuation records
Length:	3 characters
Character Type:	Numeric
Examples:	001, 002, 003

5.155 Intentionally Left Blank

5.156 Intentionally Left Blank

5.157 Airway Restriction Start/End Date (START/END DATE)

Definition/Description: The Airway Restriction Start Date field is used to indicate the earliest GMT date at which the restriction takes effect. The Airway Restriction End Date is used to indicate the latest GMT date at which the restriction is still in effect. This date information may be supplemented by Time of Operation information contained in an Airway Restriction Record, Type AE or TC. When no AE or TC record exists for the Restriction Identifier, the Start time is 0000 GMT and the end time is 2359 GMT of the dates indicated.

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Source/Content: When entered, start dates and end dates will be in the format DDMMMYY. If the YY portion is equal to blanks, the restriction is valid every year. When the start date is equal to blanks, the restriction is valid with immediate effect. When the end date is equal to blanks, the restriction is valid until further notice.

Used On: Enroute Airway Restriction records
Length: 7 characters
Character Type: Alpha/numeric
Examples: 15JAN92, 15 JAN (blank)

5.158 Intentionally Left Blank

5.159 Intentionally Left Blank

5.160 Units of Altitude (UNIT IND)

Definition/Description: The Units of Altitude field is used to indicate the units of measurement for the values in the Restriction Altitude fields.

Source/Content: The actual values are derived from official government sources and expressed as one of the following codes.

Field Content	Description
F	Restriction Altitudes are expressed in hundreds of feet
K	Restriction Altitudes are expressed in metric Flight Levels
L	Restriction Altitudes are expressed in feet Flight Levels
M	Restriction Altitudes are expressed in tens of meters

Used On: Airway Restriction records and Airway Restriction Continuation Records
Length: 1 character
Character Type: Alpha

5.161 Restriction Altitude (RSTR ALT)

Definition/Description: The Restriction Altitude fields are used to specify the altitude profile for a specific restriction.

Source/Content: Altitudes will be derived from official government sources and entered in hundreds of feet, tens of meters, standard or metric Flight Levels. The units used are determined through the Units of Altitude field. Altitudes are expressed in ascending order. All altitude fields after a blank altitude will also be blank.

Used On: Airway Restriction, Airway Restriction Continuation records
Length: 3 characters
Character Type: Numeric
Examples: 310 (standard FL310 or metric FL3199m or 31000 feet or 3100 meters)
090 (standard FL90 or metric FL900m or 9000 feet or 900 meters)

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5.162 Step Climb Indicator (STEP)

Definition/Description: The Step Climb Indicator field is used to indicate if step climb up or down is permitted.

Source/Content:

Field Content	Description
B	Step climb up or down is permitted
D	Only step climb down is permitted
N	No step climb is permitted
U	Only step climb up is permitted

Used On: Airway Restriction and Airway Restriction Continuation records
Length: 1 character
Character Type: Alpha

5.163 Restriction Notes

Definition/Description: The Restriction Notes field may contain any restriction not otherwise covered by the altitude or time restriction.

Source/Content: Restriction notes will be derived from official government sources.

Used On: Airway Restriction continuation records
Length: 104 characters
Character Type: Alpha/numeric
Examples: AVAILABLE FOR WESTBOUND DEPARTURES FROM GATWICK. EASTBOUND AND OVER-FLIGHTS BY ATC ONLY. REROUTING MUST BE EXPECTED MON-FRI 1800-2400 DUE TO MILITARY TRAFFIC.

5.164 EU Indicator (EU IND)

Definition/Description: The EU Indicator field is used to identify those Enroute Airway records that have an Airway Restriction record without identifying the restriction.

Source/Content: The field will contain the alpha character Y when a restriction for the segment is contained in the restriction file or a blank when no restriction record exists.

Used On: Enroute Airways records
Length: 1 character
Character Type: Alpha

5.165 Magnetic/True Indicator (M/T IND)

Definition/Description: The field has multiple definitions. For Airport and Heliport Primary Records, it is used to indicate that all bearing and course detail for that airport/heliport are included in the database with a reference to either Magnetic North or to True North. The field is blank in Airport/Heliport Record when the database contains a mix of magnetic and true bearing or course information for the airport. The Magnetic/True Indicator field is also used to indicate if the Course From and Course To fields of the Cruise Table record and the Sector Bearing fields of the MSA and TAA record are in magnetic or true degrees.

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Source/Content: In Airport/Heliport Records, the field will contain the alpha character M if all bearing and course detail for the airport/heliport are provided in magnetic or the alpha character T if all bearing and course detail for the airport/heliport are provided in true. Setting the airport/heliport to T does not indicate that courses and bearings at that airport/heliport do not need to be coded as true. True coding of courses and bearings must still comply with the true coding described in those sections. The field will be blank if bearing and course data are provided in a mix of magnetic and true for the airport. Cruise Table Courses, MSA, and TAA Sector Bearings will be derived from official government source. The field will contain the alpha character M if the Course From/To or Sector Bearings are magnetic. It will contain the alpha character T if the courses/bearings are true.

Used On:	Airport, Heliport, Cruise Table and Airport and Heliport MSA Records, and Airport and Heliport TAA Record
Length:	1 character
Character Type:	Alpha

5.166 Channel

Definition/Description: The Channel field specifies the channel of the Azimuth, Elevation and Data transmissions for the MLS identified in the MLS Identifier field of the record.

Source/Content: Channels are derived from official government sources and range from 500 to 699.

Used On:	MLS records
Length:	3 characters
Character Type:	Numeric

5.167 MLS Azimuth Bearing (MLS AZ BRG) MLS Back Azimuth Bearing (MLS BAZ BRG)

Definition/Description: The MLS Azimuth Bearing and the MLS Back Azimuth Bearing fields define the inbound magnetic final approach course assigned to the center of the Azimuth or Back Azimuth Coverage (see Section 5.172).

Source/Content: The fields are populated with the inbound magnetic course information derived from official government source documents, generally the inbound course for a given approach procedure to a given runway considered the primary use of the MLS facility. The values are provided in degrees and tenths of degrees with the decimal point suppressed. Should the source value be provided with the intent to be used only in degrees true, the last character of the field will contain a T in place of the tenths of a degree value.

Used On:	MLS and MLS Continuation records
Length:	4 characters
Character Type:	Numeric
Examples:	0550, 0155, 015T

5.168 Azimuth Proportional Angle Right/Left (AZ PRO RIGHT/LEFT) Back Azimuth Proportional Angle Right/Left (BAZ PRO RIGHT/LEFT)

Definition/Description: The MLS Azimuth and Back Azimuth Proportional Angle fields define the limits of proportional guidance of the azimuth transmitter signal on the right and left side of the MLS Azimuth bearing (Section 5.167). The BAZ is

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identical to the AZ and provides guidance for Missed Approach Procedures and departures. See figure under Section 5.172.

Source/Content: Azimuth Proportional angles will be derived from official government publications and entered in whole degrees.

Used On:	MLS and MLS Continuation records
Length:	3 characters
Character Type:	Numeric
Examples:	040, 025, 015

5.169 Elevation Angle Span (EL ANGLE SPAN)

Definition/Description: The Elevation Angle Span field defines the scan of the elevation transmitter signal between the lower and upper limits.

Source/Content: Elevation angle span limits will be derived from official government publications and entered in degrees and tenths of degrees with the decimal point suppressed.

Used On:	MLS records
Length:	3 characters
Character Type:	Numeric
Examples:	300, 150

5.170 Decision Height (DH)

This section deleted by Supplement 20.

5.171 Minimum Descent Height (MDH)

This section deleted by Supplement 20.

5.172 Azimuth Coverage Sector Right/Left (AZ COV RIGHT/LEFT) Back Azimuth Coverage Sector Right/Left (BAZ COV RIGHT/LEFT)

Definition/Description: The Azimuth Coverage Sector fields define the limit of the azimuth transmitter signal on the right and left side of the MLS Bearing (Section 5.167). The Back-Azimuth Coverage Sector is identical to the Azimuth Coverage Sector and provides guidance for Missed Approach Procedures and departures.

Source/Content: Azimuth Coverage Sectors will be derived from official government publications and entered in whole degrees.

Used On:	MLS and MLS Continuation records
Length:	3 characters
Character Type:	Numeric
Examples:	040, 062, 110

COMMENTARY

The Azimuth Coverage Sector includes the Proportional Guidance Sector and the Clearance Guidance Sector as illustrated in below.

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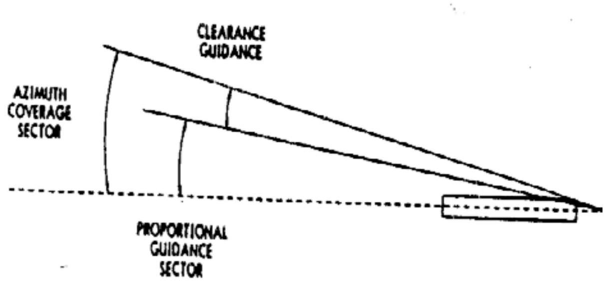

5.173 Nominal Elevation Angle (NOM ELEV ANGLE)

Definition/Description: The Nominal Elevation Angle field defines the normal glide path angle for the MLS installation.

Source/Content: Glide Path angles from official government sources are entered into the field in tens of degrees, tenths of a degree, and hundredths of a degree with the decimal point suppressed.

Used On:	MLS records
Length:	4 characters
Character Type:	Numeric
Examples:	1000, 0275

5.174 Restrictive Airspace Link Continuation (LC)

Definition/Description: The Restrictive Airspace Link Continuation field is used to indicate cases where it is not possible to store all Enroute Airway to Restrictive Airspace Links in the Flight Planning Continuation Record defined in 4.6.3 (more than four area links required).

Source/Content: When an additional Continuation Record (as defined in Section 4.1.6.4) is required to provide further Enroute Airway to Restrictive Airspace Links, this field will contain the alpha character Y to indicate that status.

Used On:	Enroute Airway Flight Planning Continuation records
Length:	1 character
Character Type:	Alpha

5.175 Holding Speed (HOLD SPEED)

Definition/Description: The Holding Speed will be the maximum speed in a holding pattern.

Source/Content: The speed limit will be derived from official government sources. If the value is different from the limit given with ICAO rules, it will be shown in knots, else the field will be blank.

Used On:	Holding Pattern record
Length:	3 characters
Character Type:	Numeric
Examples:	250, 015

5.176 Pad Dimensions

Definition/Description: The Pad Dimensions field defines the landing surface dimensions of the helicopter landing pad. The pad may be described as a runway, a rectangle or a circle.

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Source/Content: Pad dimensions will be derived from official government sources and entered into the field in feet with a resolution of one foot.

When the pad is rectangular, the first five digits define one side of the landing pad and the last three digits the other side of the pad, e.g., 00060120 indicates the pad is 60 feet by 120 feet.

When the pad is circular, the first five digits define the diameter of the pad and the last three digits will be zeros, e.g., 00080000 indicates a pad that is 80 feet in diameter.

When the pad is a runway, the first five digits define the length of the pad and the last three digits the width of the pad, e.g., 12500120 indicates a pad that is 12500 feet long and 120 feet wide.

Used On: Airport Helipad Records, Heliport Helipad Records
Length: 8 characters
Character Type: Numeric
Examples: 00060060, 10220150, 00040040, 00080000

5.177 Public/Military Indicator (PUB/MIL)

Definition/Description: Airports can be classified into four categories, airports open to the general public, military airports, joint use civil and military, and airports closed to the public. This field permits these airports to be categorized by their use.

Source/Content: Airport data is obtained from official government sources and their use is defined in these civil and or military publications.

Field Content	Description
C	Airport/Heliport is open to the public (civil)
M	Airport/Heliport is military airport
P	Airport/Heliport is not open to the public (private)
J	Airport is joint Civil and Military

Used On: Airport and Heliport records
Length: 1 character
Character Type: Alpha

5.178 Time Zone

Definition/Description: The standard time zone system is based on the division of world into 24 zones, each of 15 degrees longitude. The zero-time zone is entered at Greenwich meridian with longitudes 7 degrees, 30 minutes West and 7 degrees, 30 minutes east, and there is no difference in the standard time of this time zone and Greenwich Mean Time. Time zones are designated by letters of the alphabet and numbers by which the standard time of each zone differs from that at Greenwich.

Source/Content: Time zones will be derived from official Time Zone Charts of the World, or individual time zones can be published based on country. The first character of the field indicates the time zone observed by the airport. Time zones are indicated by a letter of the alphabet and numbers according to the following table:

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Field Cont	Diff to Zulu time	Lat/long Boundaries	Field Cont	Diff to Zulu time	Lat/Long Boundaries
Z	0	W007 30/E007 30			
A	-1	E007 30/E022 30	N	+1	W007 30/W022 30
B	-2	E022 30/E037 30	O	+2	W022 30/W037 30
C	-3	E037 30/E052 30	P	+3	W037 30/W052 30
D	-4	E052 30/E067 30	Q	+4	W052 30/W067 30
E	-5	E067 30/E082 30	R	+5	W067 30/W082 30
F	-6	E082 30/E097 30	S	+6	W082 30/W097 30
G	-7	E097 30/E112 30	T	+7	W097 30/W112 30
H	-8	E112 30/E127 30	U	+8	W112 30/W127 30
I	-9	E127 30/E142 30	V	+9	W127 30/W142 30
K	-10	E142 30/E157 30	W	+10	W142 30/W157 30
L	-11	E157 30/E172 30	X	+11	W157 30/W172 30
M	-12	E172 30/180 00	Y	+12	W172 30/180 00
1	-13	Phoenix Island Tonga			
2	-14	Kiribati Line Island			

The second and third characters indicate, in minutes, that the time observed by the airport/heliport must be adjusted from the hour by the number of minutes indicated.

When the 1st character is a 1 or 2, then the 2nd and 3rd characters will always be blank.

Used On: Airport and Heliport records
Length: 3 characters
Character Type: Alpha/numeric
Examples: India falls in the E (-5) and F (-6) time zones; however, the time zone observed in all of India is E30 (-5 hours and 30 minutes). For any country falling into the M or Y time zone and observing a time equal to the next greater time zone, the adjustment of 1 hour will be indicated by 60 in the second and third positions.

5.179 Daylight Time Indicator (DAY TIME)

Definition/Description: The Daylight Time Indicator field is used to indicate if the airport observes Daylight or Summer time when such time changes are in effect for the country or state the airport resides in.

Source/Content: Countries and states that observe Daylight time will be obtained from official publications and the field will contain the alpha character Y if airport observes Daylight or Summer time. The field will contain the alpha character N if the airport does not observe Daylight time or if it is unknown.

Used On: Airport and Heliport records
Length: 1 character
Character Type: Alpha

5.180 Pad Identifier (PAD IDENT)

Definition/Description: The PAD Identifier field identifies the helipad described in the heliport records, helipad field, or that pad served by ILS/MLS described in the Airport and Heliport ILS/MLS records.

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Source/Content: PAD Identifiers will be derived from official government publications when available. If not available from source, unique identifiers will be assigned by the data supplier.

Used On:	Airport and Heliport Localizer and Glideslope Records, Airport and Heliport Localizer Marker Primary Records, GLS Primary Records, GBAS Path Point Primary Records, Airport and Heliport Helipad Records, Helicopter Operations Company Routes, and MLS Records
Length:	5 characters max
Character Type:	Alpha/numeric
Examples:	Source Supplied - PADA1, NWPAD, ALPHA, A1 Data Supplier - HELO1, HELO2, HELO3

5.181 H24 Indicator (H24)

Definition/Description: The 24H Indicator field is used to indicate whether a communications service frequency is available for use on a continual, i.e., 24 hours a day, seven days a week, basis or not.

Source/Content: Hours of operation for a communications service frequency are derived from official government publications. The field will contain the character Y if the frequency is continually available, the character N if the frequency is not continually available and other Times of Operation are provided or the character U are unknown.

If the field is set to Y, the Time Code (5.131) in the Primary Extension Continuation Record for the frequency will be set to C or H. If the field is set to N, the Time Code in the Primary Extension Continuation Record for the frequency will be set to N or P. If the field is set to U, the Time Code will also be set to U.

Used On:	Enroute/Airport and Heliport Communications records
Length:	1 character
Character Type:	Alpha

5.182 Guard/Transmit (G/T)

This section is withdrawn. The status of transmits only, receives only or both for a given frequency is provided by transmit and receive frequency columns of the communications records.

5.183 Sectorization (SECTOR)

Definition/Description: The Sectorization field is used to define the airspace sector a communication frequency is applicable for when an airport defines sectors by bearing from the same point.

Source/Content: Source/Content: Sectors are derived from official government publication. Each Sectorization will contain two bearings, expressed in whole degrees, of the sector being defined. The first three numeric characters define the beginning bearing from the station and the last three characters define the ending bearing from the station, moving in a clockwise direction from start to end. If the sector is a complete circle, this field will be set to 180180. The radius of the circle will be provided as the Communications Distance, Section 5.188.

Sectors which are defined by cardinal directions may be translated to bearings using the table below.

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If the sectors are not defined by bearings, then the sectorization will be shown in narrative form in an Airport Communications Continuation Record.

Sector bearing data relates to the lat/long location of the Sector Facility (5.185). If no Section Facility is provided in the communications record, the sector bearing data relates to the lat/long included in the same communications record.

Source Cardinal Direction	**ARINC 424 Sectorization**
Source Used Four Compass Points	
North	316045
East	046135
South	136225
West	226315

Source Used Eight Compass Points	
North	341025
North East	026070
East	071115
South East	116160
South	161205
South West	206250
West	251295
North West	296340

If the sectors are not defined by bearings or cardinal directions, the sectorization will be shown in narrative form in a Continuation Record.

Used On: Airport Communication records
Length: 6 characters
Character Type: Alpha/numeric
Examples: 010189, 190009

5.184 Communication Altitude (COMM ALTITUDE)

Definition/Description: The Communications Altitude 1 and Altitude 2 fields are used to provide information on use of communications services frequencies with reference to specific altitudes. If the communications record in which Communications Altitude data is provided includes Sectorization data (5.183), the altitude data is valid only for the specific Sector.

Source/Content: Communications Altitude information will be derived from official government source documentation. The fields are to be processed in conjunction with the Communications Altitude Description field. The field will contain altitude expressed in hundreds of feet. The Communications Altitude 1 field will contain a value when the Communications Altitude Description contains the character + (plus) or - (minus). The Communications Altitude 1 field may contain a value when the Communications Altitude Description is blank, indicating that communications service/frequency is used at a specific altitude only. The Communications Altitude 1 and Altitude 2 fields will contain values when the Communications Altitude Description contains the character B.

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Used On:	Enroute, Airport, and Heliport Primary Communications Records
Length:	3 characters
Character Type:	Alpha/numeric
Examples:	050 (5000 feet), 245 (24500 feet)

5.185 Sector Facility (SEC FAC)

Definition/Description: The Sector Facility field is used to define the Navaid or Airport upon which the information in the Sector (5.183) field is based.

Source/Content: Sector related facility information will be derived from official government sources. The field will contain the official Navaid or Airport identifier.

Used On:	Airport and Heliport Communications Records
Length:	4 characters
Character Type:	Alpha/numeric
Examples:	IOC, COS, DEN, KJFK

5.186 Sectorization Narrative

Definition/Description: The Sectorization Narrative field is used to define sectors of operations for communications services on specific frequencies in a narrative format when that data cannot be formatted in the Sectorization (5.183) field. The field may also be used to qualify the Sectorization information. This is usually the and situation, meaning the communications service/frequency is to be used in the defined sector and in some other defined situation that cannot be formatted such as Sectorization. An example is 309127 in the Sectorization field and When Departing Runway 31L/R in the Narrative field.

Source/Content: Sector Narrative data will be derived from official government source.

Used On:	Airport and Heliport Sector Narrative Continuation Records
Length:	60 characters
Character Type:	Alpha/numeric
Examples:	North Complex, Departures to North, When Rwy 09/27 is Active

5.187 Distance Description (DIST DESC)

Definition/Description: The Distance Description field will designate whether a Communications frequency is to be used from the facility out to a specified distance or from a specified distance and beyond in the Airport Communications Record. In the VHF Navaid Limitation Continuation Record and the TACAN Only Navaid Limitation Continuation Record, the field is used to define whether the limitation applies from the navaid out to a specified distance or from a specified distance and beyond.

Source/Content: The field will contain the character - when the communications frequency or navaid limitation is out to a specified distance. When the field content is +, then the communications frequency is used or the navaid limitation applies beyond a specified distance. When the field is blank, no restrictions/limitations apply.

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Used On:	Airport Communications Records, VHF Navaid Limitation Continuation Records, TACAN-Only NAVAID Limitation Continuation Record
Length:	1 character
Character Type:	Alpha

5.188 Communications Distance (COMM DIST)

Definition/Description: The Communications Distance field is used to define the distance restriction a communication frequency is to be used within or beyond when such restrictions apply. This field is used in conjunction with the Distance Description field.

Source/Content: Distances restrictions are derived from official government publications and will contain a value in nautical miles from the communications facility. If the Distance Description field contains the character -, then the frequency is to be used from the facility to the distance specified. If the Distance Description field contains the character + then the frequency is to be used from the distance specified and beyond. The field will be blank if no restrictions apply.

Used On:	Airport Communications records
Length:	2 characters
Character Type:	Numeric
Examples:	05, 10, 15

5.189 Position Narrative

Definition/Description: The Position Narrative field is a textual description of the location of a communications transmitter. This may be the name of a Remote Communications Outlet, a Remote Communications Air/Ground Station or the place name of the geographical location of the transmitter site.

Source/Content: Position Narrative information will be derived from official government source. The field may be blank in cases where the source information is not available.

Used On:	Enroute Communications records
Length:	25 characters
Character Type:	Alpha/numeric
Examples:	CHEYENNE, ABBEVILLE

5.190 FIR/RDO Identifier (FIR/RDO)

Definition/Description: The FIR/RDO Identifier field used on Enroute Communications records is the source provided identifier for a communication service as used in message addressing. For Information Regions (FIR/UIR) it is the four-character identifier assigned to the Information Region as published in ICAO Document 7910, Location Indicators. For Flight Service Stations, it is the three or four-character identifier assigned to the station by the relevant authority. For other communications services established for enroute use and not addressable under the Information Region, Flight Service Station concept, it is the identifier assigned by the relevant authority to that station for the purpose of addressing message traffic.

Source/Content: The field content will be derived from official government source documentation as indicated above. Only three or four-character identifiers are to be used.

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Used:	Enroute Communications records
Length:	4 characters
Character Type:	Alpha/numeric
Examples:	KZDN, DEN

5.191 Triad Stations (TRIAD STA)

Deleted by Supplement 14.

5.192 Group Repetition Interval (GRI)

Deleted by Supplement 14.

5.193 Additional Secondary Phase Factor (ASF)

Deleted by Supplement 14.

5.194 Initial/Terminus Airport/Fix

Definition/Description: The Initial Fix and the Terminus Fix fields are used to define the departure airport or initial fix and the destination airport or terminus fix of a preferred route.

Source/Content: For preferred and preferential routes, these fields will normally contain an airport identifier. For North America Routes for North Atlantic Traffic - Common portion routes, these fields may contain NAVAID or waypoint identifiers. For North America routes for North Atlantic Traffic - Non-common portion routes, these fields may contain airport, NAVAID or waypoint identifiers. These fields will be entered on the first sequence of a route only, except when the route serves more than one airport, in which case the additional airports are shown on succeeding sequences.

Used On:	Preferred Route record
Length:	5 characters
Character Type:	Alpha/numeric
Examples:	KDEN, CYUL, DEN, YUL, COLOR
	Entries for Metro Area New York to Atlanta
	Seq 010 KJFK K6 KATL K7
	Seq 020 KLGA K6
	Seq 030KEWR K6
	Entries for Atlanta to Metro Area New York
	Seq 010KATL K7 KJFK K6
	Seq 020LGA K6
	Seq 030KEWR K6

5.195 Time of Operation

Definition/Description: The Time of Operation field is used to indicate the times of operation of a Facility or Restriction.

Source/Content: The times of operation are derived from official government source. Each Time of Operation group contains the definition of a daily period of operations within a calendar week.

The first two positions identify days of the week, with Monday equal to 1 and Sunday equal to 7. A single day, for example, Monday, is depicted as 01. A consecutive series of days, for example Monday through Friday, is depicted as 15. Non-consecutive days require multiple Time of Operation entries. The remaining 8

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characters define a starting time of four characters and an ending time of four characters. These times are in the format HHMM (H= hours, M= minutes) using a 24-hour time system. For example, 00012350 starts at one minute after midnight and ends at 10 minutes before midnight. 07152000 starts at 07:15 hours and ends at 20:00 hours.

Times of Operation can also be expressed in terms of Sunrise (SR) and Sunset (SS). When a Time of Operation is defined as starting at or ending at Sunrise, that time is specified as 000R. When a Time of Operation is defined as starting at or ending at Sunset, that time is specified as 000S. When a Time of Operation is defined as starting at or ending at a certain number of hours/minutes before or after Sunrise or Sunset, those times are specified as in the following examples:

030R for 30 minutes before Sunrise or R030 for 30 minutes after Sunrise.

100R for 1 hour before Sunrise or R100 for 1 hour after Sunrise.

030S for 30 minutes before Sunset or S030 for 30 minutes after Sunset.

100S for 1 hour before Sunset or S100 for 1 hour after Sunset

Of the three digits associated with R or S, the first is an expression of hours, the second and third an expression of minutes. 1 hour, 30 minutes would be 130, 2 hours, 15 minutes would be 215, etc.

When multiple definitions are required to fully define the Time of Operation for a given calendar week, these are coded as second and subsequent Time of Operation fields.

Examples:

A restriction valid on Mondays, Wednesdays and Fridays only, 0700 to 1700, would require three Time of Operation entries, one for 01 (Monday), one for 03 (Wednesday), one for 05 (Friday), and would be expressed as 0107001700, 0307001700, and 0507001700.

A continuous restriction, starting on Monday at 0700 and ending on Friday at 1700 would require three Time of Operation entries, one for Monday of 0107002359, one for Tuesday through Thursday of 2400002359, and one for Friday of 0500001700.

When the times to be defined go over midnight, the second four characters of time information are valid on the actual ending day. For example, a Time of Operation of Monday through Friday, 1700 to 0300 actually ends on Saturday and would be shown as 1617000300, not 1517000300.

Used On:	Enroute Airway Restriction Primary and the following Continuation Records - Airport/Heliport/Enroute Communications, Restrictive Airspace, Preferred Route, Enroute Airway Restrictions, and Controlled Airspace
Length:	10 characters
Character Type:	Alpha/numeric

5.196 Name Format Indicator (NAME IND)

Definition/Description: The Name Format Indicator field is used to describe the format of the Waypoint Name/Description field (5.43). This field will be formatted

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according to the rules described in Chapter 7 of this specification, Waypoint Naming Conventions.

Source/Content: Values for this field have no official government source and are adjusted by input from the following table. Code may not be used in combination between columns.

Record 96	Column 97	Content 98	Description
A			Abeam Fix
B			Bearing and Distance Fix
D			Airport Name as Fix
F			FIR Fix
H		Note 1	Phonetic Letter Name Fix
I			Airport Ident as Fix
L			Latitude/Longitude Fix
M			Multiple Word Name Fix
N			Navaid Ident as Fix
P			Published Five - Letter - Name - Fix
Q			Published Name Fix, less than five letters
R			Published Name Fix, more than five letters
T			Airport/Rwy Related Fix (Note 2)
U			UIR Fix
	O		Localizer Marker with officially published five - letter identifier
	M		Localizer Marker without officially published five - letter identifier

Note 1: Column 98 is reserved for future expansion of the Name-Format-Indicator concept.

Note 2: The T indicator will be used with all fixes established in accordance with Chapter 7, Section 7.2.6, Terminal Waypoints, in this document.

Used On: Enroute Waypoints, Airport, and Heliport Terminal Waypoints
Length: 3 characters
Character Type: Alpha

5.197 Datum Code (DATUM)

Definition/Description: The Datum Code field defines the Local Horizontal Reference Datum to which a geographical position, expressed in latitude and longitude, is associated.

Source/Content: Local Horizontal Reference Datums will be derived from official government documentation. The Datum Code field will contain a three-letter code corresponding to that government publication. A listing of valid three letter codes is contained in Attachment 2 to this specification.

Used On: VHF Navaid, NDB Navaid, Terminal NDB, Enroute Waypoint, Airport, Fan Marker, Heliport, and GLS Transmitter Records
Length: 3 characters
Character Type: Alpha
Examples: AGD, NAS, WGA

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5.198 Modulation (MODULN)

Definition/Description: The Modulation field will design the type of modulation for the frequency in the Communication Frequency (5.103) field.

Source/Content: The field contains the following information:

The field will be set to A unless the source documentation specifies otherwise.

Field Content	Description
A	Amplitude Modulated Frequency
F	Frequency Modulated Frequency

Used On: Enroute, Airport, and Heliport Communication Records
Length: 1 character
Character Type: Alpha

5.199 Signal Emission (SIG EM)

Definition/Description: High Frequency (HF) signals used in aeronautical communications can be the complete signal or a portion of the signal, called a sideband. The Signal Emission field will designate for each HF Frequency what emission is used.

Source/Content: The field will be set to 3 unless the source documentation specifies otherwise. The field content contains the following information:

Note: The field is blank on records with frequencies that are not HF, see Section 5.104.

Field Content	Description
3	Double Sideband (A3)
A	Single sideband, reduced carrier (A3A)
B	Two Independent sidebands (A3B)
H	Single sideband, full carrier (A3H)
J	Single sideband, suppressed carrier (A3J)
L	Lower (single) sideband, carrier unknown
U	Upper (single) sideband, carrier unknown

Used On: Enroute, Airport, and Heliport Communications Records
Length: 1 character
Character Type: Alpha/numeric

5.200 Remote Facility (REM FAC)

Definition/Description: The Remote Facility field is used to identify a Navaid or Airport that has been used to provide the latitude/longitude of a communications transmitter, Table 5-19 and Notes 7 and 8 in Section 5.37 of this specification.

Source/Content: The field will contain the official identifier of the navaid or airport used, as derived from official government sources.

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Used On:	Enroute, Airport and Heliport Communications Records.
Length:	4 characters
Character Type:	Alpha/numeric

5.201 Restriction Record Type (REST TYPE)

Definition/Description: The Restriction Record Type field is used to define what type of a restriction is contained in the Enroute Airway Restriction Record in question.

Source/Content: The content of this field should be selected from the following listing of possible codes:

AE = Altitude Exclusion. The record contains altitudes, normally available, that are excluded from use for the Enroute Airway Segment. May be further restricted by Time of Operation information.

TC = Cruising Table Replacement. The record contains only a reference to a Cruising Table Identifier. That Cruise Table will be in force, replacing the Cruise Table Identifier in the Enroute Airway segment records defined in the Start Fix/End Fix fields.

SC = Seasonal Restriction. Record is used to close an Airway or portion of an Airway on a seasonal basis.

NR = Note Restrictions. The record contains restrictions that do not fit the pattern of formatted information allowed by other Restriction Record Types.

Used On:	Enroute Airway Restriction Records
Length:	2 characters
Character Type:	Alpha

5.202 Exclusion Indicator (EXC IND)

Definition/Description: The Exclusion Indicator field is an indication of how the altitudes contained in the Cruising Table record referenced by the Airway segment(s) are restricted. This is an all altitude restriction, further defined by direction of flight. These codes will not be used when certain altitudes remain available in a direction of flight.

Source/Content: The content of the field will be one of the codes from the following listing:

A =	All altitudes in both directions of flight are restricted. This effectively closes the airway in both direction of flight.
B =	All altitudes in the opposite direction in which the Enroute Airway is coded are restricted. This effectively closes the airway in one direction of flight, i.e., the opposite direction from that in which the airway is coded.
F =	All altitudes in the direction in which the Enroute Airway is coded are restricted. This effectively closes the airway in one direction of flight, i.e., the direction in which the airway is coded.
(blank) =	The restriction is not an all altitude restriction.

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Used On:	Enroute Airway Restriction Records
Length:	1 character
Character Type:	Alpha

5.203 Block Indicator (BLOCK IND)

Definition/Description: The Block Indicator field is used to specify that the altitudes that follow in the restriction record are either block of altitudes that are restricted (not available for flight) or are individual altitudes that are restricted.

Source/Content: The field will either be set to B indicating an altitude block or I indicating individual altitudes. One or the other or both codes will appear in restriction records that are not Exclusive restrictions (see Section 5.201).

Used On:	Enroute Airway Restriction, Enroute Airway Restriction Continuation Records	
Length:	1 character	
Character Type:	Alpha	
Examples:	(using multiple columns of the record)	
	030B090 =	all altitudes from 3000 feet to 9000 feet (inclusive) are not available
	030I090 =	the individual altitudes of 3000 feet and 9000 feet are not available
	030I070B130 =	the individual altitude of 3000 feet and all altitudes from 7000 feet to 13000 feet (inclusive) are not available

5.204 ARC Radius (ARC RAD)

Definition/Description: The ARC Radius field is used to define the radius of a precision turn. In Terminal Procedures, this is the Constant Radius To A Fix Path and Termination, for RF Leg. In Holding Patterns, this is the turning radius, inbound to outbound leg, for RNP Holding. The ARC Radius field is also used to specify the turn radius of RNP holding patterns included in SID, STAR, and Approach Records as HA, HF, and HM legs.

Source/Content: The content of the field will be derived from official source publications. It will be expressed in nautical miles, tenths, hundredths and thousandths of a nautical mile, with the decimal point suppressed. A conversion to feet of the resolution in nautical miles is equal to an accuracy of 6 feet.

Used On:	SID, STAR and Approach Records, Holding Pattern Records
Length:	6 characters
Character Type:	Numeric
Examples:	246868, 460820, 691231

5.205 Navaid Limitation Code (NLC)

Definition/Description: The Navaid Limitation Codes field is used to define the type of limitation to be expected with a VHF Navaid.

Source/Content: The type of limitation will be derived from official government publications and entered using one of the codes defined in the table.

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Content	Limitation Description
C	Coverage, the limitations are expressed as maximum reception reliability.
F	Fluctuations, radial(s) are affected by course fluctuations.
G	Roughness, signal roughness experienced in the sector(s) defined.
N	Unreliable in the sector(s), at the altitude(s), at the distance(s) defined.
R	Restricted in the sector(s), at the altitude(s), at the distance(s) defined.
T	Unusable in the sector(s), at the altitude(s), at the distance(s) defined.
U	Out of Tolerance in the sector(s), at the altitude(s), at the distance(s) defined.

Used On: VHF Navaid Limitation Continuation Records, TACAN-Only NAVAID Limitation Continuation Record
Length: 1 character
Character Type: Alpha

5.206 Component Affected Indicator (COMP AFFTD IND)

Definition/Description: The VHF Navaid File contains navaids that have one or two components - azimuth and/or distance. Published limitations may apply to one or both of the components. The Component Affected Indicator defines which component(s) are affected by the limitation.

Source/Content: The field content will be entered as indicated in the table based on official government publications. When different limitations apply to different components or components pairs, this will result in multiple Component Affected Indicators for a single navaid to cover the complete limitation. In these cases, the Sequence Number (Section 5.12) will start again with one (01) with each new Component Affected Indicator.

Content	Component Description
A	TACAN or VORTAC, TACAN azimuth component only affected.
B	VORDME, or VORTAC, both azimuth and distance component affected.
D	VORDME or DME, distance component only affected.
M	VORTAC or TACAN, TACAN azimuth and distance component affected.
T	TACAN or VORTAC, distance component affected.
V	VOR, VORDME or VORDME, VOR azimuth component affected.
Z	VORDME, VORTAC or TACAN, VOR and TACAN azimuth and distance component affected.

Used On: VHF Navaid Limitation Continuation Records, TACAN-Only NAVAID Limitation Continuation Record
Length: 1 character
Character Type: Alpha

5.207 Sector From/Sector To (SECTR)

Definition/Description: The Sector From/Sector To field defines sectorization applicable to the range limited sectors of VOR/DME, VORTAC, or TACAN facilities, using the sector letters from the table. Each sector is described by two characters and is to be interpreted as from the first character, clockwise to the second character.

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Source/Content: Field content is derived through interpretation of official government publication information which may be in a variety of formats.

Sector Character	From (degrees true)	To (degrees true)
A	000	015
B	015	030
C	030	045
D	045	060
E	060	075
F	075	090
G	090	105
H	105	120
I	120	135
J	135	150
K	150	165
L	165	180
M	180	195
N	195	210
O	210	225
P	225	240
Q	240	255
R	255	270
S	270	285
T	285	300
U	300	315
V	315	330
W	330	345
X	345	000

Used On: VHF Navaid Limitation Continuation Records TACAN-Only NAVAID Limitation Continuation Record
Length: 2 characters
Character Type: Alpha
Examples: AB, TA, LW

5.208 Distance Limitation (DIST LIMIT)

Definition/Description: The Distance Limitation field is used to define the distance(s) from the navaid at which the limitation applies.

Source/Content: Distance Limitations are derived from official government publications. The field will contain one or two distances expressed in nautical miles from the facility. Used together with the Distance Description field, the distances can be provided as indicated in the table of examples. The field will be blank if there are no distances associated with the limitation.

Used On: VHF Navaid Limitation Continuation Records, TACAN-Only NAVAID Limitation Continuation Record
Length: 6 characters
Character Type: Alpha/numeric
Examples:

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Distance Description	Distance Limit – First Three Digits	Distance Limit – Second Three Digits	Description of Content
–	040	000	Limitation valid out to 40NM from the facility.
+	040	000	Limitation valid beyond 40NM from the facility.
B	100	040	Limitation valid between 40NM and 100NM.
Blank	040	000	Limitation valid at 40NM from the facility.

5.209 Altitude Limitation (ALT LIMIT)

Definition/Description: The Altitude Limitation field is used to define the altitude(s) at which the limitation applies.

Source/Content: Altitude Limitations are derived from official government publications. The field will contain one to two altitudes, expressed in hundreds of feet MSL. Used together with the Altitude Description field, the altitudes can be provided as indicated in the table of examples. The field will be blank if there are no altitudes associated with the limitation.

Used On: VHF Navaid Limitation Continuation Records, TACAN-Only NAVAID Limitation Continuation Record
Length: 6 characters
Character Type: Alpha/numeric
Examples:

Altitude Description	Altitude Limit - First Three Digits	Altitude Limit - Second Three Digits	Description of Content
-	040	000	Limitation valid at or below 4000/FL040.
+	040	000	Limitation valid at or above 4000/FL040.
B	100	040	Limitation valid from 4000/FL040 to 10000/FL100.
blank	040	000	Limitation valid at 4000/FL040.

5.210 Sequence End Indicator (SEQ END)

Definition/Description: The Sequence End Indicator field is used to define the end of a set of sequences defining a given limitation to a given VHF Navaid Component or Component pair.

Source/Content: Limitations are derived from official government publications. The field will contain the character E in that sequence which is the end of a given limitation.

Used On: VHF Navaid Limitation Continuation Records, TACAN-Only NAVAID Limitation Continuation Record
Length: 1 character
Character Type: Alpha

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5.211 Required Navigation Performance (RNP)

Definition/Description: Required Navigation Performance (RNP) is a statement of the Navigation Performance necessary for operation within a defined airspace in accordance with ICAO Annex 15 and/or State published rules.

Source/Content: RNP values derived from official government source will be used when available. They are entered into the field in nautical miles (two digits) with a zero or negative exponent (one digit). The contents can be:

When used on Enroute Airway segments, RNP shall apply inbound to the fix when viewed in increasing sequence number order. The RNP applies only to the airway leg on which it is specified. If no RNP values is coded on a segment, there is not a database specified RNP for that segment.

When used on a SID, STAR and Approach Procedure records, the RNP shall apply to the segment on which it is coded. RNP will be coded on every segment where it is specified by source. Lack of an RNP value on a segment indicates no source supplied RNP value was available for that segment.

When used on Holding Patterns, the RNP applies to the holding pattern as defined in the record.

Note 1: The RNP concept will also be applied to defined airspaces, in addition to the specific flight paths as defined above. ARINC 424-13 added an airspace record that includes a reservation for RNP until actual content can be defined.

Note 2: There are no provisions for Vertical RNP in ARINC 424 at this time.

Used On:	Airport and Heliport SID/STAR/Approach, Enroute Airways, Airport and Heliport SID/STAR/Approach Continuation, Controlled Airspace and Holding Pattern Records
Length:	3 characters (see content paragraph)
Character Type:	Numeric
Examples:	990 (equal to 99.0 NM), 120 (equal to 12.0 NM), 013 (equal to 0.001 NM), 302 (equal to 0.3 NM)

5.212 Runway Gradient (RWY GRAD)

Definition/Description: The Runway Gradient field indicates an overall gradient in percent, measured from the start of take-off roll end of the runway designated in the record. The gradient is expressed as a positive or negative gradient; positive being an upward and negative being a downward gradient.

Source/Content: The values will be derived from official government source. The first position will be either a + or a - sign indicating upward or downward gradient. Positions 2 through 5 indicate the gradient with the decimal point suppressed. The Maximum Gradient that can be expressed in this field is (+9.000 or -9.000).

Used On:	Runway Records
Length:	5 characters
Character Type:	Alpha/numeric
Examples:	+0450, -0300

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5.213 Controlled Airspace Type (ARSP TYPE)

Definition/Description: The Controlled Airspace Type field is used to indicate the type of controlled airspace, using codes from the table below.

Source/Content: The airspace type should be derived from official government publications. The table below shows the indicators used for the various types. For the USA, the previous applied designations such as TCA are supplied for ease of reference, they are longer officially published.

Field Content	Description
A	Class C Airspace (was ARSA within the USA)
C	Control Area, ICAO Designation (CTA)
M	Terminal Control Area, ICAO Designation (TMA or TCA)
R	Radar Zone or Radar Area (was TRSA within the USA)
T	Class B Airspace (Was TCA with the USA)
Z	Class D Airspace within the USA, Control Zone, ICAO Designation (CTR)

Used On: Controlled Airspace Records
Length: 1 character
Character Type: Alpha

5.214 Controlled Airspace Center (ARSP CNTR)

Definition/Description: The Controlled Airspace Center field is used to define the navigation element upon which the controlled airspace being defined is predicated, but not necessarily centered. Where the Airspace is not defined then the Region Identifier should be used. In this case, the Controlled Airspace Center will contain the ICAO Identification code for the Controlled Airspace to which the data contained in the record relates.

Source/Content: The Controlled Airspace Center will be determined during the construction of the records. As an example, the New York Class B Airspace (formerly TCA) is centered on the JFK VOR, the LGA VOR and the Newark airport. The Controlled Airspace Center field could contain the Kennedy Airport identifier KJFK as the key for all records describing the New York Class B Airspace. The field may contain a Navaid, Enroute Waypoint, Heliport or Airport Identifier. A Region Identifier content should be derived from official government source where the controlling authority is published or from ICAO Document 7910, Location Indicators. In cases where no official identifier is published that can be used as the Airspace Center where the controlled airspace is used for more than one airport, the Region Identifier can be used.

COMMENTARY

It should be noted that during construction of a Controlled Airspace Center, no published Navaid, Enroute Waypoint, Airport Identifier or Region Identifier may be found to be suitable. Data suppliers may create a center waypoint for use in the Airspace Center field in such cases.

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Used On:	Controlled Airspace records
Length:	5 characters
Character Type:	Alpha/numeric
Examples:	OTR, FISHS, KJFK, EGTT

5.215 Controlled Airspace Classification (ARSP CLASS)

Definition/Description: The Controlled Airspace Classification field will contain an alpha character indicating the published classification of the controlled airspace, when assigned.

Source/Content: Classification codes will be derived from official government sources. If source does not provide a classification, the field will be blank.

Used On:	Controlled Airspace records
Length:	1 character
Character Type:	Alpha
Examples:	B, C, G, Blank

5.216 Controlled Airspace Name (ARSP NAME)

Definition/Description: The Controlled Airspace Name field will contain the name of the controlled airspace when assigned.

Source/Content: Names will be derived from official government sources. The name, if assigned, will be entered in the first record only. If source does not assign a name, the field may be blank.

Used On:	Controlled Airspace records
Length:	30 characters
Character Type:	Alpha/numeric
Examples:	DENVER CLASS B, OAKLAND OCTA

5.217 Controlled Airspace Indicator (CTLD ARSP IND)

Definition/Description: The Controlled Airspace Indicator field is used to indicate if an airport is associated with controlled airspace of a terminal type such as a Terminal Control Area (TMA or TCA) Radar Area or Class B or C Airspace within the USA.

Source/Content: Airports lying within or below terminal controlled airspace will be determined through the use of official government publications describing the lateral limits of such airspace. The Controlled Airspace Airport/ICAO fields identify the airport for which terminal-controlled airspace has been included in the Controlled Airspace Section of the file. The Controlled Airspace Indicator field will contain one of the codes from the table below. If an airport is not associated with any terminal controlled airspace of the types in this table, the Controlled Airspace Indicator field will be blank. The Controlled Airspace Airport/ICAO may be identical to or different than the record airport. Although Control Zones (CTR) are provided as Controlled Airspace, no reference to them is made in this manner in the Airport Flight Planning Continuation Record.

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Field Content	Description
A	The Airport is within or below the lateral limits of Class C Airspace.
C	The Airport is within or below the lateral limits of a CTA.
M	The Airport is within or below the lateral limits of a TMA or TCA.
R	The Airport is within or below the lateral limits Radar Zone.
T	The Airport is within or below the lateral limits of Class B Airspace.

Used On: Airport Flight Planning Continuation Records
Length: 1 character
Character Type: Alpha

5.218 Geographical Reference Table Identifier (GEO REF TBL ID)

Definition/Description: The Geographical Reference Table Identifier will be used to provide a unique identification for each Geographical Entity. As the Geographical Entity field is a large field with no established content, this two-character code will act as a pseudo key for the record.

Source/Content: The content of this field will be determined by the data supplier using the rules below.

Position One - The first letter or other significant letter of the Geographical Entity.

Position Two - A numeric of 0 thru 9 for each multiple of the character in position one.

Used On: Geographical Reference Table records
Length: 2 characters
Character Type: Alpha/numeric
Examples: Scandinavia S1
Southern United Kingdom S2
Baleric Islands B0

5.219 Geographical Entity (GEO ENT)

Definition/Description: The Geographical Reference Table will be used to identify Geographical Entities not definable by other established encoding systems. For established systems refer to Section 7 of this document.

Source/Content: The content of the field will be derived from official government source documentation for preferred route systems of any kind.

Used On: Geographical Reference Table Records
Length: 29 characters
Character Type: Alpha/numeric

5.220 Preferred Route Use Indicator (ET IND)

Definition/Description: The Preferred Route Use Indicator provides information on whether the route in question is point-to-point and therefore usable for navigation, or area-to-area and usable only as advisory information which requires further

--`,,`,,,`,,`,`,`,,,`,`,`,````-`-`,,`,,`,`,,`---

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processing. The field will also provide information on whether or not RNAV equipment is required to use the route.

Source/Content: The content of this field will be determined by the data supplier at the time the route is established. The two-character field will be used to denote both the definition of the route initial/terminus nature and the RNAV equipment requirement. In position one, the field will contain the alpha character P if the route is point-to-point or A if the route is area-to-area. In position two, the field will contain the alpha character R if RNAV equipment is required and the alpha character N if RNAV equipment is not required.

Used On: Preferred Route and Geographical Reference Table Records
Length: 2 characters
Character Type: Alpha

5.221 Aircraft Use Group (ACFT USE GP)

Definition/Description: The Aircraft Use Group field provides information on what aircraft or groups of aircraft are permitted to use a certain route.

Source/Content: The raw information for this field will be derived from government sources and encoded according to the table below. The first column will contain the code valid for the routing. See Note One for the second column content.

<table>
<tr><th>Aircraft or Aircraft Group</th><th>Field Content</th><th>Field Content</th></tr>
<tr><td>All Aircraft</td><td>A</td><td rowspan="14">See Note 1</td></tr>
<tr><td>All Aircraft, Cruise speed 250 kts or less</td><td>C</td></tr>
<tr><td>Non-Jet and Turbo Prop</td><td>D</td></tr>
<tr><td>Multi-Engine Props Only</td><td>E</td></tr>
<tr><td>Jets and Turbo Props/Special, Cruise Speed 190 kts or greater</td><td>F</td></tr>
<tr><td>Helicopter Only</td><td>H</td></tr>
<tr><td>Jet Power</td><td>J</td></tr>
<tr><td>Turbo-Prop/Special, Cruise Speed 190 kts or greater</td><td>M</td></tr>
<tr><td>Non-Jet, Non-Turbo Prop</td><td>N</td></tr>
<tr><td>Non-Jet, Cruise speed 190 kts or greater</td><td>P</td></tr>
<tr><td>Non-Jet, Cruise speed 189 kts or less</td><td>Q</td></tr>
<tr><td>Aircraft as defined in a Notes Continuation Record</td><td>R</td></tr>
<tr><td>Single Engine</td><td>S</td></tr>
<tr><td>Twin Engine</td><td>T</td></tr>
</table>

Note 1: When two routings have been defined between end fixes/areas for the sole purpose of separating aircraft groups of use, the first column will contain the code for the group that may use the routing and the second column will contain the code for the group that must use the alternative routing. If there is no alternative routing for aircraft group separation, the second column will be blank.

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Used On: Preferred Route Records
Length: 2 characters
Character Type: Alpha
Examples: For a pair of routings established for aircraft group separation between Single Engine and Twin Engine, the Single Engine would carry the code of ST and the Twin Engine Route would be TS.

5.222 GNSS/FMS Indicator (GNSS/FMS IND)

Definition/Description: The GNSS/FMS Indicator field provides an indication of whether or not the responsible government agency has authorized the overlay of a conventional, ground based approach procedure with the use of a sensor capable of processing GNSS data or if the procedure may be flown with FMS as the primary navigation equipment. The field is also used to indicate when a PBN RNP procedure has been authorized for GNSS-based vertical navigation.

Source/Content: The Indicator will be selected from the table below.

Indicator Definition	Field Content
Procedure Not Authorized for GNSS or FMS Overlay.	0
Procedure Authorized for GNSS Overlay, primary Navaids operating and monitored.	1
Procedure Authorized for GNSS Overlay, primary Navaids installed, not monitored. Example: Procedure Title includes (GPS) or (GNSS)	2
Procedure Authorized for GNSS Overlay, Procedure Title includes GPS or GNSS	3
Procedure Authorized for FMS Overlay	4
PBN RNP Procedure SBAS use authorized; SBAS-based vertical navigation authorized	A (Note 1)
PBN RNP or RNAV Visual Procedure, SBAS-based vertical navigation NOT Authorized	B (Note 2)
PBN RNP Procedure, SBAS-based vertical navigation use not published	C (Note 3)
PBN RNP Procedure within the SBAS operational footprint, but SBAS-based vertical navigation NOT Authorized	D (Note 4)
Stand Alone GPS (GNSS) Procedure	P
PBN RNP Approach provide as GPS	G (Note 5)
Localizer only coding portion of ILS	L (Note 6)
Procedure Overlay Authorization not published	U

Note 1: The GNSS/FMS IND of A indicates that the PBN RNP procedure is authorized for SBAS-based vertical navigation.

Note 2: The GNSS/FMS IND of B indicates that the PBN RNP or RNAV Visual procedure is not authorized for SBAS-based vertical navigation. Advisory vertical may be provided.

Note 3: The GNSS/FMS IND of C indicates that thePBN RNP use of SBAS-based vertical navigation has not been published.

Note 4: The GNSS/FMS IND of D indicates that PBN RNP is SBAS authorized only for lateral navigation. Advisory vertical may be provided.

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Note 5: The GNSS/FMS IND of G indicates that the GPS approach is an PBN RNAV approach provided with route type P.

Note 6: The GNSS/FMS IND of L indicates that the LOC approach is the Localizer only portion of an ILS approach which contains glideslope out information.

Used On: Airport and Heliport Approach Procedure Records
Length: 1 character
Character Type: Alpha/numeric

5.223 Operation Type (OPS TYPE)

Definition/Description: The Operation Type field indicates whether the operation is an approach procedure, an advanced operation or other operational to be defined later.

COMMENTARY

Advanced operation can be straight-in approaches followed by a missed approach, a precision curved approach or departure procedures and roll-out and taxiing procedures.

Source/Content: This field should contain a value in the range of 0 to 15, defined as follows:

SBAS	
0	Straight-in or point-in-space approach procedure
1-2	Reserved for future definition
3-15	Spare
GBAS	
0	Straight-in approach path
1	Terminal Area Path definition (not for FAS Datablock)
2	Missed Approach (not for FAS Datablock)
3-15	Spare

Used On: Airport and Helicopter Operations SBAS Path Point Records, GBAS Path Point Records
Length: 2 characters
Character Type: Numeric

5.224 Route Indicator (RTE IND)

Definition/Description: The Route Indicator field is a single alpha character used to differentiate between multiple final approach segments to the same runway or helipad contained in the Final Approach Coding.

Source/Content: A code of A through Z, (omitting I and O).

Note: This single character is consistent with the Multiple Approach Indicator included as the fifth character of an Approach Procedure Identifier as defined in Section 5.10 of this specification.

--`,,`,,,`,,`,``,`,,,`,``,`````-`-`,,`,,`,`,,`---

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Used On:	Airport and Helicopter Operations SBAS Path Point, GBAS Path Point Record
Length:	1 character
Character Type:	Alpha

5.225 Ellipsoidal Height

Definition/Description: The Ellipsoidal Height field is the height of a surveyed point in reference to the WGS-84 ellipsoid.

Source/Content: The Ellipsoidal Height will be an official publication value. It will be provided in meters with a resolution of one tenth. The decimal point is suppressed. When the published Height is below the Ellipsoid, the first position will carry a minus (-) sign to indicate this condition. Otherwise, this first position will be a plus (+) sign. When used on Path Point Records, the Ellipsoidal Height will be for the LTP or FTP Position defined in the Path Point Record. When used on Helicopter Operations SBAS Path Point Records, the value is the height above ellipsoid for the Fictitious Helipoint (or helipoint). When used on Runway Records, the Ellipsoidal Height will be for the Landing Threshold defined in the Runway Record.

Used On:	Airport and Helicopter Operations SBAS Path Point Record, GBAS Path Point Records, and Runway Records
Length:	6 characters
Character Type:	Alpha/numeric
Examples:	+00356, +00051, +00015, -00022, -01566

5.226 Glide Path Angle (GPA)

Definition/Description: The Glide Path Angle field is an angle, expressed in degrees, tenths and hundredths of degrees, measured at the Flight Path Control Point (FPCP) of those approach procedures that require the coding of an Airport or Helicopter Operations SBAS Path Point record or GBAS Path Point Record. It establishes the intended descent gradient for the final approach flight path. For an illustration of the GPA and related points, see Figure 5-8.

Source/Content: The values will be derived from official government source.

Used On:	Airport and Helicopter Operations SBAS Path Point Record, GBAS Path Point Records
Length:	4 characters
Character Type:	Numeric
Examples:	0275 (is equal to 2.75°), 1015 (is equal to 10.15°), 0300 (is equal to 3.00°)

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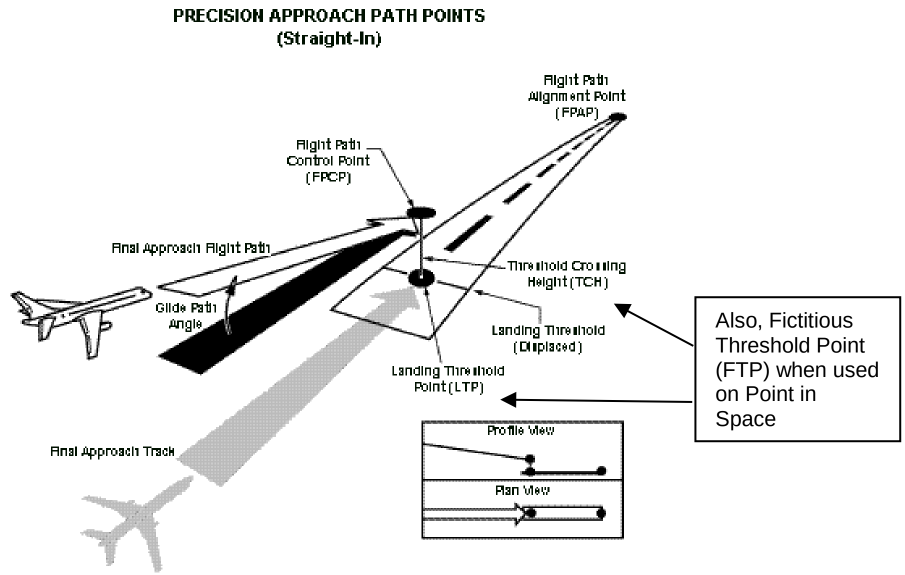

Figure 5-8 – Precision Approach Path Points

5.227 Orthometric Height (ORTH HGT)

Definition/Description: The Orthometric Height field is the height of a surveyed point in reference to Mean Sea Level (MSL).

Source/Content: The Orthometric Height will be derived from official government source and entered with a resolution of a tenth a meter, with the decimal point suppressed. When the height is below MSL, the first position will carry a minus (-) sign; otherwise, this position will be a plus (+) sign.

Used On:	Airport and Helicopter Operations Path Point Continuation Records, GBAS Path Point Continuation Records, SBAS Path Point Continuation Records
Length:	6 characters
Character Type:	Alpha/numeric
Examples:	+00356, +00051, +01566, -00022, -01566

5.228 Course Width At Threshold (CRS WDTH)

Definition/Description: The Course Width At Threshold field defines the width of the lateral course at the Landing Threshold Point (LTP) or Fictitious Helipoint (or helipoint). This width, in conjunction with the location of the Flight Path Alignment Point (FPAP) defines the sensitivity of the lateral deviations throughout the approach.

Source/Content: The width will be derived from official government sources and entered in meters in the hundreds, tens, units, tenths and hundredths format with the decimal point suppressed. The value requires a data resolution of 0.25 meters and acceptable values will end in 00, 25, 50, and 75. When the procedure is to a helicopter alighting point (helipad), the value is 38 meters (expressed as 03800). When the procedure is a helicopter operations Point in Space (PinS) procedure, the value is the course width at a fictitious helipoint (or helipoint), see Figure 5-9**.**

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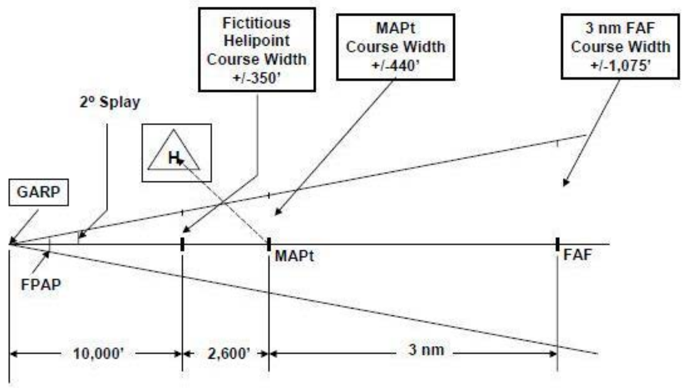

Figure 5-9 – Lateral Display Scaling for PinS Approach Operations

Used On:	Airport and Helicopter Operations SBAS Path Point Records, GBAS Path Point Records
Length:	5 characters
Character Type:	Numeric
Examples:	08025, 14375, 03800

5.229 Final Approach Segment Data CRC Remainder (FAS CRC)

Definition/Description: The Final Approach Segment Data CRC Remainder field is an eight (8) character hexadecimal representation of the 32-bit CRC value provided by the source for the information contained in the aeronautical data fields being monitored for integrity. The value is calculated by a specific mathematical algorithm, which is both machine and man processible.

Source/Content: For CRC calculation information refer to RTCA DO-229 Minimum Operational Performance Standards for Global Positioning System/Wide Area Augmentation System Airborne Equipment for Final Approach Segment (FAS) Data Block CRC standards or RTCA DO-246 GNSS Based Precision Approach Local Area Augmentation System (LAAS) – Signal-in-Space Interface Control Document (ICD) as appropriate.

Used On:	Airport and Helicopter Operations SBAS Path Point Records, GBAS Path Point Records
Length:	8 characters
Character Type:	Alpha/numeric
Examples:	243BC649, A6934B72

5.230 Procedure Type (PROC TYPE)

Definition/Description: The Procedure Type field used on Flight Planning Arrival/Departure Data Record is a single character code indicating the type of procedure in the record, such as Arrival, Standard Instrument Arrival Route, Approach.

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Source/Content: The Procedure Type code must be one of the following codes:

Procedure Type Description	Procedure Type Code
Arrival Procedure, Available in Database	A
Arrival Procedure, Not Available in Database	B
Departure Procedure, Available in Database	C
Departure Procedure, Not Available in Database	D
Standard Terminal Arrival Route (STAR), Available in Database	E
Standard Terminal Arrival Route (STAR), Not Available in Database	F
Standard Instrument Departure (SID), Available in Database	G
Standard Instrument Departure (SID), Not Available in Database	H
Vector SID, Available in Database	I
Vector SID, Not Available in Database	J
Approach Procedure, Available in Database	K
Approach Procedure, Not Available in Database	L

Used On: Flight Planning Arrival/Departure Data Records
Length: 1 character
Character Type: Alpha

5.231 Along Track Distance (ATD)

Definition/Description: The Along Track Distance field used on Flight Planning Arrival/Departure Data Records is the total distance for a given transition, from the initial fix to the ending fix in the transition. A single occurrence of a Flight Planning Arrival/Departure Data record can contain up to three Along Track Distance fields, one for each of the transition types that can make up a single terminal route in the Primary Record and up to four possible intermediate fix points in each Continuation Record. Collectively, the values equal the along track distance from the first fix in the first transition to the last fix in the last transition.

Source/Content: The along track distances will be calculated by data suppliers using coded terminal procedures or uncoded terminal procedures derived from official government source and expressed in nautical miles with a 1NM resolution.

Used On: Flight Planning Arrival /Departure Data Records
Length: 3 characters
Character Type: Numeric

5.232 Number of Engines Restriction (NOE)

Definition/Description: The Number of Engines Restriction field used on Flight Planning Arrival/Departure Data Records is derived from government source and is included whenever a given procedure, normally departure, is restricted to, or designed for, aircraft with a specific number of engines.

Source/Content: The number of engines will be taken from official government source. The field will contain the character Y for each engine configuration position, 1, 2, 3, and 4, for which the procedure is authorized. Non-authorized configuration positions will contain the character N.

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Used On: Flight Planning Arrival/Departure Data Records
Length: 4 characters
Character Type: Alpha
Examples: YYYY (1, 2, 3, or 4 Engine aircraft may use procedure)
NNYY (3 and 4 Engine aircraft may use procedure)

5.233 Turboprop/Jet Indicator (TURBO)

Definition/Description: The Turboprop/Jet Indicator field used on Flight Planning Arrival/Departure Data Records is derived from government source and is included whenever a given procedure, normally departure, is restricted to, or designed for, aircraft with a specific kind of engines.

Source/Content: The indication of Turboprop, Jet, or Both on the use restriction of given procedure will be taken from official government source. The field will indicate the use restriction with a character from the table below.

Aircraft or Aircraft Group	Field Content
All Aircraft	A
Jets and Turbo Props	B
All Aircraft, Cruise speed 250 kts or less	C
Non-jet and Turbo Prop	D
Multi-Engine Props Only	E
Jets	J
Non-Jet, Non-Turbo Prop	N
Turbo Props	P

Used On: Flight Planning Arrival /Departure Data Records
Length: 1 character
Character Type: Alpha

5.234 RNAV Flag (RNAV)

Definition/Description: The RNAV Flag field used on Flight Planning Arrival/Departure Data Records is derived from government source and is included whenever a given procedure included in the record is restricted to, or designed for, aircraft capable of flying RNAV Procedures.

Source/Content: The indication of RNAV, Yes or No, on a given procedure will be taken from official government source. The field will indicate Y for Yes, the procedure is an RNAV procedure or N for No, the procedure is not RNAV.

Used On: Flight Planning Arrival/Departure Data Records
Length: 1 character
Character Type: Alpha

5.235 ATC Weight Category (ATC WC)

Definition/Description: The ATC Weight Category field used on Flight Planning Arrival/Departure Data Records is derived from government source and is included whenever a given procedure included in the record is restricted to, or designed for, a specific aircraft weight grouping.

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Source/Content: The indication of Heavy, Medium, or Light aircraft on a given procedure will be taken from official government source. The field will be derived from that source to indicate:

H for Heavy, all aircraft types of 136,000kg (300000LB) or more.

M for Medium, aircraft types less than 136,000kg (300,000LB) and more than 7,000kg (155,000LB).

L for Light, aircraft types of 7,000kg (155,000LB) or less.

Used On:	Flight Planning Arrival/Departure Data Records
Length:	1 character
Character Type:	Alpha

5.236 ATC Identifier (ATC ID)

Definition/Description: The ATC Identifier field used on Flight Planning Arrival/Departure Data Records is the indication of the officially published procedure designation which is required for Flight Planning.

Source/Content: The ATC Identifier will be derived from official government source. This seven-character field is required in addition to the six-character identifier, the former is used in Flight Planning, the latter in accessing the database.

Used On:	Flight Planning Arrival/Departure Data Records
Length:	7 characters
Character Type:	Alpha/numeric

5.237 Procedure Description (PROC DESC)

Definition/Description: The Procedure Description field used on Flight Planning Arrival/Departure Data Records is the textual representation of the procedure name.

Source/Content: The Procedure Description will be derived from official government source. It will assist in matching flight plan content to charted procedures.

Used On:	Flight Planning Arrival/Departure Data Records
Length:	15 characters
Character Type:	Alpha/numeric

5.238 Leg Type Code (LTC)

Definition/Description: The Leg Type Code field used on Flight Planning Arrival/Departure Data Records is a simplification of the Path Terminator concept. It will provide the information on the path between intermediate waypoints as straight or curved and provide an indication of the change in direction of flight, expressed as left or right, at an intermediate waypoint.

Source/Content: The Leg Type Code will be derived from official government source. In this two-character field, the first position will indicate with the character S, straight line point to point and with the character C, curved line flight track. The second position will be used as a turn indication, L for Left and R for Right when there is a turn requirement at an intermediate waypoint.

Used On:	Flight Planning Arrival/Departure Data Records
Length:	2 characters
Character Type:	Alpha

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5.239 Reporting Code (RPT)

Definition/Description: The Reporting Code field used on Flight Planning Arrival/Departure Data Records is a simplification of the Waypoint Description concept. It will provide the information on intermediate waypoints as either Position Report Required (Compulsory Report) or Position Report Not Required (On-Request Report).

Source/Content: The Reporting Code will be derived from official government source. In this single character field, the code C will indicate Position Report Required and the code X Position Report Not Required.

Used On: Flight Planning Arrival/Departure Data Records
Length: 1 character
Character Type: Alpha

5.240 Altitude (ALT)

Definition/Description: The Altitude field used on Flight Planning Arrival/Departure Data Records is a simplification of the altitude concept used in the full procedure records. It will provide an altitude indication in hundreds of feet, no AGL, MSL, FL, etc., indication provided.

Source/Content: The Altitude will be derived from official government source and reduced to this flight planning resolution requirement.

Used On: Flight Planning Arrival/Departure Data Records
Length: 3 characters
Character Type: Numeric
Examples: FL100 = 100
10000 feet = 100
03500 feet = 035

5.241 Fix Related Transition Code (FRT Code)

Definition/Description: The Fix Related Transition Code is used on Flight Planning Arrival/Departure Data Continuation Records containing Intermediate Fix information and provides an indication, through use of the standard coding practices of separating the procedure into transitions, as to where in the procedure the intermediate fix is located.

Source/Content: The field will contain a code and meaning as indicated in the table below.

Intermediate Fix is Located in Transition Type	Field Content
Fix Located in SID Runway Transition	1
Fix Located in SID Common Portion	2
Fix Located in SID Enroute Transition	3
Fix Located in STAR Enroute Transition	4
Fix Located in STAR Common Portion	5
Fix Located in STAR Runway Transition	6

Used On: Flight Planning Arrival/Departure Data Records
Length: 1 character
Character Type: Numeric

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5.242 Procedure Category (PROC CAT)

Definition/Description: The Airport and Heliport SID/STAR/Approach Procedure Route Type supports the All Sensor RNAV Approach procedure. This kind of approach will have multiple sets of weather minimums (DH and NDA) associated with it. This field identifies the Procedure Categories for which these minimums apply.

Source Content: The field will contain a coded category from the following table:

Content	Procedure Category
LAAS	Local Area Differential Augmentation System
WAAS	Wide Area Differential Augmentation System
FMS	Flight Management System
GPS	Global Positioning System, no Augmentation
VDME	VORDME, VORTAC
CIRC	Circle-To-Land

Used On: Airport and Heliport SID/STAR/Approach Procedure Continuation Records
Length: 4 characters
Character Type: Alpha

5.243 GLS Station Identifier

Definition/Description: The GLS Identifier field defines the identification code for retrieval of such a transmitter from a database. This is not a transmitted identifier.

Source/Content: The content of this field will be the Airport or Heliport ICAO Location Identifier Code at which the transmitter is installed.

Used On: GLS Records
Length: 4 characters max
Character Type: Alpha/numeric

5.244 SBAS/GBAS Channel

Definition/Description: The GNSS Channel Number field identifies the channel to be used for a given approach.

Source/Content: The Channel Number is derived from official government sources and is entered as five numeric characters. It consists of numeric characters in the ranges 0000 to 9999 and 20001 to 99999. In general, numbers less than 20000 are reserved for ILS and MLS. In some countries, Channel Numbers from 0000 to 9999 are reserved for SCAT-1 and will be entered as 00000 through 09999. Channel Numbers from 20001 to 39999 are reserved for GBAS (and SBAS if applicable). Channel Numbers from 40000 to 99999 are reserved for SBAS.

Used On: GLS and Path Point Continuation Records
Length: 5 characters
Character Type: Numeric
Examples: 01423, 20010, 56234

5.245 Service Volume Radius

Definition/Description: The service volume radius identifies the radius of the service volume around the transmitter in Nautical miles.

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Source/Content: The value for this field will be derived from official government sources. If no source is provided, the default value will be blanked.

Used On:	GLS Record
Length:	2 characters
Character Type:	Numeric
Examples:	05, 19

5.246 TDMA Slots

Definition/Description: The Time Division Multiple Access (TDMA) identifies the time slot(s) in which the ground station transmits the related approach. The high precision time source available through GPS permits utilization of Time division multiplexing or TDMA (Time Division Multiple Access), allowing multiple ground stations to share a common frequency by dividing it into eight time slots. An individual station may broadcast in one or more of eight slots.

Source/Content: The value for this field will be derived from official government sources. The range is 01 to FF. If no source is provided, the default value will be blank.

Used On:	GLS Record
Length:	2 characters
Character Type:	Alpha/numeric
Examples:	A2, 01, FF

5.247 Station Type

Definition/Description: The station type identifies the type of the differential ground station. The first character will be L for LAAS/GLS ground station, C for SCAT-1 station. The second and third character will be blank for the moment. They will indicate the interoperability standard to which the station conforms.

Source/Content: The value for this field will be derived from official government sources. If LAAS/GLS or SCAT-1 is not specified in source, the default value will be blank.

Used on:	GLS Record
Length:	3 characters
Character Type:	Alpha/numeric
Examples:	L, C

5.248 Station Elevation WGS84

Description/Definition: This field identifies the WGS84 elevation of the GLS ground station described in the record.

Source/Content: The value for this field will be derived from official government sources or entered into this field in feet with respect to the WGS84 ellipsoid. When elevation is below the WGS 84 ellipsoid, the first column of the field contains a minus (-) sign.

Used On:	GLS Record
Length:	5 characters
Character Type:	Alpha/numeric
Examples:	00530, -0140

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5.249 Longest Runway Surface Code (LRSC)

Definition/Description: On Airport Records, the Longest Runway Surface Code field is used to define whether or not there is a hard surface runway at the airport, the length of which is indicated in the Longest Runway field.

On Runways Continuation records, the Runway Surface Code field is used to define whether or not the runway described in the record is a hard surface runway.

On Helipad records, the Helipad Surface Code field is used to define whether or not the helipad described in the record is a hard surface helipad.

Source/Content: The content will be selected from the table below.

Field Content	Description
H	Hard Surface, for example, asphalt or concrete
S	Soft Surface, for example, gravel, grass or soil
W	Water Runway
U	Undefined, surface material not provided in source

Used On: Airport Records Runway Continuation Record, Airport, and Heliport Helipad Records
Length: 1 character
Character Type: Alpha

5.250 Alternate Record Type (ART)

Definition/Description: The Alternate Record Type field identifiers the record as being applicable to the departure airport (take-off alternate), destination airport (arrival alternate) or a fix along the route (enroute alternate).

Source/Content: The Alternate Record Type will be selected from the following table:

Content	Description
AA	The Airport identifier in Columns 7 through 11 of the Primary Record is the identifier of the Arrival Airport.
DA	The Airport identifier in Columns 7 through 11 of the Primary Record is the identifier of the Departure Airport.
EA	The end fix of a Company Route is identified in Columns 7 through 15 of the Primary Record.

Used On: Alternate Records
Length: 2 characters
Character Type: Alpha

5.251 Distance To Alternate (DTA)

Definition/Description: The Distance To Alternate field defines either the direct (geodesic) distance from the Destination Airport or Fix to the Alternate Airport or the along track distance of an alternate Company Route.

Source/Content: When the Alternate Type field carries the character A, the Distance to Alternate field carries the straight line (geodesic) distance in nautical miles between the Destination Airport or Fix and the Alternate Airport as listed in Alternate

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Identifier fields. When the Alternate Type field carries the character C, the Distance to Alternate field carries the cumulative along track distance for the Alternate Company Route as listed in the Alternate Identifier fields.

Used On:	Alternate Records
Length:	3 characters max.
Character Type:	Numeric

5.252 Alternate Type (ALT TYPE)

Definition/Description: The Alternate Type field is an information processing indicator. The Alternate Destination can be defined as an airport or an airport and route to an airport. This field defines that an alternate airport or, a company route is defined in the Alternate Identifier fields.

Source/Content: The field will contain either the character A when an Airport is provided or the character C when a Company Route is provided.

Used On:	Alternate Records
Length:	1 character
Character Type:	Alpha

5.253 Primary and Additional Alternate Identifier (ALT IDENT)

Definition/Description: The Primary Alternate Identifier and the Additional Alternate Identifiers (two through five) uniquely identify either an Alternate Airport or an Alternate Company Route. The determination of whether the content is an Airport Identifier or a Company Route Identifier is accomplished through the Alternate Type field.

Source/Content: The content of this field is determined by the customer.

Used On:	Alternate Records
Length:	10 characters max
Character Type:	Alpha/numeric

5.254 Fixed Radius Transition Indicator (FIXED RAD IND)

Definition/Description: Indicates that a specific turn radius from the inbound course to the outbound course is required by the airspace controlling agency.

Source/Content: When a fix radius turn is required a 3-digit numeric value will be entered in this field representing the radius of the turn to 1 decimal place (tenths, decimal point suppressed) in nautical miles. A blank entry in this field indicates that no fixed radius transition is required.

Used On:	Enroute Airway Records
Length:	3 characters
Character Type:	Numeric
Examples:	225=22.5nm, 150=15.0 nm

5.255 SBAS Service Provider Identifier (SBAS ID)

Definition/Description: The SBAS Service Provider Identifier field is used to associate the SBAS approach procedure to a particular satellite-based approach system service provider. The SBAS Service Provider is carried in the GBAS Path Point Record only for the purpose of CRC calculations.

Source/Content: A number from 00 to 15. The current definitions are:

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0	WAAS
1	EGNOS
2	MSAS
3	GAGAN
4	SDCM
5-13	(Spare)
14	Not intended for SBAS, **used as the CRC default value for GBAS**
15	Any Service provider may be used

Used On: Airport and Helicopter Operations SBAS Path Point Records, GBAS Path Point Records
Length: 2 characters
Character Type: Numeric

5.256 Reference Path Data Selector (REF PDS)

Definition/Description: The Reference Path Data Selector field enables the automatic tuning of a procedure by Ground Based Augmentation Systems (GBAS) avionics. This data is not used for SBAS operations.

Source/Content: A number from 00 to 48. Values 0-48 are selected via receiver channeling. The field is set to zero for SBAS Path Point Records.

Used On: Airport, Helicopter Operations SBAS Path Point Records, GBAS Path Point Records
Length: 2 characters
Character Type: Numeric

5.257 Reference Path Identifier (REF ID)

Definition/Description: The Reference Path Identifier field represents the three or four alphanumeric characters used to uniquely designate the reference path. The Reference Path Identifier is synonymous with the approach ID located beneath the Channel Number on Instrument Approach Plates and is unique only for a given airport.

Source/Content: Upper-case Alpha characters or numeric digits are used. The content will be derived from official government sources and analogous to the Morse code identifier on existing ILS approach Procedures. While existing industry practices call for a leading character based on the service provider such as W for WAAS or E for EGNOS, the specific use of such characters is not mandatory and other characters may be used. This is followed by the runway number, and a trailing alpha character. For Point in Space procedures, the final approach segment course rounded to the nearest 10 degrees is use in place of the runway number.

Used On: Airport and Helicopter Operations SBAS Path Point Records, GBAS Path Point Records
Length: 4 characters
Character Type: Alpha/numeric
Examples: W12A, E27A, W34A

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5.258 Approach Performance Designator (APD)

Definition/Description: The Approach Performance Designator field is used to indicate the type or category of approach. The data is not used for SBAS operations.

Source/Content: A number between 0 and 7 as indicated in the table below. The field is set to zero for SBAS Path Point Records.

0	GAST A or GAST B
1	GAST C
2	GAST C or GAST D
3-7	Spare

COMMENTARY

From RTCA DO-253:

GBAS Approach Service Types (GAST)

A GBAS Approach Service Type is defined as the matched set of airborne and ground performance and functional requirements that are intended to be used in concert in order to provide approach guidance with quantifiable performance.

Used On:	Airport, Helicopter Operations SBAS Path Point Records, GBAS Path Point Records
Length:	1 character
Character Type:	Numeric
Example:	1 (Category I Approach)

5.259 Length Offset (OFFSET)

Definition/Description: The Length Offset field is the distance from the Stop End of the Runway (SER) to the FPAP. This distance defines the location where lateral sensitivity changes to the missed approach sensitivity. If the FPAP is located at the designated center of the opposite runway end, the distance is zero. **If the Length Offset is not provided by source**, the value is set to **blank**.

Source/Content: A value, expressed in meters, derived from official government sources (Explanation and details will appear in appropriate FAA and ICAO documents). The actual resolution is 8 meters.

Used On:	Airport and Helicopter Operations SBAS Path Point Records, GBAS Path Point Records
Length:	4 characters
Character Type:	**Alpha/**Numeric
Examples:	0000, 0432

5.260 Terminal Procedure Flight Planning Leg Distance (LEG DIST)

Definition/Description: The Terminal Procedure Flight Planning Leg distance is the along track distance required to complete any given leg. It is used to determine a cumulative track distance for a given terminal procedure for flight planning purposes, from the beginning of the take-off or arrival point to the termination point of the procedure.

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Source/Content: The values will be determined during route definition of the procedure records. The content is controlled through requirements of the Path and Termination and coding rules in force with the data supplier. The values are expressed in nautical miles and tenths of nautical miles, with the decimal point suppressed.

Used On:	Airport and Heliport SID, STAR, and Approach Procedure Flight Planning Continuation Records
Length:	4 characters
Character Type:	Numeric
Examples:	0176, 0822, 0208 0016, 0100

5.261 Speed Limit Description (SLD)

Definition/Description: The Speed Limit Description field will designate whether the speed limit coded at a fix in a terminal procedure description is a mandatory, minimum, or maximum speed.

For Maximum speeds: The SID Procedure Records and Missed Approach Procedures speed limit will apply to all legs up to and including the termination of the leg on which the speed is coded from the beginning of the procedure or a previous speed limit. If a different speed is coded on a subsequent leg, the limit will be applied for that leg and from that leg backwards to the previous terminator which contained a speed limit.

The STAR and Approach Procedure Record speed limit will be applied forward to the end of the arrival (excluding the missed approach procedure) or until superseded by another speed limit.

For Minimum speeds: The SID Procedure Records and Missed Approach Procedures speed limit will be applied forward to the end of the SID or Missed Approach Procedure or until superseded by another speed limit.

The STAR and Approach Procedure Record speed limit will apply to all legs up to and including the termination of the leg on which the speed is coded from the beginning of the procedure or a previous speed limit. If a different speed is coded on a subsequent leg, the limit will be applied for that leg and from that leg backwards to the previous terminator which contained a speed limit.

For Mandatory speeds: The speed requirement shall be met at the fix. The speed will not be applied to previous legs or applied forward to the next legs of the procedure record.

Source/Content: The content will be as defined in the table below.

Field Content Value	Description
@ (blank)	Mandatory Speed, Cross Fix AT speed specified in Speed Limit
+ (plus)	Minimum Speed, Cross Fix AT or ABOVE speed specified in Speed Limit
- (minus)	Maximum Speed, Cross Fix AT or BELOW speed specified in Speed Limit

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Used On:	Airport/Heliport SID/STAR/Approach Records
Length:	1 character
Character Type:	Alpha

5.262 Approach Type Identifier (ATI)

Definition/Description: Identifies the approach types published on a given approach procedure which require Airport or Helicopter Operations SBAS Path Points records.

Source/Content: Up to 10 characters representing the literal name of an approach with vertical guidance requiring path points, Horizontal Alert Limit (HAL) and Vertical Alert Limit (VAL). The name is derived from government source material.

Used On:	Airport and Helicopter Operations SBAS Path Point Continuation Records
Length:	10 Characters
Character Type:	Alpha/numeric
Examples:	LPV, LP, APV-II

5.263 HAL

Definition/Description: The Horizontal Alert Limit (HAL) is the radius of a circle in the horizontal plane (the local plane tangent to the WGS-84 ellipsoid), with its center being at the true position, which describes the region which is required to contain the indicated horizontal position with the required probability for a particular navigation mode assuming the probability of a GPS satellite integrity failure being included in the position solution is less than or equal to 10^{-4} per hour.

Source/Content: A value, expressed in meters to a resolution of tenths of meters with the decimal point suppressed, derived from official government sources.

Used On:	Airport and Helicopter Operations SBAS Path Point Records
Length:	3 Characters
Character Type:	Numeric
Examples:	400, 200

5.264 Vertical Alert limit (VAL)

Definition/Description: The Vertical Alert Limit (VAL) is half the length of a segment on the vertical axis (perpendicular to the horizontal plane of WGS-84 ellipsoid), with its center being at the true position, which describes the region which is required to contain the indicated vertical position with a probability of $1\text{-}10^{-7}$ per approach, assuming the probability of a GPS satellite integrity failure being included in the position solution is less than or equal to 10^{-4} per hour. For approaches with lateral only guidance, the VAL will equal 0. This indicates the vertical deviations cannot be used.

Source/Content: A value, expressed in meters to a resolution of tenths of meters with the decimal point suppressed, derived from official government sources.

Used On:	Airport and Helicopter Operations SBAS Path Point Records
Length:	3 Characters
Character Type:	Numeric
Examples:	120, 500

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5.265 Path Point TCH

Definition/Description: On procedures to runways or helipads, the Path Point TCH is the height above the runway threshold (LTP) or the helicopter alighting point. On procedures which are Point in Space, the height of the fictitious helipoint (or helipoint) above the height of the heliport. It is the same as the TCH defined in Section 5.67, but has greater resolution due to the required precision.

Source/Content: The value is derived from official government sources. The value may be expressed in feet to a resolution of tenths of feet, decimal point suppressed or expressed in meters to a resolution of hundredths of meters, decimal point suppressed. Whether the value is in feet or meters can be determined from the TCH Units Indicator.

Used On:	Airport and Helicopter Operations SBAS Path Point Records, GBAS Path Point Records
Length:	6 characters
Character Type:	Numeric
Examples:	000526, 001023 (Feet) 001603, 003118 (meters)

5.266 TCH Units Indicator

Definition/Description: The TCH Units Indicator field is used in Path Point Records to define the units, Feet or Meters for the Path Point TCH.

Source/Content: The field will contain the character F if the Path Point TCH is provided in source documentation in feet or the character M if that value is provided in meters.

Used On:	Airport and Helicopter Operations SBAS Path Point Records, GBAS Path Point Records
Length:	1 character
Character Type:	Alpha

5.267 High Precision Latitude (HPLAT)

Definition/Description: The High Precision Latitude field contains the latitude of the navigation feature identified in the record.

When used on Airport Path Point Records, one navigation feature is the LTP/FTP, the other is the FPAP. When used on Helicopter Operations Path Point Records, one navigation feature is the Fictitious Helipoint (or Helipoint), the other is the FPAP.

Source/Content: The content of field is an expansion of the latitude defined in Section 5.36 to include degrees, minutes, seconds, tenths, hundredths, thousandths and tenths of thousandths of seconds to accommodate the high precision resolution of 0.0005 arc seconds.

Used On:	Airport and Helicopter Operations SBAS Path Point Records, GBAS Path Point Records
Length:	11 characters
Character Type:	Alpha/numeric
Example:	N3028422400

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5.268 High Precision Longitude (HPLONG)

Definition/Description: The High Precision Longitude field contains the latitude of the navigation feature identified in the record.

When used on Airport Path Point Records, one navigation feature is the LTP/FTP, the other is the FPAP. When used on Helicopter Operations Path Point Records, one navigation feature is the Fictitious Helipoint (or Helipoint), the other is the FPAP.

Source/Content: The content of field is an expansion of the latitude defined in Section 5.36 to include degrees, minutes, seconds, tenths, hundredths, thousandths and tenths of thousandths of seconds to accommodate the high precision resolution of 0.0005 arc seconds.

Used On:	Airport and Helicopter Operations SBAS Path Point Records, GBAS Path Point Records
Length:	12 characters
Character Type:	Alpha/numeric
Example:	W08142030100

5.269 Helicopter Procedure Course (HPC)

Definition/Description: The Helicopter Procedure Course field is used on Path Point Continuation Records to define the final approach course of procedures designed for helicopter operations to runways, to helipads, and to points in space.

Source/Content: The field will contain the full degree final approach course of a procedure designed to a runway, helipad or Point in Space and be derived from official government source. It will be used in conjunction with the Approach Procedure Identifier and Runway/Helipad Identifier data in the Path Point Primary record to uniquely identify an approach procedure.

Used On:	Airport and Helicopter Operations SBAS Path Point Continuation Records
Length:	3 Characters
Character Type:	Numeric
Examples:	003, 013, 103, 310, 333

5.270 TCH Value Indicator (TCHVI)

Definition/Description: The TCH Value Indicator field will define which TCH value is provided in the runway record.

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Source/Content: The field will contain a value from the following table:

Field Content	Description
I	TCH provided in Runway Record is that of the Electronic Glideslope.
R	TCH provided in Runway Record is that of an RNAV procedure to the runway.
D	TCH provided in the Runway Record is the default value of 40 or 50 fee*t* (See Section 5.67).

Used On: Runway Records
Length: 1 character
Character Type: Alpha

5.271 Procedure Turn (PROC TURN)

Definition/Description: The TAA Procedure Turn field is used to indicate whether or a course reversal is necessary when flying within a particular TAA Area.

Source/Content: Official government source will carry an indication when the course reversal is not necessary. Generally, that indication is NOPT. Otherwise, the execution of a course reversal is expected. When the course reversal is not necessary, this field will carry an N. When the course reversal is necessary, the field will carry a Y. The indication is provided for each sector on a particular TAA Initial Approach Fix.

Used on: Airport or Heliport TAA Primary Record
Length: 1 character
Character Type: Alpha

5.272 TAA Sector Identifier

Definition/Description: The Fix Position Indicator field contains an indication as to which TAA Initial Approach Fix (IAF) or intermediate Fix (IF) the data in the record applies.

Source/Content: Airport and Heliport Terminal Area Altitude (TAA) are published for each Initial Approach Fix (IAF) or intermediate Fix (IF) for some RNAV and GPS Approach Procedures. The field identifies the fix to which the data contained in the record applies. The content is derived from official government source and entered as indicated in the table below. The terminology left, right and center refers to the position of the TAA fix to the final approach course. Center indicates on the final approach course. Left indicates left of the final approach course. Right indicates right of the final approach course. It could also be viewed as the direction of turn onto final approach an aircraft would make from the base leg defined by the fix. When used on Airport and Heliport Approach Procedure Records, it serves as a pointer to the specific Airport or Heliport TAA Record (PK) where the data pertaining to the fix resides.

Field Content	TAA Fix Position Indicator
C	Straight-In or Center Fix
L	Left Base Area
T	Right Base Area

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Used On:	Airport and Heliport TAA Primary Records
Length:	1 character
Character Type:	Alpha

5.273 TAA Waypoint

Definition/Description: The TAA Waypoint field contains the identifier of the Initial Approach Fix (IAF) or Intermediate Fix (IF) associated with a given Terminal Area Altitude sector. There may be one, two or three such IAF waypoints defined for a single approach procedure. The TAA IAF Waypoint in the individual TAA Sector records is the fix from which radius distances are defined.

Source/Content: The field contains the official identifier of the waypoint for which the TAA Sector is defined. They will be derived from official government sources.

Used On:	Airport and Heliport TAA Records
Length:	5-character max
Character Type:	Alpha/numeric

5.274 TAA Sector Radius

Definition/Description: The Sector Radius field in TAA records defines the start and end distances that define a TAA area. They are referenced to the TAA IAF Waypoint defined in that record. As TAA information is used towards that waypoint, the radius information is provided towards that waypoint. They enclose the sector defined in the record. The values are inclusive.

Source/Content: The Sector Radius information will be derived from official government source. Each TAA sector is made up of the start of sector radius and the end of sector radius. The values are provided in nautical miles. The first two digits define the radius for start of the sector, the second two digits the end of the sector, when flying towards the IAF/IF Waypoint.

Used On:	Airport and Heliport TAA Primary Records
Length:	4 characters
Character Type:	Numeric
Examples:	3011, a Sector that starts at 30 nautical miles to the IAF Waypoint and ends at 11 nautical miles to the IAF Waypoint. 0500, a Sector that starts at 5 nautical miles to the IAF Waypoints and ends at that IAF Waypoint

5.275 Level of Service Name (LSN)

Definition/Description: The Level of Service Name field identifies the official procedure level of service based on published procedure operating minimums information for **PBN RNP APCH or A_RNP** Approach Procedures.

Source/Content: The field will be derived from official government. The table below shows examples of Level of Service Names.

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Level of Service Name (Note 1)	
LPV	(Note 2)
LPV200	(Note 2)
LP	(Note 2)
LNAV	
LNAV/VNAV	

Used On: Procedure Data Continuation Records
Length: 10 characters (Note 3)
Character Type: Alpha

Note 1: The Level of Service Names of LPV, LPV200, LP, LNAV/VNAV, and LNAV are derived from available industry documentation in use at the time Supplement 20 was published. Other terminology to describe these procedures may be in use.

Note 2: At the time Level of Service was originally introduced, the only Level of Service published for which there was a FAS Block Provided category was LPV. Subsequently, other criteria and terminology has been developed and this is reflected in the examples above. As there can be only one **FAS Block Level of Service name per approach** procedure, the Level of Service Names LPV, LPV200, and LP are provided as appropriate in the field named FAS Block Provided Level of Service Name in Sections 4.1.9.5 or 4.2.3.5 while the other Level of Service Names are provided in dedicated fields in those paragraphs. It should be noted that it is possible for LNAV/VNAV and/or LNAV to be authorized either with or without a FAS Datablock provided and therefore these Level of Service Names are always carried in the dedicated field.

Note 3: The 10 character fields are left justified. Any remaining columns are filled with blanks. When the paired Level of Service Authorized field (Sections 4.1.9.5 or 4.2.3.5, and 5.276) is set to N (Not Authorized), the entire10-character Level of Service Name field should be blank.

5.276 Level of Service Authorized

Definition/Description: The Level of Service Authorized field defines whether the Level of Service designated in an associated field (Section 5.275) is authorized or not authorized for a procedure.

Source/Content: The Level of Service Authorized can be derived from official government sources. It is a code selected from the table below.

Description	Field Content
Designated Level of Service is authorized for the procedure.	A
Designated Level of Service is not authorized for the procedure.	N

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Used On: Procedure Data Continuation Records
Length: 1 characters
Character Type: Alpha

5.277 DME Operational Service Volume (D-OSV)

Definition/Description: The DME Operational Service Volume field is used to specify the service volume information of DME Navaids to support using DME-DME and DME-DME-IRU FMS capabilities in RNAV procedures and routes.

Source/Content: The information will be derived from official government source documentation and encoded based on the table below:

Field Content	D-OSV Description
A	40NM or less
B	70NM or less
C	130NM or less
D	Greater than 130NM
U	Unspecified

Used On: VHF Navaid Primary Records
Length: 1 character
Character Type: Alpha

5.278 Activity Type

Definition/Description: The Activity Type is used to define the type of Special Activity that is occurring.

Source/Content: The Activity Type should be derived from official government publications.

Type	Field Content
Parachute Jumping Area	P
Glider Operations	G
Hang Glider Activities	H
Ultralight Activities	U

Used On: Special Activity Area records
Length: 1 character
Character Type: Alpha

5.279 Activity Identifier

Definition/Description: The Activity Identifier field contains the number or name that uniquely identifies the Special Activity Area.

Source/Content: The Activity Identifier is to be derived from official government publications. The field will contain an alphanumeric designation up to 6 characters.

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Field Content			
Activity	**Type**	**State/Nation**	**Activity Designator**
Parachute Jumping Area	P	TX	117
Glider Operations	G	VA	5
Hang Glider Activities	H	CA	45
Ultralight Activities	U	OR	99

Used On: Special Activity Area records
Length: 6 characters
Character Type: Alpha/numeric
Examples: PTX117, GVA5, UOR99

5.280 Special Activity Area Size

Definition/Description: The Special Activity Area Size field contains the radius around the center point where the Special Activity is expected to occur.

Source/Content: The Special Activity Area Size is to be defined from official government publications when available. The radius is entered in nautical miles to a tenth of a nautical mile with the decimal point suppressed.

Used On: Special Activity Area records.
Length: 3 characters
Character Type: Numeric
Examples: 020, 105, 050

5.281 Special Activity Area Volume

Definition/Description: The Special Activity Area Volume field contains the expected annual level of intensity of the Special Activity.

Source/Content: The Special Activity Area Volume is to be derived from official government publications when available.

Used On: Special Activity Area records
Length: 1 character
Character Type: Alpha/numeric

5.282 Special Activity Area Operating Times

Definition/Description: The Special Activity Area Operating Times field contains the annual expected operation schedule of the Special Activity.

Source/Content: The Special Activity Area Operating Times is to be derived from official government publications when available.

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Field Content			
Description	**Days**	**Holiday Qualifier**	**Time of Use**
Weekdays and Weekends	C		
Weekdays	D		
Weekends	E		
Other	O		
Unknown	U		
Including Holidays		H	
Excluding Holidays		X	
Unknown		U	
SR-SS			D
Night Use			N
Continuous			C
Active by NOTAM			A

Used On: Special Activity Area records
Length: 3 characters
Character Type: Alpha
Examples: DXD (Weekdays, Excluding Holidays from Sunrise to Sunset)

5.283 Communications Class (Comm Class)

Definition/Description: The Communications Class field will designate the major grouping of the Communications Types contained in the record.

Source/Content: The value will be selected from the options in the table below:

Field Content	Description
LIRC	The Communications Type is that of one linked to an Information Region (FIR/UIR) for the purposes of providing control services to aircraft.
LIRI	The Communications Type is that of one linked to an Information Region (FIR/UIR) for the purposes of providing information services to aircraft.
USVC	The Communications Type is that of one used within an Information Region (FIR/UIR) for purposes other than control or information services and is not linked to that Region.
ASVC	The Communications Type is that of one providing automated or broadcast services within an Information Region (FIR/UIR).
ATCF	The Communications Type is that of one providing ATC services to aircraft within the terminal area of an airport.
GNDF	The Communications Type is that of one providing ATC services to aircraft on the ground at an airport.
AOTF	The Communications Type is that of one providing services other than ATC functions on the ground or within the terminal area of an airport.
AFAC	The Communications Type is that of one provided automated or broadcast services to aircraft on the ground or with the terminal area of an airport.

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Used On:	Enroute, Airport, and Heliport Primary and Continuation Communications Records and the Communications Type Translation Table Record
Length:	4 characters
Character Type:	Alpha

5.284 Assigned Sector Name (ASN)

Definition/Description: The Associated Sector Name field is used to indicate the published name of an Enroute Communications Sector.

Source/Content: The content of the field will be derived from official government source.

Used On:	Enroute Communications Records
Length:	25 characters max
Character Type:	Alpha/numeric
Examples:	West Sector, Mediterranean Sector, UR Sector, SE High Sector

5.285 Time Narrative

Definition/Description: The Time Narrative field is used to provide Time of Operations and/or Conditions of Operations in a narrative form when source information cannot be formatted in accordance with Section 5.195 of this specification.

Source/Content: The field content will be derived from official government sources.

Used On:	Enroute Airway Restriction, Enroute/Airport/Heliport Communications, Restrictive Airspace, Controlled Airspace and Preferred Route Continuation Records
Length:	100 characters max (per record)
Character Type:	Alpha/numeric

5.286 Multi-Sector Indicator (MSEC IND)

Definition/Description: The Multi-Sector Indicator field is used to indicate that the communications service and frequency are used in more than one defined sector. The actual sector data will be contained in the primary and continuation records of the affected airport or heliport communications record set.

Source/Content: The field will be set to Y, indicating multi-sector data is published in official government source for the service and frequency or N, indicating that the official government source has provided only a single defined sector for the service and frequency. The field will be left blank if there is no defined sector data published for the service and frequency.

Used On:	Airport and Heliport Communications Primary Records
Length:	1 character
Character Type:	Alpha/numeric

5.287 Type Recognized By (TRB)

Definition/Description: The Type Recognized By field is used to provide an indication of the provider of a given Communications Type (5.101).

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Source/Content: The field content will be derived from the official government source used to establish the Communications Type and will be selected from the table below:

Field Content	Description
I	The Communications Type is found in government source provided in accordance with ICAO standards.
F	The Communications Type is found in government source provided in accordance with US FAA standards.
B	The Communications Type is found in government source provided in accordance with both ICAO and US FAA standards.
C	The Communications type is found in government source provided by the country in which the communications is used.
O	The Communications type is found in government source provided by the country in which the communications is used.
S	The Communications Type has been established by the data supplier.

Used On: Communications Type Translation Table Records
Length: 1 character
Character Type: Alpha

5.288 Translation

Definition/Description: The Translation field is used to provide a decoding of a three-character Communications Type (5.101).

Source/Content: The content of the field will be derived from official government source documentation. There will be a listing for every Communications Type contained in the output file.

Used On: Communications Type Translation Table Records
Length: 80 characters max
Character Type: Alpha/numeric
Examples: TWR: ATC Control Tower
GCO: Ground Communication Outlet
ATI: Automated Terminal Services

5.289 Used On

Definition/Description: The Used On field provides an indication of what kind of communications records a particular Communications Type is used on.

Source/Content: The content will be derived from official government source and will be selected from the table below.

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Field Content	Description
A	The Communications Type is used on Airport Communications Records only.
E	The Communications Type is used on Enroute Communications Records only.
H	The Communications Type is used on Heliport Communications Records only.
B	The Communications Type is used on Airport, Heliport and Enroute Communications Records.
C	The Communications Type is used on Airport and Heliport Communications Records.

Used On: Communications Type Translation Table Records
Length: 1 character
Character Type: Alpha

5.290 Procedure Design Mag Var (PDMV)

Definition/Description: The Procedure Design Mag Var field specifies the angular difference between True North and Magnetic North at the location defined in the record. That location may be the airport for which the procedure was designed, the so-called Airport Magnetic Variation of Record, or may be the procedure leg defined in the record. Which location is intended can be determined from the content of the data coded to Section 5.291 (Procedure Design Mag Var Indicator).

Source/Content: Procedure Design Mag Var is obtained from official government procedure data sources and is understood to be the Epoch Year value used when the procedure last revised. This value may differ from magnetic variation data in the primary record of the airport for which the procedure was designed and from data for individual navaids or waypoints used in the procedure. Updating of this value is based only on procedure source data change. Position one of the field contains an alpha character taken from the table below. Positions 2 thru 5 carry the angular difference value expressed in degrees and tenths of a degree with the decimal point suppressed. When Position one is set to T, Positions 2 thru 5 will be all zeros.

Field Content	Description
E	Procedure Designed based on Magnetic Variation (angular difference) that is East of True North
W	Procedure Designed based on Magnetic Variation (angular difference) that is West of True North
T	Procedure Designed based on True North

Length: 5 characters
Character Type: Alpha/numeric
Examples: E0140, E0007, T0000

5.291 Procedure Design Mag Var Indicator (PDMVI)

Definition/Description: The Procedure Design Mag Var Indicator field is an indication of how procedure design magnetic variation was provided in official source data for the procedure defined in the record/record set.

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Source/Content: Procedure Design Mag Var (5.290) will be obtained from official government source procedure data. That data can be a value valid for the entire procedure or a series of values valid for individual legs of the procedure. The field will contain the alpha character P when the value applies to the entire procedure or the alpha character L with the value applies to the leg with which it is associated. With the exception of VOR radials and tracks in VORDME RNAV Approach procedures, Approach Procedures are designed using the airport magnetic variation of record and a single value will apply for the complete procedure. VOR radials use the establish station declination of the VOR. Tracks in VORDME RNAV procedures use the station declination of the procedure reference navaid.

Used On:	Airport and Heliport SID/STAR/Approach Primary Extension Continuation Records
Length:	One character
Character Type:	Alpha

5.292 Category Distance

Definition/Description: The Category Radii fields, expressed in tenths of nautical miles, specifies the obstacle clearance area for aircraft maneuvering to land on a runway which is not aligned with the FAC of the approach procedure. The limits of the circling area are defined to be an arc from the center of the end of each usable runway. The extremities of the adjacent arcs are joined by lines drawn tangent to the arcs. The area thus enclosed is the circling approach area.

Source/Content: Category radii are obtained from official government publications. The field will contain a figure expressed in nautical miles, with a resolution of 1/10. If the radii are not known or defined, the field is filled with 00.

Used On:	Airport and Heliport Approach Continuation Records
Length:	2 characters
Character Type:	Alpha/numeric
Examples:	00, 13, 15, 17, 23

5.293 Vertical Scale Factor (VSF)

Definition/Description: Vertical Scale Factor (VSF) is used to set the vertical deviation scale.

Source/Content: VSF values derived from official source will be used when available. They are entered into the field in feet (three digits). The content can be:

When used on Enroute Airway segments, VSF shall apply inbound to the fix when viewed in decreasing sequence number order. The VSF applies only to the airway leg on which it is specified. If no VSF value is coded on a segment, there is not a database specified VSF for that segment.

When used on a SID, STAR, Approach Transition or Missed Approach record, the VSF shall apply to the balance of the procedure route unless superseded by another value of VSF on a subsequent record. Procedure route must be determined by the Route Type field (see Section 5.7).

When used on final approach records, VSF must apply to the waypoint referenced by the final approach record.

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Used On:	Enroute Airways, SID, STAR and Approach Route and Controlled Airspace Records, Holding Pattern Records
Length:	3 characters
Character Type:	Numeric
Examples:	250, 100, 050

5.294 RVSM Minimum Level

Definition/Description: RVSM Minimum Level is the lowest defined cruising level for an airway or holding pattern.

Source/Content: RVSM Minimum Levels are derived from official source when available. They are entered into the field as a three-digit numeric flight level.

Used On:	Enroute Airway Records, Holding Pattern Records
Length:	3 characters
Character Type:	Numeric
Examples:	080,180,270

5.295 RVSM Maximum Level

Definition/Description: RVSM Maximum Level is the highest defined cruising level for an airway or holding pattern.

Source/Content: RVSM Maximum Levels are derived from official source when available. They are entered into the field as a three-digit numeric flight level.

Used On:	Enroute Airway Records, Holding Pattern Records
Length:	3 characters
Character Type:	Numeric
Examples:	270,250,510

5.296 RNP Level of Service (LSN)

Definition/Description: The Level of Service field identifies the official procedure level of service based on published procedure operating minimums information for Approach Procedures authorized for RNP.

Source/Content: The field will be derived from official government source and provided beginning with the least restrictive value. The table below shows examples of Level of Service for RNP.

Level of Service Name – RNP (Note 1)
031
152
112

Note 1: The RNP level of service name fields are formatted per chapter 5 Section 5.211. In the case that the field is not applicable because the associated Level of Service Authorized (Section 4.1.9.5 or 4.2.3.5, and 5.276) is N for Not Authorized, the RNP Level of Service will be populated regardless of the Level of Service Authorized (5.276) designation.

Used On:	Procedure Data Continuation Records
Length:	3 characters
Character Type:	Numeric

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5.297 Route Inappropriate Navaid Indicator

Definition/Description: A Route Inappropriate Navaid Indicator is used when a DME navaid has source provided information identifying the navaid as inappropriate for use in navigation solutions for RNAV 1 and RNAV 2 routes.

Source/Content: The content of the field is derived from official government sources. The field will be set to the character N when the DME navaid has not been published as being inappropriate for navigation solutions for RNAV 1 or RNAV 2 routes or the character Y when the DME navaid has been published as being inappropriate for navigation solutions for one or more RNAV 1 or RNAV 2 routes.

Used On:	VHF Navaid Primary Records
Length:	1 character
Character Type:	Alpha

5.298 Holding Pattern/Race Track Course Reversal Leg Inbound/Outbound Indicator

Definition/Description: The Leg Inbound/Outbound Indicator is used to identify the Leg Length or Leg Time field values (5.64 or 5.65) as being applicable to either the inbound or the outbound leg of a holding pattern or race track course reversal.

Source/Content: The field will contain either the character I for Inbound or O for Outbound. This content is derived from official government source documentation. On SID/STAR/Approach Records, the field is populated when the Path and Terminator in the record is HA, HF, or HM only, otherwise it is left blank.

Used On:	Holding Pattern, Airport, and Heliport SID/STAR/Approach Records
Length:	1 character
Character Type:	Alpha

5.299 Procedure Referenced Fix Identifier

Definition/Description: The Procedure Referenced Fix Identifier field contains the five-character-name-code, or other series of characters, with which the Fix is identified. The officially published Waypoint Identifier, VHF Navaid Identifier or NDB Navaid identifier will be required for use in the terminal procedure, but is not included in the SID, STAR, or Approach primary record procedure coding.

Source/Content: Officially published identifiers.

Used On:	Airport/Heliport SID/STAR/Approach Primary Extension Continuation Records
Length:	5 characters max
Character Type:	Alpha/numeric (no embedded blanks)
Examples:	SHARP, BBNSI

5.300 Final Approach Course as Runway

Definition/Description: The Final Approach Course as Runway field is a method of providing data for Point in Space approach procedure that are not to a runway.

Source/Content: The Final Approach Course is derived from government publications and is populated with the final approach course rounded to the nearest 10 degrees and expressed as a two-digit number. Other positions are zero filled.

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Used On:	Helicopter Operations SBAS Path Point Records, Airport SBAS Path Point Primary Records, and GBAS Path Point Primary Records
Length:	5 characters
Character Type:	Numeric
Examples:	01000, 15000, 36000

5.301 Procedure Design Aircraft Category or Type

Definition/Description: This field provides the aircraft category(s) or types for which the procedure or portion of a procedure (transition) was designed. This can be aircraft category information or aircraft type information. **This field also provides the aircraft category(s) or types applicable to a speed limit in a Controlled Airspace.**

Source/Content: The content of this field is derived from official government source and will contain a single alpha character from the table below. For Approach Procedures, the content is specific to a Transition and can vary between Transitions for a single procedure.

AIRCRAFT CATEGORY or TYPE	FIELD CONTENT
Aircraft Category A only	A
Aircraft Category B only	B
Aircraft Category C only	C
Aircraft Category D only	D
Aircraft Category E only	E
Aircraft Categories A and B only	F
Aircraft Categories C and D only	G
Aircraft Categories A, B, and C only	I
Aircraft Categories A, B, C, and D only	J
Aircraft Categories A, B, C, D, E only	K
Aircraft Categories D and E only	L
Aircraft Category H – (Helicopter) only	H
Aircraft Categories B and C only	M
Aircraft Categories C, D, and E only	N
Aircraft Categories B, C, D, and E only	O
Aircraft Type Jets only	W
Aircraft Type Non-Jets only	X
Aircraft Type Pistons only	Y
Aircraft Type Not Limited	P
Aircraft Type Turbojet and Turboprop only	**Q**
Aircraft Type Turbojet only	R
Aircraft Type Turboprop only	S
Aircraft Type Prop only	T
Aircraft Type Turboprop and Prop	U
Aircraft Type Non-Turbojets only	V
Aircraft Category/Type not provided	Blank

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Used On:	Airport and Heliport SID, STAR and Approach, **and Controlled Airspace** Records
Length:	1 Character
Character Type:	Alpha (may be blank)

5.302 Surface Type

Definition/Description: The Surface Type field defines the predominant surface type of the runway/helipad described in the record.

Source/Content: Valid contents are defined in column 1 of the table below. Column 3 defines the Runway Surface Code that must be associated for each Runway Surface Type.

Surface Type	Description	Surface Code (5.249)
ASPH	Asphalt	H
ASGR	Asphalt and grass	H
BITU	Bituminous tar or asphalt and/or oil or bitumen bound, mix-in-place surfaces (often referred to as "earth cement")	H
BRCK	Brick, laid, or mortared	S
CLAY	Clay	S
CONC	Concrete	H
COAS	Concrete and asphalt	H
COGS	Concrete and grass	H
CORL	Coral	S
DIRT	Dirt	S
GRAS	Grass	S
GRVL	Gravel	S
ICE	Ice	S
LATE	Laterite - a high iron clay formed in tropical areas	S
MACA	A macadam or tarmac surface consisting of water-bound crushed rock	H
MATS	Landing mat portable system usually made of aluminum	S
MEMB	A protective laminate usually made of rubber	S
META	Metal - steel, aluminum	H
MIX	Non-Bituminous mix	S
OTHR	Other	U
PAVD	Paved (generic hard surface type)	H
PSP	Pierced steel planking	S
SAND	Sand	S
SELD	Sealed	S
SILT	Silt	S
SNOW	Snow	S
SOIL	Soil (Earth (in general))	S
STON	Stone	H
TARM	Tarmac	H
TRTD	Treated	S
TURF	Turf	S
UNKN	Unknown	U

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Surface Type	Description	Surface Code (5.249)
UNPV	Unpaved (generic soft surface type)	S
WATE	Water	W

Used On: Runway Continuation, Airport Helipad, Heliport Helipad Records
Length: 4 Character
Character Type: Alpha

5.303 Helipad Shape

Definition/Description: The Helipad Shape field defines the geometric shape of a helipad as being either circle, runway, or rectangular.

Source/Content: The field contains the shape of the helipad derived from official government sources when available. The content will be selected from the table below:

Field Content	Description
C	Circle
S	Square/Rectangle
R	Runway
U	Undefined, helipad shape not provided in source
C	Circle

Used On: Airport Helipad Records, Heliport Helipad Records
Length: 1 Character
Character Type: Alpha

5.304 Sector Bearing Reference Waypoint

Definition/Description: The Sector Bearing Reference Waypoint field contains the identifier of the waypoint that the Sector Bearings are referenced to within a given Terminal Area Altitude sector.

Source/Content: The field contains the official identifier of the waypoint that the Sector Bearings within a TAA sector are referenced to. The field will be derived from official government sources.

Used On: Airport and Heliport TAA Records
Length: 5 Character Max
Character Type: Alpha/numeric

5.305 Heliport Type

Definition/Description: This field provides information on the type of heliport facility.

Source/Content: The indicator will be selected from the table below.

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Heliport Type	Field Content
Hospital	H
Oil Rig	O
All other types	Blank
Type not provided	U

Used On: Heliport Records
Length: 1 Character
Character Type: Alpha (may be blank)

5.306 Preferred Multiple Approach Indicator

Definition/Description: Preferred Multiple Approach Indicator is used to identify the multiple approach that is generally considered to be the most likely one to be utilized/needed when there are only multiple approaches available for a given approach type at a runway. This will be defined on the Approach FAF record in the Final Approach. For a given approach type at a runway, there shall be one and only one Primary Multiple Approach Indicator provided.

Source/Content: The Preferred Multiple Approach Indicator is per official government source. When not provided by official source, it is defined by the data suppliers as they deem appropriate to support their customers. A P in this field on the approach final FAF record indicates the approach is the preferred multiple approach and can be given priority during data packing, if desired. A blank on the approach final FAF record will be interpreted that the approach is not the preferred multiple approach.

Used On: Airport and Heliport SID/STAR/Approach Records
Length: 1 Character
Character Type: Alpha (may be blank)

5.307 Special Indicator

Definition/Description: This field provides an indicator whether the terminal procedure requires specific operational approval defined by official government sources. Special procedures may be developed based on aircraft performance, aircraft equipment, or crew training, and may also require the use of landing aids, communications, or weather services not available for public use. Examples of special procedures include: SIAP, RCAP, etc.

Source/Content: Special indicator derived from official government sources will be entered using a Y in this field. A blank will be interpreted that the procedure is not defined as a special procedure.

Used On: Airport and Heliport SID/STAR/Approach Records
Length: 1 Character
Character Type: Alpha (may be blank)

5.308 Remote Altimeter Flag

Definition/Description: The field indicates whether or not the existence and use of a Remote Altimeter Setting is applicable to the procedure with the meaning that LNAV/VNAV (Baro-VNAV) is Not Authorized with the Remote Altimeter Setting is being used.

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Source/Content: The field content is based on government sources. The field contains the character R when there is a Remote Altimeter Restriction on the use of LNAV/VNAV (Baro-VNAV) Lines of Minimum. For all other cases, the field is blank.

Used On:	Procedure Data Continuation Records
Length:	1 Character
Character Type:	Alpha

5.309 Maximum Allowable Helicopter Weight

Definition/Description: The Maximum Allowable Helicopter Weight represents the maximum weight, expressed in hundreds of pounds, that a helipad or FATO can support.

Source/Content: The value for this field will be derived from official government sources. If no source is provided, the default value will be blanked

Used On:	Airport Helipad Records, Heliport Helipad Records
Length:	3 Character
Character Type:	Numeric
Examples	101, 050, 100

5.310 Helicopter Performance Requirement

Definition/Description: The Helipad Performance Requirement is used to identify any restriction imposed on helicopter performance in order to use a given helipad.

Source/Content: The field contains the performance requirement of the helipad derived from official government sources when available. The content will be selected from the table below:

Field Content	Description
M	Multi-engine required
S	Single engine only
U	Unknown

5.311 FIR/FRA Transition Waypoint

Definition/Description: The Flight Information Region (FIR) Free Route Airspace (FRA) Waypoint column allows designation of specific waypoint types used to enter, exit, and/or transition through FRA areas. These waypoint designations will normally be provided by host nation authorities via their AIP.

Source/Content: The field content will be derived from official government sources. The content will be selected from the table below. A waypoint may have multiple values assigned by the State airspace authority.

Column	Field Content	Description
44	E	Entry Point
45	X	Exit Point
46	A	Arrival Transition Point
47	D	Departure Transition Point
48	I	Intermediate Point
49	H	Terminal Holding Point

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Used On:	Waypoint Flight Planning Continuation Records
Length:	1 Character
Character Type:	Alpha/Numeric

5.312 Starter Extension

Definition/Description: Starter Extension means an area made available for take-off, prior to the normal runway end at the beginning of the takeoff run. Starter extensions are established where additional takeoff distance, takeoff run or accelerate-stop distance is required, but physical limitations do not allow provision of the mandatory runway strip or width.

Source/Content: The Starter Extension will be derived from official government sources and shown in feet (See Table 5-1**5**).

Used On:	Runway Records
Length:	4 Character
Character Type:	Numeric
Examples:	0900, 1000

5.313 TORA

Definition/Description: Take Off Run Available is the declared distance value which is available for take-off ground roll. The field is used in conjunction with Section 5.317, Runway Usage Indicator.

Source/Content: The TORA value will be derived from official government sources and shown in feet. Starter extension distances are not included in the TORA distance and may be added if a starter extension is available. A value of 00000 indicates that the runway is not usable for take-off. A blank field means that no value is declared in source.

Used On:	**Runway Continuation Records**
Length:	**5 Character**
Character Type:	**Numeric**
Examples:	**02900, 10000**

5.314 TODA

Definition/Description: Take Off Distance Available is the declared distance value which is available for take-off over a 50 ft obstacle. The field is used in conjunction with Section 5.317, Runway Usage Indicator. Typically, the TODA equals the TORA plus clearway.

Source/Content: The TODA value will be derived from official government sources and shown in feet. Starter extension distances are not included in the TODA. A value of 00000 indicates that the runway is not usable for take-off. A blank field means that no value is declared in source.

Used On:	**Runway Continuation Records**
Length:	**5 Character**
Character Type:	**Numeric**
Examples:	**02900, 10000**

5.315 ASDA

Definition/Description: Accelerate Stop Distance Available is the declared distance value which is available in case of an aborted take-off. The field is

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used in conjunction with Section 5.317, Runway Usage Indicator. Typically, the ASDA equals the TORA plus stopway.

Source/Content: The ASDA value will be derived from official government sources and shown in feet. Starter extension distances are not included in the TODA distance and may be added if a starter extension is available. A value of 00000 indicates that the runway is not usable for take-off. A blank field means that no value is declared in source.

Used On: Runway Continuation Records
Length: 5 Character
Character Type: Numeric
Examples: 02900, 10000

5.316 LDA

Definition/Description: Landing Distance Available is the declared distance value which is available for landing. The field is used in conjunction with Section 5.317, Runway Usage Indicator. Typically, the LDA equals the runway length minus the threshold displacement distance.

Source/Content: The LDA value will be derived from official government sources and shown in feet. A value of 00000 indicates that the runway is not usable for landing. A blank field means that no value is declared in source.

Used On: Runway Continuation Records
Length: 5 Character
Character Type: Numeric
Examples: 02900, 10000

5.317 Runway Usage Indicator

Definition/Description: The Runway Usage Indicator field specifies if a Runway is usable for take-off, landing, or both operations.

Source/Content: The field will be derived from official government sources. The content will be selected from the table below.

Field Content	Description
L	Landing only
T	Take-off only
B	Take-off and landing

A field content of L will require the TORA, TODA, and ASDA to be 0 and the LDA either blank or non-0. A field content T will require the TORA, TODA, and ASDA to be blank or non-0 and the LDA to be 0.

Used On: Runway Continuation Records
Length: 1 Character
Character Type: Alpha

5.318 Runway Accuracy Compliance Flag

Definition/Description: Flag that indicates if runway parameters meet Runway Accuracy Requirements defined as follows:

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- Difference between coded Runway Length (PG 5.57) and runway length measured with an independent means (e.g., satellite imagery) is 5 meters or less.
- Difference between coded Runway Threshold Position (PG 5.36 and 5.37) and runway landing threshold location measured with an independent means (e.g., satellite imagery) is 5 meters or less.
- Difference between coded Runway Threshold Displacement Distance (PG 5.69) and runway threshold displacement distance measured with an independent means (e.g., satellite imagery) is 5 meters or less.
- Difference between runway true bearing computed using coded Runway Magnetic Bearing (PG 5.58) and coded Airport Magnetic Variation (PA 5.39) and runway true bearing measured with an independent means (e.g., satellite imagery) is less than 0.5°.

Source/Content: The field will be populated by the data provider, using one of the three possibilities presented in the below table:

Field Content	Description
Y	Runway data meets Accuracy Requirements
N	Runway data does not meet Accuracy Requirements
Blank	Runway data has not been evaluated against Accuracy Requirements

Used On: Runway Records
Length: 1 Character
Character Type: Alpha

5.319 Landing Threshold Elevation Accuracy Compliance Flag

Definition/Description: Flag that indicates if the Runway Landing Threshold Elevation meets Accuracy Requirements defined as follows:

Difference between Runway Landing Threshold Elevation (A424 PG 5.68) and runway landing threshold elevation measured with an independent means is 5 meters or less.

Source/Content: The field will be populated by the data provider, using one of the three possibilities presented in the below table:

Field Content	Description
Y	Landing Threshold Elevation data meets Accuracy Requirements
N	Landing Threshold Elevation data does not meet Accuracy Requirements
Blank	Landing Threshold Elevation data has not been evaluated against Accuracy Requirements

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Used On:	Runway Record
Length:	1 Character
Character Type:	Alpha

5.320 SBAS Final Approach Course

Definition/Description: The SBAS Final Approach Course field contains the published final approach course of the PBN procedure with SBAS level of service.

Source/Content: The content of this field is derived from PBN procedure Final Approach Course.

Used On:	Path Point Continuation Records
Length:	4 Character
Character Type:	Alpha/Numeric
Examples:	2570, 0147, 2910, 347T

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6.0 ENCODING STANDARDS

6.1 General

This chapter sets forth the encoding standards to be employed for ARINC 424 and other master user data files. The data will be encoded with ASCII characters.

6.2 Header Records

There will be at least one 132-character header record for each data file. The header records contain information to uniquely identify each data file. Header record fields are considered required unless specified otherwise. Header records are identified by HDR in columns 1 through 3 of the record.

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6.2.1 Header Record 1

Column	Field Name	Field Length	Reference
1 thru 3	Header Ident	3	Contains HDR
4 thru 5	Header Number	2	Contains decimal 01 to indicate this is the first Header Record.
6 thru 20	File Name	15	Contains the file name.
21 thru 23	Version Number	3	Contains 3 decimal numbers to uniquely identify revision of this file. Initially set to 001, but will be incremented if the file is created more than once in the same cycle.
24	Production/Test Flag	1	Contains P if this is a production data file. Contains T if this is a file created for test purposes.
25 thru 28	Record Length	4	Contains the decimal number 0132, i.e., the number of characters in each data record.
29 thru 35	Record Count	7	Contains the decimal count of the number of data records in the file.
36 thru 39	Cycle Date	4	Contains Cycle Date (5.32).
40 thru 41	Blank (spacing)	2	Contains blanks.
42 thru 52	Creation Date	11	Contains the date when the file was created. Format is DD-MMM-YYYY. Where DD is the two-digit decimal day of month, MMM is a three-character month abbreviation, and YYYY is the four-digit decimal year. (Example: 12-APR-2002)
53 thru 60	Creation Time	8	Contains the UTC time when the file was created. The format is two decimal digits each for hours, minutes, and seconds, separated by colons. (Example: 13:12:02 = 1:12:02 p.m.)
61	Blank (spacing)	1	Contains blank.
62 thru 77	Data Supplier Ident	16	Contains information to identify the data supplier. Content defined by the data supplier.
78 thru 93	Target Customer Ident	16	Contains information to identify the data user/customer (for example, the customer name(s), file codes). Content defined by the data supplier and/or customer. (Optional)
94 thru 113	Database Part Number	20	Unique part number for database. (Optional - Content TBD)
114 thru 124	Reserved	11	Contains blanks.
125 thru 132	File CRC	8	This field contains the 32-bit CRC value for the ARINC 424 data file (including data and header records). ARINC Report 665, Loadable Software Standards, Section 4.0 defines the use of CRC codes. The CRC Polynomial used to calculate the CRC of the ARINC 424 data file shall be the 32-bit CRC (0x04C11DB7), calculated as described in ARINC Report 665. For purposes of calculating a CRC value, Header record 1, Columns 125 through 132, shall be considered to contain zeros.

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6.2.2 Header Record 2

Column	Field Name	Field Length	Reference
1 thru 3	Header Ident	3	Contains HDR.
4 thru 5	Header Number	2	Contains decimal 02 to indicate this is the second Header Record.
6 thru 16	Effective Date	11	If the Effective Date is the date associated with the Cycle Date, this field will contain blanks. If the file is created outside of standard cycles, this field will provide the effective date. The format is the same as the Creation Date. (Optional)
17 thru 27	Expiration Date	11	If the Expiration Date is the date associated with the Cycle Date, this field will contain blanks. If the file is created outside of standard cycles, this field will provide the expiration date. The format is the same as the Creation Date. (Optional)
28	Blank (spacing)	1	Contains blank.
29 thru 58	Supplier Text Field	30	Contains information specific to data supplier, contents to be defined by data supplier. (For example, extract program version) (Optional)
59 thru 88	Descriptive Text	30	Contains description of file contents, or other information agreed upon by data supplier and customer. (For example, description of file content, test file notes, etc.) (Optional)
89 thru 132	Reserved	43	Contains blanks.

6.2.3 Additional Header Records

Additional Header Records may be added.

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7.0 NAMING CONVENTIONS

7.1 General

This chapter establishes the coding rules for Identifiers and Name fields when government source does not provide these Identifiers or Names within the rules established by ICAO Annex 11.

ICAO Annex 11 defines the international standards for coded designators of NAVAIDS, Waypoints, Airways, Standard Instrument Arrivals Routes, and Standard Instrument Departures.

7.2 Fix Identifiers

Fix identifiers will be assigned to all waypoints with the ground rules set forth in this chapter. Section 5.13 establishes the use and limits the field to five characters maximum.

7.2.1 VOR, VORDME, VORTAC, TACAN, and Non-Directional Beacons (NDB)

Waypoints located at any of the above types of facilities will take on the official 1-, 2-, 3-, or 4-character identifier of the facility in question.

Examples:

Facility	Fix Field Entry
Los Angeles VORTAC becomes	LAX
Tyndall TACAN becomes	PAM
Ft. Nelson NDB becomes	YE

7.2.2 Non-Directional Beacons (NDB)

For systems employing the NDB as Waypoint concept, waypoints located at NDBs should be identified using the station identifier followed by the alpha characters NB.

Examples:

Facility	Fix Field Entry
Fort Nelson, CAN becomes	YENB
Newark, NJ becomes	EWRNB

7.2.2.1 Navaid Waypoint

When the position of a navaid is used to create a waypoint such as during navaid outage or lack of complete navaid information, the waypoint identifier will be created using the navaid name, following the conventions of Section 7.2.3 for One Word Names and Multiple Word Names. For example, a waypoint established at the position of a navaid with the name Uzgorod would have an identifier of UZGOD. A waypoint established at the position of a navaid with the name of Camp Henry would have an identifier of CHENY.

7.2.2.2 Airport Waypoint

When the position of an airport is used to create a waypoint, the waypoint identifier will be created either from the airport identifier, if known, or from the airport name, following the conventions of Section 7.2.3 for One Word Names and Multiple Word Names. For example, a waypoint established at the position of an airport with the identifier of JHKD and a name of Juhankerd Airfield would use the airport identifier JHKD as the waypoint identifier. A waypoint established at the position of an airport

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without an identifier but with a name of Rondaville Airport would have an identifier of RONDE.

7.2.3 Named RNAV Waypoints, Intersections, and Reporting Points

In many countries, these waypoints are assigned unique five-character names, and the identifier is the same as the name. For waypoints not so named, identifiers are developed using the following rules sequentially until five, or fewer, character groups remain.

ONE-WORD NAMES

A. If five or less characters are involved, use the full name.

Examples:

Facility	Fix Field Entry
DOT becomes	DOT
ACRA becomes	ACRA
LOGAN becomes	LOGAN

B. If the name is more than five characters, reduce to five characters with one or more of the following methods.

1. Eliminate double letters

Examples:

Waypoint Name	Fix Field Entry
KIMMEL becomes	KIMEL
COTTON becomes	COTON
RABBITT becomes	RABIT

2. Keep the first letter, first vowel, and last letter. Drop other vowels starting from right to left.

Examples:

Waypoint Name	Fix Field Entry
ADOLPH becomes	ADLPH
BAILEY becomes	BAILY
BURWELL becomes	BURWL

3. Drop consonants, starting from right to left

Examples:

Waypoint Name	Fix Field Entry
ANDREWS becomes	ANDRS
BRIDGEPORT becomes	BRIDT

MULTIPLE WORD NAMES

Use the first letter of the first word and shorten the last word using the rules for One-Word names to reduce it four characters, for a total of five characters.

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Examples:

Waypoint Name	Fix Field Entry
CLEAR LAKE becomes	CLAKE
ROUGH AND READY becomes	RREDY

PHONETIC LETTER NAMES

When an ICAO phonetic alpha character is used as a waypoint name (Alpha, Bravo, Charlie, etc.), use the rules established in One-Word Names. When more than one waypoint in a country has the same phonetic name, obtain uniqueness by applying Duplicate Identifier rules below.

Examples:

Waypoint Name	Fix Field Entry
ALPHA becomes	ALPHA
NOVEMBER becomes	NOVMR
CHARLIE becomes	CHARE

Two waypoints having the same Waypoint Identifiers within the same country two-letter ICAO, for example, CHARLIE, would become CHAR1 and CHAR2.

When a double phonetic, such as TANGO INDIA, is used as the waypoint name, use the rules established under Multiple Word Names. For example, TANGO INDIA becomes TINDA.

When a phonetic alpha character followed by a numeric and/or other alpha character (A1, A1N, B2, etc.), is used as the waypoint name, it will be coded in the database the same as shown on aeronautical charts.

7.2.4 Unnamed Waypoints

Waypoints not assigned unique five-character names, but where a defined fix is required for charting and is to be included in navigation databases, will have identifiers developed using the following guidelines:

A. Unnamed turn points, intersections, and bearing/distance waypoints

If the unnamed turn point, intersection, or bearing/distance is collocated with a named waypoint or NAVAID station on a different route structure (e.g., low level or approach), the name or identifier of the collocated waypoint should be used.

Example: Unnamed turn point on J2 between Lake Charles (LCH) and New Orleans (MSY) VORTACs is coincidental with the Lafayette (LFT) low level VORTAC. LFT should be used as the identifier code for the turn point.

Identifier codes for unnamed turn points, intersection, or bearing/distance waypoints that are not coincidental with named waypoints should be constructed by taking the identifier code of the reference NAVAID for the turn point/intersection/(bearing/distance waypoint) (expected to be the nearest NAVAID serving the airway structure in which it is located) and the distance from the NAVAID to the turn point/intersection/(bearing/distance waypoint). If the distance is 99 nautical miles or less, the NAVAID identifier should be placed first, followed by the distance. If the distance is 100 nautical miles or

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more, the last two digits only should be used and placed ahead of the NAVAID identifier.

NAVAID	DISTANCE	CODE
INW	18	INW18
CSN	106	06CSN
TCS	89	TCS89

B. FIR, UIR, and Controlled Airspace Reporting Positions

In cases where the government authority does not provide unique, five-letter or less waypoint names and in cases where the government supplied name cannot be converted to a unique five-letter identifier using previous rules, the following rules should be applied in developing an identifier for such waypoints.

1. FIR - use the three characters FIR plus a numeric from 02 to 99. An identifier so developed is to be unique within the geographical area code.
2. UIR - use the three characters UIR plus a numeric from 02 to 99. An identifier so developed is to be unique within the geographical area code.
3. FIR/UIR - use FIR and a numeric as indicated above.
4. Controlled - use the three- letter characters for the Airspace type of controlled airspace plus a numeric from 02 to 99. If these are Terminal Waypoints, they are to be unique within the Terminal Area. If these are Enroute Waypoints, they are to be unique within the geographic area code. Examples of controlled airspace types are:

TMA	Terminal Area
CTR	Controlled Zone
ATZ	Aerodrome Traffic Zone
CTA	Controlled Area
TIZ	Traffic Information Zone

7.2.5 Reporting Positions Defined by Coordinates

Entry, Exit, and intermediate points within Oceanic Control Areas are often defined by waypoints which are undesignated, meaning there is no published five-letter-name-code. These points are quite often made available in source documentation as geographical coordinates, expressed in full degrees or half degrees of Latitude and full degrees of Longitude. When such waypoints are to be entered into a database, the following rules are to be applied:

A. Full Degree of Latitude

1. Positions in the northern hemisphere use the letters N and E, the southern hemisphere uses the letters S and W.
2. Latitude will always precede Longitude.
3. Both will use numeric for latitude and longitude as follows:
   a. Latitude - use values provided by source.
   b. Longitude - use only the last two digits of the three-digit longitude. Placement of the longitude value in reference to the identifier character (of N, S, W, or E, see below) will provide

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the information as to whether the longitude digit dropped was 0 or 1. That character will follow the longitude digits if the longitude is less than 100 degrees and precede the longitude digits if the longitude is equal to or greater than 100.

c. Use of a single character to provide both latitude and longitude information:

N = North Latitude and West Longitude
E = North Latitude and East Longitude
S = South Latitude and East Longitude
W = South Latitude and West Longitude

d. Examples:

North Latitude/West Longitude, longitude less than 100 degrees

N5200/W07500 - 5275N
N5000/W04000 - 5040N
N0700/W00800 - 0708N

North Latitude/West Longitude, longitude equal to or greater than 100 degrees

N7500/W17000 - 75N70
N0700/W12000 - 07N20

North Latitude/ East Longitude, longitude less than 100 degrees

N5000/E02000 - 5020E
N7500/E05000 - 7550E
N0600/E00800 - 0608E

North Latitude/East Longitude, longitude equal to or greater than 100 degrees

N7500/E15000 - 75E50
N0600/E11000 - 06E10

South Latitude/West Longitude, longitude less than 100 degrees

S5200/W07500 - 5275W
S5000/W04000 - 5040W
S0700/W00800 - 0708W

South Latitude/West Longitude, longitude equal to or greater than 100 degrees

S7500/W17000 - 75W70
S0700/W12000 - 07W20

South Latitude/East Longitude, longitude less than 100 degrees

S5000/E02000 - 5020S
S7500/E05000 - 7550S
S0600/E00800 - 0608S

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South Latitude/East Longitude, longitude equal to or greater than 100 degrees

S7500/E15000 - 75S50
S0600/E11000 - 06S10

B. Half Degree of Latitude

1. Positions in the northern hemisphere use the letters N and E, the southern hemisphere uses the letters S and W.
2. Latitude will always precede Longitude.
3. Both will use numeric for latitude and longitude as follows:
   a. Latitude - use the full degree values provided by source. Placement of the latitude value in reference to the identifier character (of N, S, W, or E, see below) will provide the information as to whether the latitude is full degree or half degree.
   b. Longitude - use only the last two digits of the three-digit longitude. Placement of the longitude value in reference to the identifier character (of N, S, W, or E, see below) will provide the information as to whether the longitude digit dropped was 0 or 1. That character will follow the longitude digits if the longitude is less than 100 degrees and precede the longitude digits if the longitude is equal to or greater than 100.
   c. Use of a single character to provide both latitude and longitude information:

      N = North Latitude and West Longitude
      E = North Latitude and East Longitude
      S = South Latitude and East Longitude
      W = South Latitude and West Longitude
   d. Examples:

      North Latitude/West Longitude, longitude less than 100 degrees

      N5630/W02000 - N5620
      N5030/W04000 - N5040
      N0730/W00800 - N0708

      North Latitude/West Longitude, longitude equal to or greater than 100 degrees

      N7530/W17000 - 7N570
      N0730/W12000 - 0N720

      North Latitude/East Longitude, longitude less than 100 degrees

      N5030/E02000 - E5020
      N7530/E05000 - E7550
      N0630/E00800 - E0608

      North Latitude/East Longitude, longitude equal to or greater than 100 degrees

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N7530/E15000 - 7E550
N0630/E11000 - 0E610

South Latitude/West Longitude, longitude less than 100 degrees

S5230/W07500 - W5275
S5030/W04000 - W5040
S0730/W00800 - W0708

South Latitude/West Longitude, longitude equal to or greater than 100 degrees

S7530/W17000 - 7W570
S0730/W12000 - 0W720

South Latitude/East Longitude, longitude less than 100 degrees

S5030/E02000 - S5020
S7530/E05000 - S7550
S0630/E00800 - S0608

South Latitude/East Longitude, longitude equal to or greater than 100 degrees

S7530/E15000 - 7S550
S0630/E11000 - 0S610

7.2.6 Terminal Waypoints

The following rules should be applied in developing identifiers for waypoints used solely in terminal area procedures. Such waypoint identifiers will be unique only for the airport specified; a waypoint identifier used in a terminal area cannot be repeated in that terminal area but can be used in an enroute area encompassed by the same geographical area code. Terminal waypoint identifiers can be repeated in areas covered by different geographical codes. These identifiers developing rules should only be applied when the waypoints in question have not been assigned official names/identifier by the government authority.

A. Airport/Heliport or Runway/Helipad related Terminal Waypoints

Single Approach Procedure for a given runway or helipad coded and Waypoints common to more than one approach.

The following two-character codes are to be added to the runway identifier or helicopter approach alignment bearing to create an airport related waypoint identifier when no named waypoint has been established by the government source for the fix type:

FF =	Final Approach Fix
AF =	Initial Approach Fix
IF =	Intermediate Approach Fix
CF =	Final Approach Course Fix
MA =	Missed Approach Point Fix
SD =	Stepdown Fix (when not using convention in paragraph E)
RW =	Runway Fix
OM =	Outer Marker Fix

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MM = Middle Marker Fix
IM = Inner Marker Fix
BM = Backcourse Marker Fix
TD = Touchdown Fix inboard of runway threshold
HC = Helipad Fix
EP = Final End Point

Multiple Approach Procedures for a given runway or helipad coded for which common waypoints cannot be established:

The following two-character codes are to be added to the runway identifier to create an airport-related waypoint identifier when no named waypoint has been established by the government source for the fix type:

Fx = Final Approach Fix, where x equals the Route Type (Section 5.7) for the procedure in question
Ax = Initial Approach Fix, where x equals the Route Type (Section 5.7) for the procedure in question
Ix = Intermediate Approach Fix, where x equals the Route Type (Section 5.7) for the procedure in question
Cx = Final Approach Course Fix, where x equals the Route Type (Section 5.7) for the procedure in question
Mx = Missed Approach Point Fix, where x equals the Route Type (Section 5.7) for the procedure in question
Sx = Step-Down Fix Note: if multiple step-down fix waypoints need to be created, replace D with another character, retain the S.
Rx = Runway Centerline Fix, where x equals the Route Type (Section 5.7) for the procedure in question
Tx = Touchdown Fix inboard of runway threshold, where x equals the Route Type (Section 5.7) for the procedure in question

The convention for Multiple Approaches/Multiple Waypoints is contained in Table 7-1.

Note: C-T-L is Circle-To-Land Approach

The prefixes indicated in the table above assume that a unique geographical position (Latitude/Longitude) is required for each Waypoint and the common waypoint idea cannot be used. Should a single waypoint's geographical position be such that it will serve as the same waypoint type for more than one coded approach procedure, a common waypoint; the Single Approach/Common Waypoint convention should be used.

Note on prefixes for FMS(F) Approach Waypoints:

As the majority of the prefixes generated using the standard convention and the Route Type F produced duplicates or two character codes that would be easily confused with other coded, the numeric/alpha/runway identifier concept is used.

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7.0 NAMING CONVENTIONS

B. Bearing and Distance Waypoints

Identifiers should be developed by the application of the following rules:

1. The first character of the fix identifier should be D.
2. Character two through four should simplify the Navaid course on which the waypoint lies.
3. The last character should be the distance of the radius defining the position of the waypoint. This radius should be expressed as the equivalent letter of the alphabet, i.e., A = 1nm, G = 7nm, O = 15nm, etc.

4. If the arc radius is greater than 26 NM, then use the convention for unnamed Turn Points, Intersections, and Bearing/Distance Waypoints.
5. If the arc radius is provided in official government source as nautical miles and tenths of nautical miles, the letter of the alphabet will reflect values rounded to full nautical miles, i.e., 10.5nm = 11nm or K, 10.4nm = 10nm or J. All values between 0.1 and 1.4 will be character A.

C. Along Track Distance Waypoints

Along Track Distance Waypoints are expressed in government source documentation as being x number of nautical miles from a named waypoint/fix. On aeronautical charts, they are normally identified as xx.x NM from Named Waypoint.

When not provided by the source document, identifiers for such waypoints should be developed from the along track distance portion of the source information, in two parts:

Part One - the distance in nautical miles and tenths of nautical miles when the tenths is greater than zero, with the decimal point suppressed. Tenths values equal to zero are dropped.

Part Two - the suffix NM if the value is equal to or less than 9.9 or a prefix of NM if the value is greater than 9.9.

Examples:

3.0 NM from DOOTY should be expressed as 3NM.
2.8 NM from CHASS should be expressed as 28NM.
11.0 NM from BACUP should be expressed as NM11.
13.8 NM from KITTY should be expressed as NM138.

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Table 7-1 Multiple Approaches/Multiple Waypoints

Waypoint Type	Waypoint Codes Based on the Procedure Route Type					
	ILS (I)	ILS (L)	ILS (B)	VOR (V)	NDB (N)	MLS (M)
IAF	AI	AL	AB	AV	AN	AM
IF	II	IL	IB	IV	IN	IM
FACF	CI	CL	CB	CV	CN	CM
FAF	FI	FF	FB	FV	FN	FM
MAP	MI	ML	MB	MV	MN	MM
TDP	TI	TL	TB	TV	TN	TM
Step-down	SI	SL	SB	SV	SN	SM
FEP	EI	EL	EB	EV	EN	EM
	RNAV (R)	TACAN (T)	IGS (G)	LDA (X)	SDF (U)	GPS (P)
IAF	AR	AT	AG	AX	AU	AP
IF	IR	IT	IG	IX	IU	IP
FACF	CR	CT	CG	CX	CU	CP
FAF	FR	FT	FG	FX	FU	FP
MAP	MR	MT	MG	MX	MU	MP
TDP	TR	TT	TG	TX	TU	TP
Step-down	SR	ST	SG	SX	SU	SP
FEP	ER	ET	EG	EX	EU	EP
	MLS (W)	MLS (Y)	NDB+DME(Q)	FMS (F)	GLS (J)	VORDME (D)
IAF	AW	AY	AQ	1F	AJ	AD
IF	IW	IY	IQ	2F	IJ	ID
FACF	CW	CY	CQ	3F	CJ	CD
FAF	FW	FY	FQ	4F	FJ	FD
MAP	MW	MY	MQ	5F	MJ	MD
TDP	TW	TY	TQ	6F	TJ	TD
Step-down	SW	SY	SQ	7F	SJ	SD
FEP	EW	EY	EQ	8F	EJ	ED
	VOR (S)					
IAF	AS					
IF	IS					
FACF	CS					
FAF	FS					
MAP	MS					
TDP	TS					
Step-down	SS					
FEP	ES					

D. Constant Radius to a Fix Waypoint

The Constant Radius to a Fix Path Terminator (RF LEG) has available a constellation of three fixes to assist in defining the arc. These are the ARC Center Fix, the Initial Fix, and the Ending Fix. As the waypoints in question will be related to a specific terminal procedure or set of procedures for an airport, these waypoints are defined as Terminal Waypoints.

When not provided by the source document, identifiers for such waypoints should be developed from their use in the arc definition, in two parts:

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Part One - a three-character alpha code indicating position within the constellation:

ARC = ARC Center Waypoint
AIF = ARC Initial Waypoint
AEF = ARC Ending Waypoint

Part Two - a two character numeric that ensures a unique waypoint within the set of terminal waypoints for a given airport.

Examples: ARC01, AIF01, AEF01

E. Unnamed Step-down Fix Waypoints

The majority of published, unnamed step-down fix waypoints are defined by DME distances from a DME associated with procedure reference facility. The naming convention for these points makes use of that general standard. The convention will still be used for unnamed step-down fix waypoints even if they are not DME defined.

1. Two digits to identify the distance.
2. Three characters to identify the procedure type.
3. Position digits to identify decimal or full nautical miles.

Examples:

An unnamed step-down fix at 0.5 DME from an ILS DME = 05ILS
An unnamed step-down fix at 1.7 DME from a LOC DME = 17LOC
An unnamed step-down fix at 3.5 GPS = 35GPS
An unnamed step-down fix at 12 DME from a VORDME = DME12

7.3 Waypoint Name/Description

The waypoint Name field is assigned to all waypoints in accordance with the ground rules set forth in this section. ICAO Document 4444 defines an international standard for the name of both officially assigned and non-assigned designators at significant points along a route of flight. These rules are in accordance with that standard.

7.3.1 Named Waypoints

UNIQUE FIVE-LETTER

The name field will contain the same five-letter name as the Waypoint Identifier field.

Examples:

Fix Ident	Fix Name
LOGAN	LOGAN

NAME WITH MORE THAN FIVE LETTERS

The name field will contain the full name of the fix.

Examples:

Fix Ident	Fix Name
RABIT	RABBITT
RREDY	ROUGH AND READY

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NAMES WITH MORE THAN FIVE LETTERS AND AN ASSIGNED FIX IDENTIFIER

The name field will contain the full name of the fix with the assigned identifier in parenthesis.

Examples:

Fix Ident	Fix Name
SPH	SEA PERCH (SPH)
CRP	CARP (CRP)

7.3.2 Unnamed Waypoints

UNNAMED TURN POINTS, INTERSECTIONS, AND BEARING/DISTANCE WAYPOINTS

The name field for unnamed waypoints whose identifiers are established under rule 7.2.4 will have a description of the waypoint to assist in finding the location on aeronautical charts. This description will use the forming NAVAID identifier and bearing/distance information.

Examples:

Fix Ident	Fix Name	
ABC12	ABC090012	ABC 090 degrees, 12 nm
81ABC	ABC090181	ABC 090 degrees, 181 nm
AB13	AB180013	AB 180.3 degrees 12.8

Decimal values, round up for 0.5 or greater and round down for 0.4 or less

D185J ABC185010 ABC 185 degrees, 10 nm

If duplications result from this convention, the duplicate and subsequent waypoint idents will remove the third character of the navaid ident (if necessary) and add a duplicate alpha indicator suffix after the distance information beginning with A. When the distance information is at the beginning of the waypoint ident, the duplicate indicator will prefix the distance information.

Examples:

Fix Ident	Fix Name	
SD40A	SDG313040	SDG 313 degrees, 40 nm
SD40B	SDG318040	SDG 318 degrees, 40 nm
SD40C	SDG327040	SDG 327 degrees, 40 nm
A81SD	SDG090181	SDG 090 degrees, 181 nm
B81SD	SDG100181	SDG 100 degrees, 181 nm
C81SD	SDG110181	SDG 110 degrees, 181 nm

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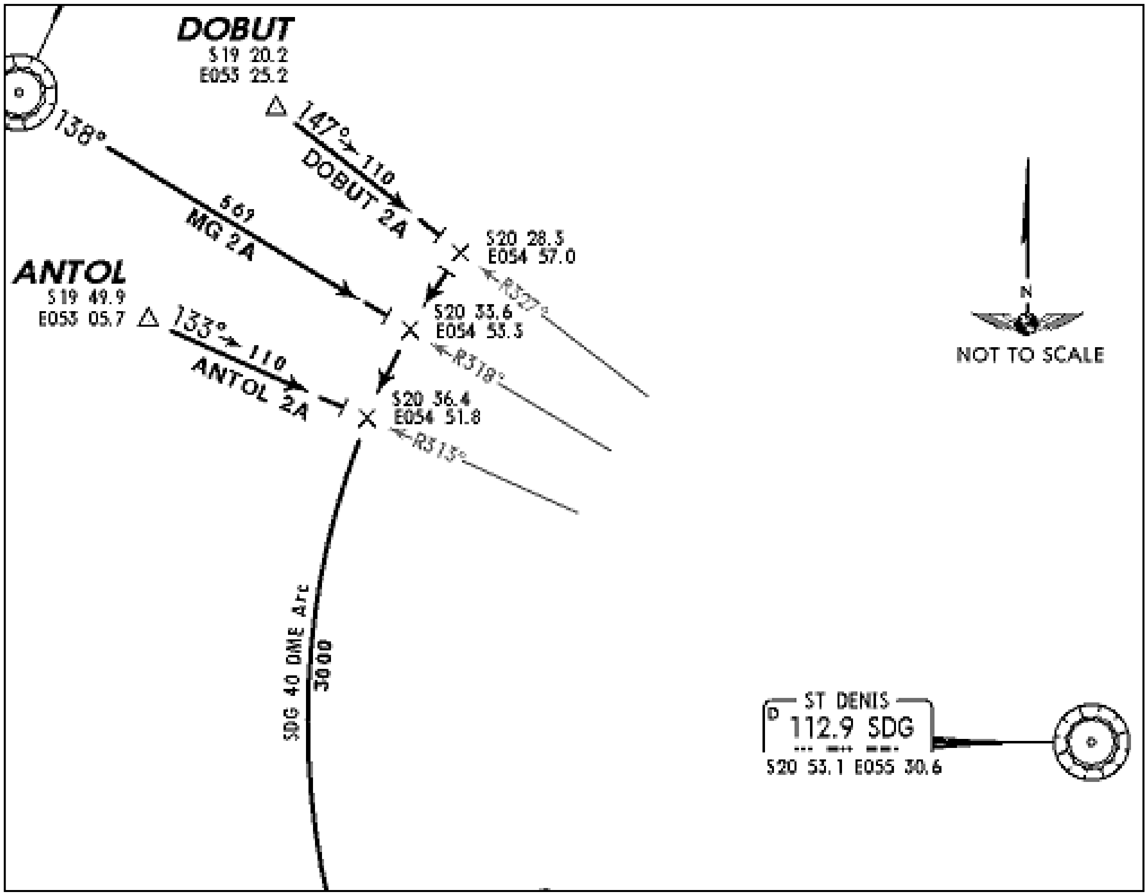
Example from ST PIERRE, REUNION (FMEP):



7.3.3 Airport-Related Waypoints

MARKERS AS TERMINAL WAYPOINTS

For Markers that are shown as Terminal Waypoints, the runway with which the marker is associated will be included in the name field.

Pos 1 and 2: OM, IM, MM, or BM
Pos 3: blank
Pos 4 thru 8: runway identifier
Pos 9: blank
Pos 10 thru 25: additional name when required

Examples:

Fix Ident	Fix Name
OM18	OM RW18
ALTUR	OM RW26L ALTUR

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7.3.4 Navaid Waypoint

The Name/Description field of a waypoint established at the position of a navaid will contain the full navaid name, and navaid type when known.

Examples:

Fix Ident	Fix Name
UZGOD	Uzgorod NDB
CHENY	Camp Henry VORTAC

7.3.5 Airport Waypoint

The Name/ Description field of a waypoint established at the position of an airport will contain the full airport name and the published airport term.

Examples:

Fix Ident	Fix Name
JHKD	Juhankerd Airfield
RONDE	Rondaville Airport

7.3.6 VFR Waypoints

If a VFR Waypoint is to be included in the Enroute (EA), Airport Terminal (PC), or Heliport Terminal (HC) Waypoint files for which the government authority has not provided a five-letter-name-code, one is to be created using the following conventions:

Positions 1 and 2 =	use the characters VP or VC, alternatively VF or VS
Positions 3 thru 5 =	numeric

The identifiers so created are to be unique within a given ARINC Area Code.

Examples: VP001
VC101

VP or VC are the preferred position 1 and 2 codes. VF and VS are to be used after all numeric, 001 to 999, for given ARINC Area Code have been used.

7.4 SID/STAR Procedure Identifiers

Naming Rules

When source documents for procedure identifiers published by the controlling agency include computer abbreviations, they will be used in the appropriate fields. When the source provides codes, designations are not compatible with the requirements of an aeronautical database, modifications are required. In such cases, SID/STAR identifiers are assigned to all procedures in accordance with the ground rules set forth in this Chapter. The SID/STAR identifier must be limited to a maximum of 6 characters in length. Current international standards for assigning coded designators permit up to 7 characters (ICAO Annex 11, Appendix 3). These seven characters normally consist of a basic indicator, validity indicator, and, when required, a route indicator. The basic indicator names the significant point where the departure terminates or the arrival begins. The ICAO validity indicator publicizes the current edition of the arrival or departure. This is a numeric character from one to nine. The ICAO route indicator is an alpha character which is added, as necessary, to distinguish between more than one departure terminating at the same significant point or arrival beginning at the same point.

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A. For a published SID or STAR identifier not derived from the ending/beginning NAVAID or waypoint follow these rules:

If the identifier is:

1. Alphanumeric, then shorten the published name down to six characters by simply dropping characters from the name from right to left. If such a SID or STAR uses numeric or alpha detail, always retain that suffix (validity/route indicator) detail, dropping an additional number of characters from the name as required.

   Examples:

   POGO Departure, no waypoint named POGO, would be POGO
   North Departure (or Departure to North), would be NORTH
   Military One Arrival would be MILIT1
   Noise Abatement Six Departure would be NOISE6
   Arrival Seven would be ARRIV7

2. Either all numeric or a runway identifier, then add the characters DEP for Departure or ARR for Arrival to the identifier, dropping letters (on DEP or ARR) from right to left where required.

   Examples:

   One Departure would be DEP1
   31 Arrival would be ARR31
   131 Departure would be DEP131
   311 Arrival would be ARR311
   1001 Departure would be DE1001
   2000 Arrival would be AR2000
   Runway 07 Departure would be DEP07
   Runway 25 Arrival would be ARR25
   Runway 01L Departure would be DEP01L

B. For a published SID or STAR identifier derived from a NAVAID or Waypoint follows these rules:

If the SID (departure) terminates or STAR (arrival) begins with a

1. NAVAID, then use the ident of the NAVAID in all cases, even when the NAVAID name is five characters or less.

   Examples:

   Bucks Seven Arrival from Bucks VOR BKS would be BKS7

   Kellogg Five Alpha Departure to Kellogg VOR WDK would be

   WDK5A

   Fink Two Delta Arrival from Fink VOR FNK would be FNK2D

2. Published Waypoint with 5-character name, then if:
   a. No validity indicator or route indicator has been published, then retain the basic name as published.
   b. Only a validity indicator has been published, then retain the basic name and the validity indicator as published.

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c. Only a route indicator has been published, then retain the basic name and the route indicator as published.

Examples:

ALLAN Departure to ALLAN waypoint would be ALLAN
CAROL One Departure to CAROL waypoint would be CAROL1

STEVE Alpha Arrival from STEVE waypoint would be STEVEA

d. Both a validity indicator and a route indicator have been published, then drop the last (5th) character of the basic name and retain the validity indicator and route indicator.

Examples:

DAVIS Five Bravo Departure to DAVIS waypoint would be DAVI5B

ANITA Six Delta Arrival from ANITA waypoint would be ANIT6D

e. The Waypoint name contains double letters and both validity indicator and route indicator are published, then drop the 5th character of the waypoint name and retain the validity indicator and route indicator.

Examples:

WITTY One Alpha Departure to WITTY waypoint would be WITT1A

MASSA Two Charlie Arrival from MASSA waypoint would be MASS2C

3. Published Waypoint with more than 5 characters, then reduce the name to 5 characters using the established waypoint rules from this chapter and then apply rule B.2 above.

Examples:

COTTON One Departure to COTTON waypoint would be COTON1
BURWELL Bravo Arrival from BURWELL waypoint would be BURWLB

CLEAR LAKE Three Golf Departure to CLEAR LAKE waypoint would be CLAK3G

4. Published Duplicate Waypoint (as identified by WAYPOINT IDENTIFIERS, Section 7.2.3) then, drop the digit added to provide uniqueness (unless the digit is necessary because of the procedures existing at the same airport).

Examples:

CHARLIE Departure to a waypoint in the database as CHAR1 or CHAR2 would be CHAR (retain only these four characters)

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CHARLIE One Departure to a waypoint in the database as CHAR1 or CHAR2 would be CHAR1

CHARLIE One Alpha Departure to a waypoint in the database as CHAR1 or CHAR2 would be CHAR1A

SHAWNEE Departure to a waypoint in the database as SHA1E as there are more than nine points named SHAWNEE within the ICAO would be SHAE (as SHAE1 through SHAE9 came before SHA1E)

SHAWNEE One BRAVO Departure to a waypoint in the database as SHA1E as there are more than nine points named SHAWNEE within the ICAO would be SHAE1B.

5. Unpublished Waypoint name, then use the rule for the points as described in WAYPOINT IDENTIFIERS, Section 7.2.4 (unnamed waypoints), and apply the rule in B.2 above.
6. Unpublished SIDs or STARs without any name or identifier are currently not included in the aeronautical navigation database and, hence, are not currently provided for in these naming rules for SID/STAR identifiers.

For Engine Out SIDs, use an identifier provided by source documentation when such is available. If an Engine Out SID is to be coded that does not have a source provided identifier, it is recommended that an identifier will be created by adding the prefix EO to the Runway Designator. For example, an Engine Out SID for Runway 07L could be designated EO07L. Note that with this convention, only one Engine Out SID per runway could be included in a master airline user file. This does not preclude coding an Engine Out SID with other naming conventions. Examples of other naming conventions would be: AO07L, E007L, EO07LA, EO07-B, etc.

7.5 Preferred Route Identifiers

7.5.1 North American Routes

For North American Routes for North Atlantic Traffic, Non-Common portion and other Preferred or Preferential Routes without published identifiers but with unique initial and terminus fix points, the route identifier will be developed using the initial and terminus fix identifiers, as indicated in the table below.

Fix Type	Create Identifier Using
Airport	Three or Four Character Airport Identifier
Navaid	Navaid Identifier
Waypoint	Waypoint Identifier (five-character max)

Examples: From Airport to Airport – CYYLCYYC
From Airport to Navaid – CYYLART
From Navaid to Waypoint - ARTCOLAR

7.5.2 Multiple Routes - Same Fix

If there is more than one routing without a published identifier between the same two fixes and the rules in Section 7.5.1 are being used to create the route identifier, then add numeric to indicate the multiple routings.

Examples: For two routes between the airports CYYL and CYYC, CYYLCYYC1 and CYYLCYYC2

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7.5.3 Preferred or Preferential Routes

For Preferred or Preferential Routes without a published identifier and not between unique initial and terminus fix points but rather from areas or regions such as Terminal Control Areas, FIRs or Geographical Entities, the route identifier will be derived from commonly understood elements such as communications center identifiers, country or region abbreviations and the like. Note that if one end of the routing is a unique fix, the rules in Section 7.5.1 apply for that fix.

Area or Region	Create Identifier Using
FIR, ARTCC	Four Character ICAO Identifier of FIR or Center
Terminal Area	Three or Four Character Identifier of owning airport
Geographical Entity	Commonly used abbreviations
ICAO Region	Two-character ICAO Region Code

Examples: From Terminal Area to Airport – CYULCYYC
From FIR to FIR – ENBOGCCC
From Center to Airport – KZTLKRDM
From Geographical Entity to Terminal Area SCANDIGCCC

7.5.4 Multiple Routes - Same Points/Areas/Regions

If there is more than one routing without a published identifier between the same two points/areas/regions and the rules in Section 7.5.3 is being used to create the route identifier, add numeric to indicate the multiples.

Examples: For two routes between KZTL and KRDM KZTLKRDM1 and KZTLKRDM2

7.5.5 Preferred or Preferential Overfly Routings

For Preferred or Preferential Overfly Routings, routings that are not designed to serve an initial departing airport/terminal area or terminus arriving airport/terminal area, the route identifier will be derived from the fix, area or region to be overflown and a direction of overflight prefix or a direction of origin in reference to the direction of overflight suffix, according to the table below. If the route is an overflight route and no directional restrictions apply, the character O for overfly is used instead of the directional indication.

Fix/Area/Region	Direction	Create Identifier Using
Airport		Three or 4-character Airport Identifier
Navaid		Navaid Identifier
Waypoint		Waypoint Identifier
FIR, ARTCC		Four Character FIR/Center ICAO
Terminal Area		Identifier
Geographical Entity		Identifier of owning Airport
		Commonly used abbreviations
ICAO Region		Two-character ICAO Region Code
	North	The character N
	South	The character S
	East	The character E
	West	The character W
	Overfly	The character O

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Note: The direction codes shown in the table are provided for guidance only. Any published direction may be indicated by the use of a one, two, or three character prefix/suffix.

Examples:

Overflying Terminal Area Eastbound – ECYUL
Overflying FIR Southbound – SENBO
Overflying from West of a Center – KZTLW
Overflying Center Southwest bound – SWKZDV
Overflying Terminal Area (no direction specified) OEGLL

7.5.6 Multiple Routes - Overfly

If there is more than one routing without a published identifier between the fix/area/region and the rules in Section 7.5.5 are being used to create the identifier, add a numeric to indicate the multiples.

Examples: SENBO1 and SENBO2
OEGLL1, OEGLL2, 0EGLL3

7.5.7 Preferred Weekday/Weekend

For Preferred or Preferential Routings that are published with a weekday and a weekend version, the rules for multiples are replaced with a two-character suffix (replacing the numeric). WK is used for weekday and WE are used for weekend. This rule applies to routes both with and without published identifiers.

Examples: Published Identifiers - TOS1WK and TOS1WE
Unpublished Identifiers - SENBOWK and SENBOWE

7.5.8 Weekday/Weekend

If there is more than one routing published as weekday or weekend and the rules in Section 7.5.7 are being used to create the identifier, add a numeric to indicate the multiples.

Examples: TOS1WK1 and TOS1WK2

7.5.9 Geographical Routings

For Preferred or Preferential Routings that are published as being between large areas not definable with aeronautical terms, a convention of Geographical Entity abbreviations is used to create Route Idents. As these Route Idents will have reduced the entity name down considerably, the Geographical Entity Reference Table is used to provide a link between the Route Ident and the full entity name. While the Route Ident is 10 characters long and normal split five and five between the initial and terminus points of the route, that split does not have to be applied when creating Route Idents based on Geographical Entities.

Examples: Routing between UK North and Greece West - UKNOGRECW or NOUKWGRECE

7.5.10 Multiple Routes - Geographical

If there is more than one routing without a published identifier between geographical entities and the rules in Sections 7.5.8 are being used to create the identifier, add a numeric to indicate the multiples.

Examples: UKNOGRECW1 and UKNOGRECW2

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7.5.11 Off Load Route

For Preferred or Preferential Routings that are published with an off-load route, the rules for multiples are replaced with a three-character suffix (replacing the numeric). OLR is used for the off-load route. The standard route would not use a suffix. This rule applies to routes both with and without published identifiers.

Examples: Published Identifiers - TOS1 and TOS1OLR
Unpublished Identifiers - SENBO and SENBOOLR

7.5.12 Multiple Routes - Off Load

If there is more than one routing published as off load route and the rules in Section 7.5.11 are being used to create the identifier, add a numeric to indicate the multiples.

Examples: SENBOOLR1 and SENBOOLR2

7.6 Transition Identifiers

Unless a transition identifier, compatible with the maximum five-character length for such identifiers, are provided in official government source data, transition identifiers are created by the data supplier based on the rules in this section.

Transition Identifiers are required for Approach Transitions, SID and STAR Enroute Transitions, SID and STAR Runway Transitions, and certain types of Missed Approach Transitions. See Section 5.11 of this document.

When official government source provides a Transition Name, that Name will be used as the Transition Identifier, as long as it is compatible with the maximum five-character length for this data field.

When official government source provides a Transition Name that exceeds the maximum character length of five characters, that Name will be shortened to five characters for the Transition Identifier, using the same conventions that are applied to Waypoint Names and Identifiers as defined in Section 7.2.3.

Data suppliers will create Transition Identifiers in those cases where a source provided Identifier or Name is not available. These identifiers will be based on the identifier assigned to a fix as follows:

> For Approach Transitions and STAR Enroute Transitions, the identifier of the fix at which the transition begins.
>
> For SID Enroute and some Missed Approach Transitions, the identifier of the fix at which the transition ends.
>
> When Approach Transition Identifiers are not published in source documentation, they are created using the identifier of the Navaid or Waypoint at which the transition starts. If multiple Approach Transitions start at the same Navaid or Waypoint, the Navaid or Waypoint is supplemented with an additional numeric character to ensure a unique identifier for each transition.

Example: When two transitions start at a Navaid ABC, one would be given the identifier of ABC1 and the other ABC2. When two transitions start at a Waypoint ABCDE, drop the last character and assign a number such as ABCD1 and ABCD2.

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When multiple Missed Approach Procedures are required, a Missed Approach Transition Identifier is also required. The identifiers will be developed based on the identifier of the missed approach holding fix, Navaid or Waypoint, or the last fix coded in the Missed Approach Procedure if no missed approach holding fix is provided. If multiple Missed Approach Procedures end at the same missed approach holding or ending fix, the Navaid or Waypoint identifier is supplemented with an additional character to ensure a unique identifier for each transition.

Example: When two transitions end at a Navaid ABC, one would be given the identifier of ABC1 and the other ABC2. When two transitions end at a Waypoint ABCDE, drop the last character and assign a number such as ABCD1 and ABCD2.

For SID and STAR Runway Transitions, the identifier of the runway from which (SID) or to which (STAR) the transition is associated using the convention detailed in Section 7.2.6.A of this specification, i.e., RW plus the runway designation. In the coding of individual runway transitions, the use of the character B along with the runway designation, such as RW08B, indicates that a single runway transition has been coded for all available parallel runways. This can be RW08L and RW08R or RW08L, RW08C, and RW08R. If there are parallel runways and the single transition cannot be coded for all instances, individual runway transitions must be coded.

If a SID or STAR Runway Transition applies identically to all parallel runways, the transition is coded once and the Transition Identifier is created by replacing the parallel indications of C (Center), L (Left) and R (Right) with the alpha character B (Both). For example, transitions for Runways (RW) 08L and 08R are identical. The transition can be coded once with an identifier of RW08B.

If the fix involved in Rules 7.6.5.1 and 7.6.5.2 is a waypoint and the identifier of that waypoint has been created or modified by the data supplier using the conventions contained in Sections 7.2.2.1, 7.2.2.2, 7.2.3, 7.2.4, 7.2.5, and 7.2.6 of this section, the exact same convention is applied to the creation or modification of the Transition Identifier.

SID/STAR Runway Transition Identifiers for procedures from or to helipads will be established using the helipad identifier, followed by an additional character when there is more than one Runway Transition from the same pad.

Examples: Transitions for a Helipad with the identifier of MAIN in multiple directions would have the Transition Identifiers of MAIN1, MAIN2 or MAINN, MAINS.

In cases where multiple transitions are starting or ending at the same fix and are based on the aircraft categories of A&B or C&D, the transition identifier for C&D aircraft will be the fix identifier with a numeric 1 suffix added. The transition identifier for A&B aircraft will be the fix identifier with a numeric 2 suffix added. If the transition identifier is five characters, the last character of the fix identifier will be replaced with the appropriate numeric suffix.

If there are multiple transitions starting at the same fix (Approach and STAR) or ending at the same fix (SID, some Missed Approach), and they are not designated as category A&B or C&D, the transition whose track angle is most closely aligned with north (360) will have a transition identifier of the fix identifier and a numeric suffix of 1, the identifier of the second transition, in the clockwise direction, will contain a numeric suffix of 2, etc. If the transition identifier is five characters, the last character of the fix identifier will be replaced with the appropriate numeric suffix.

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8.0 ARINC 424 XML

8.1 XML

In computing, Extensible Markup Language (XML) is a markup language that defines a set of rules for representing data.

The XML implementation of ARINC 424 data was created to enable greater flexibility for the increasing complexity of aeronautical data, e.g., procedure and route design parameters.

Use of the ARINC 424 XML implementation will require the accompanying electronic files:

- XML Schema Definition files (XSD)
- Model documentation (HTML and/or PDF)

8.1.1 XSD

XSD (XML Schema Definition) specifies the formal description of the elements in an XML document. XSD expresses a set of rules to which an XML document must conform in order to be considered "valid" according to that schema.

The ARINC 424 XSD files specify the ARINC 424 XML format, and therefore form the actual ARINC 424 XML specification itself.

The model documentation is automatically generated from the ARINC 424 XSD files and provides detailed documentation of the XSD schema.

COMMENTARY

Supplement 22 added the XML implementation of the data in Chapters 4 and 5 of ARINC 424.

This initial implementation is a beta version and the NDB Subcommittee designated this initial implementation mature so that business units could start development.

The XML definition is considered an integral part of the this standard and is expected to be updated at the release of each subsequent supplement.

All new ARINC 424 legacy fixed width proposals will include information to allow them to be incorporated into the XML schema. However, the reverse will not be true going forward with XML specific proposals. It will be up to those that wish to continue with the fixed-width format to develop a proposal to incorporate any new XML proposal back into the fixed-width format.

8.2 XML Schema Definition (XSD) Files

The ARINC 424 XSD schema definitions are organized into the following files:

Types/DataTypes.xsd	Contains all the type definitions for the XML records.
Types/Enumerations.xsd	Contains all the enumeration constants for the XML records.

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Records/______.xsd	Contains the individual ARINC 424 XML record definitions (e.g., Ports.xsd, SIDSTARApproach.xsd, Legs.xsd, etc.)

The definitions in the first two files correspond to Chapter 5 of this document. The definitions in the Records sub-directory correspond to Chapter 4 of this document.

8.3 ARINC 424 XML Design

One of the fundamental aspects of the ARINC 424 XML design is that it makes use of two hierarchies:

1. A "class" hierarchy, which describes the relationship between types of data elements. The ARINC 424 XML hierarchy is an example of a typical class hierarchy found throughout object-oriented software design. This class hierarchy is metadata.
2. A "containment" hierarchy, which describes how actual navigation data is grouped into lists or containers.

8.3.1 Class Hierarchy

The ARINC 424 XML class hierarchy is specified by the XSD schema definition files. It is not manifested in the XML data itself.

The class hierarchy for ARINC 424 XML is shown in Figure 8-1.

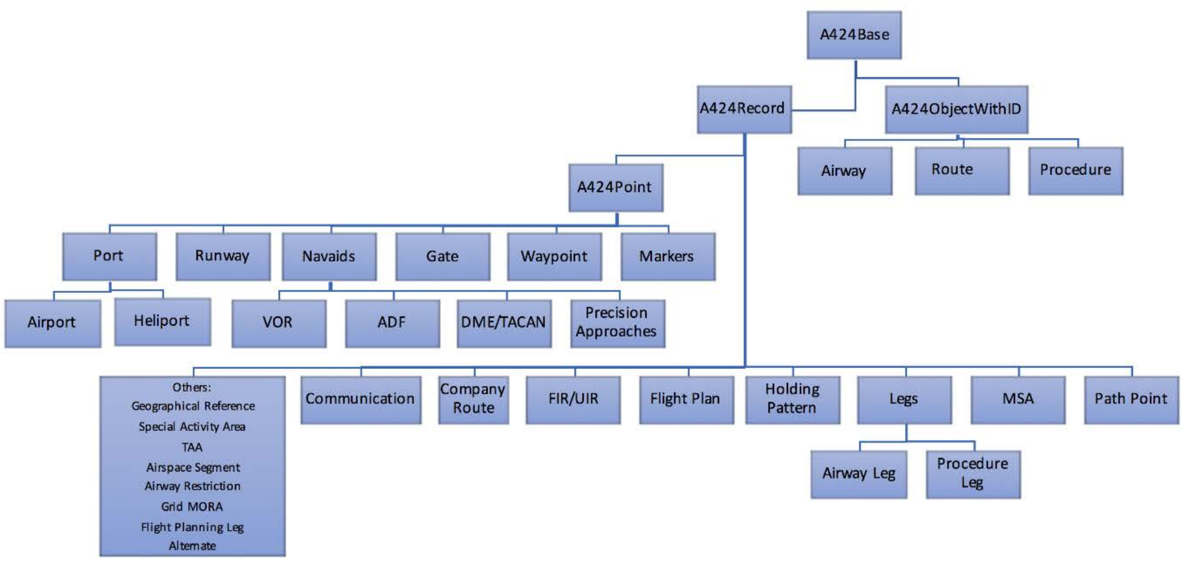

Figure 8-1 – Class Hierachy

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Class	Notes
A424Base	Contains only user or application specific supplemental data
A424ObjectWithID	Parent of any class of data which has a unique identifier, but is not an ARINC 424 record by itself (for example a terminal procedure).
A424Record	Parent of any class which represents an ARINC 424 record (in the sense of the legacy ARINC 424 format). Includes record type, cycle date, and customer or area code.
A424Point	Parent of any record class which contains a latitude and longitude

Note: Airspace and Cruising Tables are subclasses of A424Base directly because they do not have identifiers, and are not ARINC 424 records in and of themselves.

8.3.2 Containment Hierarchy

All of the data normally contained within a single ARINC 424 database is contained in an ARINC 424 XML structure named *AeroPublication*. An AeroPublication contains the database metadata, such as origin, validity, etc., and a series of lists representing the actual navigation data. The lists structure generally mirrors the record or “file” structure of the ARINC 424 legacy format.

The general list structure is as follows:

AeroPublication
Waypoints
Navaids
Airports
Heliports
Airways
Company routes
Airspaces
Alternates
Cruising tables
Preferred routes
Communication
Geographical references
Grid MORAs
Holding patterns

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Airport and heliport data elements also contain a series of lists in addition to the data about the airport or heliport itself. The structure of these lists is as follows

Airport/Heliport
Runways
Helipads
Procedures
SIDs
STARs
Approaches
Terminal waypoints
Terminal NDBs
TAAs
Localizers
MSAs
Communications

8.3.3 Flight Paths

Terminal procedures are composed of a collection of procedure routes. The procedure routes correspond most closely to what are commonly known as transitions. For example, approaches generally consist of several approach transitions, a final approach route, and one or more missed approach routes. Each of these is an instance of an approach route.

Airways are composed of a sequence of routes commonly known as segments.

Airway segments and procedure routes are composed of sequenced lists of legs.

The other lists in an AeroPublication are generally flat lists of records.

8.3.4 References Within XML Databases

A key element of the ARINC 424 XML design is the use of references between elements or records. The ARINC 424 XML Schema uses the XSD types ID and IDREF to implement these references. These references are effectively links or pointers which allow one element to refer to another. For example, the fix element on a leg record can link directly to the record for that fix (e.g., an airport, navaid, or waypoint).

This design has two benefits:

1. It avoids the need to perform a lookup based on identifier etc., for these referenced elements
2. It reduces the amount of duplicated data in the legacy format

8.3.5 Cycle Dates for Procedures and Routes

If any data at the procedure or route level change (e.g., transition altitude), the cycle date for all legs on that procedure or route must change with it because procedures and routes do not have independent cycle dates. This does not preclude the ability to change cycle dates on individual legs when data specific to that leg is changed.

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8.4 Notes on Specific Schema Fields/Elements

8.4.1 Identifiers

The ARINC 424 XML Schema provides a common type – *CoreIdentifier* – for all identifiers. This type encompasses the identifier fields described in Sections 5.6, 5.8, 5.9, 5.10, 5.11, 5.13, 5.33, and 5.116 of this document. See those sections for additional specifications for identifiers.

8.4.2 Route Identifiers

Routes (procedure transitions, airway segments, etc.) are generally required to have identifiers. The exceptions to this are common segments of SIDs and STARs, and final and missed approach routes on approaches. These fields may have empty strings for identifiers in the ARINC 424 XML format. See Section 5.11 of this document for more details.

8.4.3 DME and TACAN Navaid Records

The ARINC 424 XML Schema provides for separate record types for DME and TACAN records. In the ARINC 424-legacy format, DME navaids share the record with VORs. If the DME is standalone, the VOR fields in the legacy record are not filled in.

The new XML design explicitly allows for both independent, stand-alone DME and TACAN navaids, as well as DME and TACAN navaids paired with VORs. The dmeRef field in the VOR record is used to indicate paired navaid combinations.

8.4.4 Time Zones

Start and end times are specified in the *TimesOfOperations* data type using the XSD type *xs:time*. A time zone may be set for these fields, in which case the time is specified in the local time zone. If no time zone is set, UTC is assumed.

If a time zone is set indicating a local time, it should be the same for both start and end times. The *adjustForDST* field in the enclosing *TimesOfOperation* instance may then be set to indicate that the time follows daylight saving time changes in accordance with the local DST calendar.

8.5 Glossary

Class refers to the meta-data description of a type of data, e.g., an airport or waypoint description

Object or *data element* refers to an actual piece of data, e.g., a specific airport, latitude, etc.

--`,,`,,,`,,`,``,`,,,`,`,`````-`-`,,`,,`,`,,`---

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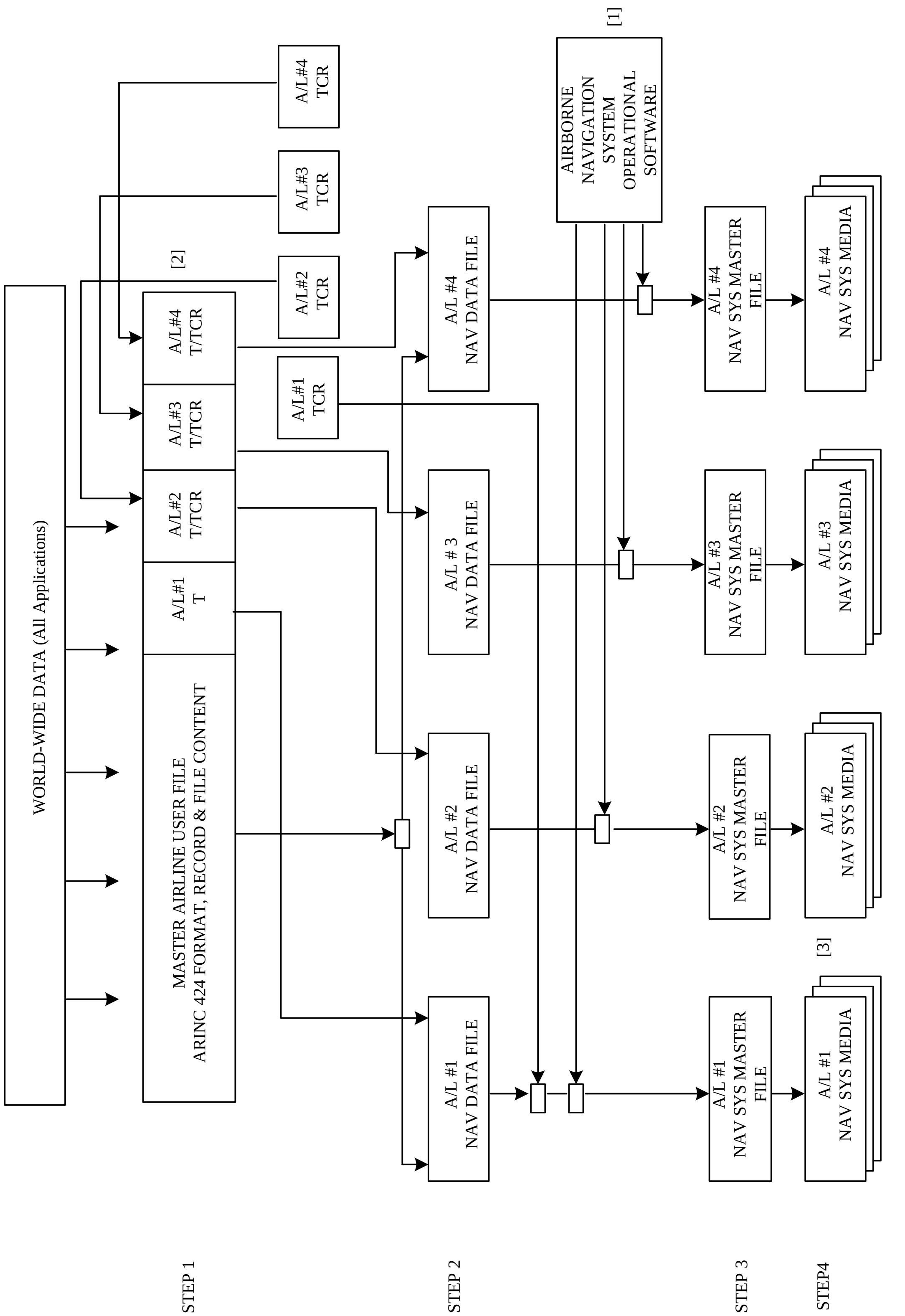
ATTACHMENT 1
FLOW DIAGRAM

ATTACHMENT 1 FLOW DIAGRAM



See next page for Notes 1 and 2.

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ATTACHMENT 1
FLOW DIAGRAM

Notes Concerning the Flow Diagram

1. The flow diagram shows alternate paths to individual airline master files for Tailored Company Route (TCR) data in the individual airline boxes of step 1 level.
2. Airline tailored records (denoted by the letter T in the individual airline boxes of the Step 1 level) will be formatted according to the standards set forth in this document.

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ATTACHMENT 2 LOCAL HORIZONTAL REFERENCE DATUM NAME, DATUM CODE, ELLIPSOID LIST, AND OGP REFERENCE

Attachment 2 represents the ARINC 424 standard for the horizontal datum values found in Section 5.197 Datum Code, in Chapter 5.

Although Attachment 2 is a representation of ARINC Specification 424, the tables within the attachment were created using the following documentation:

NIMA TR8350.2 3rd edition, January 3, 2000. Supplementing the NIMA document were updated versions of datum documentation from the International Association of Oil and Gas Producers (OGP), ESRI datum code list, University of Colorado Geography Dept., ISO 1911 Geographic Information – Spatial referencing by coordinates, and web searches for specific state provided information.

Attachment 2 will not be maintained based on revision activity of these docs.

Of the various columns in Attachment 2, only the ARINC 424 Datum Code column data is used to populate the 5.197 Datum Code field.

Attachment 2A also includes Datum Names that do not have an associated Datum Code that can be used for reference purposes.

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ARINC 424 Datum Name	ARINC Datum Code	Associated Ellipsoid Name	Associated Ellipsoid Code	Typical Location Use	OGP DATUM CODE	OGP Ellipsoid Code	OGP Description/Notes
Adindan	ADI	Clarke 1880	CD	Burkina Faso, Cameroon, Ethiopia, Mali, Senegal, Sudan	6201	7012	
Afgooye	AFG	Krassovsky 1940	KA	Somalia	6205	7024	
Ain El Abd 1970	AIN	International 1924	IN	Bahrain Island, Saudi Arabia	6204	7022	
American Samoa 1962	AMA	Clarke 1866	CC	American Samoa Islands	6199	7008	
Anna 1 Astro 1965	ANO	Australian National	AN	Cocos Islands	6708	7003	
Antigua Island Astro 1943	AIA	Clarke 1880 (RGS)	CD	Antigua, Leeward Islands	6601	7012	
Arc 1950	ARF	Clarke 1880 (Arc)	CD	Botswana, Burundi, Lesotho, Malawi, Swaziland, Zaire, Zambia, Zimbabwe	6209	7013	
Arc 1960	ARS	Clarke 1880 (RGS)	CD	Kenya, Tanzania	6210	7012	
Ascension Island 1958	ASC	International 1924	IN	Ascension Island	6712	7022	
Astro Beacon E 1945	ATF	International 1924	IN	Iwo Jima	6709	7022	Iwo Jima 1945
Astro DOS 71/4	SHB	International 1924	IN	St. Helena Island	6710	7002	St. Helena 1971
Astro Tern Island (Frig) 1961	TRN	International 1924	IN	Tern Island	6707	7002	Tern Island 1961
Astronomical Station 1952	ASQ	International 1924	IN	Marcus Island	6711	7002	Marcus Island 1952
Australian Geodetic 1966	AUA	Australian National	AN	Australia and Tasmania	6202	7003	Australian Geodetic Datum 1966 - Alias AGD66
Australian Geodetic 1984	AUG	Australian National	AN	Australia and Tasmania	6203	7003	Australian Geodetic Datum 1984 - Alias AGD84
Austria NS	ANS	International 1924	IN				
Ayabelle Lighthouse	PHA	Clarke 1880 (RGS)	CD	Djibouti	6713	7012	Alias - Base SW, Graciosa, Azores Central 1948
Bellevue (IGN)	IBE	International 1924	IN	Efate and Erromango Islands	6714	7022	Bellevue - Alias Bellevue (IGN)
Bermuda 1957	BER	Clarke 1866	CC	Bermuda Islands	6216	7008	
Bissau	BID	International 1924	IN	Guinea-Bissau	6165	7022	Bissau
Bogota Observatory	BOO	International 1924	IN	Colombia	6218	7022	Alias is ‘Bogota’

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ARINC 424 Datum Name	ARINC Datum Code	Associated Ellipsoid Name	Associated Ellipsoid Code	Typical Location Use	OGP DATUM CODE	OGP Ellipsoid Code	OGP Description/Notes
Bukit Rimpah	BUR	Bessel 1841	BR	Bangka and Belitung Islands (Indonesia)	6219	7004	
Camp Area Astro	CAZ	International 1924	IN	Camp McMurdo Area, Antarctica	6715	7022	
Campo Inchauspe 1969	CAI	International 1924	IN	Argentina	6221	7022	Campo Inchauspe
Canton Astro 1966	CAO	International 1924	IN	Phoenix Islands	6716	7022	Phoenix Islands 1966
Cape	CAP	Clarke 1880 (Arc)	CD	South Africa	6222	7013	Alias - South Africa
Cape Canaveral	CAC	Clarke 1866	CC	Florida (East) and Bahamas	6717	7008	
Carthage	CGE	Clarke 1880 (IGN)	CD	Tunisia	6223	7011	
Chatham Island Astro 1971	CHI	International 1924	IN	Chatham Island (New Zealand)	6672	7022	Superseded by Chatham Islands Datum 1979
Chua Astro	CHU	International 1924	IN	Paraguay	6224	7022	Chua
Co-Ordinate System 1937 of Estonia	EST	Bessel 1841	BR	Estonia			
Corrego Alegre	COA	International 1924	IN	Brazil	6225	7022	
Dabola	DAL	Clarke 1880 (IGN)	CD	Guinea	6155	7011	Dabola 1981
Danish Geodetic Institute 1934 System	DAN	Danish 1876	DA	Denmark		7051	
Deception Island	DID	Clarke 1880 (RGS)	CD	Deception Island, Antarctica	6736	7012	
Djakarta (Batavia)	BAT	Bessel 1841	BR	Sumatra (Indonesia)	6211	7022	Alias - GENUK
DOS 1968	GIZ	International 1924	IN	Gizo Island (New Georgia Islands)	6722	7022	South Georgia 1968
Easter Island 1967	EAS	International 1924	IN	Easter Island	6719	7022	

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ARINC 424 Datum Name	ARINC Datum Code	Associated Ellipsoid Name	Associated Ellipsoid Code	Typical Location Use	OGP DATUM CODE	OGP Ellipsoid Code	OGP Description/Notes
uropean 1950	EUR	International 1924	IN	Austria, Belgium, Channel Islands, Cyprus, Denmark, Egypt, England, Finland, France, Federal Republic of Germany (West Germany), Gibraltar, Greece, Iran, Iraq, Ireland, Israel, Italy, Jordan,	6230	7022	European Datum 1950 - Alias - ED50
				Kuwait, Lebanon, Luxembourg, Malta, Netherlands, Norway, Portugal, Sardinia, Saudi Arabia, Scotland, Shetland Islands, Sicily, Spain, Sweden, Switzerland, Syria, Tunisia			
European 1979	EUS	International 1924	IN	Austria, Finland, Netherlands, Norway, Spain, Sweden, Switzerland	6668	7022	European Datum 1979 - Alias ED79
Fort Thomas 1955	FOT	Clarke 1880	CD	Nevis, St. Kitts, Leeward Islands	6605	7012	St. Kitts 1955
Gan 1970	GAA	International 1924	IN	Republic of Maldives	6684	7022	
Gandajika Base	GAN	International 1924	IN	Zaire	6259	7022	Malongo 1987 - Alias - Mhast
Geodetic Datum 1949	GEO	International 1924	IN	New Zealand	6272	7022	New Zealand Geodetic Datum 1949 - Alias - GD49
Graciosa Base SW 1948	GRA	International 1924	IN	Faial, Graciosa, Pico, Sao Jorge and Terceira Islands (Azores)	6183	7022	Azores Central Islands 1948 - Alias - Base SW or Graciosa
Greek Geodetic Reference System 1987	GRX	GRS 80	RF	Greece	6121	7019	Alias - GGRS87
Guam 1963	GUA	Clarke 1866	CC	Guam	6675	7008	

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ARINC 424 Datum Name	ARINC Datum Code	Associated Ellipsoid Name	Associated Ellipsoid Code	Typical Location Use	OGP DATUM CODE	OGP Ellipsoid Code	OGP Description/Notes
Gunuung Segara	GSE	Bessel 1841	BR	Kalimantan (Indonesia)	6613	7004	Alias - P2 Exc, P2 Exc-T9, Samboja
GUX 1 Astro	DOB	International 1924	IN	Guadalcanal Island	6718	7022	Solomon 1968
Herat North	HEN	International 1924	IN	Afghanistan	6255	7022	
Hermannskogel	HER	Bessel 1841	BR	Yugoslavia (Prior to 1990), Slovenia, Croatia, Bosnia and Herzegovina, and Serbia	6312	7004	Militar-Geograp hische Institut - Alias - MGI, HR1901, D48
Hjorsey 1955	HJO	International 1924	IN	Iceland	6658	7022	
Hong Kong 1963	HKD	International 1924	IN	Hong Kong	6738	7022	Alias - HK63
Hu-Tzu-Shan	HTN	International 1924	IN	Taiwan	6236	7022	
Indian	IND	Everest	EA	Bangladesh			
			EC	India, Nepal			
			EF	Pakistan			
Indian 1954	INF	Everest 1830 (1937 Adjustment)	EA	Thailand	6239	7015	
Indian 1960	ING	Everest 1830 (1937 Adjustment)	EA	Vietnam	6131	7015	
Indian 1975	INH	Everest 1830 (1937 Adjustment)	EA	Thailand	6240	7015	
Indonesian 1974	IDN	Indonesian 1974	ID	Indonesia	6238	7021	Indonesian Datum 1974 - Alias - ID74
Ireland 1965	IRL	Modified Airy	AM	Ireland	6300	7002	Geodetic Datum of 1965 - Alias - TM65
ISTS 061 Astro 1968	ISG	International 1924	IN	South Georgia Island	6722	7022	South Georgia 1968
ISTS 073 Astro 1969	IST	International 1924	IN	Diego Garcia	6724	7022	Diego Garcia 1969
Johnston Island 1961	JOH	International 1924	IN	Johnston Island	6725	7022	
Kandawala	KAN	Everest 1830 (1937 Adjustment)	EA	Sri Lanka	6244	7015	
Kerguelen Island 1949	KEG	International 1924	IN	Kerguelen Island	6698	7022	IGN 1962 Kerguelen - From Kerguelen Island 1949 Datum
Kertau 1948	KEA	Everest	EE	West Malaysia, Singapore	6245	7018	Kertau 1968 - Alias - Malaysia Revised Triangulation 1968
Kusaie Astro 1951	KUS	International 1924	IN	Caroline Islands, Fed. States of Micronesia	6735	7022	Kusaie 1951
L.C. 5 Astro 1961	LCF	Clarke 1866	CC	Cayman Brac Island	6726	7008	Little Cayman 1961
Leigon	LEH	Clarke 1880	CD	Ghana	6250	7012	
Liberia 1964	LIB	Clarke 1880	CD	Liberia	6251	7012	

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ARINC 424 Datum Name	ARINC Datum Code	Associated Ellipsoid Name	Associated Ellipsoid Code	Typical Location Use	OGP DATUM CODE	OGP Ellipsoid Code	OGP Description/Notes
Luzon	LUZ	Clarke 1866	CC	Philippines	6253	7008	Luzon 1911 Superceded by Philippine Reference System 1992 - Alias - PRS92
M'Poraloko	MPO	Clarke 1880	CD	Gabon	6266	7011	Datum - Clarke 1880 (IGN)
Mahe 1971	MIK	Clarke 1880	CD	Mahe Island	6256	7012	
Manchurian Principal System	MCN	Bessel 1841	BR	Manchuria			
Massawa	MAS	Bessel 1841	BR	Eritrea (Ethiopia)	6262	7004	
Merchich	MER	Clarke 1880 (IGN)	CD	Morocco	6261	7011	
Midway Astro 1961	MID	International 1924	IN	Midway Islands	6727	7022	Midway 1961
Minna	MIN	Clarke 1880 (RGS)	CD	Cameroon, Nigeria	6263	7012	
Montjong Lowe	MOL	Bessel 1841	BR	Sulawesi (Indonesia)			
Montserrat Island Astro 1958	ASM	Clarke 1880 (RGS)	CD	Montserrat, Leeward Islands	6604	7012	Montserrat 1958
Nahrwan	NAH	Clarke 1880 (RGS)	CD	Masirah Island (Omna), United Arab Emirates, Saudi Arabia	6270	7012	Nahrwan 1967 - Datum Clarke 1880 (RGS)
Nanking 1960	NAN	International 1924	IN	China			
Naparima, BWI	NAP	International 1924	IN	Trinidad and Tobago	6271	7022	Naparima 1972

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ARINC Datum Name	ARINC Datum Code	Associated Ellipsoid Name	Associated Ellipsoid Code	Typical Location Use	OGP DATUM CODE	OGP Ellipsoid Code	OGP Description/Notes
North American 1927	NAS	Clarke 1866	CC	Bahamas, Canada, Canal Zone, Caribbean, Central America, Greenland, Mexico, United States	6267	7008	Several versions of NAD27 exist. Care must be taken when converting NAD27 to include the country and in some cases a region within the country for coordinate transformation.
North American 1983	NAR	GRS 1980	RF	Canada, Central America, Mexico, United States	6269	7019	
North Sahara 1959	NSD	Clarke 1880	CD	Algeria	6307	7012	Nord Sahara 1959 - Datum Clarke 1880 (RGS)
Nouvelle Triangulation de France (FRANCE)	IGF	Clarke 1880	CD				
Observatorio Meteorologico 1939	FLO	International 1924	IN	Corvo and Flores Islands (Azores)	6182	7022	Azores Occidental Islands 1939 - Alias - Observatario Flores, Observatorio 1966, Azores Occidental 1939
Old Egyptian 1907	OEG	Helmert 1906	HE	Egypt	6229	7020	Egypt 1907 - Alias Old Egypt superseded by Egypt 1930 - Alias - New Egypt
Old Hawaiian	OHA	Clarke 1866	CC	Hawaiian Islands	6135	7008	
Oman	FAH	Clarke 1880	CD	Oman	6134	7012	PDO Survey Datum 1993 - Datum Clarke 1880 (RGS)
Ordnance Survey of Great Britain 1936	OGB	Airy 1830	AA	England, Isle of Man, Scotland, Shetland Islands, Wales	6277	7001	OSGB 1936 - Updated with OS (SN) 1980 (6279)
Palmer Astro	PAM	International 1924	IN	Antarctica			
Parametrop Zemp 1990 (English translation) The Parameters of the Earth 1990	RPE	PZ-90	PE	Russian Federation Alias – PE90 and SGS90	6740	7054	Used for GLONASS
Pico de las Nieves	PLN	International 1924	IN	Canary Islands	6728	7022	
Pitcairn Astro 1967	PIT	International 1924	IN	Pitcairn Island	6729	7022	Pitcairn 1967
Point 58	PTB	Clarke 1880	CD	Burkina Faso, Niger	6620	7012	Datum - Clarke 1880 (RGS)
Point Noire 1948	PTN	Clarke 1880	CD	Congo	6282	7011	Congo 1960 Pointe Noire - Datum Clarke 1880 (IGN)
Porto Santo 1936	POS	International 1924	IN	Porto Santo and Madeira Islands	6663	7022	Porto Santo 1936 (6615) updated to Porto Santo 1995 (6663)
Portuguese Datum 1973	PRD	International 1924	IN				
Potsdam	PDM	Bessel 1841	IN	Germany	6746	7004	Multiple versions of the Potsdam datum exist, i.e., Postdam Datum/83
Provisional South American 1956	PRP	International 1924	IN	Bolivia, Chile, Colombia, Ecuador, Guyana, Peru, Venezuela	6248	7022	Alias - PSAD56
Provisional South Chilean 1963 (also known as Hito XVIII 1963)	HIT	International 1924	IN	Southern Chile (near 53°S)	6254	7022	Also called Hito XVIII 1963

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ARINC Datum Name	ARINC Datum Code	Associated Ellipsoid Name	Associated Ellipsoid Code	Typical Location Use	OGP DATUM CODE	OGP Ellipsoid Code	OGP Description/Notes
Puerto Rico	PUR	Clarke 1866	CC	Puerto Rico and Virgin Islands	6139	7008	
Pulkovo 1942	PUK	Krassovsky 1940	KA	Russia	6200	7024	Pulkovo 1942 (6284) updated to Pulkovo 1995 (6200)
Qatar National	QAT	International 1924	IN	Qatar	6614	7022	Qatar 1974 (6285) updated to Qatar National Datum 1995 (6614)
Qornoq	QUO	International 1924	IN	South Greenland	6194	7022	Qornoq 1927
Reunion	REU	International 1924	IN	Mascarene Islands	5156	7022	Reunion 1947 (6626) - Alias Piton des Neiges - updated to Reseau Geodesique de la Reunion 1992 (6627)
Rome 1940	MOD	International 1924	IN	Sardinia	6806	7022	Monte Mario (6265) - Alias Rome 1940 updated to Monte Marion (Rome) (6806)
RT90	RTS	Bessel 1841	BR	Sweden - Onshore & Offshore	6124	7004	Rikets Koordinatsystem 1990 (RT90) - Central Meridan = Stockholm
S-42 (Pulkovo 1942)	SPK	Krassovsky 1940	KA	Albania, Czechoslovakia (prior to 1 January 1993), Hungary, Kazakhstan, Latvia, Poland, Romania	6178	7024	Pulkovo 1942/58 (6179) updated to Pulkovo 1995 (6178) - Alias - S42
Santo (DOS) 1965	SAE	International 1924	IN	Espirito Santo Island	6730	7022	Santo 1965 - Alias - Santo (DOS)
Sao Braz	SAO	International 1924	IN	Sao Miguel, Santa Maria Islands (Azores)	6664	7022	Datum Azores Oriental Islands 1940 (6184) updated to Azores Oriental Islands 1995 (6664)
Sapper Hill 1943	SAP	International 1924	IN	East Falkland Island	6292	7022	
Schwarzeck	SCK	Bessel Namibia (GLM)	BN	Namibia	6293	7046	Ellip - Bessel Namibia (GLM)
Selvagem Grande 1938	SGM	International 1924	IN	Salvage Islands	6616	7022	Datum - Alias - Marco Astro, Selvagem Grande
Sierra Leone 1960	SRL	Clarke 1880	CD	Sierra Leone	6175	7012	Ellip - Clarke 1889 (RGS)
S-JTSK	CCD	Bessel 1841	BR	Czechoslovakia (prior to 1 January 1993)	6818	7004	S-JTSK (Ferro)
South American 1969	SAN	GRS 1967 (SAD69)	SA	Argentina, Bolivia, Brazil, Chile, Colombia, Ecuador, Baltra and Galapagos Islands, Guyana, Paraguay, Peru, Trinidad and Tobago, Venezuela	6618	7050	
South Asia	SOA	Modified Fischer 1960	FA	Singapore			
Stockholm 1938 (RT38)	STO	Bessel 1841	BR	Sweden - Onshore & Offshore	6308	7004	Stockholm 1938 (6308) Prime Meridian = Greenwich, superseded by Rikets koordinatsystem 1990 (RT90) (6124)
Sydney Observatory	SYO	Clarke 1858	CA	New South Wales, Australia			

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ARINC Datum Name	ARINC Datum Code	Associated Ellipsoid Name	Associated Ellipsoid Code	Typical Location Use	OGP DATUM CODE	OGP Ellipsoid Code	OGP Description/Notes
Tananarive Observatory 1925	TAN	International 1924	IN	Madagascar	6297	7022	Tananarive 1925 (6297)
Timbalai 1948	TIL	Everest	EB	Brunei and East Malaysia (Sarawak and Sabah)	6298	7016	Ellip - Everest 1830 (1967 Definition)
Tokyo	TOY	Bessel 1841	BR	Japan, Okinawa, South Korea	6301	7004	
Trinidad Trigonometrical Survey	TRI	Clarke 1858	CA	Trinidad and Tobago	6302	7007	Trinidad 1903
Tristan Astro 1968	TDC	International 1924	IN	Tristan da Cunha Island Group	6734	7022	Tristan 1968
Unknown	U						
Viti Levu 1916	MVS	Clarke 1880 (International Foot)	CD	Viti Levu Island (Fiji Islands)	6752	7055	Viti Levu 1916 also known as Viti Levu 1912
Voirol 1874	VOI	Clarke 1880	CD	Tunisia, Algeria	6304	7011	
Voirol 1960	VOR	Clarke 1880	CD	Algeria			
Wake Island Astro 1952	WAK	International 1924	IN	Wake Atoll	6733	7022	Wake Island 1952
Wake-Eniwetok, 1960	ENW	Hough 1960	HO	Marshall Islands	6732	7053	Marshall Islands 1960
World Geodetic System 1960	WGA	WGS-60	WS	Global			
World Geodetic System 1966	WGB	WGS-66	WC	Global			
World Geodetic System 1972	WGC	WGS-72	WD	Global	6322	7043	Alias WGS72
World Geodetic System 1984	WGE	WGS-84	WE	Global	6326	7030	WGS84
Yacare	YAC	Intl 1924	IN	Uruguay	6309	7022	
Zanderij	ZAN	Intl 1924	IN	Suriname	6311	7022	

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The following is a list of datum names that do not have an assigned datum code.

ARINC Datum Name	ARINC Datum Code	Associated Ellipsoid Name	Associated Ellipsoid Code	Typical Location Use	OGP DATUM CODE	OGP Ellipsoid Code	OGP Description/Notes
Australian Antarctic Datum 1998	Not Assigned	GRS 1980	RF	Antarctica - Australian Sector	6176	7019	Alias - AAD98
Azores Central Islands 1995	Not Assigned	International 1924	IN	Central Azores - Gracisoa, Terceira, Sao Jorge, Pico, Faial	6665	7002	Alias - Base SW, Graciosa, Azores Central 1995
Azores Occidental Islands 1939	Not Assigned	International 1924	IN	Western Azores - Flores, Corvo	6182	7002	Alias - Observatario Flores, Azores Occidental 1939, Observatorio 1966
Azores Oriental Islands 1940	Not Assigned	International 1924	IN	Eastern Azores - Sao Miguel, Santa Maria	6184	7002	Alias - Sao Bras, Azores Oriental 1940
Azores Oriental Islands 1995	Not Assigned	International 1924	IN	Eastern Azores - Sao Miguel, Santa Maria	6664	7002	Alias - Sao Bras, Azores Oriental 1995
Chatham Island Datum 1979	Not Assigned	International 1924	IN	Chatham Island (New Zealand)	6673	7022	
Estonia 1992	Not Assigned	GRS 1980	RF	Estonia	6133	7019	Alias -EST92
Estonia 1997	Not Assigned	GRS 1980	RF	Estonia	6180	7019	Alias - EST97
Fiji 1956	Not Assigned	International 1924	IN	Fiji - Viti Levu, Vanua Levu, Taveuni	6721	7022	Supersedes Vitu Levu 1912 and Vanua Levu 1915.
Fiji Geodectic Datum 1986	Not Assigned	WGS 1972	WD	Fiji - Viti Levu, Vanua Levu, Taveuni, Yasawa Group, Kadavu Group, Lau Islands, Rotuma Islands	6720	7043	Supersedes Vitu Levu 1912 and Vanua Levu 1915 and Fiji 1956 - Alias - Fiji 1986, FGD 1986
Geocentric Datum of Australia 1994	Not Assigned	GRS 1980	RF	Mainland Australia+F120	6283	7019	Geocentric Datum of Australia 1994 - Alias - GDA94
Geodetic Datum of Malaysia 2000	Not Assigned	GRS 1980	RF		6751	7019	Supersedes all Malaysian Datums
Hong Kong 1980	Not Assigned	International 1924	IN	Hong Kong	6611	7022	Alias - HK80
International Terrestrial Reference Frame 1988	Not Assigned	GRS 1980	RF		6647	7019	ITRF88
International Terrestrial Reference Frame 1989	Not Assigned	GRS 1980	RF		6648	7019	ITRF89
International Terrestrial Reference Frame 1990	Not Assigned	GRS 1980	RF		6649	7019	ITRF90
International Terrestrial Reference Frame 1991	Not Assigned	GRS 1980	RF		6650	7019	ITRF91

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ARINC Datum Name	ARINC Datum Code	Associated Ellipsoid Name	Associated Ellipsoid Code	Typical Location Use	OGP DATUM CODE	OGP Ellipsoid Code	OGP Description/Notes
International Terrestrial Reference Frame 1992	Not Assigned	GRS 1980	RF		6651	7019	ITRF92
International Terrestrial Reference Frame 1993	Not Assigned	GRS 1980	RF		6652	7019	ITRF93
International Terrestrial Reference Frame 1994	Not Assigned	GRS 1980	RF		6653	7019	ITRF94
International Terrestrial Reference Frame 1995	Not Assigned	GRS 1980	RF		6654	7019	ITRF95
International Terrestrial Reference Frame 1996	Not Assigned	GRS 1980	RF		6655	7019	ITRF96
International Terrestrial Reference Frame 1997	Not Assigned	GRS 1980	RF		6656	7019	ITRF97
International Terrestrial Reference Frame 2000	Not Assigned	GRS 1980	RF		6657	7019	ITRF2000
International Terrestrial Reference Frame 2005	Not Assigned	GRS 1980	RF		6658	7019	ITRF2005
Libyan Geodetic Datum 2006	Not Assigned	International 1924	IN		6754		Alias - LGD2006 - 5 stations tied to ITRF2000
Monte Mario (Rome)	Not Assigned	International 1924	IN	Italy	6806	7022	Alias - Rome 1940 (Rome)
New Zealand Geodetic Datum 1949	Not Assigned	International 1924	IN	NZGD49	6272	7022	Alias - GD49, NZGD49
New Zealand Geodetic Datum 2000	Not Assigned	GRS 1980	RF	NZGD2000	6167	7019	Alias - NZGD2000
North American 1983 (High Accuracy Regional Network)	Not Assigned	GRS 1980	RF	USA, South Pacific Islands, Caribbean Islands			Alias - NAD83(HARN), NAD83(HPGN)
Egypt 1930	Not Assigned	International 1924	IN	Egypt	6199	7022	Egypt 1930 - Alias - New Egypt - supersedes Old Egypt 1907
Ordnance Survey of Great Britain 1970 (SN)	Not Assigned	Airy 1830	AA	UK	6278	7001	Alias - OSGB70
Philippine Reference System 1992	Not Assigned	Clarke 1866	CC	Philippines - Onshore and Offshore.	6683	7008	Replaced Luzon 1911
Potsdam Datum/83	Not Assigned	Bessel 1841	BR	Germany	6746	704	Alias - PD/83

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ATTACHMENT 2
LOCAL HORIZONTAL REFERENCE DATUM NAME, DATUM CODE, ELLIPSOID LIST, AND OGP REFERENCE

ARINC Datum Name	**ARINC Datum Code**	**Associated Ellipsoid Name**	**Associated Ellipsoid Code**	**Typical Location Use**	**OGP DATUM CODE**	**OGP Ellipsoid Code**	**OGP Description/Notes**
	Not Assigned						
Pulkovo 1942/58	Not Assigned	Krassovsky 1940	KA	Poland	6179	7024	
Pulkovo 1942/83	Not Assigned	Krassovsky 1940	KA	Former East Germany	6178	7024	
Pulkovo 1995	Not Assigned	Krassovsky 1940	KA	Russian Federation	6200	7022	
Qatar National Datum 1995	Not Assigned	International 1924	IN	Qatar	6614	7022	Alias - QND95
Reseau Geodesique de la Reunion 1992	Not Assigned	GRS 1980	RF	Reunion Islands	6627	7019	Alias - RGR92 - Supersedes Reunion 1947 -
Sierra Leone 1968	Not Assigned	Clarke 1880 (RGS)	CD	Sierra Leone	6175	7012	
SIRGAS 1995	Not Assigned	GRS 1980	RT	Central and South America	6170	7019	Tied to ITRF94 - Superceded by SIRGAS 2000
SIRGAS 2000	Not Assigned	GRS 1980	RT	Central and South America	6674	7019	Also called Sistema de Referencia Geocentrico para America del Sur 2000, tied to ITRF2000
Stockholm 1938 (Stockholm) (RT38 - Stockholm)	Not Assigned	Bessel 1841	BR	Sweden - Onshore	6814	7004	Rikets Koordinatsystem 1938 Stockholm - Prime Meridan = Stockholm
SWEREF99	Not Assigned	GRS 1980	RT	Sweden - Onshore & Offshore	6619	7019	Densification of ETRS89 - Equilv to WGS84
Porto Santo 1995	Not Assigned	International 1924	IN	Porto Santo and Madeira Islands	6663	7022	Update of Porto Santo 1936 - Alias - Base SE, Madeira SE Base 1995

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ATTACHMENT 3 NAVIGATION DATA FILE RELATIONSHIPS

The following pages show a sample computer printout of an ARINC 424 data file. Each record in an ARINC 424 file is included. Relationships between various record types within the data file have been maintained, e.g., the Navaids and Waypoints used on the Enroute Airways are available in the appropriate Sections/Subsections.

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ATTACHMENT 3
NAVIGATION DATA FILE RELATIONSHIPS

The following ARINC 424 data file is for example only.

MINIMUM OFF ROUTE ALTITUDE (MORA) (AS)

```
S   AS    N36W120    105168135095143104104116112105122117107139155116111073052046046034030033037035038030027023    000018708
S   AS    N36W150    010010010010010010010010010010010010010010010010010010010010010010010010010010010022082076    000028508
S   AS    N37W120    155166129118118117127137131137137165166164167160095075053049041037037037037032031047031033    000038902
S   AS    N37W150    010010010010010010010010010010010010010010010010010010010010010010010010010010020046057082    000048508
S   AS    N38W120    148136141143139154121145140139151129167168165147084072053045040041042032028030028031026028    000058708
S   AS    N38W150    010010010010010010010010010010010010010010010010010010010010010010010010010010046071036127    000068508
S   AS    N39W120    131111138129131144144124143125119132165168166117086074057049042036031037037032025029030023    000078708
S   AS    N39W150    010010010010010010010010010010010010010010010010010010010010010010010010010034090098095116    000088508
S   AS    N40W120    113122121120137128109134141159146120147146166089078059050046046044042031028028027032023024    000098708
S   AS    N40W150    010010010010010010010010010010010010010010010010010010010010010010010010010054113109128103    000108508
S   AS    N41W120    109117121127132131123117123121119119134144120091079060056049045041049039040031041026034032    000118708
S   AS    N41W150    010010010010010010010010010010010010010010010010010010010010010010010010010041113165104122    000128708
```

CRUISING TABLE (TC)

```
S   TCA01    36001790M   020000200028000280000300031000310000400UNLTD    000358706
S   TCA02    18003590M   0100002000290002900004000UNLTD                  000368706
S   TCA11    36003590M   290000200043000                                 000378810
S   TCA21    36003590M   280000200042000                                 000388810
S   TCA31    36001790M   300000200040000                                 000398810
S   TCA32    18003590M   290000200041000                                 000408810
S   TCAA1    36001790M   0100002000290002900004000UNLTD                  000418706
S   TCAA2    18003590M   020000200028000280000300031000310000400UNLTD    000428706
S   TCBB1    03002090M   0100002000290002900004000UNLTD                  000438810
S   TCBB2    21000290M   020000200028000280000300031000310000400UNLTD    000448903
S   TCC11    36000890M   0100002000290003300004000UNLTD                  000458810
S   TCC12    09001790M   0150002000275003000004000UNLTD                  000468810
S   TCC13    18002690M   0200002000280003100004000UNLTD                  000478810
S   TCC14    27003590M   0250002000285003200004000UNLTD                  000488810
S   TCCC1    36001790M   0100002000290002900004000UNLTD                  000498810
S   TCCC2    18003590M   020000200028000280000300031000310000400UNLTD    000508810
```

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ATTACHMENT 3
NAVIGATION DATA FILE RELATIONSHIPS

The following ARINC 424 data file is for example only.

VHF NAVAID (D)
(With Simulation and Flight Planning Continuations)

```
SUSAD   ACV  K2111020VDTA N40585370W124062570    N40585370W124062570E0170001910  256NASARCATA                015638502
SUSAD   ACV  K22 TB030100+040000B100040                                                                      015648502
SUSAD   ACV  K23PKZSEKZSE                                                                                    015658613
SUSAD   ACV  K24S    UY                                              E017500191                              015668502
SUSAD   AHC  K2110900VDTW N40160466W120090328    N40160466W120090328E0170040080  206NASAMEDEE (HERLONG)      015678811
SUSAD   AHC  K22PKZOAKZOA                                                                                    015698613
SUSAD   AHC  K23S    UN                                              E016604008                              015708201
SUSAD   ALW  K1111640VDLA N46051360W118172930    N46051360W118172930E0200011501      NASWALLA WALLA          015718413
SUSAD   ALW  K12PKZSEKZSE                                                                                    015738613
SUSAD   ALW  K13S    UY                                              E018401150                              015748413
SUSAD   AST  K1111400VDLA N46094270W123524480    N46094270W123524480E0190000101  330NASASTORIA               015758809
SUSAD   AST  K12PKZSEKZSE                                                                                    015778613
SUSAD   AST  K13S    UY                                              E019700010                              015788406
SUSAD   AVE  K2111710VTH  N35384925W119583948    N35384925W119583948E0160007102  567NASAVENAL                015798401
SUSAD   AVE  K22PKZLAKZLA                                                                                    015818613
SUSAD   AVE  K23S    UY                                              E015000710                              015828401
SUSAD   BTG  K1111660VTHA N45445270W122352520    N45445270W122352520E0210002502  451NASBATTLE GROUND         015998801
SUSAD   BTG  K12PKZSEKZSE                                                                                    016018801
SUSAD   BTG  K13S    UY                                              E019300250                              016028801
SUSAD   ELN  K1111790VTHA N47012830W120272620    N47012830W120272620E0210017702  451NASELLENSBURG            016398304
SUSAD   ELN  K12PKZSEKZSE                                                                                    016418613
SUSAD   ELN  K13S    UY                                              E019401770                              016428304
SUSAD   ENI  K2111230VTHA N39031200W123162310    N39031200W123162310E0160029802  411NASMENDOCINO             016438807
SUSAD   ENI  K22PKZOAKZOA                                                                                    016458613
SUSAD   ENI  K23S    UY                                              E016702980                              016468409
SUSAD   EPH  K1111260VTHA N47224100W119252230    N47224100W119252230E0210012502  394NASEPHRATA               016478411
SUSAD   EPH  K12PKZSEKZSE                                                                                    016498613
SUSAD   EPH  K13S    UY                                              E019301250                              016508411
SUSAD   MOD  K2111460VDH  N37373880W120572460    N37373880W120572460E0170000902  571NASMODESTO               017398608
SUSAD   MOD  K22PKZOAKZOA                                                                                    017418613
SUSAD   MOD  K23S    UY                                              E015800090                              017428608
SUSAD   MVA  K2111510VTHA N38335535W118015484    N38335535W118015484E0170078602  476NASMINA                  017438306
SUSAD   MVA  K22PKZOAKZOA                                                                                    017458613
SUSAD   MVA  K23S    UY                                              E015507860                              017468306
SUSAD   NUQ  K2111760 TL                     NUQ N37255680W122032320E0170000041  314NASNAVY MOFFETT FIELD    017758806
SUSAD   NUQ  K22PKZOAKZOA                                                                                    017778806
SUSAD   NUQ  K23S    UY                                              E0159                                   017788806
SUSAD   NUW  K1111380 TH                     NUW N48211838W122393600E0200000502  325NASNAVY WHIDBEY ISLAND   017798806
SUSAD   NUW  K12PKZSEKZSE                                                                                    017818806
SUSAD   NUW  K13S    UY                                              E0205                                   017828806
SUSAD   OAK  K2111680VTH  N37433360W122132100    N37433360W122132100E0170000103  477NASOAKLAND               017838110
SUSAD   OAK  K22PKZOAKZOA                                                                                    017858613
SUSAD   OAK  K23S    UY                                              E016000010                              017868110
SUSAD   OED  K1111360VTHA N42284710W122544250    N42284710W122544250E0190020802  410NASMEDFORD               017918411
SUSAD   OED  K12PKZSEKZSE                                                                                    017938613
SUSAD   OED  K13S    UY                                              E017902080                              017948411
```

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ATTACHMENT 3
NAVIGATION DATA FILE RELATIONSHIPS

The following ARINC 424 data file is for example only.

VHF NAVAID (D)
(With Simulation and Flight Planning Continuations)
(Continued)

```
SUSAD        UBG  K1111740VTHA N45211220W122583700    N45211220W122583700E0210014402  493NASNEWBERG                019078110
SUSAD        UBG  K12PKZSEKZSE                                                                                      019098613
SUSAD        UBG  K13S    UY                                          E019101440                                    019108110
SUSAD        YKM  K1111600VTHA N46341350W120263640    N46341350W120263640E0210009802  525NASYAKIMA                 019158502
SUSAD        YKM  K12PKZSEKZSE                                                                                      019178613
SUSAD        YKM  K13S    UY                                          E019200980                                    019188502
SUSAD KSEAK1 ISZI K1111170 IT                      ISZIN47260947W122183980     003660  588NASSEATTLE-TACOMA INTL   019588808
SUSAD KSEAK1 ISZI K12PKZSEKZSE                                                                                      019598713
SUSAD KSEAK1 ISZI K13S    UN  L                                       E020000366                                    019608901
```

NDB NAVAID (DB)
(With Simulation and Flight Planning Continuations)

```
SUSADB       ARU  K2102150H MW N41281600W120332500                   E0180           NASALTURAS                019768110
SUSADB       ARU  K22S     U21                                                                                  019788110
SUSADB       ARU  K23PKZSEKZSE                                                                                  019798110
SUSADB       CAN  K1102740H MW N47243880W122501510                   E0200           NASCARNEY (BREMERTON)     019848308
SUSADB       CAN  K12S     U21                                                                                  019868308
SUSADB       CAN  K13PKZSEKZSE                                                                                  019878308
SUSADB       CC   K2103350HOMW N38024740W122015640                   E0170           NASKANAN                  019888807
SUSADB       CC   K22S     U21                                                                                  019908807
SUSADB       CC   K23PKZOAKZOA                                                                                  019918807
SUSADB       F    K2103140H  W N37415400W123001200                   E0170           NASFARALLON ISLAND        020088110
SUSADB       F    K22S     U21                                                                                  020108110
SUSADB       F    K23PKZOAKZOA                                                                                  020118110
SUSADB       MOG  K2103820H  A N41433840W122285050                   E0200           NASMONTAGUE               020768110
SUSADB       MOG  K22S     U21                                           02620                                  020788110
SUSADB       MOG  K23PKZSEKZSE                                                                                  020798110
```

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ATTACHMENT 3
NAVIGATION DATA FILE RELATIONSHIPS

The following ARINC 424 data file is for example only.

ENROUTE WAYPOINT (EA)
(With Flight Planning Continuations)

```
SUSAEAENRT   26FLW K21     I D  N36442340W121282270          E0156   NAS    B  FLW306/D126       021528110
SUSAEAENRT   26FLW K22PKZOAKZOA                                                                  021538701
SUSAEAENRT   ALFOR K11     R F L N44183310W123090510         E0187   NAS    P  ALFOR             021648207
SUSAEAENRT   ALFOR K12PKZSEKZSE                                                                  021658613
SUSAEAENRT   ALTAM K21     R Z L N37484410W121444580         E0160   NAS    P  ALTAM             021668613
SUSAEAENRT   ALTAM K22PKZOAKZOA                                                                  021678701
SUSAEAENRT   BRINY K21     RF  L N37181740W122393800         E0159   NAS    P  BRINY             022408303
SUSAEAENRT   BRINY K22PKZOAKZOA                                                                  022418701
SUSAEAENRT   BTG32 K11     I   L N45335140W121524960         E0190   NAS    B  BTG089/DLS234     022488802
SUSAEAENRT   BTG32 K12PKZSEKZSE                                                                  022498802
SUSAEAENRT   BTG51 K11     I   L N44522830W122361410         E0189   NAS    B  BTG160/EUG010     022508802
SUSAEAENRT   BTG51 K12PKZSEKZSE                                                                  022518802
SUSAEAENRT   LOFAL K11     R Z L N47503790W122401980         E0203   NAS    P  LOFAL             025738409
SUSAEAENRT   LOFAL K12PKZSEKZSE                                                                  025748613
SUSAEAENRT   MOGNB K21     N   B N41433840W122285050         E0175   NAS    Q  MONTAGUE          026278110
SUSAEAENRT   MOGNB K22PKZOAKZOA                                                                  023858613
SUSAEAENRT   ODESS K11     R Z H N47081310W117582330         E0188   NAS    P  ODESS             026708304
SUSAEAENRT   ODESS K12PKZSEKZSE                                                                  026718613
SUSAEAENRT   SHOEY K21     R Z L N36444462W122075863         E0157   NAS    P  SHOEY             028438904
SUSAEAENRT   SHOEY K22PKZOAKZOA                                                                  028448701
```

ENROUTE MARKER (EM)

```
SUSAEM       K101  K10.-.  EL   N46123100W1235751001290      E0210   NAS    FORT STEVENS         029988706
SUSAEM       K104  K10.-.  EL   N43072800W1232054101770      E0200   NAS    WINSTON              029998613
```

HOLDING (EP)

```
SUSAEPENRT            10AVE  K2D 01300R   1518000FL450             AVENAL             030038904
SUSAEPENRT            10ODESSK1EA02530R   10       17999           ODESS              030048904
SUSAEPENRT            20ALTAMK2EA01770L   100500017999160          ALTAM              030058904
SUSAEPENRT            20BTG  K1D 01490R   10       17999           BATTLE GROUND      030068904
SUSAEPENRT            20OED  K1D 03370R   10       17999           MEDFORD            030078904
SUSAEPENRT            20UBG  K1D 00030L   10       17999           NEWBERG            030088904
SUSAEPENRT            21BRINYK2EA00570R   10       17999           BRINY              030098904
SUSAEPENRT            22BRINYK2EA02370R   10       17999           BRINY              030108904
SUSAEPENRT            30EPH  K1D 02460R   10       17999           EPHRATA            030118904
SUSAEPENRT            40EPH  K1D 02460R   10       17999           EPHRATA            030128904
SUSAEPENRT            40UBG  K1D 00030L   10       17999           NEWBERG            030148904
SUSAEPENRT            50MOD  K2D 02440L   10       17999           MODESTO            030158904
SUSAEPENRT            50ELN  K1D 02500R   10       17999           ELLENSBURG         030168904
SUSAEPKSEAK1          40FINNYK1PC00230R   0500150009000150         FINNY              030178904
SUSAEPKSEAK1          50FINNYK1PC00230R   0500150009000150         FINNY              030188904
```

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ATTACHMENT 3
NAVIGATION DATA FILE RELATIONSHIPS

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ENROUTE AIRWAY (ER)

```
SUSAER    C1415   0010FOT  K2D 0V    CB AA        252012400000 UNKNN     FL450        030308803
SUSAER    C1415   0020REDOOK2EA0EEC  CB           000000002510                        030318702
SUSAER    C1416   0010FOT  K2D 0V    CB AA        305013300000 UNKNN     FL450        030328704
SUSAER    C1416   0020DAASHK2EA0EEC  CB           000000003050                        030338902
SUSAER    C1418   0010HQM  K1D 0V    CB AA        210013800000 UNKNN     FL450        030348704
SUSAER    C1418   0020SEDARK1EA0EEC  CB           000000002100                        030358110
SUSAER    C1419   0010ONP  K1D 0V    CB AA        216013700000 UNKNN     FL450        030368704
SUSAER    C1419   0020HEMLOK1EA0EEC  CB           000000002160                        030378110
SUSAER    C1486   0010ENI  K2D 0V C  CB AA        285019600000 UNKNN     FL450        030388803
SUSAER    C1486   0020REDOOK2EA0EEC  CB           000000002850                        030398803
SUSAER    J1      0570OAK  K2D 0V C  OH AA        343014203010 1800022000FL450        030408704
SUSAER    J1      0580RBL  K2D 0V C  OH AA        330014603420 1800022000FL450        030418704
SUSAER    J1      0590OED  K1D 0V C  OH AA        345019703290 1800022000FL450        030428704
SUSAER    J1      0600BTG  K1D 0V    OH AA        345006503430 1800022000FL450        030438801
SUSAER    J1      0610ALDERK1EA0T  H OH AA        345003703450 1800022000FL450        030448704
SUSAER    J1      0620SEA  K1D 0VEC  OH           000000003450                        030458207
SUSAER    J110    0010OAK  K2D 0V C  OH AA        138007000000 18000     FL450        030468704
SUSAER    J110    0030SNS  K2D 0V    OH AA        064008801380 18000     FL450        030478704
SUSAER    J110    0040CZQ  K2D 0V C  OH AA        086002600670 24000     FL450        030488704
SUSAER    J110    0050PINNIK2EA0E    OH AA        086003400860 24000     FL450        030498704
SUSAER    J110    0055MITELK2EA0R    OH AA        086011700860 24000     FL450        030508704
SUSAER    J20     0210PDT  K1D 0V C  OH AA        290008202750 18000     FL450        030828704
SUSAER    J20     0220YKM  K1D 0V    OH AAY       284005402880 18000     FL450        030838704
SUSAER    J20     0225RADDYK1EA0R  H OH AAY       281003902840 18000     FL450        030848704
SUSAER    J20     0230SEA  K1D 0VEC  OH           000000002810                        030858110
SUSAER    J3      0010OAK  K2D 0V C  OH AA        343014200000 18000     FL450        030868704
SUSAER    J3      0020RBL  K2D 0V C  OH AAY       010016303420 18000     FL450        030878704
SUSAER    J3      0030LKV  K1D 0V C  OH AAY       356013400100 18000     FL450        030888704
SUSAER    J3      0040IMB  K1D 0V C  OH AA        006019503550 18000     FL450        030898704
SUSAER    V105    0220YERINK2EA0E    OL AA        299003102990 10000     17999        031678704
SUSAER    V105    0230CHIMEK2EA0E    OL AA        299001502990 10000     17999        031688704
SUSAER    V105    0240FMG  K2D 0VEC  OL           000000002990                        031698603
SUSAER    V107    0120CITIEK2EA0R    OL AA        313002003130 07000     17999        031708704
SUSAER    V107    0130PXN  K2D 0V C  OL AA        296003403130 07000     17999        031718704
SUSAER    V107    0140CATHEK2EA0E    OL AA        296002602960 07000     17999        031728704
SUSAER    V107    0150VINCOK2EA0R    OL AA        294000502940 06000     17999        031738704
SUSAER    V107    0160MABRYK2EA0R    OL AA        294000602940 05500     17999        031748704
SUSAER    V107    0170MISONK2EA0T    OL AA        294000502940 04500     17999        031758704
SUSAER    V107    0180IMPLYK2EA0T    OL AA        294000502940 04500     17999        031768704
SUSAER    V107    0190DECOTK2EA0T    OL AA        294001102940 04500     17999        031778704
SUSAER    V107    0200OAK  K2D 0V C  OL AA        288001602940 05000     17999        031788704
SUSAER    V107    0210COMMOK2EA0E    OL AA        288000802880 05000     17999        031798704
SUSAER    V107    0220MICRAK2EA0T    OL AA        288001302880 05000     17999        031808704
SUSAER    V107    0230PYE  K2D 0V C  OL AA        289001502880 05000     17999        031818704
SUSAER    V107    0240BOARSK2EA0EE   OL           000000002890                        031828206
```

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ATTACHMENT 3
NAVIGATION DATA FILE RELATIONSHIPS

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ENROUTE AIRWAY (ER)
(Continued)

```
SUSAER     V108     0050STS  K2D 0V    OL AA           118002900000 04500    17999          031838704
SUSAER     V108     0060SGD  K2D 0V    OL AA           114001101170 03000    17999          031848704
SUSAER     V108     0070CROITK2EA0E    OL AA           079000701140 03000    17999          031858704
SUSAER     V108     0080CCR  K2D 0V    OL AA           071000700790 03000    17999          031868704
SUSAER     V108     0090PITTSK2EA0E    OL AA           071001100710 03500    17999          031878902
SUSAER     V108     0100OAKEYK2EA0E    OL AA           071001600710 02000    17999          031888902
SUSAER     V108     0110LODDIK2EA0E    OL AA           071001500710 02000    17999          031898704
SUSAER     V108     0120LIN  K2D 0VEC  OL              000000000710                         031908110
```

ENROUTE AIRWAY RESTRICTION RECORD (EU)

```
SUSAEUJ20  001TCOYKM  K1D SEA  K1D 31JAN9031MAR90CS1707001700                   A0          031918913
SUSAEUJ3   001NR1RBL  K2D IMB  K1D 01JAN9031DEC90AVBL ONE WAY RBL TO IMB DURING LAKEVIEW AFB  031928913
SUSAEUJ3   001NR2                     MORNING AND EVENING SCRAMBLE ACTIVITY                    031938913
```

ENROUTE COMMUNICATIONS (EV)

```
SUSAEVALW    MOSES LAKE          FSS0012240 V1  R A N47123960W119185640E0193     Y                        039188810
SUSAEVALW    MOSES LAKE          FSS0012240 V2                                    WALLA WALLA              039198810
SUSAEVALW    MOSES LAKE          TWE0011500 V1    A N47123960W119185640E021001177Y              MWH K1D   039208810
SUSAEVALW    MOSES LAKE          TWE0011500 V2                                                              039218810
SUSAEVKZSEZRFTHE DALLES          ACC0011965 V1 DGRA N45425000W121055900E0190     Y                        041568810
SUSAEVKZSEZRFTHE DALLES          ACC0011965 V2                                    SEATTLE                  041578810
SUSAEVKZSEZRFYAKIMA              ACC0012030 V1  GRA N46314000W120304600E0192     Y                        041628810
SUSAEVKZSEZRFYAKIMA              ACC0012030 V2                                    SEATTLE                  041638810
SUSAEVKZSEZRFYAKIMA              ACC0013260 V1 DGRA N46314000W120304600E0192     Y                        041648810
SUSAEVKZSEZRFYAKIMA              ACC0013260 V2                                    SEATTLE                  041658810
SUSAEVKZSEZRUYAKIMA              ACC0012030 V1  GRA N46314000W120304600E0192     Y                        041948810
SUSAEVKZSEZRUYAKIMA              ACC0012030 V2                                    SEATTLE                  041958810
SUSAEVKZSEZRUYAKIMA              ACC0013475 V1  GRA N46314000W120304600E0192     Y                        041968810
SUSAEVKZSEZRUYAKIMA              ACC0013475 V2                                    SEATTLE                  041978810
SUSAEVSEA     THE DALLES         FSS0012200 V1E R A N45425000W121055900E021003220N              DLS K1D   045168810
SUSAEVSEA     THE DALLES         FSS0012200 V2 H  1507002300                      SEATTLE                  045178810
SUSAEVSEA     THE DALLES         FSS0012265 V1  R A N45425000W121055900E021003220Y              DLS K1D   045188810
SUSAEVSEA     THE DALLES         FSS0012265 V2                                    SEATTLE                  045198810
SUSAEVSEA     THE DALLES         TWE0011230 V1    A N45425000W121055900E021003220N              DLS K1D   045208810
SUSAEVSEA     THE DALLES         TWE0011230 V2 N                                                            045218810
USUAEVSEA     THE DALLAS         TWE0011230 V3    SPRING AND FALL PERIODS ONLY                             045228810
SUSAEVSEA     YAKIMA             FSS0012250 V1  R A N46313300W120315200E0192     Y                        045288810
SUSAEVSEA     YAKIMA             FSS0012250 V2                                    SEATTLE                  045298810
SUSAEVSEA     YAKIMA             TWE0011600 V1    A N46341350W120263640E021000980N              YKM K1D   045308810
SUSAEVSEA     YAKIMA             TWE0011600 V2                                                              045318810
```

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ATTACHMENT 3
NAVIGATION DATA FILE RELATIONSHIPS

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HELIPORT (HA)
(With Flight Planning Continuations)

```
SUSAH KKENK1AKAHHEL01110000NASY N47440610W122153300E019300996250SEA K11800018000CU00Y050100  KENMORE AIR TERMINAL      045328807
SUSAH KKENK1AKAH      2PKZSEKZSE                                                                                      045338807
```

HELIPORT COMMUNICATIONS (HV)

```
SUSAP KKENK1VTWR0011990 V0     A N47265700W122182910E019900429Y                    00      KENMORE                 045348810
SUSAP KKENK1VUNI0012295 V0     A N47265700W122182910E019900429Y                    00      KENMORE TERMINAL        045358811
```

AIRPORT (PA)
(With Flight Planning Continuations)

```
SUSAP KSEAK1ASEA      110000119Y N47265700W122182910E019900429250SEA K11800018000CU00Y NAS   SEATTLE-TACOMA INTL     045698808
SUSAP KSEAK1ASEA      2PKZSEKZSE                                                                                    045718808
```

TERMINAL WAYPOINT (PC)
(With Flight Planning Continuations)

```
SUSAP KSEAK1CANVIL K11     RCF   N47370820W122183010                 E0201          P  ANVIL                 045728804
SUSAP KSEAK1CANVIL K12PKZSEKZSE                                                                              045738613
SUSAP KSEAK1CBEAVR K11     R D   N44371085W122183020                 E0201          P  BEAVR                 045748803
SUSAP KSEAK1CBEAVR K12PKZSEKZSE                                                                              045758613
SUSAP KSEAK1CBISSL K11     R E   N47103130W121315750                 E0197          P  BISSL                 045768304
SUSAP KSEAK1CBISSL K12PKZSEKZSE                                                                              045778613
SUSAP KSEAK1CDONDO K11     O F   N47215090W122182790                 E0200           O OM RW34R DONDO        045788110
SUSAP KSEAK1CDONDO K12PKZSEKZSE                                                                              045798613
SUSAP KSEAK1CFACTS K11     R Z   N47090850W122183020                 E0199          P  FACTS                 045808304
SUSAP KSEAK1CFACTS K12PKZSEKZSE                                                                              045818613
SUSAP KSEAK1CFF16L K11     IAF   N47315580W122183020                 E0201          T  SEA338/D5.8           045828804
SUSAP KSEAK1CFF16L K12PKZSEKZSE                                                                              045838613
SUSAP KSEAK1CFF34L K11     IAF   N47215010W122183020                 E0200          T  SEA158/D4.3           045848804
SUSAP KSEAK1CFF34L K12PKZSEKZSE                                                                              045858613
SUSAP KSEAK1CFINNY K11     R E   N46374050W122183020                 E0196          P  FINNY                 045868304
SUSAP KSEAK1CFINNY K12PKZSEKZSE                                                                              045878613
SUSAP KSEAK1CGRAME K11     R E   N46560520W122183020                 E0198          P  GRAME                 045888304
SUSAP KSEAK1CGRAME K12PKZSEKZSE                                                                              045898613
SUSAP KSEAK1CMILLT K11     RCF   N47150990W122183020                 E0199          P  MILLT                 045908804
SUSAP KSEAK1CMILLT K12PKZSEKZSE                                                                              045918613
SUSAP KSEAK1CPARKK K11     RAF   N47315720W122182060                 E0201          P  PARKK                 045928804
SUSAP KSEAK1CPARKK K12PKZSEKZSE                                                                              045938613
SUSAP KSEAK1CTHUNN K11     R E   N47060860W122183020                 E0198          P  THUNN                 045948811
SUSAP KSEAK1CTHUNN K12PKZSEKZSE                                                                              045958613
```

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```
                                  STANDARD INSTRUMENT DEPARTURES (SIDs) (PD)
                                   (With Flight Planning Continuations)

SUSAP KSEAK1DMOUNT12ALL   010ELN  K1D 1VE    IF                          18000           045968507
SUSAP KSEAK1DMOUNT12ALL   010ELN  K1D 2P                   0000                          045978801
SUSAP KSEAK1DMOUNT13GEG   010ELN  K1D 1V     IF                          18000           045988507
SUSAP KSEAK1DMOUNT13GEG   010ELN  K1D 2P                   0000                          045998801
SUSAP KSEAK1DMOUNT13GEG   020HAMURK1EA1E     TF                                          046008413
SUSAP KSEAK1DMOUNT13GEG   020HAMURK1EA2P                   0630                          046018613
SUSAP KSEAK1DMOUNT13GEG   030GEG  K1D 1VE    TF                                          046028413
SUSAP KSEAK1DMOUNT13GEG   030GEG  K1D 2P                   0630                          046038613
SUSAP KSEAK1DMOUNT13MLP   010ELN  K1D 1V     IF                          18000           046048507
SUSAP KSEAK1DMOUNT13MLP   010ELN  K1D 2P                   0000                          046058801
SUSAP KSEAK1DMOUNT13MLP   020HAMURK1EA1E     TF                                          046068413
SUSAP KSEAK1DMOUNT13MLP   020HAMURK1EA2P                   0630                          046078613
SUSAP KSEAK1DMOUNT13MLP   030ODESSK1EA1E     TF                                          046088413
SUSAP KSEAK1DMOUNT13MLP   030ODESSK1EA2P                   0400                          046098613
SUSAP KSEAK1DMOUNT13MLP   040MLP  K1D 1VE    TF                                          046108413
SUSAP KSEAK1DMOUNT13MLP   040MLP  K1D 2P                   0970                          046118613
SUSAP KSEAK1DMOUNT13ODESS 010ELN  K1D 1V     IF                          18000           046128507
SUSAP KSEAK1DMOUNT13ODESS 010ELN  K1D 2P                   0000                          046138801
SUSAP KSEAK1DMOUNT13ODESS 020HAMURK1EA1E     TF                                          046148413
SUSAP KSEAK1DMOUNT13ODESS 020HAMURK1EA2P                   0630                          046158613
SUSAP KSEAK1DMOUNT13ODESS 030ODESSK1EA1EE    TF                                          046168413
SUSAP KSEAK1DMOUNT13ODESS 030ODESSK1EA2P                   0400                          046178613
```

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STANDARD INSTRUMENT ARRIVALS (STARs) (PE)
(With Flight Planning Continuations)

```
SUSAP KSEAK1EELN2  1GEG   010GEG  K1D 1V      IF                                   18000                   046328508
SUSAP KSEAK1EELN2  1GEG   010GEG  K1D 2P                              0000                                 046338804
SUSAP KSEAK1EELN2  1GEG   020HAMURK1EA1E      TF                                                           046348508
SUSAP KSEAK1EELN2  1GEG   020HAMURK1EA2P                              0630                                 046358613
SUSAP KSEAK1EELN2  1GEG   030ELN  K1D 1VE H   TF                                                           046368508
SUSAP KSEAK1EELN2  1GEG   030ELN  K1D 2P                              0630                                 046378613
SUSAP KSEAK1EELN2  1HAMUR 010HAMURK1EA1E      IF                                   18000                   046388508
SUSAP KSEAK1EELN2  1HAMUR 010HAMURK1EA2P                              0000                                 046398804
SUSAP KSEAK1EELN2  1HAMUR 020ELN  K1D 1VE H   TF                                                           046408508
SUSAP KSEAK1EELN2  1HAMUR 020ELN  K1D 2P                              0630                                 046418613
SUSAP KSEAK1EELN2  1MLP   010MLP  K1D 1V      IF                                   18000                   046428508
SUSAP KSEAK1EELN2  1MLP   010MLP  K1D 2P                              0000                                 046438804
SUSAP KSEAK1EELN2  1MLP   020ODESSK1EA1E  H   TF                                                           046448613
SUSAP KSEAK1EELN2  1MLP   020ODESSK1EA2P                              0970                                 046458613
SUSAP KSEAK1EELN2  1MLP   030HAMURK1EA1E      TF                                                           046468508
SUSAP KSEAK1EELN2  1MLP   030HAMURK1EA2P                              0400                                 046478613
SUSAP KSEAK1EELN2  1MLP   040ELN  K1D 1VE H   TF                                                           046488508
SUSAP KSEAK1EELN2  1MLP   040ELN  K1D 2P                              0630                                 046498613
SUSAP KSEAK1EELN2  1ODESS 010ODESSK1EA1E  H   IF                                   18000                   046508613
SUSAP KSEAK1EELN2  1ODESS 010ODESSK1EA2P                              0000                                 046518804
SUSAP KSEAK1EELN2  1ODESS 020HAMURK1EA1E      TF                                                           046528508
SUSAP KSEAK1EELN2  1ODESS 020HAMURK1EA2P                              0400                                 046538613
SUSAP KSEAK1EELN2  1ODESS 030ELN  K1D 1VE H   TF                                                           046548508
SUSAP KSEAK1EELN2  1ODESS 030ELN  K1D 2P                              0630                                 046558613
SUSAP KSEAK1EELN2  2RW34B 010ELN  K1D 1V  H   IF                                   18000                   046568508
SUSAP KSEAK1EELN2  2RW34B 010ELN  K1D 2P                              0000                                 046578804
SUSAP KSEAK1EELN2  2RW34B 020BISSLK1PC1E      TF                                                           046588508
SUSAP KSEAK1EELN2  2RW34B 020BISSLK1PC2P                              0450                                 046598613
SUSAP KSEAK1EELN2  2RW34B 030         1       VD SEA K1           26000300                250              046608508
SUSAP KSEAK1EELN2  2RW34B 030         2P                              0060                                 046618613
SUSAP KSEAK1EELN2  2RW34B 040         1       VD SEA K1           26000250      10000                      046628508
SUSAP KSEAK1EELN2  2RW34B 040         2P                              0050                                 046638613
SUSAP KSEAK1EELN2  2RW34B 050KSEA K1PA1AE     VM                  2600                                     046648508
```

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INSTRUMENT APPROACH PROCEDURES (PF)
(With Flight Planning Continuations)

```
SUSAP KSEAK1FI16R  APAE   010PAE   K1D 1V        FC PAE K1       0000000016100131    + 02000    18000                          047128504
SUSAP KSEAK1FI16R  APAE   010PAE   K1D 2P                                    0131                                           047138613
SUSAP KSEAK1FI16R  APAE   020ANVILK1PC1EE        CF ISZIK1       3383011016100040    + 02000                                   047148401
SUSAP KSEAK1FI16R  APAE   020ANVILK1PC2P                                     0040                                           047158613
SUSAP KSEAK1FI16R  I      010ANVILK1PC1E   I     IF ISZIK1       33830110            I 020000190018000                         047168504
SUSAP KSEAK1FI16R  I      010ANVILK1PC2P                                     0000                                           047178804
SUSAP KSEAK1FI16R  I      020PARKKK1PC1E   F     CF ISZIK1       3397005815800052    G 0190001803              000PARKK K1PC   047188904
SUSAP KSEAK1FI16R  I      020PARKKK1PC2P                                     0052                                           047198613
SUSAP KSEAK1FI16R  I      030RW16RK1PG1G         CF ISZIK1       3383001715800041      01809                                   047208506
SUSAP KSEAK1FI16R  I      030RW16RK1PG2P                                     0041                                           047218613
SUSAP KSEAK1FI16R  I      040DONDOK1PC1E M       CF SEA K1       1577004315720060      01800                                   047228506
SUSAP KSEAK1FI16R  I      040DONDOK1PC2P                                     0060                                           047238613
SUSAP KSEAK1FI16R  I      050DONDOK1PC1EE HR     HM                        3380T010                                         047248506
SUSAP KSEAK1FI16R  I      050DONDOK1PC2P                                     0000                                           047258506
SUSAP KSEAK1FV16L  APAE   010PAE   K1D 1V        FC PAE K1       0000000016200123    + 02100    18000                          047448709
SUSAP KSEAK1FV16L  APAE   010PAE   K1D 2P                                    0123                                           047458613
SUSAP KSEAK1FV16L  APAE   020FF16LK1PC1EE        CF PAE K1       1603022315800100    + 02100                                   047468709
SUSAP KSEAK1FV16L  APAE   020FF16LK1PC2P                                     0100                                           047478613
SUSAP KSEAK1FV16L  ASEA   010SEA   K1D 1V        IF                                             18000                          047488602
SUSAP KSEAK1FV16L  ASEA   010SEA   K1D 2P                                    0000                                           047498804
SUSAP KSEAK1FV16L  ASEA   020FF16LK1PC1E         CF SEA K1       3380005833900058    + 02100                                   047508709
SUSAP KSEAK1FV16L  ASEA   020FF16LK1PC2P                                     0058                                           047518613
SUSAP KSEAK1FV16L  ASEA   030FF16LK1PC1E   R     PI SEA K1       3380005829300100    + 02100                                   047528709
SUSAP KSEAK1FV16L  ASEA   030FF16LK1PC2P                                     0100                                           047538613
SUSAP KSEAK1FV16L  ASEA   040FF16LK1PC1EE        CF SEA K1       3380005815800100    + 01800                                   047548304
SUSAP KSEAK1FV16L  ASEA   040FF16LK1PC2P                                     0100                                           047558613
SUSAP KSEAK1FV16L  V      020FF16LK1PC1E   F     IF SEA K1       33800058              01800    18000      SEA   K1D            047568904
SUSAP KSEAK1FV16L  V      020FF16LK1PC2P                                     0000                                           047578804
SUSAP KSEAK1FV16L  V      030RW16LK1PG1G         CF SEA K1       3407001615800041      00478             -310                  047588507
SUSAP KSEAK1FV16L  V      030RW16LK1PG2P                                     0041                                           047598613
SUSAP KSEAK1FV16L  V      040DONDOK1PC1E M       CF SEA K1       1577004315850059    + 01800                                   047608711
SUSAP KSEAK1FV16L  V      040DONDOK1PC2P                                     0059                                           047618613
SUSAP KSEAK1FV16L  V      050DONDOK1PC1EE HR     HM                        3380T010                                         047628507
SUSAP KSEAK1FV16L  V      050DONDOK1PC2P                                     0000                                           047638804
```

RUNWAY (PG)
(With Simulation Continuations)

```
SUSAP KSEAK1GRW16L  1119001604 N47274546W122182351          00428049050150      0000        047888808
SUSAP KSEAK1GRW16L  2S                              18040N  L00428                          047908808
SUSAP KSEAK1GRW16R  1094251604 N47275035W122183511          00426000055150 ISZI 0000        047918808
SUSAP KSEAK1GRW16R  2S                              18030N  L00426                          047938808
SUSAP KSEAK1GRW34L  1094253404 N47261733W122183593          00359000050150      0000        047948808
SUSAP KSEAK1GRW34L  2S                              00030N  L00359                          047968808
SUSAP KSEAK1GRW34R  1119003404 N47255286W122182451          00343000064150 ISEA 0000        047978808
SUSAP KSEAK1GRW34R  2S                              00040N  L00343                          047998808
```

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NAVIGATION DATA FILE RELATIONSHIPS

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LOCALIZER/GLIDE SLOPE (PI)
(With Simulation Continuations)

```
SUSAP KSEAK1IISEA1   111030RW34RN47275488W1221823423380N47260403W1221818590464 11340331275E02206400352          048008808
SUSAP KSEAK1IISEA1   2S    U  Y                    36000N                            140                      048018505
SUSAP KSEAK1IISZI2   111170RW16RN47260944W1221836001580N47273932W1221841030799 11190395300E02205500421          048028313
SUSAP KSEAK1IISZI2   2S    U  N                    18000N                            140                      048038313
```

MLS (PL)

```
SUSAP KSEAK1MMSZI1   1516  RW34RN47275430W1221823303380N47260400W1221819000460 113004004004004 0120E022005500275335  048048808
SUSAP KSEAK1MMSZI1   2     S  HEN47260940W1221836001580N47270510W1221838400460     02002002002 01700Y3500Y56      048058808
```

LOCALIZER MARKER (PM)

```
SUSAP KSEAK1MISEA MM 0     RW34RN47251830W1221824800004                                  E0220                048068808
SUSAP KSEAK1MISEALOM 002240RW34RN47215090W1221827900004N47215090W122182790HOMW  U21 SE   E0220                048078802
SUSAP KSEAK1MISZI IM 0     RW16RN47275920W1221834601803                                  E0220                048088613
SUSAP KSEAK1MISZI MM 0     RW16RN47282060W1221835101803                                  E0220                048098613
SUSAP KSEAK1MISZILOM 002810RW16RN47315720W1221820601803N47315720W122182060HOMW  U21 SZ   E0220                048108802
```

MINIMUM SECTOR ALTITUDE (MSA) (PS)

```
SUSAP KSEAK1SDONDOK1PC           0 25180062270071360034                                                       048118612
SUSAP KSEAK1SPARKKK1PC           0 25180062360045                                                             048128704
SUSAP KSEAK1SSEA  K1D            0 25180062360034                                                             048138612
```

AIRPORT COMMUNICATIONS (PV)

```
SUSAP KSEAK1VAPP0011920 V0   RA N47265700W122182910E019900429Y070158B0400010000KSEAK1PA 00    SEATTLE               048148810
SUSAP KSEAK1VAPP0011950 V0L DRA N47265700W122182910E019900429Y261306          KSEAK1PA 00    SEATTLE               048158811
SUSAP KSEAK1VATI0012800 V0    A N47265700W122182910E019900429Y                         00                          048168810
SUSAP KSEAK1VCPT0012800 V0P   A N47265700W122182910E019900429Y                         00    SEATTLE               048178810
SUSAP KSEAK1VDEP0011920 V0   RA N47265700W122182910E019900429Y070158          KSEAK1PA 00    SEATTLE               048188811
SUSAP KSEAK1VDEP0011950 V0 S RA N47265700W122182910E019900429Y261306          KSEAK1PA 00    SEATTLE               048198810
SUSAP KSEAK1VGND0012170 V0    A N47265700W122182910E019900429Y                         00    SEATTLE               048228810
SUSAP KSEAK1VGTE0012625 V0    A N47265700W122182910E019900429Y                         00    GATE CONTROL          048238810
SUSAP KSEAK1VTCA0011920 V1   RA N47265700W122182910E019900429Y                         00    SEATTLE APPROACH      048248904
SUSAP KSEAK1VTCA0011920 V2 RW16 070-140, RW34 280-069                                                              048258904
SUSAP KSEAK1VTCA0011950 V1   RA N47265700W122182910E019900429Y141279          KSEAK1PA 00    SEATTLE APPROACH      048268811
SUSAP KSEAK1VTCA0011950 V2 RWY 34                                                                                  048278810
SUSAP KSEAK1VTWR0011990 V0    A N47265700W122182910E019900429Y                         00    SEATTLE               048328810
SUSAP KSEAK1VUNI0012295 V0    A N47265700W122182910E019900429Y                         00    SEATTLE-TACOMA INTL   048338811
```

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ATTACHMENT 3
NAVIGATION DATA FILE RELATIONSHIPS

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AIRPORT (PA)
(With Flight Planning Continuations)

```
SUSAP KYKMK1AYKM     110000076Y N46340610W120323300E019301095250YKM K11800018000MUOOY NAS    YAKIMA AIR TERMINAL          054488807
SUSAP KYKMK1AYKM     2PKZSEKZSE                                                                                         054508807
```

TERMINAL WAYPOINT (PC)
(With Flight Planning Continuations)

```
SUSAP KYKMK1CC127  K11    ICF   N46290320W120123080                   E0191                T  IYKM089/D15.5          054518903
SUSAP KYKMK1CC127  K12PKZSEKZSE                                                                                         054738903
```

TERMINAL NDB NAVAID (PN)
(With Simulation and Flight Planning Continuations)

```
SUSAPNKSEAK1 SE    K1103350HOMW N47215090W122182790                   E0220          NASSEATTLE                          019888807
SUSAPNKSEAK1 SE    K12S      U21                                                                                        019908807
SUSAPNKSEAK1 SE    K13PKZSEKZSE                                                                                         019918807
SUSAPNKSEAK1 SZ    K1103140HOMW N47315720W122182060                   E0220          NASSEATTLE                          020088110
SUSAPNKSEAK1 SZ    K12S      U21                                                                                        020108110
SUSAPNKSEAK1 SZ    K13PKZSEKZSE                                                                                         020118110
```

FIR/UIR (UF)

```
SUSAUFKZSEZQZXF00100CZVR     13N G N48200000W128000000                17999           AA SEATTLE                         059648809
SUSAUFKZSEZQZXF00200CZVR         H N48300000W125000000                                                                  059658804
SUSAUFKZSEZQZXF00300CZVR         G N48300000W124450000                                                                  059668809
SUSAUFKZSEZQZXF00400CZVR         G N48132015W123314105                                                                  059678809
SUSAUFKZSEZQZXF00500CZVR         G N48163607W123150796                                                                  059688809
SUSAUFKZSEZQZXF00600CZVR         G N48251928W123065473                                                                  059698809
SUSAUFKZSEZQZXF00700CZVR         G N48412300W123151982                                                                  059708809
SUSAUFKZSEZQZXF00800CZVR         G N48455181W122595674                                                                  059718809
SUSAUFKZSEZQZXF00900CZVR         G N48491916W122595780                                                                  059728809
SUSAUFKZSEZQZXF01000CZVR         H N49000000W123182562                                                                  059738804
SUSAUFKZSEZQZXF01050CZVR         H N49000000W121300000                                                                  059748804
SUSAUFKZSEZQZXF01100CZVR         H N49000000W121000000                                                                  059758804
SUSAUFKZSEZQZXF01200CZVR         H N49000000W120300000                                                                  059768804
SUSAUFKZSEZQZXF01300CZVR         H N49000000W120000000                                                                  059778804
SUSAUFKZSEZQZXF01400CZVR         H N49000000W119300000                                                                  059788804
SUSAUFKZSEZQZXF01500CZVR         H N49000000W119000000                                                                  059798804
SUSAUFKZSEZQZXF01600CZVR         H N49000000W118300000                                                                  059808804
SUSAUFKZSEZQZXF01700CZVR         H N49000000W118000000                                                                  059818804
SUSAUFKZSEZQZXF01800CZVR         H N49000000W117300000                                                                  059828804
```

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FIR/UIR (UF)
(Continued)

```
SUSAUFKZSEZQZXF01900CZVR      H N49000000W117000000          059838804
SUSAUFKZSEZQZXF02000CZVR      H N49000000W116330000          059848804
SUSAUFKZSEZQZXF02100CZVR      H N49000000W116300000          059858804
SUSAUFKZSEZQZXF02200CZVR      H N49000000W116000000          059868804
SUSAUFKZSEZQZXF02300CZEG      H N49000000W115300000          059878804
SUSAUFKZSEZQZXF02400CZEG      H N49000000W115000000          059888804
SUSAUFKZSEZQZXF02500CZEG      G N49000000W114400000          059898809
SUSAUFKZSEZQZXF02600KZLC      G N48250000W115000000          059908804
SUSAUFKZSEZQZXF02700KZLC      H N45200000W115000000          059918804
SUSAUFKZSEZQZXF02800KZLC      G N45200000W117450000          059928809
SUSAUFKZSEZQZXF02900KZLC      G N44510000W118270000          059938809
SUSAUFKZSEZQZXF03000KZLC      G N43380000W119170000          059948809
SUSAUFKZSEZQZXF03100KZLC      G N42400000W119000000          059958809
SUSAUFKZSEZQZXF03200KZLC      H N41000000W119300000          059968804
SUSAUFKZSEZQZXF03300KZOA      G N41000000W121150000          059978809
SUSAUFKZSEZQZXF03400KZOA      H N41200000W122250000          059988804
SUSAUFKZSEZQZXF03500KZOA      H N41200000W123000000          059998804
SUSAUFKZSEZQZXF03600KZOA      G N41200000W123320000          060008804
SUSAUFKZSEZQZXF03700KZOA      G N40231500W123320000          060018809
SUSAUFKZSEZQZXF03800KZOA      H N40130000W123500000          060028804
SUSAUFKZSEZQZXF03900KZOA      G N40130000W125200000          060038809
SUSAUFKZSEZQZXF04000KZOA      G N40590000W126540000          060048809
SUSAUFKZSEZQZXF04050KZOA      G N43180800W126404600          060058812
SUSAUFKZSEZQZXF04100KZOA      G N45000000W126300000          060068809
SUSAUFKZSEZQZXF04200KZOA      GEN45302800W126425900          060078812
```

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ATTACHMENT 3
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FIR/UIR (UF)
(Continued)

```
SUSAUFKZSEZQZXU00100   CZVR11N G N48200000W128000000                    18000FL600  AA SEATTLE          060088809
SUSAUFKZSEZQZXU00200   CZVR    H N48300000W125000000                                                    060098804
SUSAUFKZSEZQZXU00300   CZVR    G N48300000W124450000                                                    060108809
SUSAUFKZSEZQZXU00400   CZVR    G N48132015W123314105                                                    060118809
SUSAUFKZSEZQZXU00500   CZVR    G N48163607W123150796                                                    060128809
SUSAUFKZSEZQZXU00600   CZVR    G N48251928W123065473                                                    060138809
SUSAUFKZSEZQZXU00700   CZVR    G N48412300W123151982                                                    060148809
SUSAUFKZSEZQZXU00800   CZVR    G N48455181W122595674                                                    060158809
SUSAUFKZSEZQZXU00900   CZVR    G N48491916W122595780                                                    060168809
SUSAUFKZSEZQZXU01000   CZVR    H N49000000W123182562                                                    060178804
SUSAUFKZSEZQZXU01100   CZVR    H N49000000W121300000                                                    060188804
SUSAUFKZSEZQZXU01200   CZVR    H N49000000W121000000                                                    060198804
SUSAUFKZSEZQZXU01300   CZVR    H N49000000W120300000                                                    060208804
SUSAUFKZSEZQZXU01400   CZVR    H N49000000W120000000                                                    060218804
SUSAUFKZSEZQZXU01500   CZVR    H N49000000W119300000                                                    060228804
SUSAUFKZSEZQZXU01600   CZVR    H N49000000W119000000                                                    060238804
SUSAUFKZSEZQZXU01700   CZVR    H N49000000W118300000                                                    060248804
SUSAUFKZSEZQZXU01800   CZVR    H N49000000W118000000                                                    060258804
SUSAUFKZSEZQZXU01900   CZVR    H N49000000W117300000                                                    060268804
SUSAUFKZSEZQZXU02000   CZVR    H N49000000W117000000                                                    060278804
SUSAUFKZSEZQZXU02100   CZVR    H N49000000W116300000                                                    060288804
SUSAUFKZSEZQZXU02200   CZVR    H N49000000W116000000                                                    060298804
SUSAUFKZSEZQZXU02300   CZEG    H N49000000W115300000                                                    060308804
SUSAUFKZSEZQZXU02400   CZEG    H N49000000W115000000                                                    060318804
SUSAUFKZSEZQZXU02500   CZEG    G N49000000W114400000                                                    060328809
SUSAUFKZSEZQZXU02600   KZLC    G N48250000W115000000                                                    060338809
SUSAUFKZSEZQZXU02700   KZLC    H N45200000W115000000                                                    060348804
SUSAUFKZSEZQZXU02800   KZLC    G N45200000W117450000                                                    060358809
SUSAUFKZSEZQZXU02900   KZLC    G N44510000W118270000                                                    060368812
SUSAUFKZSEZQZXU03000   KZLC    G N43380000W119170000                                                    060378809
SUSAUFKZSEZQZXU03100   KZLC    G N42400000W119000000                                                    060388809
SUSAUFKZSEZQZXU03200   KZOA    H N41000000W119300000                                                    060398804
SUSAUFKZSEZQZXU03300   KZOA    G N41000000W121150000                                                    060408809
SUSAUFKZSEZQZXU03400   KZOA    H N41200000W122250000                                                    060418804
SUSAUFKZSEZQZXU03500   KZOA    H N41200000W123000000                                                    060428812
SUSAUFKZSEZQZXU03600   KZOA    G N41200000W123320000                                                    060438812
SUSAUFKZSEZQZXU03700   KZOA    G N40231500W123320000                                                    060448812
SUSAUFKZSEZQZXU03800   KZOA    H N40130000W123500000                                                    060458804
SUSAUFKZSEZQZXU03900   KZOA    G N40130000W125200000                                                    060468809
SUSAUFKZSEZQZXU04000   KZOA    G N40590000W126540000                                                    060478809
SUSAUFKZSEZQZXU04100   KZOA    G N43180800W126404600                                                    060488812
SUSAUFKZSEZQZXU04200   KZOA    G N45000000W126300000                                                    060498809
SUSAUFKZSEZQZXU04300   KZOA    GEN45302800W126425900                                                    060508812
```

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ATTACHMENT 3
NAVIGATION DATA FILE RELATIONSHIPS

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RESTRICTIVE AIRSPACE (UR)

```
SUSAURK1A680          A00101LN   CE                     N48110000W1223800000030   GND   03000MA-680                         060518807
SUSAURK1A680          A00102T T15120024001500010200                                                                           060528808
SUSAURK1A680          B00101LN   CE                     N48110000W1223800000030   03000M10000MA-680                           060538807
SUSAURK1A680          B00102T T15120024001500010130                                                                           060548808
SUSAURK1MCHINOOK A    00101LN    G N48060300W122371500                            00300M05000MCHINOOK A                       060558807
SUSAURK1MCHINOOK A    00102H T1707001700                                                               FAA SEATTLE ARTCC      060568811
SUSAURK1MCHINOOK A    00200      G N48055500W122341600                                                                        060578806
SUSAURK1MCHINOOK A    00300      G N47520700W122363100                                                                        060588806
SUSAURK1MCHINOOK A    00400      GEN47522100W122393000                                                                        060598806
SUSAURK1R5704         00101LN    G N45520000W119290000                            GND   03999MR-5704                          062498807
SUSAURK1R5704         00102T S1509001700                                                                                      062468807
SUSAURK1R5704         00200      H N45500000W119290000                                                                        062478807
SUSAURK1R5704         00300      G N45500000W119303000                                                                        062488807
SUSAURK1R5704         00400      HEN45520000W119303000                                                                        062498807
SUSAURK1W460A         00101B N   G N46430000W128490000                            GND   UNLTD W-460A                          064108807
SUSAURK1W460A         00102                                                                            FAA OAKLAND ARTCC      064118807
SUSAURK1W460A         00200      G N47013000W127230000                                                                        064128807
SUSAURK1W460A         00300      G N46080000W127000000                                                                        064138807
SUSAURK1W460A         00400      GEN45500000W128270000                                                                        064148807
```

GATES (PB)

```
TXYZP KSEAK1BABCDE    0          N47263000W122180600                                                   CENTER CONCOURSE B737-300064158813
TXYZP KSEAK1BNORTH    0          N47274200W122180600                                                   NORTH APRON NOSE IN-STAND064168813
```

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ATTACHMENT 4 AIRWAY MINIMUM ALTITUDES AND REQUIRED NAVIGATION PERFORMANCE (RNP)

Airway Minimum Altitude Coding

A. An ARINC 424 database may contain three levels of Enroute Airways. These are High, Low and Both Level routes. The following descriptions apply:
   1. High Altitude Airways, Airway Level code of H, shall contain:
      a. Routes that exist only in the upper airspace as officially designated by the appropriate authority.
      b. Routes that are officially designated as Upper or High even though the structure in which they exist has not been officially established as Upper Airspace.
      c. Routes that, by virtue of the assigned MEA or MFA, must be charted as high-level routes.
   2. Both Altitude Airways. Airway Level code of B shall contain:
      a. Routes that are not specifically defined into either the upper or lower airspace in a structure that does recognize these airspace divisions, for example the Control Routes in the USA and CAN coverages.
      b. Routes that exist without a level designator that are in a structure that does recognize the division of Upper and Lower Airspace.
      c. Routes that exist in a structure that has Upper and Lower Airspace when such routes have a MEA or MFA assigned lower than the upper limit of Lower Airspace and a MAA above the upper limit of Lower Airspace.
   3. Low Altitude Airways. Airway Level code of L shall contain:
      a. Routes that exist only the lower airspace as officially established by the appropriate authority.
      b. Routes that, by virtue of the published MAA, must be charted in lower airspace only.
   4. Enroute Airway Sequencing.
      Airways changing from one level to another level will be sequenced in order as any airway in the same level. The Airway Level Code is not used to sort airways in an ARINC 424 database.

      When an airway changes from Airway Level Code B to two separate airways that are coded as L and H, the point of change will carry the B in the level field.
B. High Altitude Airways.
   The altitude information shown on High Level records will be established with the following criteria:
   1. The altitude information included for High Altitude Airways will be derived from official government source. The values entered for Minimum Altitude will be published MEAs (Minimum Enroute Altitude) or MFAs (Minimum Flight Altitude). If neither of those two values are available through source documentation, the lower limit of the designated upper airspace will be entered.
   2. There are two Minimum Altitude fields. The second of these is only used when an Enroute Airway has been published with Directional MEAs or

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ATTACHMENT 4
AIRWAY MINIMUM ALTITUDES AND REQUIRED NAVIGATION PERFORMANCE (RNP)

Directional MFAs. Directional information is considered to exist when the difference in altitude in opposing flight directions is higher than would be indicated by normal separation standards.

3. For Enroute Airways published with non-standard separation or blocked altitudes, the first Minimum Altitude field will contain the lowest altitude available. The non-standard separation and/or blocked altitude information will be available in the Cruise Table referenced in the Enroute Airway Record.
4. The Maximum Altitude field will contain the highest useable altitude for the Enroute Airway Segment. This will be equal to the Upper Limit of the Designated Upper Airspace unless a lower altitude, a MAA or Maximum Authorized Altitude, has been published in the official government source.

C. Low Level and Both Level Airways.
The altitude information shown on Both Level and Low-Level records will be established with the following criteria:

1. The altitude information included for Both Altitude and Low Altitude Airways will be derived from official government source. The values entered for Minimum Altitude will be published MEAs (Minimum Enroute Altitude) or MFAs (Minimum Flight Altitude) when such are available. If neither of those two values are available through source documentation, a code indicating one of the following two conditions will be used:

   NESTB - MEA/MFA not established in source documentation. Used when the source does not establish minimum altitudes as a general rule. Also used when source documentation does provide minimum altitude information as a general rule and has explicitly not established a value for a specific route segment or segments.

   UNKNN - MEA/MFA Minimum Altitude was unknown at the time the database was produced but the source documentation does provide MEA or MFA as a general rule. The database supplier expects that future source documentation will provide some minimum altitude information.
2. There are two Minimum Altitude fields. The second of these is only used when an Enroute Airway has been published with Directional MEAs or Directional MFAs. Directional information is considered to exist when the difference in altitude in opposing flight directions is higher than would be indicated by normal separation standards. Directional altitudes will not be provided for NESTB and UNKNN.
3. For Enroute Airways published with non-standard separation or blocked altitudes, the first Minimum Altitude field will contain the lowest altitude available. The non-standard separation and/or blocked altitude information will be available in the Cruise Table referenced in the Enroute Airway Record.
4. The Maximum Altitude field will contain the highest useable altitude for the Enroute Airway Segment. This will be equal to the highest available Flight Level in the Designated Airspace in which the route is available (Low Altitude Structure or Both Altitude Structure) unless a lower altitude, a MAA or Maximum Authorized Altitude, has been published in the official government source.

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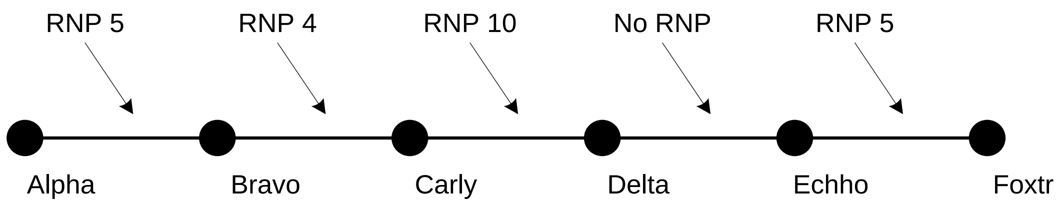
ATTACHMENT 4
AIRWAY MINIMUM ALTITUDES AND REQUIRED NAVIGATION PERFORMANCE (RNP)

RNP Coding

RNP values are supplied inbound to the fix in the airway sequence record, when viewed in increasing sequence number order. The RNP applies only to the airway leg on which it is supplied. Like-values in subsequent sequences will be repeated in the airway record. If no RNP values is supplied on a segment, there is not a database specified RNP for that segment.

Examples of coding:

Airway Sequence Number	Airway Fix Ident	Airway Segment RNP
010	ALPHA	Blank
020	BRAVO	050
030	CARLY	040
040	DELTA	100
050	ECHHO	Blank
060	FOXTR	050



Explanation:

Sequence 010 has a blank RNP field. In the example, sequence 010 is the first sequence of the airway and there is no inbound to the fix data

Sequence 020 has a coded RNP value of 050, meaning that an RNP of 5.0NM applies to the segment defined by the waypoints ALPHA and BRAVO, regardless of the direction flown.

Sequence 030 has a coded RNP value of 040, meaning that an RNP of 4.0NM applies to the segment defined by the waypoints BRAVO and CARLY, regardless of the direction flown

Sequence 040 has a coded RNP value of 100, meaning that an RNP of 10.0NM applies to the segment defined by the waypoints CARLY and DELTA, regardless of the direction flown

Sequence 050 has a blank RNP field, meaning there is no published RNP for the segment defined by the waypoints DELTA and ECHHO, regardless of the direction flown

Sequence 060 has a coded RNP value of 050, meaning that an RNP of 5.0NM applies to the segment defined by the waypoints ECHHO and FOXTR, regardless of the direction flown. In this example, sequence 060 is the last sequence of the airway.

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ATTACHMENT 5 PATH AND TERMINATOR

Throughout this attachment many rules and standards for the preparation of coding for Terminal Procedures (SIDs/STARs/Approaches) from official government source documentation into the ARINC 424 Navigation Database format have been documented. These rules and standards use the words must and will as defined below:

MUST = Obligation, no other choice.

WILL = Desired, decision by data authority implied.

The Path and Terminator concept is a means to permit coding of Terminal Area Procedures, SIDs, STARs and Approach Procedures, without proliferating the number of named waypoints required to support such procedures. Although it is the intent of this attachment to provide consistent rules, where a contradiction exists between a general rule and a specific rule, the specific rule must be used. The Path and Terminator concept includes a set of defined codes referred to as Path Terminators. Each Code defines a specific type of flight path and a specific type of termination of that flight path. Path Terminators are assigned to all SIDs, STARs and Approach Procedure segments in accordance with the rules set forth in this Attachment. This Attachment also includes rules regarding leg data fields associated with each Path Terminator.

It is desirable that all navigation systems be designed to accept all leg types defined in this Attachment. However, as this Attachment has been dynamic, with new leg types being added, it may be required or desirable not to implement all leg types in any given navigation airborne system. An example of this is the heading (VX) legs versus the course (CX) legs, which were added later. A given system may not have the CX legs (with the exception of the CF leg) implemented. Coding by database suppliers must be accomplished using Path Terminators most appropriately reflecting the official government source documentation.

COMMENTARY

The use of XA legs is required to maintain consistency with published instrument procedure instructions. It is recognized that the length of XA legs (CA, FA, or VA) is highly dependent upon the aircraft performance and the altitude situation and therefore may cause unusual path generation cases.

Unless otherwise specifically stated, all the rules, information and guidelines in this Attachment apply equally to fixed-wing and rotor-wing terminal procedures.

The RF Leg type, added with Supplement 11, was introduced with the guidelines listed below.

The RF Leg is to be used only in the following cases:

1. When coding procedure types which were designed with the RF Constant Radius Turn capability as design criteria.
2. When coding procedure types which were not designed with the RF Leg capability as a criterion when it can be ensured that both the original coding and the RF Leg specific coding are available and uniquely identified.

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ATTACHMENT 5
PATH AND TERMINATOR

3. Sufficient information is provided in the source documentation to validate the ARC Center position and the requisite tangential tracks.

In order to achieve these coding rule goals, and to ultimately simplify the path terminator matrix currently required to define present-day terminal area procedures, it is in the interest of all user airlines to prevail upon their government agencies and ATC authorities to:

a. Permit FMS-equipped airplanes to fly tracks instead of procedural headings and
b. Design Terminal area procedures to be compatible with the capabilities of the increasing number of FMS-Equipped airplanes entering service.

The Path and Terminator concept is to accommodate the performance capabilities of various fixed-wing aircraft types. Airmass Path and Terminator constraints are generally for fixed-wing aircraft only. In order to accomplish this, certain values are established for coding the Path and Termination for fixed-wing aircraft. These values have been established to allow database suppliers to code turn and distance fields to a single set of rules. If an official government source specifies values other than these established values, source data will be used.

1. Distance to Calculation

   A speed of 210 knots, ground speed, will be used to compute distance based on time (3.5 NM per minute). On Course Reversal Path Terminators, if no time or distance is specified, a minimum distance of 4.3 NM will be used prior to turning inbound.

2. Bank Angle

   A maximum bank angle of 25 degrees will be used to compute turn radius. A full 180-degree turn would require a minimum of 4 nautical miles in diameter at 250 kt. ground speed.

3. Climb Rate

   A climb rate of 500 feet per nautical mile will be used for computations. For missed approach, the climb rate must begin at the Missed Approach Point. For departure procedures, the climb rate must begin at the take-off end of the runway unless otherwise specified by source.

4. Outbound Leg Length for Teardrop Procedures

   If no distance limit is given, or if a time is given, use the following table to determine the length of the outbound leg.

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ATTACHMENT 5
PATH AND TERMINATOR

Angle of Divergence	Nautical Miles	Outbound Time
18	10.5	2:45
20	9.5	2:30
22	8.6	2:15
24	7.9	2:00
26	7.3	1:55
28	6.8	1:45
30	6.3	1:40
32	5.9	1:30
34	5.6	1:28
36	5.3	1:23
38	5.0	1:18
40	4.7	1:14
42	4.5	1:10
44	4.3	1:07

This table is based on a speed of 210 knots and a Density Altitude of 5000 Feet. Any procedure that does not fall within this table would not be coded.

5. Intercept Angles

   When the government source does not specify the intercept angle, the following angles must be used:

   A. Use the angle determined in accordance with Rule 6.3.6 of this attachment on approach transitions to intercept the localizer approach path.
   B. Use 30 to 45 degrees on all other procedures.
   C. For procedures other than approach transitions to intercept the localizer approach path, use a VI Path Terminator and 30 to 45 degrees' intercept if there is a fix termination in the current leg followed by a 3NM or greater gap between start of turn and the track in the leg to be intercepted.

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ATTACHMENT 5
PATH AND TERMINATOR

1.0 General Rules

1.1 NAVAID related Leg Types

Specific leg types require a reference Navaid. The details of which leg types and which Navaid types are to be used can be seen in Section 5.23 of the main document and Table 3 of this attachment.

1.2 Beginning and Ending Leg Types

The Beginning and Ending Leg of a SID, STAR or Approach Route will be selected from the following table.

Note: In general, the same Beginning and Ending Leg types will be used for Helicopter SIDs, STARs and Approaches as listed for fixed-wing aircraft. No additional types are authorized and use of the authorized types should be consistent with helicopter flight capabilities.

Procedure	Beginning Leg	Ending Leg
SID Runway Transition	CA, CD, CF, CI, CR, DF, FA, FC, FD FM, IF, VA, VD, VI, VM, VR	AF, CF, DF, FM, HA, **HF** HM, IF[2], RF, TF, VM
SID Common Route	CA[1], CD[1], CF[1], CI[1], CR[1], DF[1], FA, FC, FD, FM, **HF[5],** IF, VA[1], VD[1], VI[1], VM[1], VR[1]	AF, CF, DF, FM, HA, **HF, HM,** IF[2], TF, RF, VM
SID Enroute Transition	FA, FC, FD, **HF,** IF	AF, CF, DF, HA, **HF, HM,** RF, TF
STAR Enroute Transition	FC, FD, **HF,** IF	AF, CF, DF, HM, **HF, HM,** RF, TF
STAR Common Route	FC, FD, FM, **HF,** IF	AF, CF, DF, FM, **HF, HM,** IF[2], RF, TF, VM
STAR Runway Transition	FC, FD, FM, HF, IF	AF, CF, **DF,** FM, HF, HM, **IF[4]** RF, TF, VM
Approach Transition	FC, FD, **FM** HF, IF, PI	AF, CF, CI[3], HF, HM, PI, RF, TF, VI[3]
Final Approach Coding	IF	CF, RF, TF
Missed Approach	AF, CA, CD, CF, CI, CR DF, FA, FC, FD, FM, HA, HM, RF, TF, VA, VD, VI, VM, VR	AF, CA, CF, DF, FM, HM, RF, TF, VA, VM

<u>Explanation of Notes in Table</u>

1. When SID Procedure has <u>NO</u> Runway Transitions
2. When IF leg is the one and only record in the SID/STAR route.
3. When Approach Transition is localizer based.
4. For a STAR that has explicit runway transitions for only a subset of the runways to which it applies then:

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For other applicable runways, the data supplier may code single leg runway transitions consisting of an IF leg at the common point of the defined runway transitions.

5. **When SID Procedures has Runway Transitions.**

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1.3 Leg Sequencing

The following table defines the permitted leg sequences within the individual procedures. A shaded space indicates that the current leg/next leg sequence is not permitted within individual procedure routes.

		NEXT LEG																					
		AF	CA	CD[2]	CF[1]	CI	CR	DF	FA[2]	FC	FD	FM[3]	HA	HF	HM	IF[4]	PI	RF	TF	VA[2]	VD	VI	VM[3]	VR
CURRENT LEG	AF																							
	CA																							
	CD		@	@	@	@	@	@	@	@	@	@				@				@	@	@	@	@
	CF		@	@	@	@	@	@&	@	@	@	@								@	@	@	@	@
	CI				@				@	@	@	@				@								
	CR		@	@	@	@	@	@	@	@	@	@				@				@	@	@	@	@
	DF							&																
	FA																							
	FC		@	@	@	@	@	@&												@	@	@	@	@
	FD		@	@	@	@	@	@												@	@	@	@	@
	FM																							
	HA																							
	HF																							
	HM																							
	IF																							
	PI																							
	RF																							
	TF							&																
	VA															@								
	VD		@	@	@	@	@	@	@	@	@	@				@				@	@	@	@	@
	VI				@				@	@	@	@												
	VM															@								
	VR		@	@	@	@	@	@	@	@	@	@				@				@	@	@	@	@

& = A CF/DF, DF/DF, TF/DF, or FC/DF sequence should only be used when the termination of the first leg must be overflown, otherwise alternative coding should be used. See Rule 3.1 in this attachment.

@ = Leg combinations for which the first leg is allowed to be coded with a conditional altitude termination, See Rule 1.3.1 in this attachment and Section 5.29.

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[1] = TF is the preferred leg type in RNAV Terminal Procedures that are not using ground-based navaid references. The CF leg remains available for these procedures based on rules contained elsewhere in this Attachment.

[2] = The altitude termination leg types on RNAV Terminal Procedures that are not using ground-based navaid references are primarily used as the first leg of a SID or SID Runway Transition and Missed Approach.

[3] = The manual termination leg types on RNAV Terminal Procedures that are not using ground based navaid references are primarily used as the ending legs of STARs and Missed Approach Procedures and in the definition of SID intial climb-out with ATC intervention.

[4] = If the IF leg is not the beginning leg of the transition, such as an IF embedded leg, the next allowable next leg can only be TF. See Rule 3.12 in this attachment which describes the allowable use.

1.3.1 Conditional Leg Sequencing

The Altitude Description Code (Section 5.29) defines a conditional altitude termination of a leg. In such cases, the Leg Type and Leg Sequencing used must respect both the coded leg and leg combination rules and the conditional altitude termination leg combination rules. The conditional altitude termination may only be used on Cx leg, Vx legs, and on distance terminated legs (FD and FC). The conditional altitude termination may not be used on Hx or xM legs. The result is that the conditional termination may only be used when the coded leg type can be translated to an altitude termination leg (other than Hx and xM). This means that the conditional altitude termination may not be used with certain leg types. For example, there is no arc to an altitude termination leg in the valid legs table, Section 1.4, therefore the conditional altitude termination may not be used on AF legs, in any combination. This also means that the leg sequencing used must be valid for both the coded leg and the conditional altitude termination leg. For example, while CD/AF is a valid coded leg combination, it is not valid when the conditional altitude termination is applied on the CD leg as the resulting CA/AF combination is invalid. Given the purpose and intent of the conditional altitude termination coding, it is also invalid on any leg for which the primary termination is altitude.

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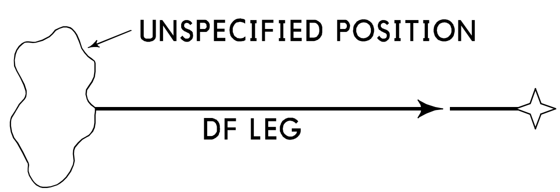
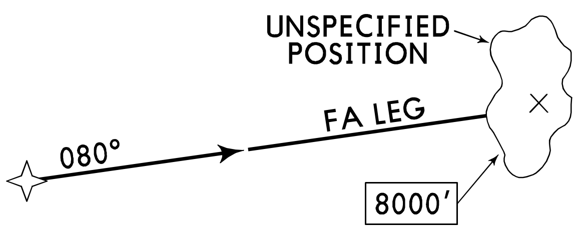
1.4 Leg Type Descriptions

The following illustrations on the various Leg Types are provided to assist coding and decoding of the Path and Terminator concept.

Leg Code	Example Path	Description
IF		Figure 1: Initial Fix or IF Leg. Defines a database fix as a point in space.
TF		Figure 2: Track to a Fix or TF Leg. Defines a great circle track over ground between two known databases fixes.
CF		Figure 3: Course to a Fix or CF Leg. Defines a specified course to a specific database fix.
DF		Figure 4: Direct to a Fix or DF Leg. Defines an unspecified track starting from an undefined position to a specific database fix. Note: See also Table 1.3, Leg Sequencing, for other uses of the DF Leg.
FA		Figure 5: Fix to an Altitude or FA Leg. Defines a specified track over ground from a database fix to a specified altitude at an unspecified position.

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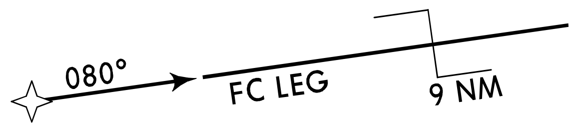
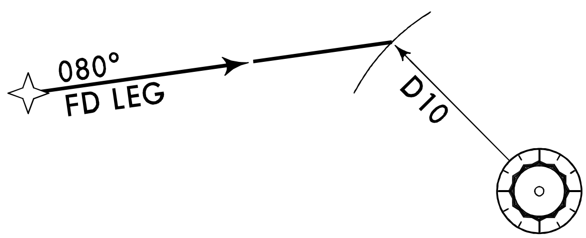
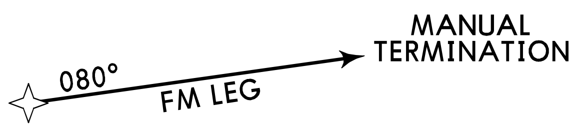
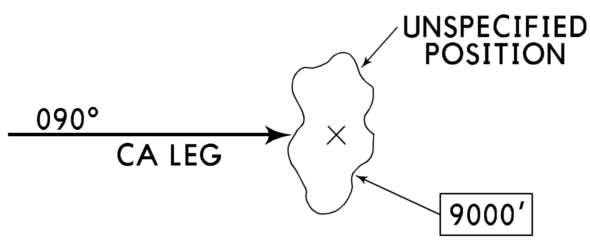
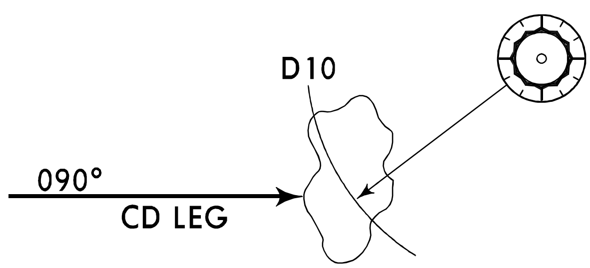
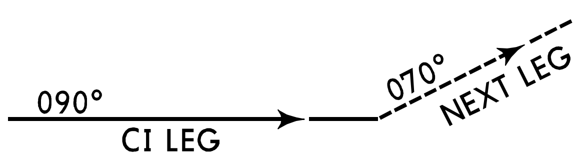
<table>
<tr><td>FC</td><td>
</td><td>Figure 6: Track from a Fix from a Distance or FC Leg. Defines a specified track over ground from a database fix for a specific distance.</td></tr>
<tr><td>FD</td><td>
</td><td>Figure 7: Track from a Fix to a DME Distance or FD Leg. Defines a specified track over ground from a database fix to a specific DME Distance which is from a specific database DME Navaid.</td></tr>
<tr><td>FM</td><td>
</td><td>Figure 8: From a Fix to a Manual termination or FM Leg. Defines a specified track over ground from a database fix until Manual termination of the leg.</td></tr>
<tr><td>CA</td><td>
</td><td>Figure 9: Course to an Altitude or CA Leg. Defines a specified course to a specific altitude at an unspecified position.</td></tr>
<tr><td>CD</td><td>
</td><td>Figure 10: Course to a DME Distance or CD Leg. Defines a specified course to a specific DME Distance which is from a specific database DME Navaid.</td></tr>
<tr><td>CI</td><td>
</td><td>Figure 11: Course to an Intercept or CI Leg. Defines a specified course to intercept a subsequent leg.</td></tr>
</table>

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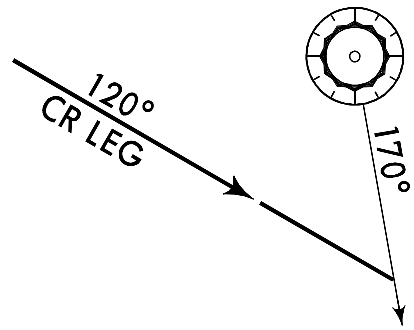
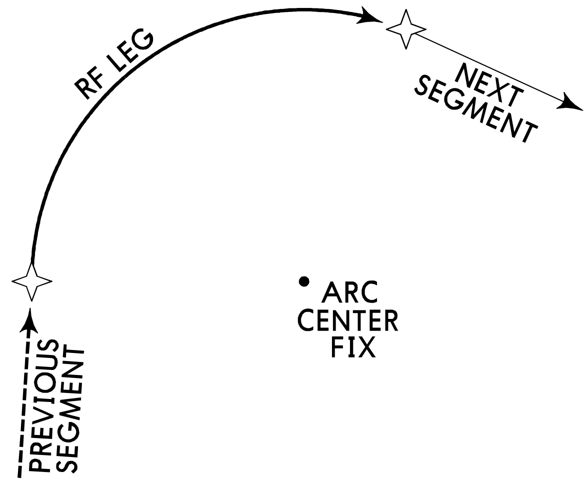
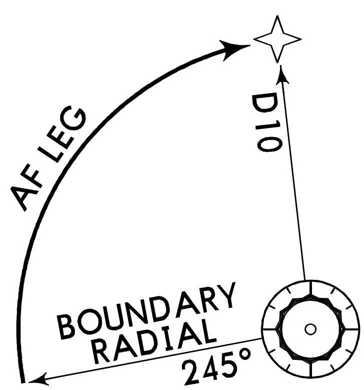
CR		Figure 12: Course to a Radial termination or CR Leg. Defines a course to a specified Radial from a specific database VOR Navaid.
RF		Figure 13: Constant Radius Arc or RF Leg. Defines a constant radius turn between two database fixes, at a specified constant distance from center fix.
AF		Figure 14: Arc to a Fix or AF Leg. Defines a track over ground at specified constant distance from a database DME Navaid.

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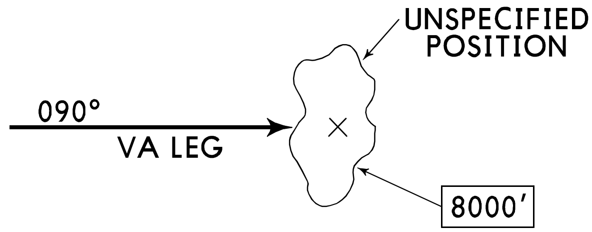
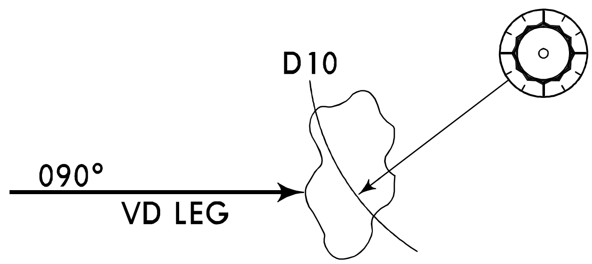
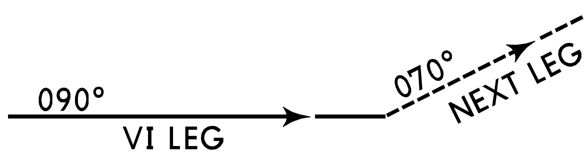
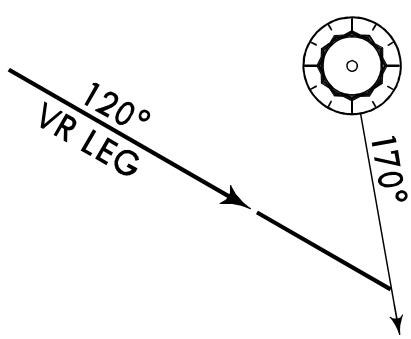
VA		Figure 15: Heading to an Altitude termination or VA Leg. Defines a specified heading to a specific Altitude termination at an unspecified position.
VD		Figure 16: Heading to a DME Distance termination or VD Leg. Defines a specified heading terminating at a specified DME Distance from a specific database DME Navaid.
VI		Figure 17: Heading to an Intercept or VI Leg. Defines a specified heading to intercept the subsequent leg at an unspecified position.
VM		Figure 18: Heading to a Manual termination or VM Leg. Defines a specified heading until a Manual termination.
VR		Figure 19: Heading to a Radial termination or VR Leg. Defines a specified heading to a specified radial from a specific database VOR Navaid.

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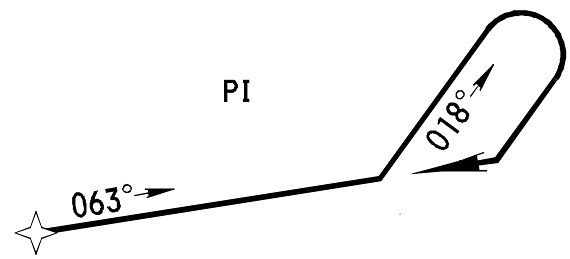
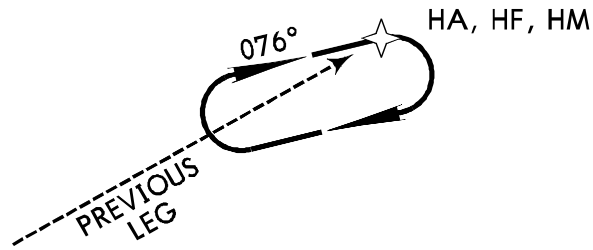
PI		Figure 20: 045/180 Procedure Turn or PI Leg. Defines a course reversal starting at a specific database fix, includes Outbound Leg followed by a left or right turn and 180-degree course reversal to intercept the next leg. A Maximum excursion Time or Distance is included as a data field.
HA, HF, HM		Figure 21: Holding in lieu of Procedure Turn (HF) for Approach Procedures and Mandatory Holds (HA, HM) in SID/STAR and Missed Approach coding. The HA, HF, and HM Leg Types define a holding pattern in lieu of procedure turn course reversal or a terminal procedure referenced mandatory holding pattern at a specified database fix. Leg time or distance is included as a data field. The three codes indicate different path termination types: HA = Altitude Termination HF = Single circuit terminating at the fix. HM = Manual Termination.

1.5 Leg Data Fields

The following table provides detail on Required and Optional parameters used to define each leg type. An O in the table indicates that the parameter is considered optional and may be omitted as required in individual cases. All other entries indicate some type of a required situation for leg definition.

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Leg Data Fields Table 3

PT	W/P ID	OVR FLY	HLD	TD	TDV	RMD NAV	THETA	RHO	OBD MAG CRS	TM/ DST	ALT ONE	ALT TWO	SPD LMT	VRT ANG	ARC RAD	ARC CTR	COMMENTS
AF	X	O	O	X		X	X	X	R		O	O	O				OB MAG CRS=BNDY RDL, THETA=FIX RDL
CA				O	O				C		+		O				ALT TERM WILL BE AT OR ABOVE
CD				O	O	X			C	D	O	O	O				
CF	X	B	O	O	O	X	X	X	C	P	O	O	O	O			OB MAG CRS IS CRS TO SPECIFIED FIX
CI		O		O	O	O			C		O	O	O				
CR				O	O	X	X		C		O	O	O				
DF	X	B	O	O		O	O	O			O	O	O				
FA	X		E	O	O	X	X	X	C		+		O				ALT TERM WILL BE AT OR ABOVE HOLDING IS AT FIX
FC	X	B	E	O	O	X	X	X	C	P	O	O	O				HOLDING IS AT FIX
FD	X		E	O	O	X	O	X	C	D	O	O	O				HOLDING IS AT FIX
FM	X		E	O	O	X	X	X	C		O		O				HOLDING IS AT FIX
HA	X	O		X		O	O	O	C	X	+		O		F		ALT TERM WILL BE AT OR ABOVE
HF	X	O		X		O	O	O	C	X	O	O	O		F		
HM	X	O		X		O	O	O	C	X	O	O	O		F		
IF	X		O			O	O	O			O	O	O				
PI	X			X		X	X	X	C	P	X		O				DIST IS EXCURSION DIST FROM FIX
RF	X		O	X		O	I		T	A	O	O	O	O	X	X	
TF	X	B	O	O	O	O	O	O	O	O	O	O	O	O			
VA				O	O				H		+		O				ALT TERM WILL BE AT OR ABOVE
VD				O	O	X			H	D	O	O	O				
VI		O		O	O	O			H		O	O	O				
VM	O			O	O				H		O		O				FOR W/P ID SEE STAR CODING RULES
VR				O	O	X	X		H		O	O	O				

LEGEND:

X = Required Field
A = Along Track Distance
O = Optional Field
R = Boundary Radial
C = Course
H = Heading
D = DME Distance
+ = At Or Above Only
Shaded = Not Applicable Field
P = Path Length
B = Required For CF/DF, DF/DF, TF/DF, or FC/DF Combinations; Otherwise Optional
E = Optional Field: Fix Must Be Part of the Terminal Procedure Route
F = Required for holds that contain an RNP value.

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T= Provided for the leg combinations of RF/RF, or RF/Hx, and when the RF is the last leg of the procedure; otherwise, the outbound tangential track is contained in the next leg.

I = The inbound tangential track is provided for leg combinations IF/RF, AF/RF, RF/RF, or DF/RF; otherwise, the inbound tangential track is contained in the previous leg.

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2.0 Coding Rules Applicable To All Procedures

2.1 All Procedures must be coded to provide guidance specified by source documentation.

2.2 Vertical angles are referenced to the terminating fix.

2.3 **Removed with Supplement 22.**

2.4 Altitude terminations must not be used in descent procedures.

2.5 Lost Communication Procedures may be coded in place of Vector Legs if the procedure defines a complete route of flight to the end of a SID or STAR.

2.6 The Turn Direction and Turn Direction Valid leg data fields are used in combination to force a particular turn direction whenever the track/heading change exceeds 135 degrees. If the turn direction is indicated with the L or R, and the turn exceeds 135 degrees, then the turn direction valid character must be set to Y. If the turn direction is indicated with E, then the turn direction valid field must always be blank. For legs that are turning legs such as the AF or RF legs, the Turn Direction is always required.

The Turn Direction/Turn Direction Valid combination is used to indicate that turn in the specified direction must be executed prior to intercepting the path defined in the record. Turn Direction must always be indicated whenever the turn is 135 degrees or more.

Turn Direction and Turn Direction Valid are not coded on TF/TF leg combinations in any procedure coding, unless turn direction is specified by source.

2.7 The first leg of each procedure will contain the appropriate transition altitude. If the transition altitude is 18,000 feet, it may be omitted. See Section 5.53 for specifics on the appropriate altitude for each type of Terminal Procedure.

2.8 Non-essential and transition essential waypoint codes are not used in the waypoint description field on terminal procedures. All waypoints must be considered as essential in these procedures.

2.9 Required Navigation Performance (RNP) must be applied to segment on which the value is coded. RNP will be coded on every segment where it is specified by source. Lack of an RNP value on a segment indicated that no source RNP value is available for the segment.

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Examples of RNP Coding:

Standard Instrument Departure (SID)

Route Type	Trans Ident	Sequence Number	Path Terminator	Fix Ident	Segment RNP
1	RW08	010	CA		Blank
1	RW08	020	DF	ALPHA	Blank
1	RW26	010	CA		Blank
1	RW26	020	DF	ALPHA	Blank
2	Blank	010	IF	ALPHA	Blank
2	Blank	020	TF	CARLY	010
3	BRAVO	010	IF	CARLY	Blank
3	BRAVO	020	TF	BRAVO	010
3	DELTA	010	IF	CARLY	Blank
3	DELTA	020	TF	INTER	010
3	DELTA	030	TF	DELTA	050
3	ECHHO	010	IF	CARLY	Blank
3	ECHHO	020	TF	ECHHO	040

Explanation:

There is no defined RNP for the Runway Transitions. The common segment has an RNP of 010 or 1.0NM from ALPHA to CARLY. The Enroute Transition from CARLY to BRAVO is RNP 010 or 1.0NM. The Enroute Transition to DELTA is RNP 010 or 1.0NM from CARLY to INTER and 050 or 5.0NM from INTER to DELTA. The Enroute Transition from CARLY to ECHHO is RNP 040 or 4.0NM. The initial fix segments carry no RNP values.

Instrument Approach Procedure

Route Type	Trans Ident	Sequence Number	Path Terminator	Fix Ident	Segment RNP
A	EAST	010	IF	EAST	Blank
A	EAST	020	TF	ALPHA	Blank
A	WEST	010	IF	WEST	Blank
A	WEST	020	TF	ALPHA	010
R	Blank	010	IF	ALPHA	Blank
R	Blank	020	TF	BRAVO (FAF)	031
R	Blank	030	TF	RW18 (MAP)	031
Z	Blank	040	DF	CARLY	010
Z	Blank	050	TF	DELTA	010
Z	Blank	060	TF	ECHHO	010
Z	Blank	070	HF	ECHHO	010

Explanation:

There is no defined RNP for the EAST transition. The WEST transition has an RNP of 010 or 1.0NM from WEST to ALPHA. The Final Approach Coding from ALPHA to Runway 18 (RW18) has an RNP of 031 or 0.3 NM. The Missed Approach Procedure from the runway through the holding pattern at ECHHO has an RNP of 010 or 1.0 NM.

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ATTACHMENT 5
PATH AND TERMINATOR

2.9.1 Appling RNP to the following path terminators allows the procedure designer to define a deterministic (predictable) path containment area: CF, DF, HA, HF, HM, RF, and TF.

2.10 The RF Leg is to be used only in the following cases:

2.10.1 When coding procedure types, which were, designed with the RF Constant Radius ARC capability as design criteria.

2.10.2 When coding procedure types which were not designed with the RF Leg capability as a criterion but for which the RF leg coding is determined to correctly reflect source intent.

2.11 Aircraft Category and Aircraft Type

2.11.1 Aircraft Category is not used on SIDs and STARS.

2.11.2 Aircraft Type, when provided on SIDs and STARs must be the same for all transitions and all legs within a transition.

2.11.3 If an Aircraft Category is provided on one leg of an Approach Transition, it must be provided on all legs of that transition and it must be the same on all legs.

2.11.4 Aircraft Category Information on Approach Transitions and on Final Approach Coding/Missed Approach Coding must be consistent, for example, there cannot be a Transition coded as A and B Aircraft only on a procedure that is category C and D only in the Final Approach Coding or Missed Approach Coding.

2.11.5 For Final Approach Coding and Missed Approach Coding, any coded data must be appropriate for all uses of that coding, for example, there cannot be two Final Approach segments, one for A and B and one for C and D.

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ATTACHMENT 5
PATH AND TERMINATOR

3.0 Path and Termination Related Rules Valid For All Procedure Types Except RNAV Terminal Procedures That Do Not Reference Ground-based Navaids.

3.1 DF legs must be used to start from an unknown position such as an altitude or from DME or Distance terminations. A DF leg may follow a CF leg only when the CF leg fix must be overflown, otherwise a TF leg should be used. A DF may also be followed by another DF leg. In these cases, the fix at the end of the first DF leg must be overflown. When DF legs follow DME or Distance Terminations, that termination must be overflown. For distance terminations, the overfly parameter must be set, otherwise the combination is not permitted.

3.2 The distance leg data field must be completed on all CF legs. When the CF is preceded by an intercept, the no wind intercept distance will be provided. If the CF leg is the first leg of a missed approach, the distance entered will be from the approach runway fix or missed approach fix, whichever applies.

3.3 When a leg terminating at a fix (XF leg) is followed by a PI leg, the PI fix must be the same fix as the terminating fix on the preceding leg.

3.4 Rules specific to arc legs, leg type AF:

3.4.1 When an AF-AF leg sequence is coded, both legs must use the same Recommended VHF Navaid facility and the DME distance must be the same for both legs.

3.4.2 When any holding leg (HX) or fix termination (XF) is followed by an AF leg, the preceding termination fix must lie on the arc defined in the AF leg.

3.4.3 When a FD leg is followed by an AF leg type, the fix in the FD leg must have the same Recommend VHF Navaid as that defining the AF leg.

3.4.4 When a CD or VD leg type is followed by an AF leg type, both legs must have the same Recommended VHF Navaid. The DME distance must be the same for both legs.

3.4.5 When a CI leg type is followed by an AF leg type, the course to must be to the Recommended VHF Navaid which defines the AF arc.

3.5 When an AF, CF, DF, IF, RF, TF, or HX leg is followed by any course-from leg type (FX legs), the FX leg must be from the same point as the preceding termination.

3.6 Leg types of CD, CR, FD, VD, and VR overfly the terminator point. If turn anticipation is required to reflect the source, alternate leg types must be used.

3.7 When the leg data type Recommended Navaid is coded in a CI or VI leg, it must be the same as the Recommended Navaid in the leg to be intercepted.

3.8 The TF leg type will be coded in preference to the CF leg type in all cases where the resulting path will be the same, except when coding some types of final approach procedure legs, see Rules in Section 6.0, 7.0 and 8.0 of this Attachment.

3.9 The FC leg type must be used when the distance in the Time/Distance field is the path length and is measured from the fix entered in the Waypoint Identifier field.

The FD leg type must be used when the distance in the Time/Distance field is the DME distance from the Navaid entered in the Recommended Navaid field.

3.10 FC or FD legs will not be used if the distance is greater than 60NM and are followed by a CF leg.

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3.11 A PI leg is used to make a 180-degree course reversal when a holding or a tear drop turn is not specified. The course must be coded as 45 degrees from the reciprocal of the inbound course. The turn direction is the direction made during the 180 reversals within the PI leg. A one-minute outbound leg is implied from the fix to the initial 45 degrees turn.

3.12 The IF leg type will normally be used in an initial sequence of a procedure. The IF leg type, followed by a TF leg type will be used in other than the first sequence if such is required to correctly code the procedure as published by the source documentation when one or more of the following criteria are met –

- There is no VHF Navaid available for use as the Recommended Navaid that would permit coding with other leg types.
- The leg to be intercepted will have a distance of more than 60 NM between the point of intercept and the terminating fix.

This will allow a segment to be constructed, from one fix to the next fix, where coding would otherwise not be possible. See the sample use of this rule below.

3.13 When coding arc paths, the choice of AF or RF is defined by source documents. When the source defined **arc is a DME arc, the AF leg is the preferred leg type, for non DME arcs, the RF leg must be used.**

3.14 The previous leg and next leg associated with an RF leg should have a course or track which is tangent to the RF leg except when the leg combination is IF/RF, RF/RF, or RF/HX.**3.15**Use of a single RF leg is limited to turns of equal to or greater than 2 degrees and equal to or less than 300 degrees.

3.16 Phantom Waypoints. These database waypoints are established during procedure coding, used to facilitate more accurate navigation under certain circumstances.

3.17 **Path and Termination Related Rules Valid For All RNAV Terminal Procedures That Do Not Reference Ground-based Navaids**

3.17.1 Waypoint flyby/flyover requirements.

3.17.1.a Setting Position Two of the Waypoint Description field (Chapter Five, Section 5.17) to Y or B indicates a Flyover Waypoint; the fix in the record is to be over flown before flying the next leg. Absence of the Y or B indicates a Flyby Waypoint; turn anticipation may be used to acquire the next leg.

3.17.1.b The coding requirement of the Flyby or Flyover condition is derived from official government source.

3.17.1.c The Y or B indication for a Flyover Waypoint must not be used on fixes that begin or terminate on an RF leg.

3.18 Deleted by Supplement 20.

3.19 The CF leg is available as a leg type in RNAV Terminal Procedures only when specifically called out in the government source documentation. When this is the case, the leg data will include a reference from which the magnetic variation for use in flying the CF Leg can be determined. This reference will be provided in the Recommended Navaid field of the procedure record.

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PATH AND TERMINATOR

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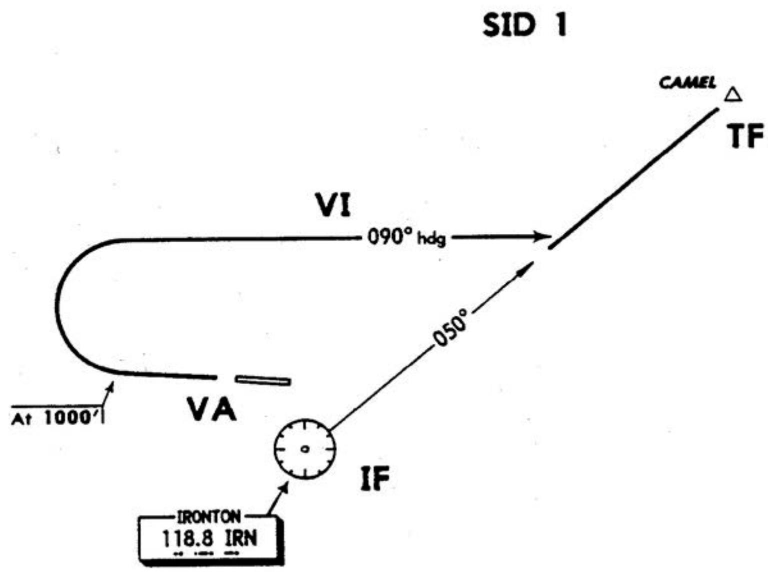
Illustration of Coding Rule 3.12



Normal SID Coding if IRN were a VORDME

SID IDENT	ROUTE TYPE	TRANS IDENT	WAYPOINT IDENT	DESC CODE	PATH TERM
SID 1	2	RW29			VA
SID 1	2	RW29			VI
SID 1	2	RW29	CAMEL	EE	CF

SID Coding required when IRN is VOR only

SID IDENT	ROUTE TYPE	TRANS IDENT	WAYPOINT IDENT	DESC CODE	PATH TERM
SID 1	2	RW29			VA
SID 1	2	RW29			VI
SID 1	2	RW29	IRN	V	IF
SID 1	2	RW29	CAMEL	EE	TF

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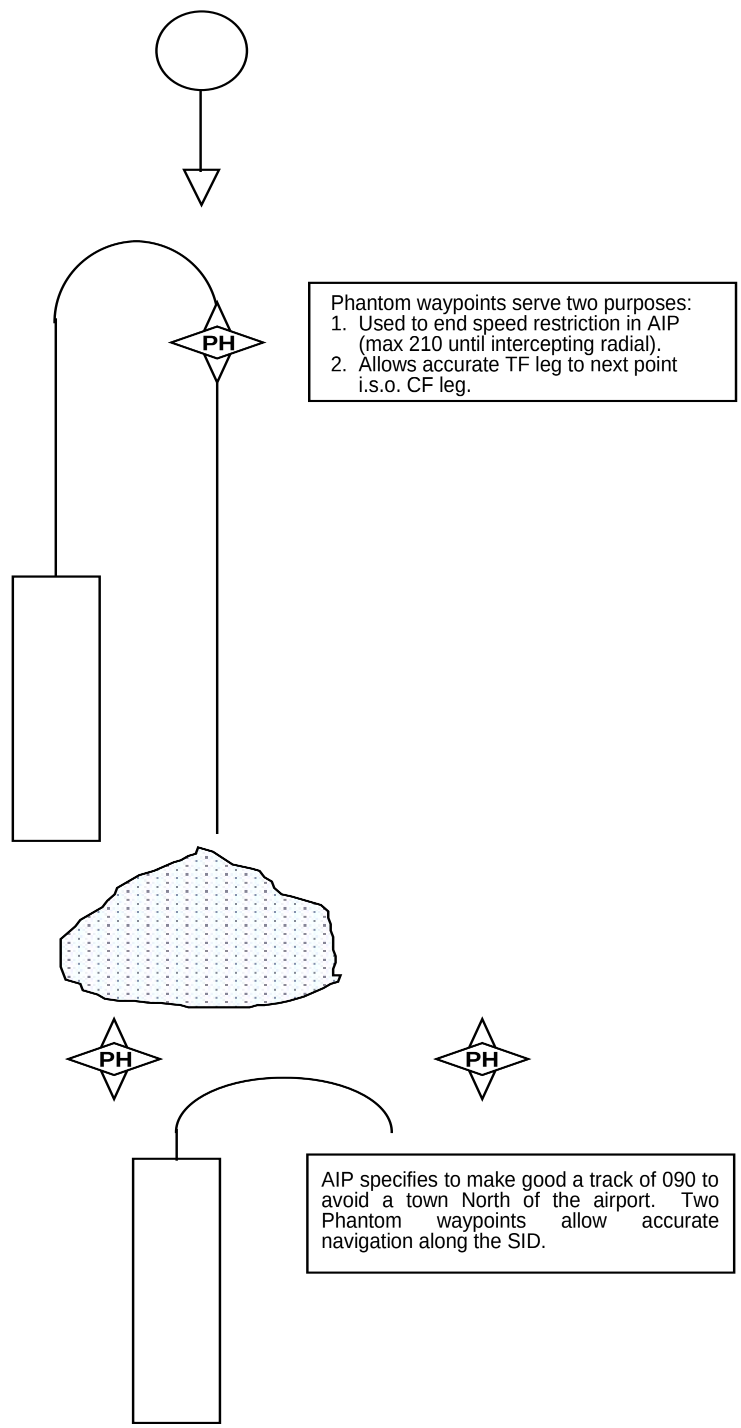
PATH AND TERMINATOR



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ATTACHMENT 5
PATH AND TERMINATOR

4.0 STANDARD INSTRUMENT DEPARTURE (SID) CODING RULES

4.1 The following rules cover the altitude coding requirements of the initial leg of a departure:

If a published take-off requires a turn of greater than 15 degrees from the runway bearing, code a CA, VA or IF/FA leg on the runway bearing/heading to an altitude of 400 feet above the airport elevation (AFE).

If a published take-off is straight ahead or requires a turn of less than 15 degrees and is to a fix such as a waypoint, Navaid, or DME distance termination, code an altitude on that fix when included in the government source, otherwise no altitude is coded.

If a published take-off is straight ahead or requires a turn of less than 15 degrees and is to a specified altitude termination, code the appropriate leg type (VA, IF/FA, CA) to that altitude.

The altitude description on a coded altitude, either a termination or at a fix, may be at, at or above, at or below and at or below to at or above.

In the case of a published Point-in-Space departure, the altitude coded on the Initial Departure Fix must be the Minimum Crossing Altitude (MCA). The altitude description on the Initial Departure Fix coded altitude, may be at or at or above.

4.2 For the first leg of a SID, course legs (CX or FX) are preferred over heading legs unless the source requires that heading legs be coded.

4.2.1 For RNAV SIDs that do not reference ground-based navaids, the following first leg rules apply.

4.2.2 Unless the initial leg of a departure is to a Fix, IF/FA is the preferred take-off leg combination, except as follows:

a. The government source prescribes the specific use of a CA or VA leg.
b. The CA leg is suitable as the first leg on take-off if there is a possibility of aircraft position or runway survey uncertainty.
c. The VA leg is suitable as first leg on takeoff when procedure design includes air mass track dispersion for noise or ATC procedures and therefore requires aircraft on heading legs.

4.3 The use of FM or VM leg types in the first leg of a SID Runway Transition for Route Types of 0 or 1is permitted when the initial heading is defined in the source**.**

4.4 If a SID ends in vectors, the heading for the FM or VM leg must be based on source documentation.

4.5 If the last fix of a SID sequence or SID Enroute Transition sequence is a fix on an Enroute Airway, the Waypoint Description Code in the Enroute Airway record for that fix must designate that fix as Essential or Transition Essential.

4.6 SID Enroute Transition legs will be coded using TF legs where possible to simplify coding. This rule does not apply if the use of TF legs would require the creation of additional waypoints.

4.7 SID Enroute Transitions published in source documentation but wholly contained in other SID Enroute Transitions will not be coded separately.

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4.8 Rule deleted by Supplement 20.

4.9 A SID which consists of a single path from an origination fix to a termination fix will be coded as a Route Type 2.

4.10 A SID which consists of Enroute Transitions only can be coded with a single IF leg as a Route Type 1 or 2, followed by the required Route Type 3 coding. The fix on which the IF leg is coded must be the first fix in all of the Enroute Transitions. The Transition Identifier must be coded in accordance with Chapter Five, Section 5.11. In the cases where all the Enroute Transitions do not begin at the same fix, but where most begin at the same fix then a partial SID may be coded.

4.11 For Vector SIDs which consist of Enroute Transitions only, the coding must be a Runway Transition Route Type T, followed by the Enroute Transition(s), Route Type V. The Enroute Transition(s) must be an IF/DF leg combination with the Airport or Heliport as the fix in the IF leg and the first fix of the Enroute Transition as the fix in the DF leg. The DF leg must carry a leg distance value in the Airport or Heliport SID/STAR/Approach flight planning continuation record, equal to the total distance between the Airport or Heliport and the fix along the approximated path.

4.12 When a SID Route or portion of a SID Route is repeated with different Runway Identifiers in the Transition Identifier, it must be coded as a Runway Transition Route Type of 1 or T (Vector SID). When a SID Route is repeated with different fix identifiers in the Transition Identifier, it must be coded as an Enroute Transition, Route Type of 3 or *V* (Vector SID).

4.13 Engine Out SIDs must be coded as Route Type 0 only. Route Type 0 is not used in combination with other SID Route Types. The Runway Transition Identifier must contain a specific Runway Identification or Helipad Identification. All other rules for Route Type 1 apply in the coding of Route Type 0.

4.14 **Rule deleted by Supplement 22.**

4.15 A Point-in-Space SID must be coded for all Airports or Heliports served as defined by source documentation.

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SID CODING EXAMPLE 1

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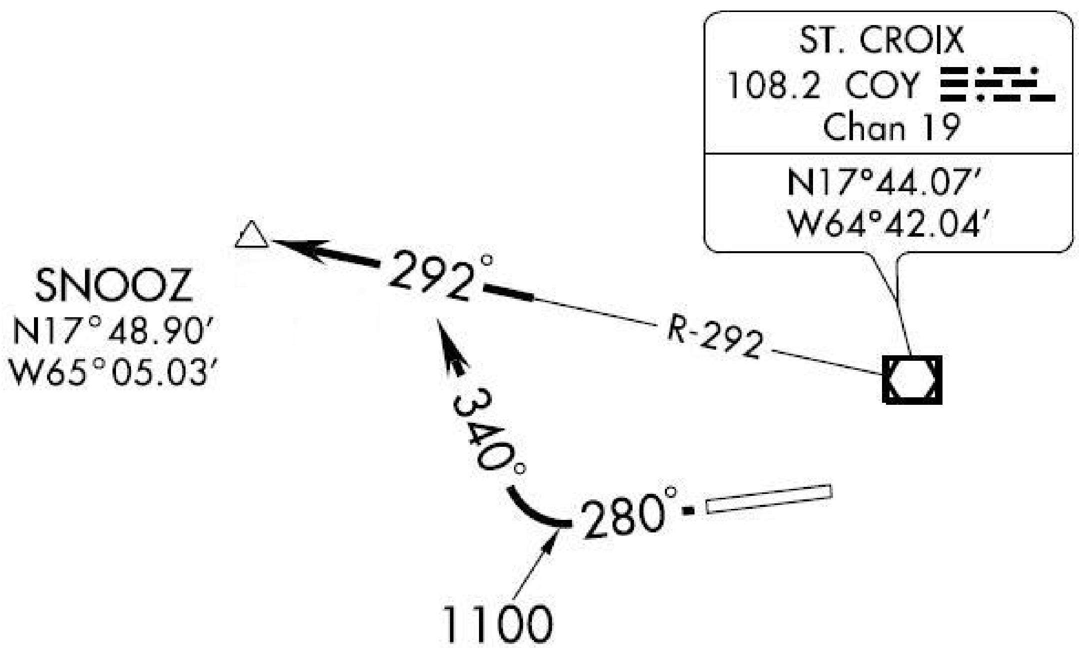
SNOOZ TWO DEPARTURE (SNOOZ2.SNOOZ)



Normal SID Coding when COY is a VORDME

SID IDENT	ROUTE TYPE	TRANS IDENT	SEQ	WAYPOINT	DESC CODE	PATH TERM
SNOOZ2	2	RW28	010		_ _ _ _	VA
SNOOZ2	2	RW28	020		_ _ _ _	VI
SNOOZ2	2	RW28	030	SNOOZ TI EA	E E _ _	CF

SID Coding required if COY were a VOR only

SID IDENT	ROUTE TYPE	TRANS IDENT	SEQ	WAYPOINT	DESC CODE	PATH TERM
SNOOZ2	2	RW28	010		_ _ _ _	VA
SNOOZ2	2	RW28	020		_ _ _ _	VI
SNOOZ2	2	RW28	030	COY TI D	V _ _ _	IF
SNOOZ2	2	RW28	040	SNOOZ TI EA	E E _ _	TF

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SID CODING EXAMPLE 2

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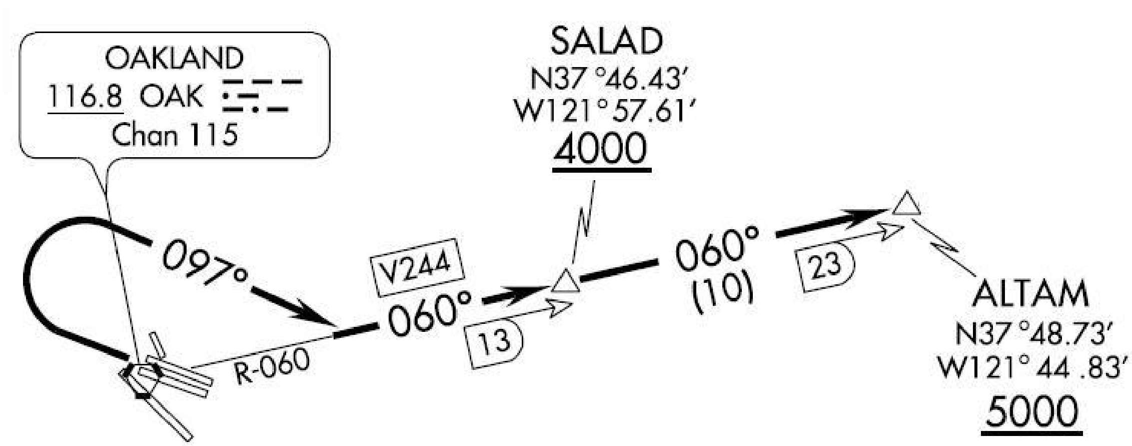
SALAD ONE DEPARTURE (SALAD1.ALTAM)



SID IDENT	ROUTE TYPE	TRANS IDENT	SEQ	WAYPOINT	DESC CODE	PATH TERM
SALAD1	2	RW27B	010		_ _ _ _	VA
SALAD1	2	RW27B	020		_ _ _ _	VI
SALAD1	2	RW27B	030	SALAD K2 EA	E _ _ _	CF
SALAD1	2	RW27B	040	ALTAM K2 EA	E E _ _	TF

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SID CODING EXAMPLE 3

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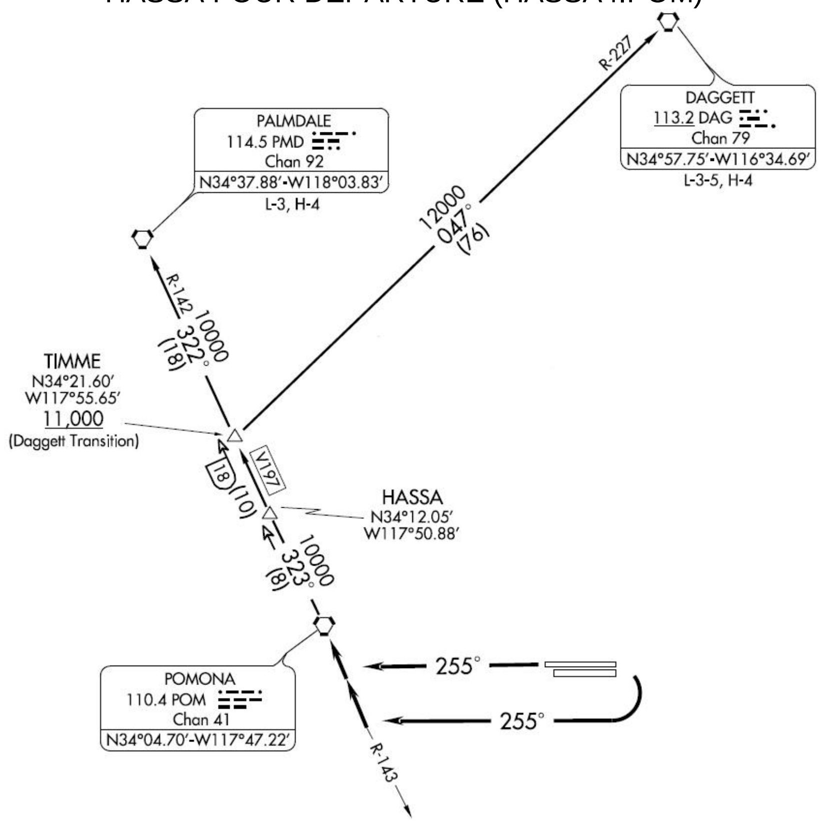
HASSA FOUR DEPARTURE (HASSA4.POM)



SID IDENT	ROUTE TYPE	TRANS IDENT	SEQ	WAYPOINT		DESC CODE	PATH TERM
HASSA4	1	RW08B	010			_ _ _ _	VA
HASSA4	1	RW08B	020			_ _ _ _	VI
HASSA4	1	RW08B	030	POM	K2 D	V E _ _	CF
HASSA4	1	RW26B	010			_ _ _ _	VI
HASSA4	1	RW26B	020	POM	K2 D	V E _ _	CF
HASSA4	2		010	POM	K2 D	V _ _ _	IF
HASSA4	2		020	HASSA	K2 EA	E _ _ _	TF
HASSA4	2		030	TIMME	K2 EA	E E _ _	TF
HASSA4	3	DAG	010	TIMME	K2 EA	E _ _ _	IF
HASSA4	3	DAG	020	DAG	K2 D	V E _ _	TF
HASSA4	3	PMD	010	TIMME	K2 EA	E _ _ _	IF
HASSA4	3	PMD	020	PMD	K2 D	V E _ _	TF

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SID CODING EXAMPLE 4

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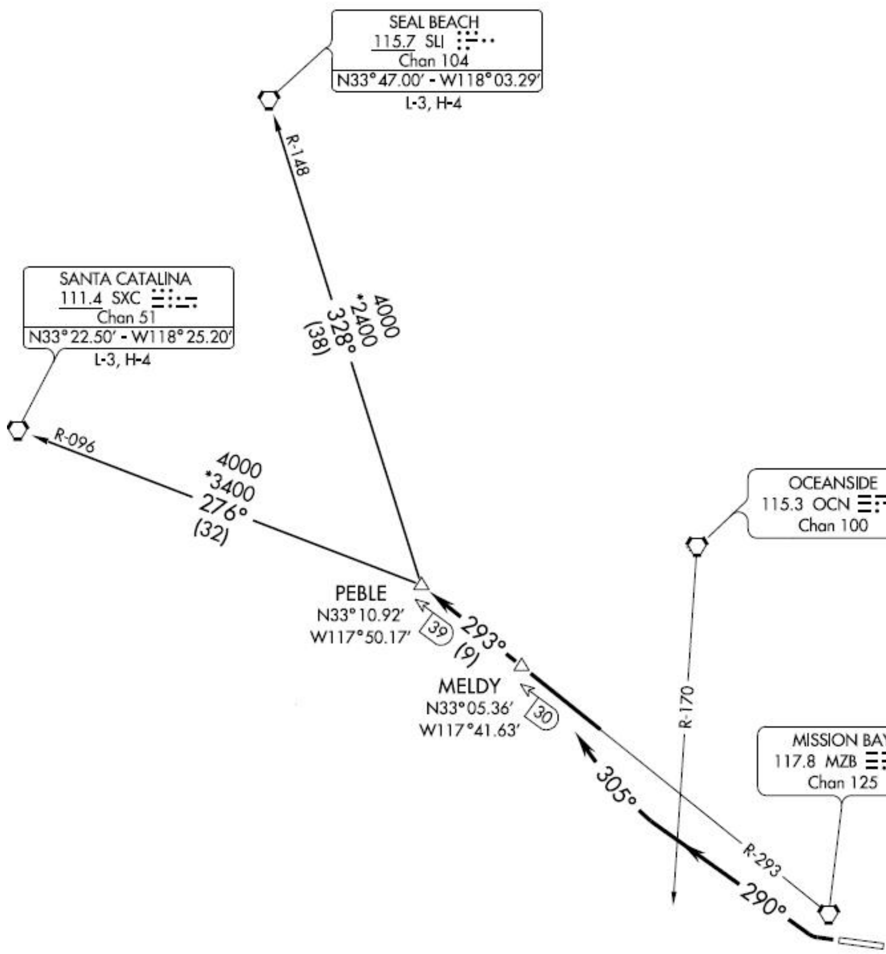
PEBLE THREE DEPARTURE (PEBLE3.PEBLE)



SID IDENT	ROUTE TYPE	TRANS IDENT	SEQ	WAYPOINT		WAYPOINT	PATH TERM
PEBLE3	2	RW27	010			_ _ _ _	VA
PEBLE3	2	RW27	020			_ _ _ _	VR
PEBLE3	2	RW27	030			_ _ _ _	VI
PEBLE3	2	RW27	040	MELDY	K2 EA	E _ _ _	CF
PEBLE3	2	RW27	050	PEBLE	K2 EA	E E _ _	TF
PEBLE3	3	SLI	010	PEBLE	K2 EA	E _ _ _	IF
PEBLE3	3	SLI	020	SLI	K2 D	V E _ _	TF
PEBLE3	3	SXC	010	PEBLE	K2 EA	E _ _ _	IF
PEBLE3	3	SXC	020	SXC	K2 D	V E _ _	TF

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SID CODING EXAMPLE 5

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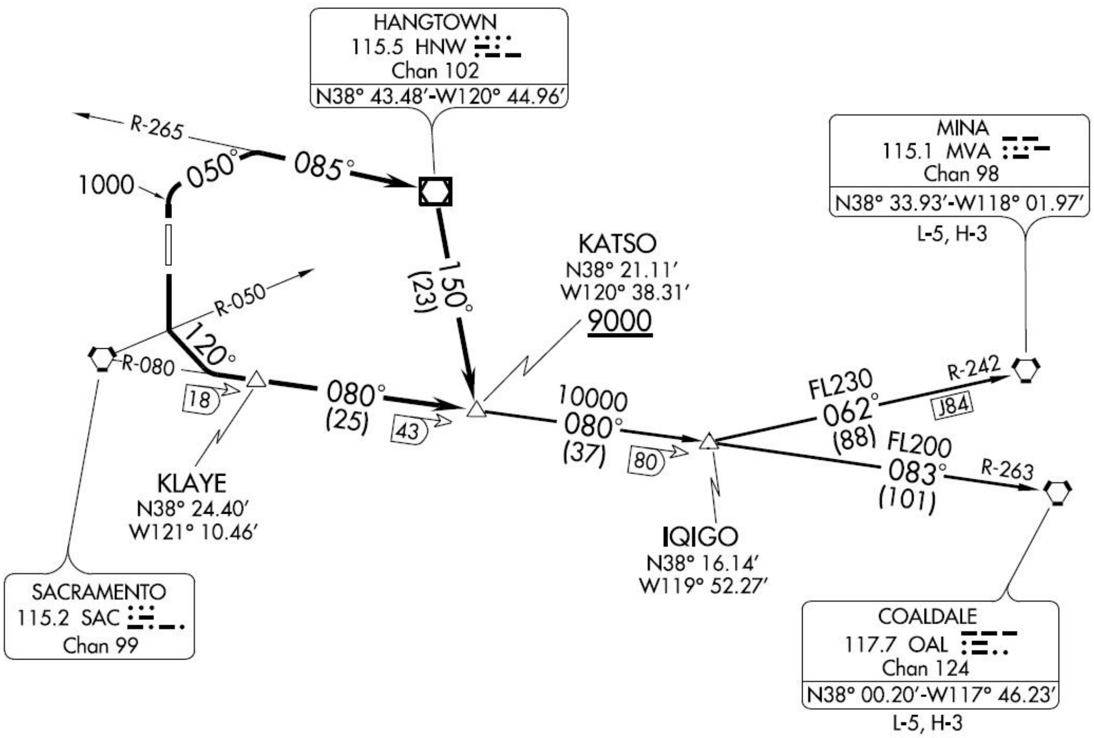
KATSO TWO DEPARTURE (KATSO2.KATSO)



SID IDENT	ROUTE TYPE	TRANS IDENT	SEQ	WAYPOINT	DESC CODE	PATH TERM
KATSO2	1	RW16	010		_ _ _ _	VR
KATSO2	1	RW16	020		_ _ _ _	VI
KATSO2	1	RW16	030	KLAYE K2 EA	E _ _ _	CF
KATSO2	1	RW16	040	KATSO K2 EA	E E _ _	TF
KATSO2	1	RW34	010		_ _ _ _	VA
KATSO2	1	RW34	020		_ _ _ _	VI
KATSO2	1	RW34	030	HNW K2 D	V _ _ _	CF
KATSO2	1	RW34	040	KATSO K2 EA	E E _ _	TF
KATSO2	2		010	KATSO K2 EA	E _ _ _	IF
KATSO2	2		020	IQIGO K2 EA	E E _ _	TF
KATSO2	3	MVA	010	IQIGO K2 EA	E _ _ _	IF
KATSO2	3	MVA	020	MVA K2 D	V E _ _	TF
KATSO2	3	OAL	010	IQIGO K2 EA	E _ _ _	IF
KATSO2	3	OAL	020	OAL K2 D	V E _ _	TF

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SID CODING EXAMPLE 6

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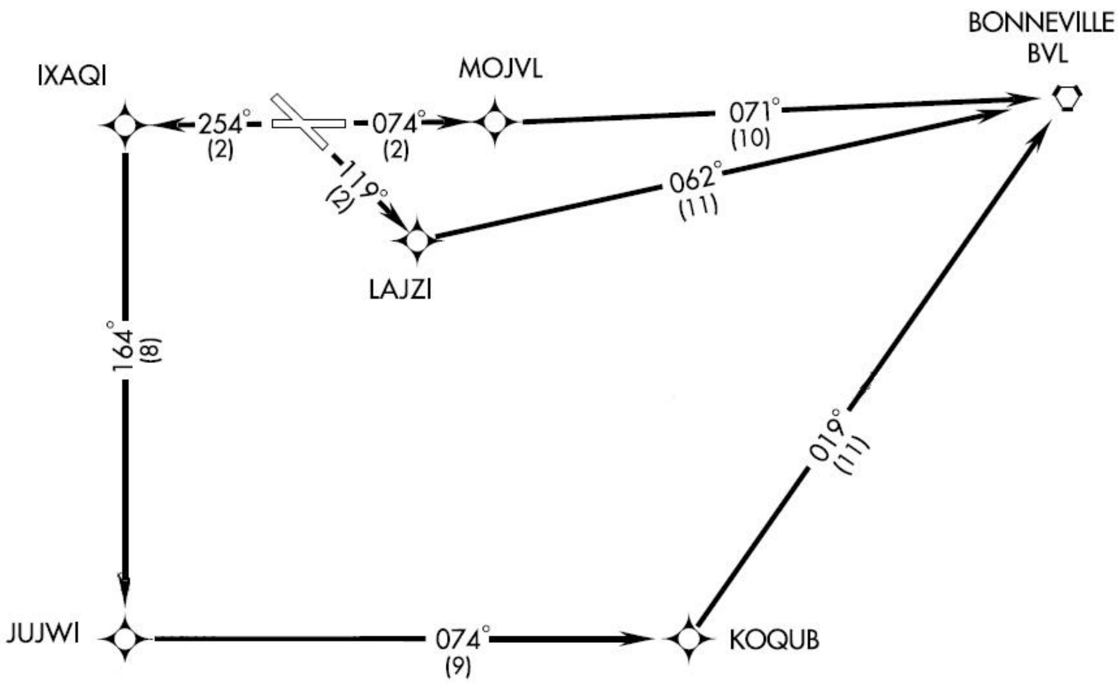
BONNEVILLE ONE DEPARTURE (ENV1.BVL)



SID IDENT	ROUTE TYPE	TRANS IDENT	SEQ	WAYPOINT		DESC CODE	PATH TERM
ENV1	1	RW08	010	MOJVL	K2 EA	E _ _ _	CF
ENV1	1	RW08	020	BVL	K2 D	V E _ _	TF
ENV1	1	RW12	010	LAJZI	K2 EA	E _ _ _	CF
ENV1	1	RW12	020	BVL	K2 D	V E _ _	TF
ENV1	1	RW26	010	IXAQI	K2 EA	E _ _ _	CF
ENV1	1	RW26	020	JUJWI	K2 EA	E _ _ _	TF
ENV1	1	RW26	030	KOQUB	K2 EA	E _ _ _	TF
ENV1	1	RW26	040	BVL	K2 D	V E _ _	TF

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SID CODING EXAMPLE 7

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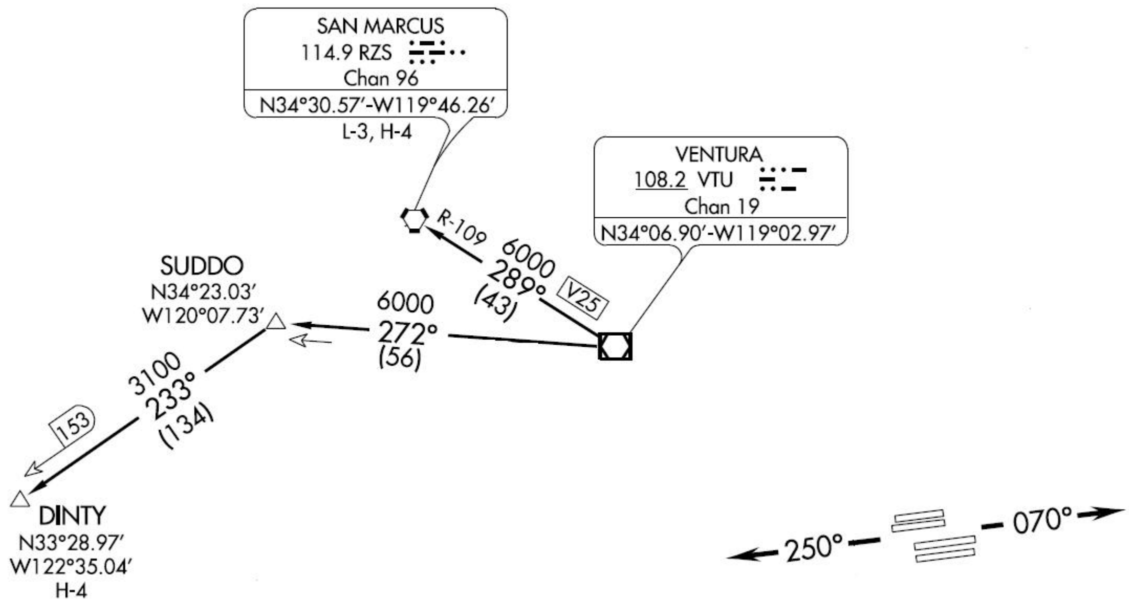
VENTURA FIVE DEPARTURE (VTU5.VTU)



SID IDENT	ROUTE TYPE	TRANS IDENT	SEQ	WAYPOINT		DESC CODE	PATH TERM
VTU5	1	RW06B	010			_ _ _ _	VM
VTU5	1	RW06B	020	VTU	K2 D	V E _ _	DF
VTU5	1	RW24B	010			_ _ _ _	VM
VTU5	1	RW24B	020	VTU	K2 D	V E _ _	DF
VTU5	3	RZS	010	VTU	K2 D	V _ _ _	IF
VTU5	3	RSZ	020	RZS	K2 D	V E _ _	TF
VTU5	3	DINTY	010	VTU	K2 D	V _ _ _	IF
VTU5	3	DINTY	020	SUDDO	K2 EA	E _ _ _	TF
VTU5	3	DINTY	030	DINTY	K2 EA	E E _ _	TF

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SID CODING EXAMPLE 8

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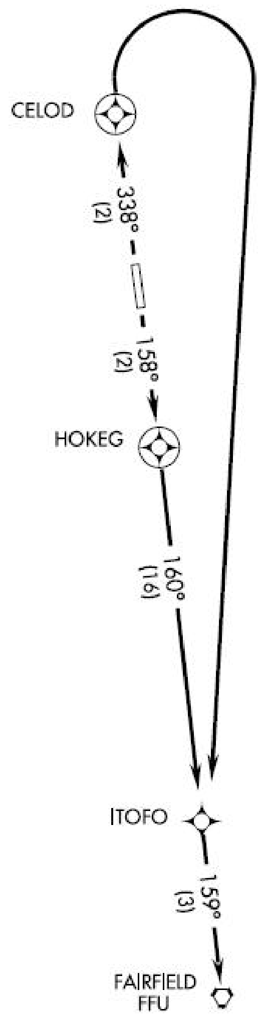
ITOFO ONE DEPARTURE (ITOFO1.FFU)



SID IDENT	ROUTE TYPE	TRANS IDENT	SEQ	WAYPOINT		DESC CODE	PATH TERM
ITOFO1	1	RW16	010	HOKEG	K2 EA	E Y _ _	CF
ITOFO1	1	RW16	020	ITOFO	K2 EA	E E _ _	TF
ITOFO1	1	RW34	010	CELOD	K2 EA	E Y _ _	CF
ITOFO1	1	RW34	020	ITOFO	K2 EA	E E _ _	DF
ITOFO1	2		010	ITOFO	K2 EA	E _ _ _	IF
ITOFO1	2		020	FFU	K2 D	V E _ _	TF

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SID CODING EXAMPLE 9

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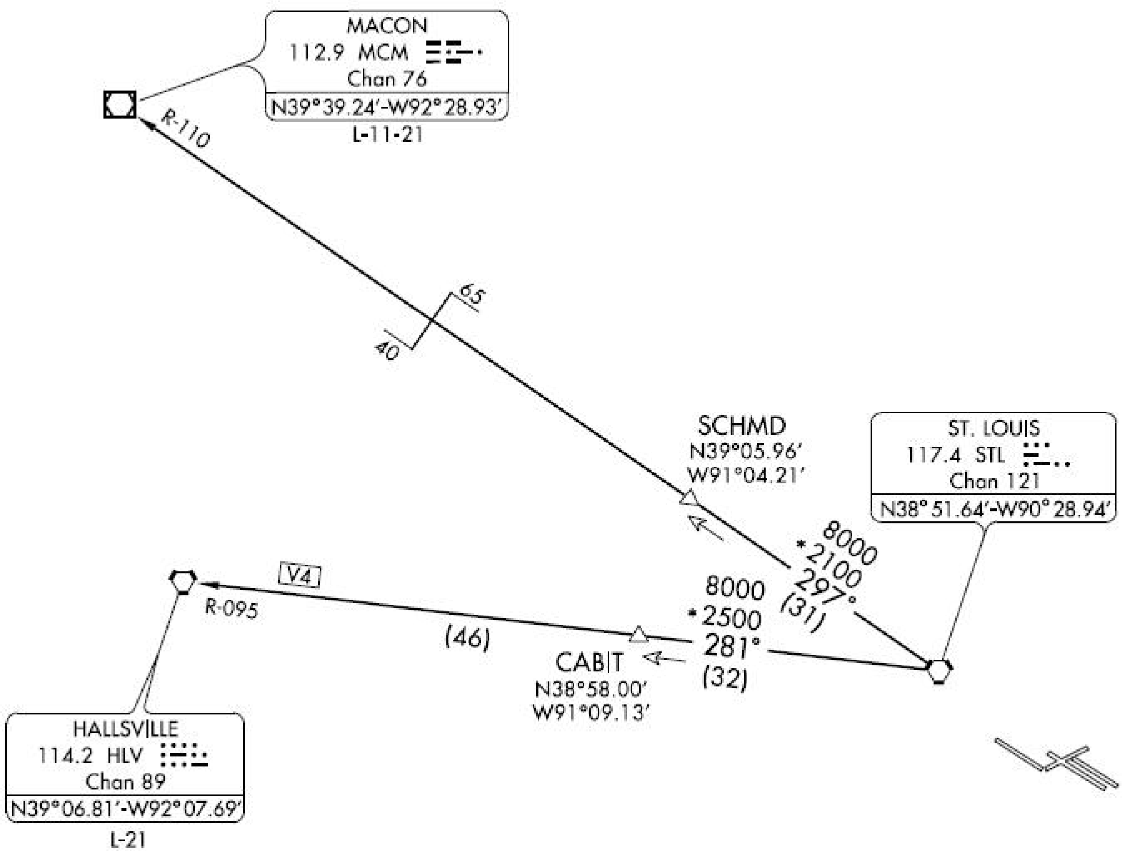
SNOOZ TWO DEPARTURE (SNOOZ2.SNOOZ)



SID IDENT	ROUTE TYPE	TRANS IDENT	SEQ	WAYPOINT		DESC CODE	PATH TERM
SNOOZ2	2	ALL	010	STL	K2 D	V E _ _	IF
SNOOZ2	3	HLV	010	STL	K2 D	V _ _ _	IF
SNOOZ2	3	HLV	020	CABIT	K2 EA	E _ _ _	TF
SNOOZ2	3	HLV	020	HLV	K2 D	V E _ _	TF
SNOOZ2	3	MCM	010	STL	K2 D	V _ _ _	IF
SNOOZ2	3	MCM	020	SCHMD	K2 EA	E _ _ _	TF
SNOOZ2	3	MCM	030	MCM	K2 D	V E _ _	TF

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5.0 Standard Terminal Arrival Route (STAR) Coding Rules

5.1 If a STAR ends in vectors to a final approach (VM leg), the Airport Record or Heliport Record for which the procedure is established will be coded in the Waypoint Ident field of the STAR Record.

5.2 Deleted by Supplement 19.

5.3 If a STAR does not begin at a fix in the source documentation, the closest named fix along the STAR track must be assigned as the initial fix (IF leg) for the STAR.

5.4 If no crossing altitudes are specified on intermediate fixes of a STAR or Profile Descent, a vertical angle will be coded in the last leg of the procedure. This angle will be computed, based on the altitudes specified at the end fixes, to provide a constant descent path through all intermediate fixes. The angle provided will ensure compliance with minimum enroute altitudes for those segments without assigned altitudes.

5.5 A STAR which consists of a single path from an origination fix to a termination fix will be coded as a Route Type 2.

5.6 When a STAR Route or portion of a STAR Route is repeated with different Runway Identifiers or different Helipad Identifiers in the Transition Identifier it must be coded as a Runway Transition Route Type 3. When a STAR Route/Profile Descent Route or portion of a STAR Route is repeated with different Fix Identifiers in the Transition Identifier, it must be coded as an Enroute Transition Route Type 1.

5.7 When an Arrival Route serves the same runway or helipad as an Approach Route and the Arrival Route overlaps an Approach Transition, both the Arrival Route and the Approach Transition will be coded in their entirety in accordance with source documentation.

5.8 A STAR which consists of Enroute Transitions only can be coded with the required Route Type 3 coding, followed by a single IF leg as a Route Type 2. The fix on which the IF leg is coded must be the last fix in all of the Enroute Transitions. The Transition Identifier must be coded in accordance with Chapter Five, Section 5.11. In the cases where all the Enroute Transitions do not end at the same fix, but where most end at the same fix then a partial STAR may be coded.

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STAR CODING EXAMPLE 1

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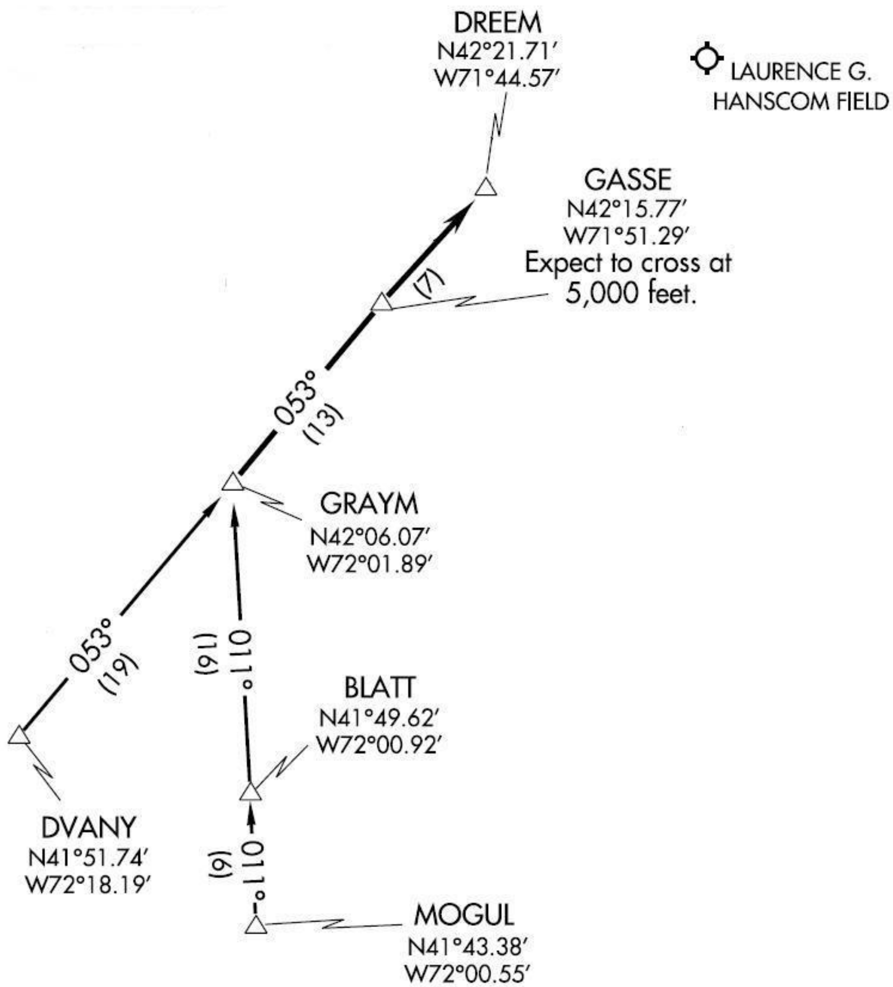
GRAYM TWO ARRIVAL (GRAYM.GRAYM2)



STAR IDENT	ROUTE TYPE	TRANS IDENT	SEQ	WAYPOINT	DESC CODE	PATH TERM
GRAYM2	1	DVANY	010	DVANY K6 EA	E _ _ _	IF
GRAYM2	1	DVANY	020	GRAYM K6 EA	E E _ _	TF
GRAYM2	1	MOGUL	010	MOGUL K6 EA	E _ _ _	IF
GRAYM2	1	MOGUL	020	BLATT K6 EA	E _ _ _	TF
GRAYM2	1	MOGUL	030	GRAYM K6 EA	E E _ _	TF
GRAYM2	2	ALL	010	GRAYM K6 EA	E _ _ _	IF
GRAYM2	2	ALL	020	GASSE K6 EA	E _ _ _	TF
GRAYM2	2	ALL	030	DREEM K6 EA	E E _ _	TF

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STAR CODING EXAMPLE 2

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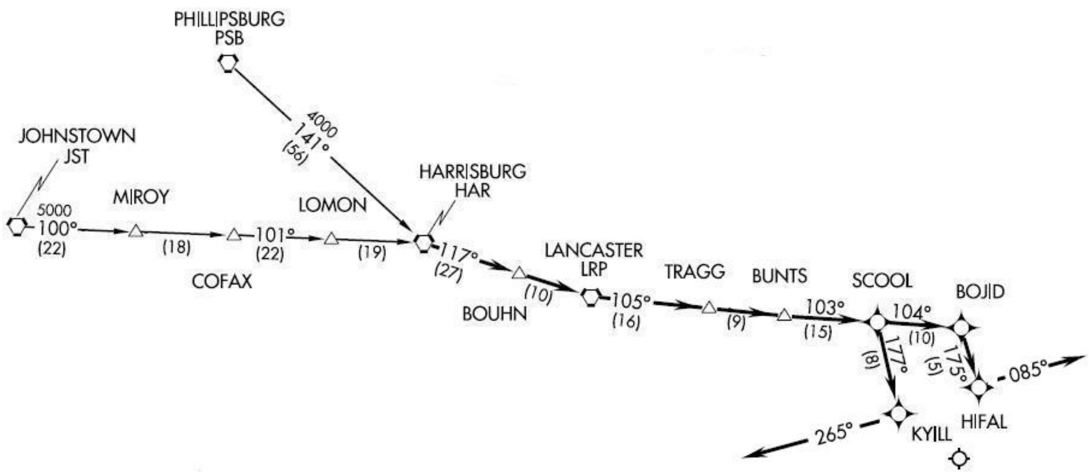
BOJID ONE ARRIVAL (BOJID.BOJID1)



STAR IDENT	ROUTE TYPE	TRANS IDENT	SEQ	WAYPOINT		DESC CODE	PATH TERM
BOJID1	1	JST	010	JST	K6 D	V _ _ _	IF
BOJID1	1	JST	020	MIROY	K6 EA	E _ _ _	TF
BOJID1	1	JST	030	COFAX	K6 EA	E _ _ _	TF
BOJID1	1	JST	040	LOMON	K6 EA	E _ _ _	TF
BOJID1	1	JST	050	HAR	K6 D	V E _ _	TF
BOJID1	1	PSB	010	PSB	K6 D	V _ _ _	IF
BOJID1	1	PSB	020	HAR	K6 D	V E _ _	TF
BOJID1	2		010	HAR	K6 D	V _ _ _	IF
BOJID1	2		020	BOUHN	K6 EA	E _ _ _	TF
BOJID1	2		030	LRP	K6 D	V _ _ _	TF
BOJID1	2		040	TRAGG	K6 EA	E _ _ _	TF
BOJID1	2		050	BUNTS	K6 EA	E _ _ _	TF
BOJID1	2		060	SCOOL	K6 EA	E E _ _	TF
BOJID1	3	RW09B	010	SCOOL	K6 EA	E _ _ _	IF
BOJID1	3	RW09B	020	KYILL	K6 EA	E _ _ _	TF
BOJID1	3	RW09B	030	KPHL	K6 PA	A E _ _	VM
BOJID1	3	RW27B	010	SCOOL	K6 EA	E _ _ _	IF
BOJID1	3	RW27B	020	BOJID	K6 EA	E _ _ _	TF
BOJID1	3	RW27B	030	HIFAL	K6 EA	E _ _ _	TF
BOJID1	3	RW27B	040	KPHL	K6 PA	A E _ _	VM

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Note: If a STAR route ends with a Vector heading, the Airport ident is entered in the waypoint ident field.

STAR CODING EXAMPLE 3

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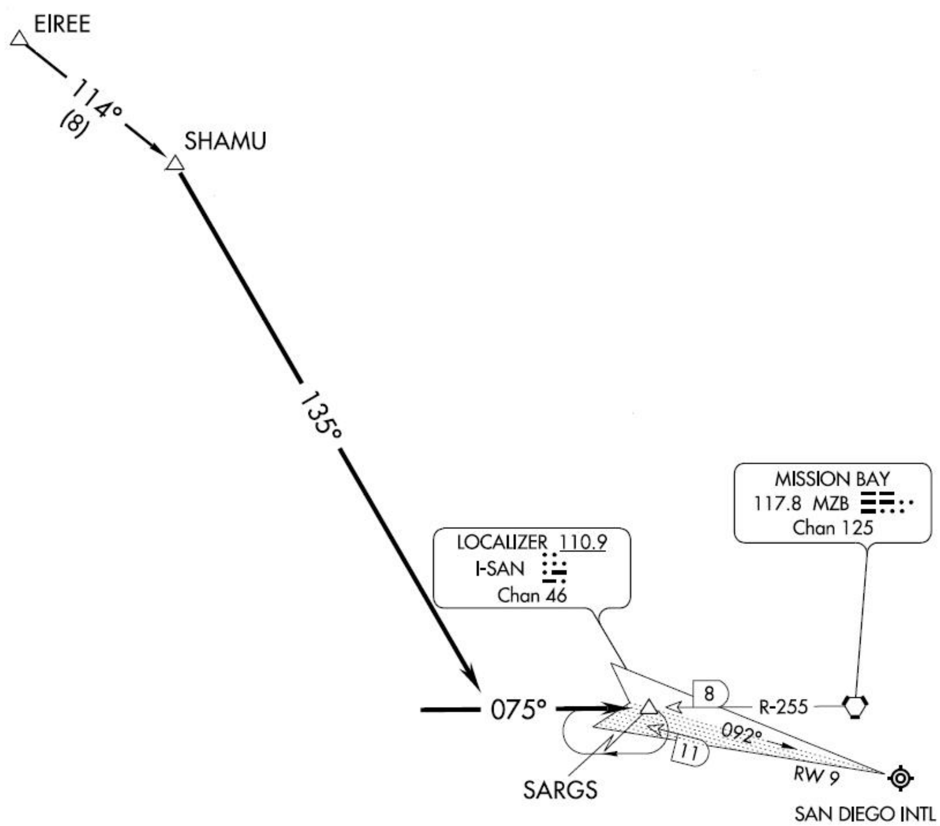
SHAMU ONE ARRIVAL (SHAMU.SHAMU1)



STAR IDENT	ROUTE TYPE	TRANS IDENT	SEQ	WAYPOINT		DESC CODE	PATH TERM
SHAMU1	2	RW09	010	EIREE	K2 EA	E _ _ _	IF
SHAMU1	2	RW09	020	SHAMU	K2 EA	E _ _ _	TF
SHAMU1	2	RW09	030			_ _ _ _	VI
SHAMU1	2	RW09	040	SARGS	K2 EA	E E _ _	CF

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STAR CODING EXAMPLE 4

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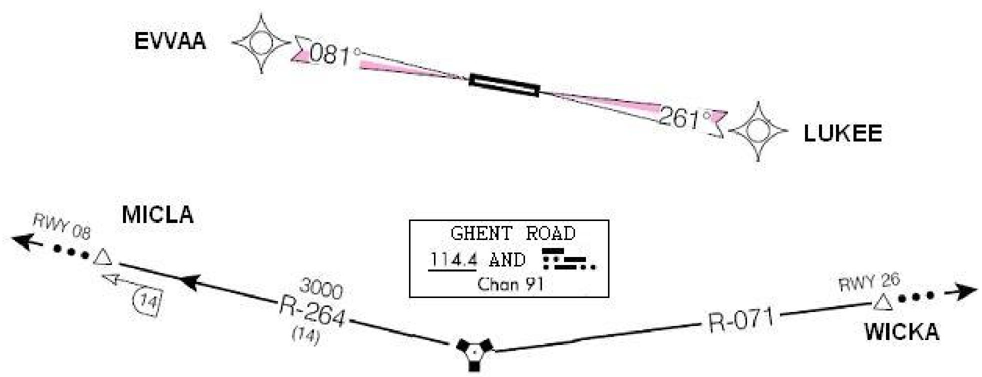
GHENT ONE ARRIVAL (AND.GHENT1)



STAR IDENT	ROUTE TYPE	TRANS IDENT	SEQ	WAYPOINT		DESC CODE	PATH TERM
GHENT1	3	RW08	010	AND	K3 D	V _ _ _	IF
GHENT1	3	RW08	020	MICLA	K3 EA	E _ _ _	TF
GHENT1	3	RW08	030	MICLA	K3 EA	E _ _ _	FM
GHENT1	3	RW08	040	EVVAA	K3 EA	E E _ _	CF
GHENT1	3	RW26	010	AND	K3 D	V _ _ _	IF
GHENT1	3	RW26	020	WICKA	K3 EA	E _ _ _	TF
GHENT1	3	RW26	030	WICKA	K3 EA	E _ _ _	FM
GHENT1	3	RW26	040	LUKEE	K3 EA	E E _ _	CF

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6.0 Approach Procedure Rules Valid For All Procedure Types

6.1 Multiple Approach Procedure Coding

6.1.1 Multiple Approach Procedure Definition

1. ILS Localizer
2. IGS Localizer
3. LDA Localizer
4. SDF Localizer
5. Localizer (Only)
6. Localizer Backcourse
7. MLS (all types)
8. RNAV (Area Navigation)
9. VORDME
10. VORTAC
11. VOR (no DME)
12. TACAN
13. NDB + DME
14. NDB
15. FMS
16. GPS
17. GLS

Notes: GPS, GLS, RNAV, are not facility types but rather an equipment classification. RNAV procedures use VORDME or VORTAC navaids along with the RNAV equipment. For the purpose of these rules, RNAV is to be considered a facility type. This will allow coding of a RNAV and VORDME or VORTAC procedure to the same runway or helipad. For GPS, GLS, a GPS or GLS sensor input to the equipment is required.

It is possible to have multiple RNAV-type approach procedures to the same runway due to official government source procedure designations, such as RNAV and GPS. These procedure designations are handled according to the rules for Route Type in Section 5.7. It is also possible to have multiple RNAV Terminal Procedures of the same type to the same runway, due to official government source procedure designations such as RNAV Y Rwy 27 and RNAV Z Rwy 27. These multiple procedures of the same type are handled according to the rules for Approach Procedure Idents in Section 5.10

Circle to Land minimum version of the various approach sensors are covered through the Approach Route Qualifier (see Section 5.7). Circle-To-Land is not a facility type but rather a weather minimum criteria. For the purpose of these rules, Circle-To-Land is to be considered an equal to the procedure reference facility.

There are three types of MLS Approach, each with a unique Route Type. Normally, there will only be one approach referencing MLS to any given runway or helipad.

GLS provides the necessary corrections to ensure precision navigation for alignment and descent during final approach. GLS-based approaches are consequently considered precision approach procedures. For GLS-based procedures, a GNSS and GLS sensor input is required.

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6.1.2 Multiple Approach Procedure Identifiers

Multiple approach procedures are identified by unique procedure identifiers and unique route types (refer to Sections 5.7 and 5.10 of this specification).

6.1.3 Multiple Approach Procedure Waypoints

Multiple approach procedures to one and the same runway or helipad may require multiple Final Approach Coding waypoints of the same category such as FACF, FAF and MAP. Where such waypoints are not established with unique identifiers through source documentation, they must be created following the rules for identifiers in Section **8**.2.6 of this specification.

6.1.4 Multiple Approach Procedure Detail

Specific details of approach procedures such as speed, altitudes and vertical angles are considered unique for the procedure and must be coded in those records where they apply, including duplication of such detail where appropriate.

6.1.5 Transitions in Multiple Approach Procedure Coding

6.1.5.1 Approach transitions are coded to be used together with specific approach procedures. As such, a transition route must be unique to a given approach, multiple use with more than one approach cannot be coded. Transition routes required for more than one approach must be coded multiple times.

6.1.5.2 If an approach transition route is coded multiple times, it must be coded with an identifier that is unique to the approach procedure for which it is to be used.

6.2 General Rules, Applicable to all Approach Route coding.

6.2.1 Altitudes used in approach route coding between the final approach course fix (FACF) and the runway or helipad or missed approach point will be coded in combination with Altitude Description Codes as detailed in Section 5.29 of this specification and in accordance with government source documents. This coding rule is intended to match the altitude publishing methods in official government sources, which may specify altitudes as minimum, maximum, mandatory, recommended, or between altitudes, defined with a minimum and a maximum altitude.

These definitions include two kinds of altitudes. One is procedural altitudes information on mandatory or minimum altitudes at designated fixes along the final approach path. The other is the altitude related to the electronic Glideslope or published vertical angle with recommended altitudes. The ordering of Procedural and Glideslope altitudes in the first and second altitude fields is accomplished in accordance with Section 5.29.

6.2.2 All fixes associated with the lateral and vertical path of approach procedures must be coded, including step-down fixes, both before and after the Final Approach Fix.

6.2.3 With the exception of the NDB + DME Approach or a Helicopter version of a NDB + DME Approach Procedure, the recommended Navaid must be the same facility for all sequences in the final approach coding, excluding the missed approach procedure sequences, which require a recommended facility. The recommended facility must be the procedure reference facility. For Approach Transitions, the recommended Navaid must be the procedure reference facility or a VORDME or VORTAC facility. When a VORDME or VORTAC is coded as the recommended

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Navaid in Final Approach Coding, the Navaid will be within 40 NM of the fix in which it is coded. GPS approach procedures do not include a recommended Navaid. GLS approach procedures must reference the GLS facility. For specific rules on recommended Navaid for NDB + DME Approach Procedures, see Rule 6.8.1.4.b of this Attachment.

6.2.4 PI Leg Coding Requirments

6.2.4.1 If a PI leg is from the FAF waypoint and the distance between the FACF and the FAF is less than 6.0 NM, code a CF leg after the PI, with the FACF as the fix in the CF. The route distance leg data field on the CF leg will be the difference between the distance coded on the PI leg and the distance between the FACF and FAF waypoints.

6.2.4.2 **If a PI-CF coding would result in a distance between PI and CF waypoints equal to 6.0 NM or more, and the Maximum Excursion Distance (turn limit) is greater than 10 NM, then a new fix must be inserted on the outbound axis at less than 6.0 NM before the CF fix, and the PI leg must be anchored at that fix. The Maximum Excursion Distance must be modified accordingly.**

6.2.4.3 **If the procedure turn is specified by an outbound time greater than one minute, then a new fix must be inserted on the outbound axis 3.5 NM (~ 1 minute) before the turning point, assuming a ground speed of 210 knots. The PI leg must be anchored at that fix. The Maximum Excursion Distance must be modified accordingly.**

6.2.5 Approach Procedure Fix Requirements:

- Final Approach Coding of all instrument approach procedures requires the coding of a Final Approach Fix (FAF) and a Missed Approach Point Fix (MAP).
- The Final Approach Coding of all instrument approach procedures requires the coding of a Final Approach Course Fix (FACF) when one of the following conditions applies:
  - The approach procedure type is ILS, LOC, SDF, LDA, IGS, or LOC Backcourse.
  - There is a single published fix designated as an Intermediate Fix
  - There is a published fix designated as a FACF
  - There is a published and named fix that is the common ending point for transitions
  - A transition ends in the intercept of a track rather than to a fix.
  - The course or track inbound to the FAF is different than the course or track from the FAF to the MAP. This requirement will be met by the addition of data supplier created FACF waypoint as indicated in Rule 6.2.5.2.
  - When a FACF is coded, it must be the first waypoint of the Final Approach Coding.
  - When a FACF is not coded, the first waypoint of the Final Approach Coding must be the FAF.

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6.2.5.1 Transitions may end at a FAF fix regardless of whether a FACF is coded for the procedure or not.

6.2.5.2 If no waypoint is established by source documentation for the final approach course fix and one is required by the requirements in Rule 6.2.5, one must be computed by the data supplier. For Localizer based approach procedures, the computer FACF will be on the localizer course at a distance of 2 to 8NM from the Final Approach Fix (FAF). For all other approach types, the FACF will be computed on the published course to the FAF at a distance not less than 2NM to the FAF. Section 2, Subsection 2.3, Special Navigation Terms, Altitude coding for this fix is defined in Rule 6.2.10.

6.2.5.3 If no waypoint is established by source documentation for the Final Approach Fix (FAF), one must be computed.

6.2.5.3a For non-precision approach procedures such as VOR or NDB, one must be computed on the final approach course, using the initial approach altitude and the vertical descent angle (source or computed). The minimum distance between the FAF and the runway threshold or helipad alighting point (or MAP) will be 4 nautical miles.

6.2.5.3b For **precision** based approach procedures, establish the FAF, when none is provided by source, at the nominal outer marker position. **If no nominal outer marker position is published in source, use the glide slope intercept position.**

6.2.5.4 Except as indicated by specific rules within this Attachment, the source provides published Missed Approach Point (MAP) is always coded as part of the approach procedure. This MAP may be a runway threshold (Landing Threshold Point, LTP), a helipad alighting point, or a dedicated missed approach point fix. The published missed approach point may be replaced by a database provider established fix when it can be determined that the published fix was intended to be the runway threshold or helipad alighting point. For more detail, see section 8.10 of this Attachment.

6.2.6 Removed by Supplement 19.

6.2.7 Removed by Supplement 19.

6.2.8 Intentionally left blank

6.2.9 Lateral Coding Rules

All approach procedure coding must be to the published Missed Approach Point, as indicated below. Missed Approach Procedure coding must begin at that point. For missed approach procedure coding, refer to Section Nine of this Attachment. For the rules that follow, the term runway threshold is meant to refer either to the Landing Threshold Point (LTP) of an actual runway or to a Fictitious Threshold Point (FTP) when the procedure is coded to a helipad.

6.2.9.1 If the published Missed Approach Point is a fix prior to the runway threshold, lateral coding is to that published Missed Approach Point.

6.2.9.2 If the published Missed Approach Point is the runway threshold, lateral coding is to the runway threshold as the published Missed Approach Point.

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6.2.9.3 If the published missed approach point is beyond the runway threshold and the runway threshold will be coded as a fix in the lateral path that fix will be on the established path, with no course changes.

6.2.9.4 If the published Missed Approach Point is beyond the runway threshold and a runway threshold fix cannot be inserted as defined in Rule 8.10, a Final End Point fix is to be inserted into the final approach coding sequence. For complete details, see Rule 8.10.

6.2.9.5 If the published Missed Approach Point is abeam the runway threshold, lateral coding must be to the published Missed Approach Point.

Refer to the Examples 1 through 15 at the end of this section for a visual depiction of these rules.

6.2.9.6 For Point-in-Space approaches, lateral coding is to that published Missed Approach Point and does end at this point. Descent Points will not be coded.

6.2.10 Vertical Coding Rules, Procedure Fix Altitudes

Vertical Approach Procedure Coding is provided through two elements, Procedure Fix Altitudes and a Vertical Angle. This section covers the Fix Altitude. Sections 7 and 8 cover the Vertical Angle for Precision and Non-Precision Approach Procedures.

6.2.10.1 Procedure Fix Altitudes, Final Approach Course Fix and Final Approach Fix.

Procedure Fix Altitudes for the Final Approach Course Fix will be coded according to official government sources and will be left blank when no altitude data is provided by the source. When coded, these altitudes will be assigned altitude descriptions codes indicating the altitude as mandatory, minimum or recommended (see Section 5.29 of this specification). When the coded Final Approach Fix is established by the government source procedure data, the altitudes for this fix will also be coded according to official government sources. These altitudes will be assigned altitude descriptions codes indicating the altitude as mandatory, minimum or recommended (see Section 5.29 of this specification). For government supplied altitude data, both Altitude 1 and Altitude 2 may be provided. If the Final Approach Fix is as an established fix rather than a published fix, the altitude for this fix must be computed using the procedures detailed in Sections 7 and 8 of this Attachment. For calculated altitude data, only Altitude 1 will be provided.

6.2.10.2 Procedure Fix Altitudes for the published Missed Approach Point, a runway threshold fix prior to the published Missed Approach Point or a Final End Point prior to the Missed Approach Point must be as indicated below.

6.2.10.2.a For a published Missed Approach Point prior to the runway threshold, an at altitude equal to the computed altitude at the published Missed Approach Point must be coded in Altitude 1. (See example 7)

6.2.10.2.b For a published Missed Approach Point at the runway threshold, an at altitude equal to the runway threshold elevation plus the published TCH must be coded in Altitude 1. If no procedure TCH is specified by source, then use 40 or 50 feet (See Section 5.67of this standard).

6.2.10.2.c For a published Missed Approach Point beyond the runway threshold and where a landing threshold point fix has been inserted into the final approach coding by the

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data supplier, based on the rules in Rule 8.10 of this Attachment, code an at altitude equal to the runway threshold elevation plus the published TCH (if no procedure TCH is specified by source, then use 40 or 50 feet) in Altitude 1 of the landing threshold point fix record. See Rule 8.10 of this attachment

6.2.10.2.d For a published Missed Approach Point beyond the runway threshold and where a final end point fix has been inserted into the final approach coding by the data supplier, based on the rules in Rule 8.10 of this Attachment, code an at altitude equal to the runway threshold elevation plus the published TCH (if no procedure TCH is specified by source, then use 40 or 50 feet) in Altitude 1 of the final end point fix record. See also Rule 8.10 of this attachment.

6.2.10.2.e For a published Missed Approach Point abeam the runway threshold, code the altitude equal to the runway threshold elevation plus the published TCH. If no TCH is specified by source, then use 40 or 50 feet (See Section 5.67of this standard).

6.2.10.2.f For a published Missed Approach Point located at a Point-in-Space, and at an altitude equal to the source provided, Obstacle Clearance Altitude (OCA) or Minimum Descent Altitude/Decision Altitude (MDA/DA) must be coded in Altitude 1.

6.2.10.3 Step down fixes will have altitude codes according to the government source documentation. These altitudes will be assigned altitude descriptions codes indicating the altitude as mandatory, minimum or recommended and altitudes on the vertical path (see Section 5.29 of this specification). Both Altitude 1 and Altitude 2 will be used on step-down fixes.

6.2.10.4 For RF Leg Fixes not at Procedure Fix locations, Waypoint Description Code, 3rd position of R, will have altitudes coded according to government source documentation. If no altitude information is provided for these fixes in source data, Altitude 1 and 2 will be left blank.

6.2.11 Vertical angle information is in Section 7 and 8 of Attachment 5 in this document.

6.2.12 Missed Approach Point

In general, the design of missed approach procedures requires that the runway, helipad or missed approach point be overflown prior to commencing any turn. In these cases, to ensure procedure coding reflects design specific intentions, the Overfly Indication must be coded into the Waypoint Description field. However, certain types of approach procedures design do require a turn prior to the runway, helipad or missed approach point. In these cases, to ensure procedure coding reflects design specific intentions, the Overfly Indication will not be set in the Waypoint Description field of the appropriate record.

6.3 Approach Transition Route Coding Rules

6.3.1 Recommended coding on approach transitions that end in leg to fix (XF) is that the fix in the ending leg must be either the Final Approach Course Fix or the Final Approach Fix. If this is not the case, for example HF leg type transitions on fixes off-set from the final approach path, a series of legs must be substituted representing

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the original flight path, but ending with a CF or TF[1] leg type to one of these two fixes. If neither of these two coding recommendations can be followed, such as in cases where the XF would terminate at the missed approach waypoint or a step-down fix not associated with the lateral guidance of the final approach, the transition must be omitted.

6.3.2 When a holding pattern used for course reversal or a procedure turn is part of an approach route, it will be included in an approach transition route.

6.3.3 If an approach transition for a specific runway or helipad is common to more than one approach, that transition must be coded for each approach, with a transition identifier that must correspond to the approach procedure identifier.

6.3.4 Rule Deleted by Supplement 16

6.3.5 Transitions of VOR based approach procedures, TACAN based approach procedures, and RNAV (VOR DME) approach procedures.

6.3.5.1 Any recommended navaid used in coding must be a VOR, VORDME, VORTAC, TACAN, DME, NDB or Un-Biased ILS DME, see Section 5.23 of this document.

6.3.6 Transitions for Localizer Based Approach Procedures

The ending leg of all localizer-based transitions will either –

- End at the FACF (AF, CF, RF, TF, HF, HM)
- End in an intercept of the localizer inside the FACF (PI, CI or VI)
- End in a course reversal, normally at the FAF (HF, HM)

6.3.6.2 The ending leg of all localizer-based transitions will contain a recommended Navaid:

- If CF, RF, TF, CI or VI, the recommended Navaid will be the procedure reference localizer
- If AF, HF, HM or PI, the recommended Navaid will be a VORDME or VORTAC or TACAN
- The HF, HM and PI leg may use the procedure reference localizer when a VORDME, VORTAC or TACAN is not available.

6.3.6.3 Deleted by Supplement 17.

6.3.6.4 Legs ending in an intercept will ideally be at angles of 30 degrees to the track intercepted. Angles **greater than 10 degrees may be coded** as required by source documentation, provided the resulting intercept is within the reception area of the localizer. **Intercept angles greater than 90 degrees must have a distance between the FACF and FAF that is at or greater than 4 NM.**

6.3.6.5 When a CF leg is used as the ending leg of a transition to a localizer-based procedure, the maximum leg distance will be within 8NM of the FACF or within the reception area of the localizer as depicted in Figure A5-6-1.

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[1] In general CF legs are used in final approach coding. TF legs are used in FMS and GPS Approach Procedures, some types of MLS Procedures and in other procedure types where the determination has been made that a TF will work better than a CF.

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Note: For precision approaches relying on an electronic glideslope, an FC/CF is preferred over a TF as illustrated in Figure A5-6-1 for those legs ending at a fix.

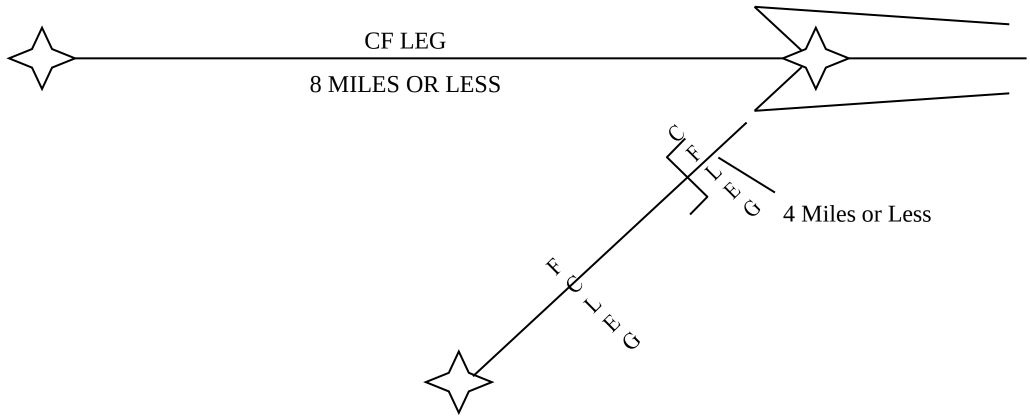

Figure A5-6-1 – CF Leg

6.3.6.6 When a CI or VI leg is used as the ending leg of a transition to a localizer-based procedure, the intercept will be between the FACF and the FAF, at no less than 2 NM to the FAF.

6.3.7 Transitions for NDB Based Approach Procedures:

6.3.7.1 Transitions for NDB based approach procedures may use a NDB Navaid as the recommended Navaid, except for transitions that are DME Arcs.

6.3.8 Transitions for MLS/GLS Approach Procedures:

6.3.8.1 MLS/GLS approach procedure coding is such that the rules can be identical to those used for Localizer based procedure coding. See Rule 6.3.6 above.

6.3.9 Transitions for Circle-To-Land Approach Procedures

6.3.9.1 If the Circle-To-Land approach procedure is runway or helipad dependent, the rules on transition route coding are identical to those of the reference facility procedure type, e.g., for a VOR Circle-To-Land that is runway dependent, follow the VOR based approach procedure rules for approach transition route coding.

6.3.9.2 If the Circle-To-Land approach procedure is not runway or helipad dependent, being valid for more than one landing direction, the rules for coding approach transitions routes are as follows.

6.3.9.3 Recommended navaids used in coding all legs except ending legs must be a VOR, VORDME, VORTAC, TACAN, DME or Un-Biased ILSDME. For the ending leg sequences, the recommended navaid, where required, must be the procedure reference facility, see Section 5.23 of this document.

6.4 Localizer Based Approach Procedure Coding

6.4.1 The following rules apply to the Final Approach Coding of Localizer-based approach procedures. These procedures may include Full ILS (Localizer and Glideslope), Localizer Only, Localizer Backcourse, Instrument Guidance System (IGS), Localizer Directional Aid (LDA) and Simplified Directional (SDF) procedures.

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6.4.1.1 All Localizer based approach procedures must begin at the FACF. They must consist of a FACF, FAF, and missed approach point (MAP).

6.4.1.1.1 For precision approach, the missed approach point will be a runway fix (landing threshold) unless otherwise indicated in government source documents. When a MAP is not provided by source and the published missed approach procedure requires a turn prior to the landing threshold, the missed approach point must be created on the glideslope at the highest published Decision Altitude.

6.4.1.1.2 For non-precision approach the source supplied missed approach point is to be used.

6.4.1.2 The FACF is defined as a fix located on the localizer beam center, 8NM or less from the FAF or within the reception range of the Localizer. This may be a source document provided fix or a fix created using these positioning rules.

6.4.1.3 The FACF is coded as an IF leg with an altitude assigned, based on the source document or equal to the altitude of a procedure turn or the altitude of the last transition leg.

6.4.1.4 The track from the FACF to the FAF is coded as a CF or a TF leg with altitude constraints as indicated for the specific procedure types below.

6.4.1.5 The recommended navaid will be the procedure reference localizer. Theta and Rho will be provided from the localizer for each sequence of the final approach, including the runway fix and/or missed approach point.

6.4.1.6 The Outbound Magnetic Course field in all sequences will be equal to the localizer magnetic bearing, rounded to the nearest whole degree, derived from official government source.

6.4.1.7 No Localizer based approach procedure may include a Final End Point Fix (FEP). For this reason, the Rules 6.2.9.3, 6.2.9.4, 6.2.10.2.c, 6.2.10.2.d do not apply.

6.4.2 Full ILS (Localizer and Glideslope) Precision Approach Procedure

6.4.2.1 For full ILS procedures and GLS procedures, code the glideslope intercept altitude in the altitude 2 field of the FAF records,

6.4.2.2 Rule removed in Supplement 19.

6.5 MLS Approach Procedure Coding

MLS Approach Procedures utilizing raw azimuth and elevation data will be coded as localizer equivalent. The rules applied for the Final Approach Coding must be identical with those stated in Section 6.4 of this attachment. The Route Type of such procedures will be coded as M. Approach procedures predicated on the use of MLS Area Navigation (MLS/RNAV) will be coded with a W or Y described below.

There are three types of MLS/RNAV approaches, listed in increasing level of complexity, computed lateral/raw vertical guidance, computer lateral and vertical guidance and curved path.

6.5.1 Approaches using computed lateral path and raw vertical path guidance, also referred to as Type A, will be used primarily where the MLS azimuth transmitter cannot be located on the extended runway centerline, but the elevation transmitter is sited normally abeam the touchdown point. All legs will be straight and aligned with the inbound course. There will be codes with Route Type W in column 20 of the primary

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approach record. Path definition will be the equivalent of a full ILS approach (Rule 6.4.2) with the exception that the leg from the PFAF inbound will be a TF leg, terminating at the runway waypoint, with the published final approach source in the Outbound Magnetic Course field. The PFAF will be coded as the Final Approach Fix in the Waypoint Description field and the first fix prior to the PFAF will be coded as the Final Approach Course Fix.

6.5.2 Approach using computed lateral and vertical guidance by no curved legs, also referred to as Type B, will be coded as Route Type Y in column 20 of the primary approach record. All legs will be straight and aligned with the inbound course. Path definition will be the equivalent of the full ILS approach (Rule 6.4.2) with the exception that the leg from the PFAF inbound will be a TF leg, with the published final approach course in the Outbound Magnetic Course field. The altitude of the PFAF and all waypoints inbound from it will be the glide path altitude at that point. The PFAF will be coded as the Final Approach Fix in Waypoint Description field and the first fix prior to the PFAF will be coded as the Final Approach Course Fix.

6.5.3 MLS/RNAV approaches using curved legs, also referred to as Type C, will be used for a variety of reasons, including parallel sidestep approaches, separation of different categories of aircraft, noise abatement, etc. These will always be precision approaches. They will be coded a with a Route type of Y in column 20 of the primary approach record. The following rules apply:

6.5.3.1 The first leg of an MLS/RNAV approach with curved legs will be an IF/TF leg combination. All other straight legs will be coded as TF legs. All TF legs in an MLS/RNAV with curved legs procedure will have the published course included in the Outbound Magnetic Course field.

6.5.3.2 All curved legs will be coded as RF legs. Every leg preceding or following an RF leg will be tangent to the RF leg at that point.

6.5.3.3 The initial portion of a MLS/RNAV approach with curved legs may be an IF/RF combination provided a straight leg approach transition is coded to the point in the IF and the rules in Section 6.5.2 are complied with.

6.5.3.4 The PFAF will be coded as the Final Approach Fix in the Waypoint Description field and the first fix prior to the PFAF will be coded as the Final Approach Course Fix. If there is not a fix at the glide path intercept, then the first fix after the intercept will be the PFAF. There must be one and only one PFAF for each MLS/RNAV approach with curved legs.

6.5.3.5 The last leg of an approach transition prior to an MLS/RNAV approach will be one of the following types CF, CI, HF, PI, RF or TF, except as indicated in Section 6.5.3.3. If the leg type is CF, CI, RF or TF, then the Recommended Navaid will contain the identifier of the MLS used for the approach. If the leg type is PI or HF, then the Recommended Navaid will contain the VHF Navaid the defines the PI or HF leg.

6.5.3.6 If the last leg prior to the approach is a CI leg, the intercept angle will be 30 degrees or less, and the intercept point will be between the first and second terminator fixes in the approach, but no closer than 2NM to the second fix.

6.5.3.7 The PFAF altitudes will be coded according to the rules outlined for Precision Approach Procedures in Rule 6.4.2.

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6.5.4 The PFAF will be used in precision MLS/RNAV approaches. It is defined as that fix along the lateral path where the published barometric altitude intercepts the glideslope. Prior to the PFAF, the aircraft is expected to fly barometric altitude to intercept the glide path. All waypoints up to the PFAF should be coded using the published barometric crossing altitude. The PFAF and all waypoints after it should be coded using the true altitude of the glide path at those points.

6.6 VOR, VORDME, VORTAC, and Area Navigation Approach Procedure Coding

The following rules apply to the Final Approach Coding of all VOR based approach procedures, regardless of the reference facility type, and to RNAV (VOR DME) Approach Procedures.

6.6.1 Reference Facility Specific Rules

The following rules apply to the Final Approach Coding of specific reference facility VOR based approach procedures.

6.6.1.1 When the reference facility is VOR only or there is no DME collocated with VOR (see VOR coding examples 1, 3 and 8), the following applies:

6.6.1.1.a Final Approach Coding will be accomplished using IF and CF or TF legs only.

6.6.1.1.b Final Approach Coding must include either a FAF and a runway fix or FAF and missed approach point fix.

6.6.1.1.c The recommended navaid will be the procedure reference VOR. Theta values will be provided from that facility in all Final Approach Coding sequences.

6.6.1.2 When the reference facility is VORDME or VORTAC (see VOR coding examples 2 and 6), the following applies:

6.6.1.2.a Final Approach Coding will be accomplished using IF and CF or TF legs only.

6.6.1.2.b Final Approach Coding must include FAF and either a runway fix or missed approach point fix. The Final Approach Coding will include a FACF when one is required by Rule 6.2.5.

6.6.1.2.c The recommended navaid will be the procedure reference VORDME or VORTAC. Theta and Rho values will be provided from that facility in all Final Approach Coding sequences.

6.6.2 Examples of VOR Coding

6.6.2.1 Example of missed approach point before the runway threshold, refer to VOR coding examples 7 and 8.

6.6.2.2 Example of missed approach point at the runway threshold, refer to VOR coding example 1 and 2.

6.6.2.3 Example of missed approach point beyond the runway threshold and the final course passes over the runway threshold, refer to VOR coding examples 3 and 4.

6.6.2.4 Example of missed approach point beyond the runway threshold and the final approach course does not cross runway threshold, refer to VOR coding examples 5 and 6.

6.6.3 RNAV- Area Navigation Procedures

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RNAV-Area Navigation procedures in the context of this attachment are the so called RNAV Procedures that require referencing ground –based navigational aids. These procedures are also referred to as VOR DME RNAV Procedures.

6.6.3.1 All RNAV- Area Navigation approach procedures will be coded to a runway threshold or a Fictitious Threshold Point (FTP) as the last leg in the Final Approach Coding sequence. The runway threshold or FTP may be a source defined name waypoint.

6.6.3.2 The recommended navaid for VORDME RNAV approaches will be the procedure VORDME or VORTAC. Theta and Rho values will be provided from that facility in all Final Approach Coding sequences.

6.6.3.3 Final Approach Coding will be accomplished using IF and CF or TF legs only. RF legs may be used in RNAV approaches when and where specified by source documentation.

6.6.3.4 Final Approach Coding must include either a FAF and a runway fix or FAF and missed approach point fix.

6.6.3.5 For RNAV Approach procedures to a Point-in-Space, a separate procedure must be coded for each Airport or Heliport that the procedure serves, as defined by source documentation.

6.7 TACAN Approach Procedure Coding

The following rules apply to the Final Approach Coding of all TACAN based approach procedures, regardless of the reference facility type.

6.7.1 Final Approach Coding will be accomplished using IF and CF or TF legs only.

6.7.2 Final Approach Coding must include, FAF and either a Runway Fix or Missed Approach Point Fix. The Final Approach Coding must also include a FACF when one is required by the rules in 6.2.5.

6.7.2.1 Deleted by Supplement 19.

6.7.2.2 Rule Deleted by Supplement 19.

6.7.3 The Recommended Navaid will be the procedure reference TACAN or VORTAC.Theta and Rho values will be provided from that facility in all Final Approach Coding sequences.

6.7.4 Vertical Angle Rules

Vertical angle will be coded per the Rules in Section 6.2.11.

6.8 NDB Approach Procedure Coding

The following rules apply to the Final Approach Coding of all NDB based approach procedures. NDB based approach procedures include procedures using a NDB or Locator as the reference facility and procedures using a NDB or Locator and a DME (NDB + DME) as reference facilities. NDB approach procedures not requiring DME but using the DME for reduced minimums will be coded as NDB with DME required D in Qualifier 1.

6.8.1 Specific Reference Facility Rules

The following rules apply to the Final Approach Coding of specific reference facility NDB based approach procedures.

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6.8.1.1 NDB Final Approach Coding must include at least FAF and a runway fix or missed approach point fix.

6.8.1.1.a Rule deleted by Supplement 17.

6.8.1.2 NDB + DME Final Approach Coding must include an FAF and runway fix or missed approach point fix. The Final Approach Coding will include a FACF when one is required by Rule 6.2.5.

6.8.1.3 Final Approach Coding will be accomplished use IF and CF or TF legs through to the runway fix or missed approach point fix. The IF leg will be at the FAF or at the FACF when one is coded.

6.8.1.4 Recommended Navaid Requirements

6.8.1.4.a On NDB *P*rocedures Final Approach Coding, the recommended navaid information will be provided on the FACF (where coded), the FAF and the Missed Approach Fix record. It will be the procedure reference NDB or Locator. Theta and Rho information will not be provided on any sequence.

6.8.1.4.b On NDB + DME procedures Final Approach Coding, the recommended navaid information will be provided on all sequences. On the FACF (when coded) and FAF, this navaid will be the procedure reference NDB or Locator. On the runway fix or missed approach point fix, the recommended navaid will be the procedure reference DME. A procedure reference DME may be any navaid with DME, including unbiased ILSDMEs. The Theta and Rho information will not be provided in any sequence of the NDB + DME final approach except in the runway fix or missed approach point fix sequence. That sequence will include Rho information from the procedure reference DME Navaid.

6.8.2 Examples of NDB Coding

6.8.2.1 Example of missed approach point before the runway threshold, refer to NDB coding example 4.

6.8.2.2 Example of missed approach point at the runway threshold, refer to NDB coding example 1.

6.8.2.3 Example of missed approach point beyond the runway threshold and the final course passes over the runway threshold, refer to NDB coding example 2.

6.8.2.4 Example of missed approach point beyond the runway threshold and the final approach course does not cross runway threshold, refer to NDB coding example 3.

6.9 RNAV Procedure Coding

This section provides coding guidelines for RNAV Approach Procedures. The term RNAV Approach Procedure is defined as an approach procedure that was designed to provide lateral and vertical path guidance using criteria that do not rely on radial, bearing, arcs or glide paths from ground-based navaids. As such, a RNAV Approach Procedure will not include references to ground-based navaid associated information such as VOR radial, NDB bearings, DME distances, ILS course, MLS Azimuth and ILS or MLS glideslopes. Exceptions to this standard may be outlined in the rules that follow. Navaids may be referenced as waypoints in the coding of the RNAV Approach Procedures.

6.9.1 Recommended Navaids

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RNAV Approach Procedures do not require referencing a specific ground-based navaid. The exception to this rule is that in those cases where the official government source a specified a Path and Termination (leg type) that requires a Recommended Navaid (see Table 1.5, Leg Data Fields), the navaid will be included in the coding of the RNAV Approach Procedure as a Recommended Navaid. Including a Recommended Navaid does not imply that this navaid is required to be used in the navigation solution.

6.9.2 The Final Approach Coding must include a Final Approach Fix (FAF) and a Missed Approach Point fix (Runway Threshold or Missed Approach Point). The Final Approach Coding must include a Final Approach Course Fix (FACF when such a fix is required by the rules in Section 6.2.5.

6.9.3 The Final Approach Coding of RNAV Approach Procedures covered by this Section 6.9 do not require a Recommended Navaid except as governed by other rules in this attachment.

6.9.4 **Deleted by Supplement 22.**

6.9.5 The track from the FACF (when coded) to the FAF and the FAF to MAP must be coded as TF or RF legs. The RF leg is not allowed as the first leg of the Final Approach Coding according to the Beginning/Ending Leg Table. The preferred coding when an approach starts with a precision arc is IF at the (FACF), followed by RF to the FAF.

6.10 Coding of Approach Procedures with Circle-To-Land Minimums

6.10.1 Any source provided approach procedure with circle-to-land minimums may be coded, regardless of sensor type through correct application of Route Type and Qualifier, see Section 5.7 of this specification.

6.10.2 Approach Procedures with circle-to-land minimums may include the runway designation in the procedure identifier when the straight-in alignment criteria are met or may be a unique identifier indicating non-straight-in alignment of the final approach course. See Section 5.10 of this specification.

6.10.2.1 Approach Procedures with circle-to-land minimums that meet straight-in alignment criteria and include the runway designation in the procedure identifier are coded following the same rules sets found elsewhere in this attachment for the appropriate sensor type.

6.10.2.2 Approach Procedures with circle-to-land minimums that do not meet straight-in alignment criteria and use the unique procedure identifiers without runway designation will be coded using the rule set defined in Rule 6.10.3 of this attachment.

6.10.2.3 If a runway is in alignment, the first altitude field in the missed approach point fix record will be coded as the LTP elevation + published TCH (if no procedure TCH is specified by source use 40 or 50 feet. See Section 5.67 of this specification.

6.10.3 Coding Rules, Approach Procedures, Circle-To-Land Minimums, Non-straight-in Alignment

6.10.3.1 The final approach coding must include a FAF and a Missed Approach Point Fix.

6.10.3.2 If no runway is specified, the altitude 1 field in the missed approach point fix record will be coded with the airport elevation.

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6.10.3.3 Altitude constraints and vertical angles will be coded as indicated in Section 8 of this attachment, specifically Rules 8.6.4, 8.9.3, and 8.9.8

6.10.3.4 Final approach segment coding will use IF and CF or TF legs only.

6.11 Lateral Guidance Rules

For FMS and GPS procedures, a missed approach point beyond the runway is not allowed, therefore Rules 6.2.9.3, 6.2.9.4, 6.2.9.5, 6.2.10.2.c, 6.2.10.2.d, and 6.2.10.2.e do not apply.

6.11.1 The track from the FACF to the FAF, where an FACF exists, is coded with TF or RF legs. The RF leg is not allowed as the first leg of the approach coding according to the Beginning/Ending Leg Table. The preferred coding when an approach starts with a precision arc is IF at the FACF, followed by RF to the FAF.

6.11.2 The track from the FACF to the FAF, where an FACF exists, is coded with TF or RF legs. The RF leg is not allowed as the first leg of the approach coding according to the Beginning/Ending Leg Table. The preferred coding when an approach starts with a precision arc is IF at the FACF, followed by RF to the FAF. According to the rules on RF legs, this will require that a straight line, fix terminated approach transition to the FACF has been included. The track in the transition must be tangent to the arc. The rule also does not exclude the use of an RF leg in between FAF and the final TF leg of the approach. Such RF legs will be coded with the 4th character of the Waypoint Description field blank.

6.12 Helicopter Procedure Coding

The following rules apply to the Final Approach Coding of of all Helicopter Approach Procedure. These rules cover Helicopter Approach Procedures which may be coded to Airports and Runways included in Sub-sections PA and PG only.

6.12.1 Helicopter Approach Procedures will be coded using the rules in Section 6 of this attachment, appropriate to the type of sensor required for the procedure, such as VORDME or ILS or RNAV- Area Navigation. This includes rules for Recommended Navaid, FACF requirements and leg types.

6.12.2 The Lateral Path Rules for the sensor related procedure coding reference a runway fix as a missed approach point or a missed approach point. Those same rules apply to helicopter procedures. For procedures designed with a dedicated helipad as the missed approach point, a Terminal Waypoint will be established and used as the missed approach point fix.

6.12.3 The Vertical Path Rules in Section 6 apply without exception, using the rules appropriate for the sensor type.

6.12.4 Missed Approach code will be accomplished according to the rule in Section 7 of this attachment, appropriate for the sensor type.

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VOR CODING EXAMPLE 1

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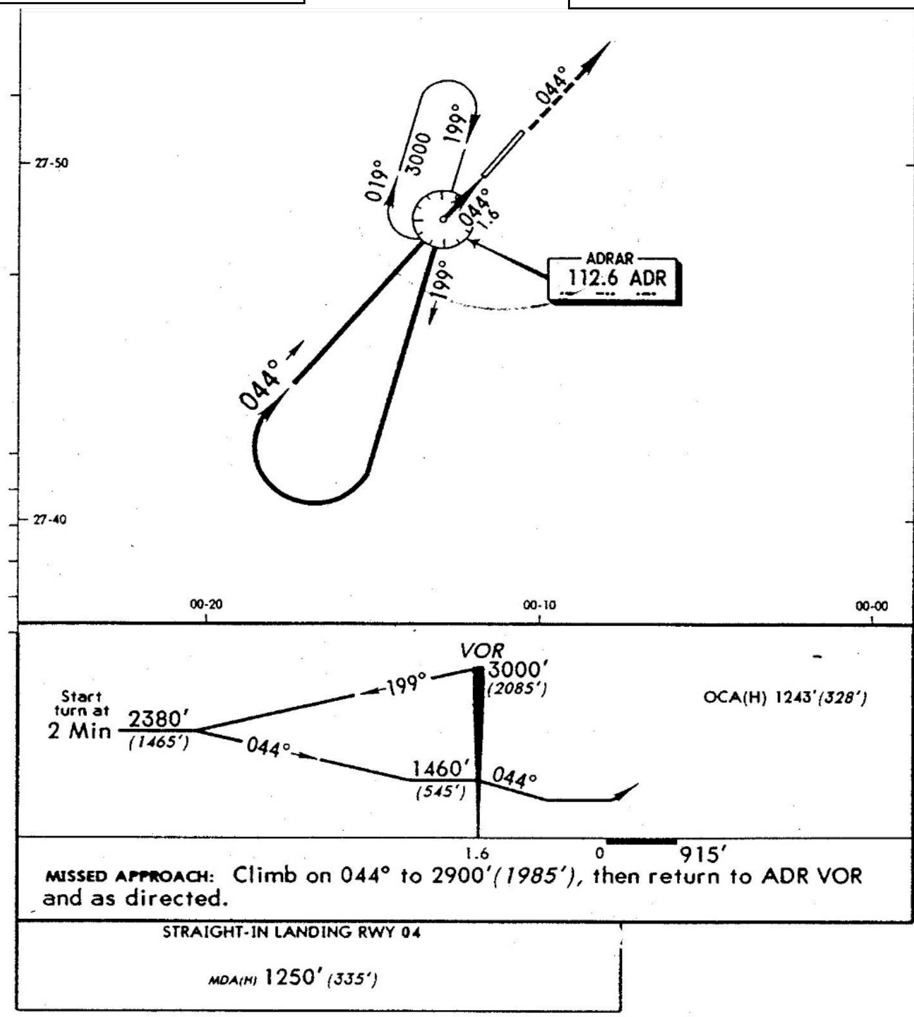

APP ID	SEQ NR	FIX ID	P/T	RECD NAV	W/P DESC	RHO	MAG CRS	DIST	ALT	VERT ANG
V04	010	CF04	IF	ADR	E__I	0034			02380	
V04	020	ADR	CF	ADR	V__F	0000	0440	0034	01460	
V04	030	RW04	CF	ADR	G___	0016	0440	0016	00965	-300
V04	040		VA		__M_		0440		02900	
V04	050	ADR	DF		VE__					

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VOR CODING EXAMPLE 2

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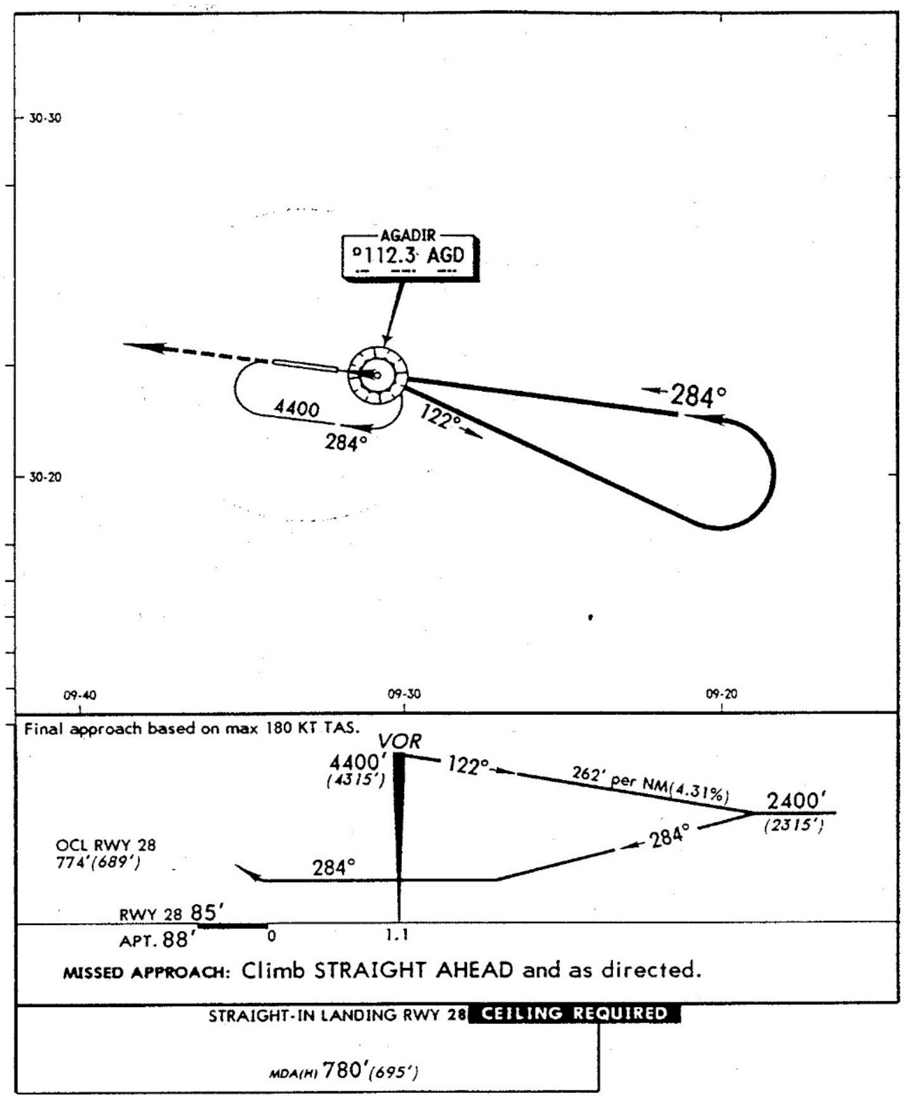

APP ID	SEQ NR	FIX ID	P/T	RECD NAV	W/P DESC	RHO	MAG CRS	DIST	ALT	VERT ANG
V28	010	CV28	IF	AGD	E__I	0076			02400	
V28	020	AGD	CF	AGD	V__F	0000	2840	0076	00486	
V28	030	RW28	CF	AGD	G___	0011	2840	0011	00135	-300
V28	040		VA		__M_		2840		00488	
V28	050		VM		EE__		2840			

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VOR CODING EXAMPLE 3

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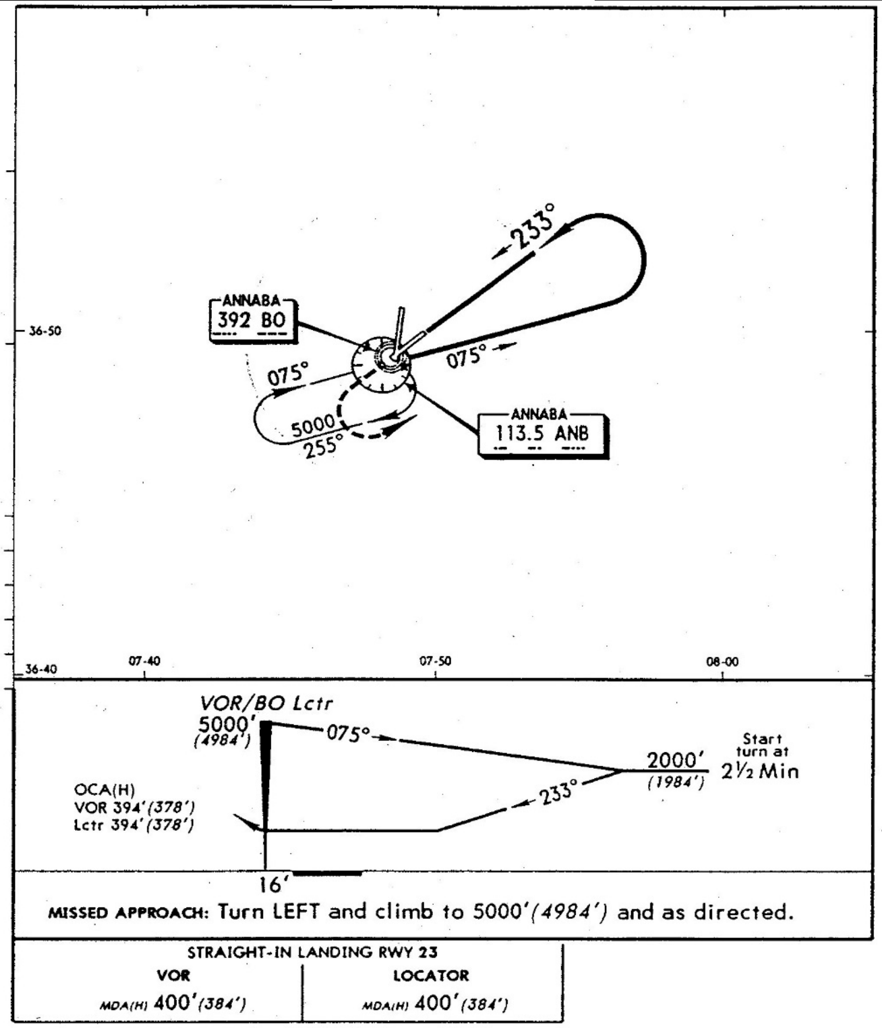

APP ID	SEQ NR	FIX ID	P/T	RECD NAV	W/P DESC	RHO	MAG CRS	DIST	ALT	VERT ANG
V23	020	FF23	IF	ANB	E_F	0080			02000	
V23	030	RW23	CF	ANB	G___	0017	2330	0063	00066	-301
V23	040	ANB	CF	ANB	V_M	0000	2330	0017	00400	
V23	050		VM		_E__		2330		05000	

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VOR CODING EXAMPLE 4

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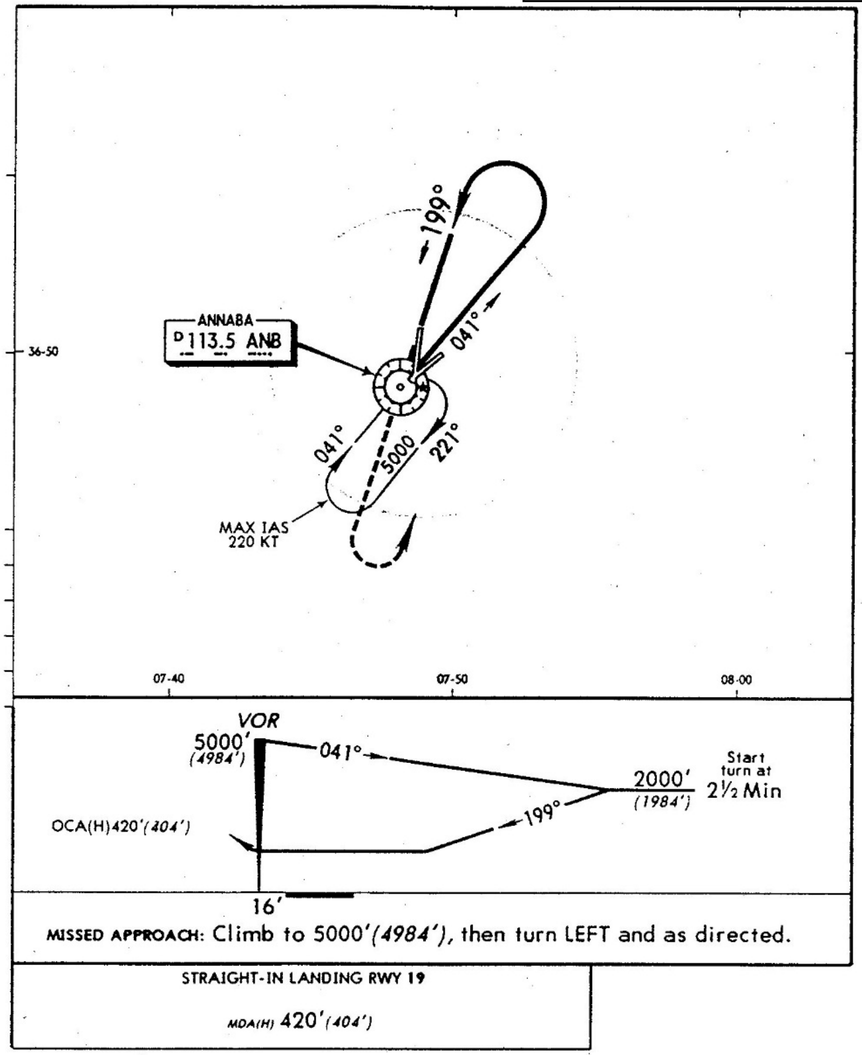

APP ID	SEQ NR	FIX ID	P/T	RECD NAV	W/P DESC	RHO	MAG CRS	DIST	ALT	VERT ANG
V19	020	FF19	IF	ANB	E_F	0080			02000	
V19	030	RW19	CF	ANB	G___	0020	1990	0061	00066	-300
V19	040	ANB	CF	ANB	V_M_	0000	1990	0020	00420	
V19	050		VM		_E__		1990		05000	

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VOR CODING EXAMPLE 5

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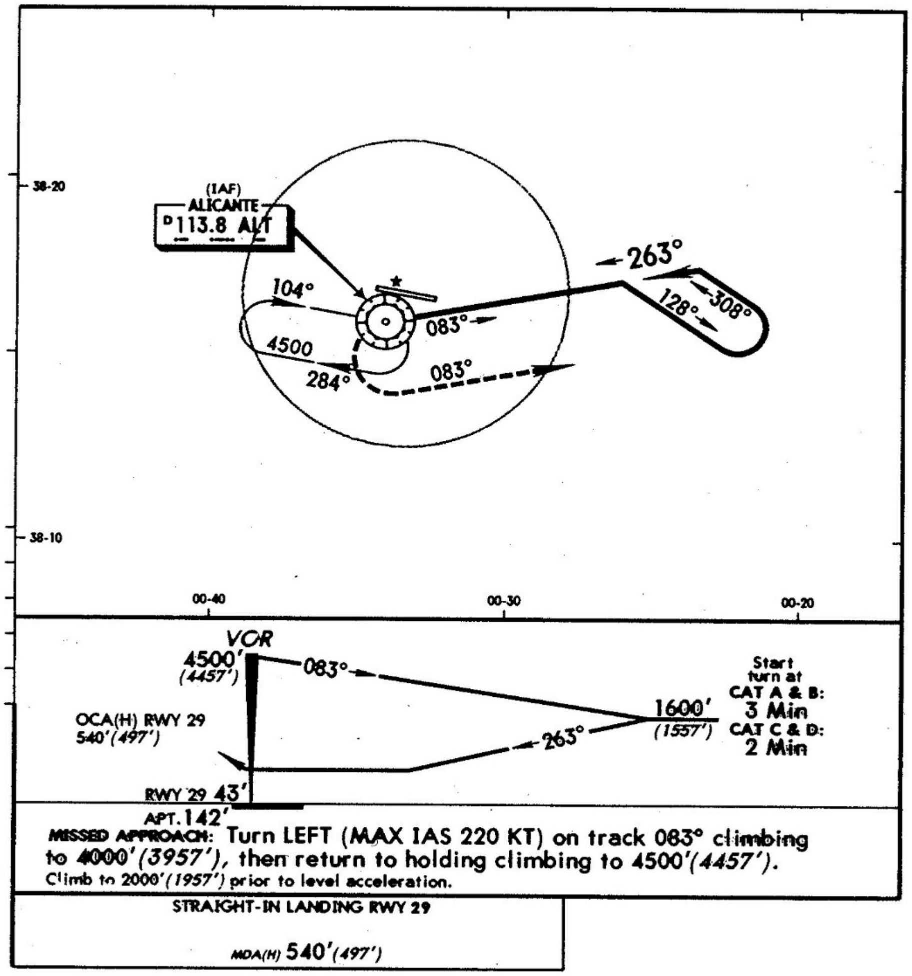

APP ID	SEQ NR	FIX ID	P/T	RECD NAV	W/P DESC	RHO	MAG CRS	DIST	ALT	VERT ANG
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V29	025	RC29	CF	ALT	R_L	0026	2630	0044	00483	
V29	030	ALT	CF	ALT	V_M	0000	2630	0026	00540	000
V29	040		VA		_M_		2630		00542	
V29	050		VA				0830		04000	
V29	060	ALT	DF		V__				04500	
V29	070	ALT	HM		VE_H		1040	001T	04500	

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VOR CODING EXAMPLE 6

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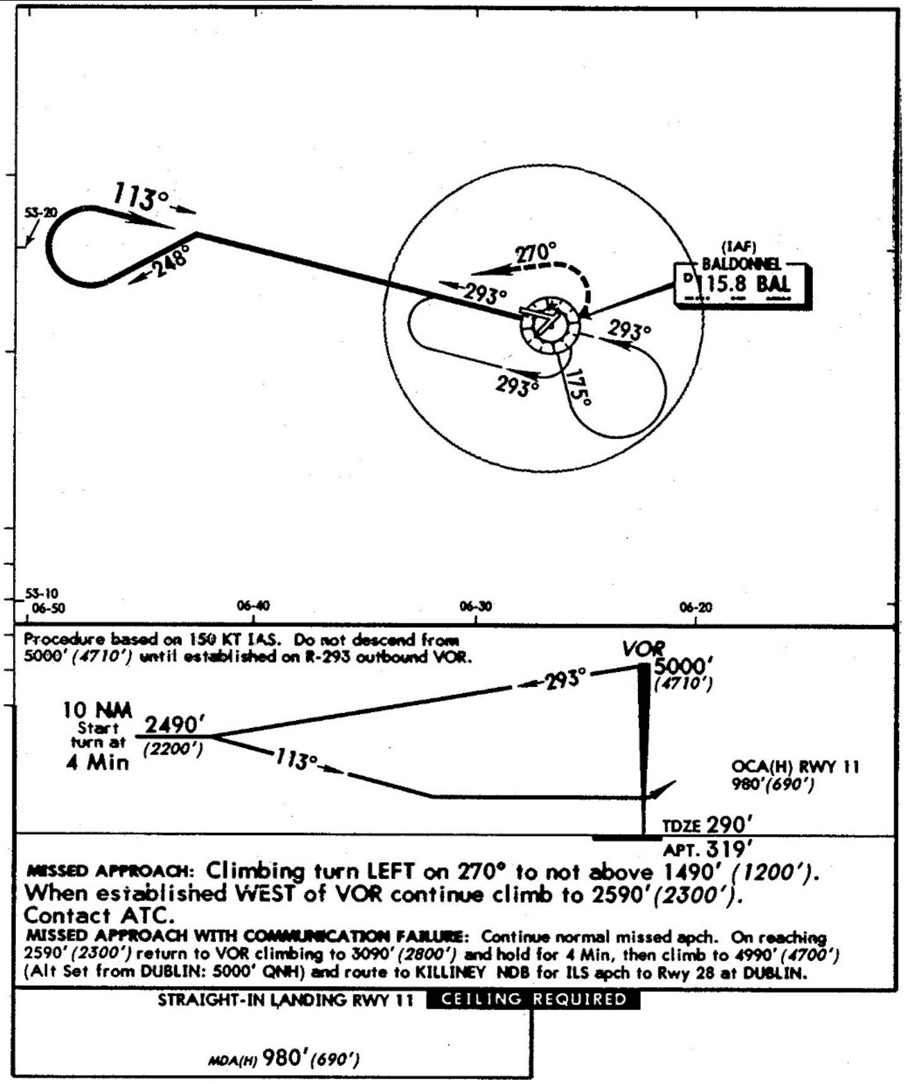

APP ID	SEQ NR	FIX ID	P/T	RECD NAV	W/P DESC	RHO	MAG CRS	DIST	ALT	VERT ANG
V11	010	CF11	IF	BAL	E__I	0110			02490	
V11	020	FF11	CF	BAL	E__F	0060	1130	0050	01830	
V11	025	RC11	CF	BAL	R__L	0029	1130	0035	00974	
V11	030	BAL	CF	BAL	V__M	0000	1130	0015	00980	000
V11	040		VA		__M_		1130		00980	
V11	050		VM		_E__		2700		01490	

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VOR CODING EXAMPLE 7

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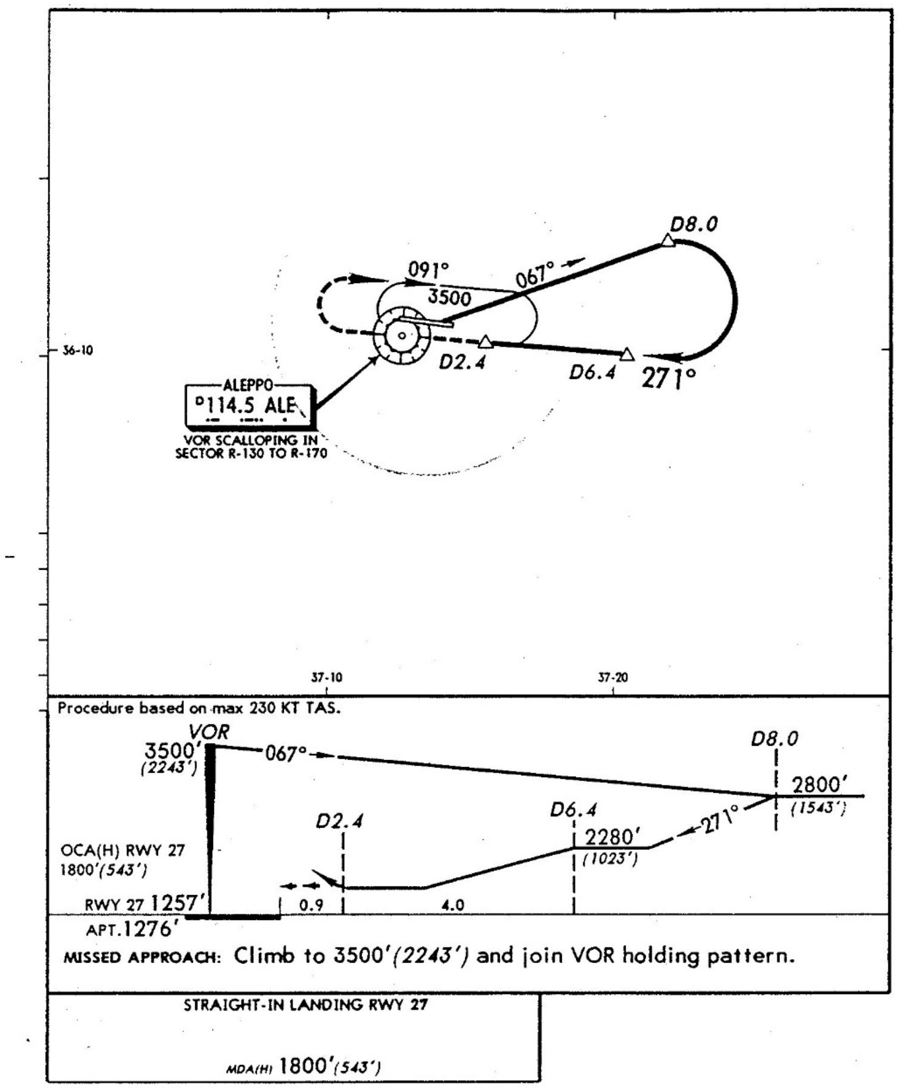

APP ID	SEQ NR	FIX ID	P/T	RECD NAV	W/P DESC	RHO	MAG CRS	DIST	ALT	VERT ANG
V27	020	FF27	IF	ALE	E__F	0064			02280	
V27	030	MA27	CF	ALE	E__M	0024	2710	0040	01800	-300
V27	040		VA		__M_		2710		03500	
V27	050	ALE	DF	ALE	V___	0000				
V27	060	ALE	HM	ALE	VE_H	0000	2710	001T	03500	

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VOR CODING EXAMPLE 8

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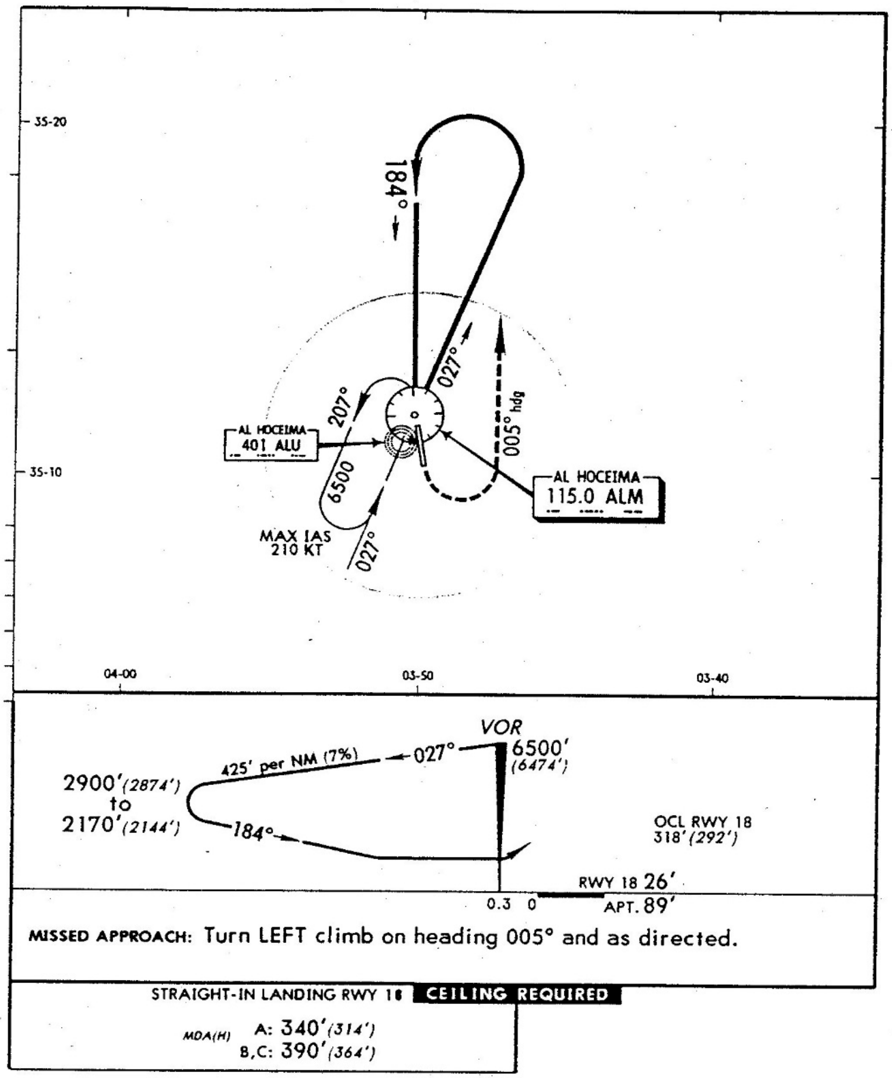

APP ID	SEQ NR	FIX ID	P/T	RECD NAV	W/P DESC	RHO	MAG CRS	DIST	ALT	VERT ANG
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V18	030	ALM	CF	ALM	V__M	0000	1840	0070	00390	-300
V18	040		VA		__M_		1840		00489	
V18	050		VM		_E__		0050			

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VOR CODING EXAMPLE 9

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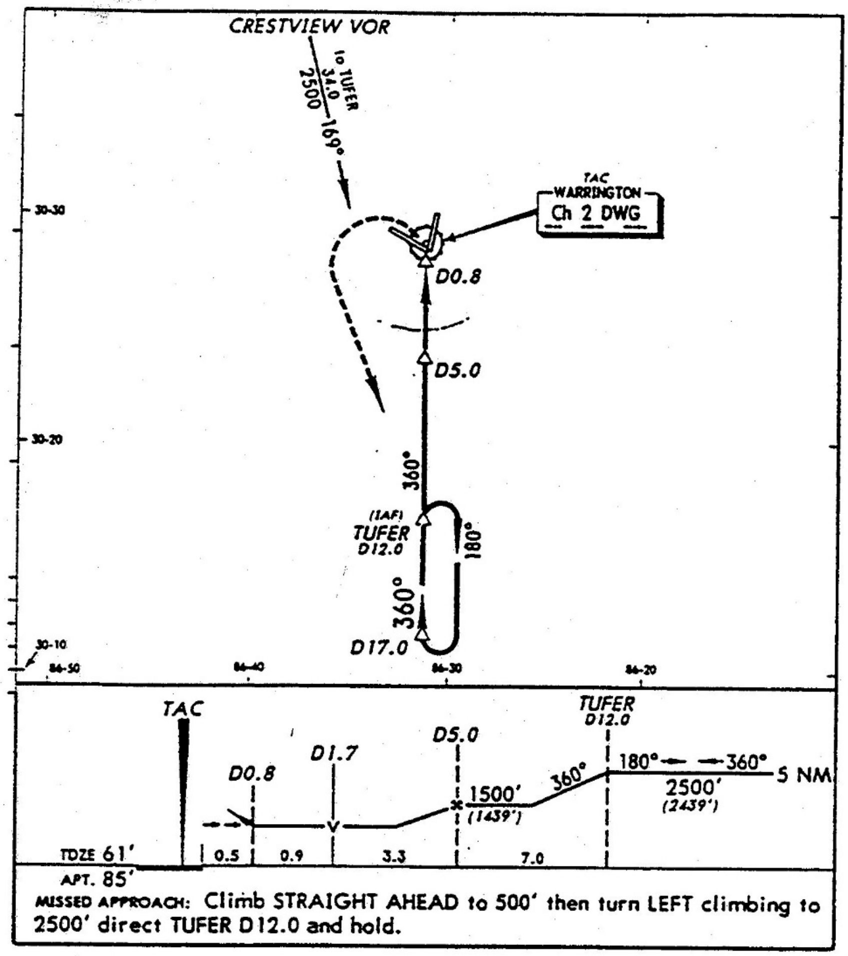

APP ID	SEQ NR	FIX ID	P/T	RECD NAV	W/P DESC	RHO	MAG CRS	DIST	ALT	VERT ANG
T01	010	TUFER	IF	DWG	E_I	0120			02500	
T01	020	FF01	CF	DWG	E_F	0050	3600	0070	01500	
T01	030	RW01	CF	DWG	G__	0008	3600	0042	00111	-300
T01	040		VA		_M_		3600		00500	
T01	050	TUFER	DF		E__				02500	
T01	060	TUFER	HM	DWG	EE_H	0120	3600	001T	02500	

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NDB CODING EXAMPLE 1

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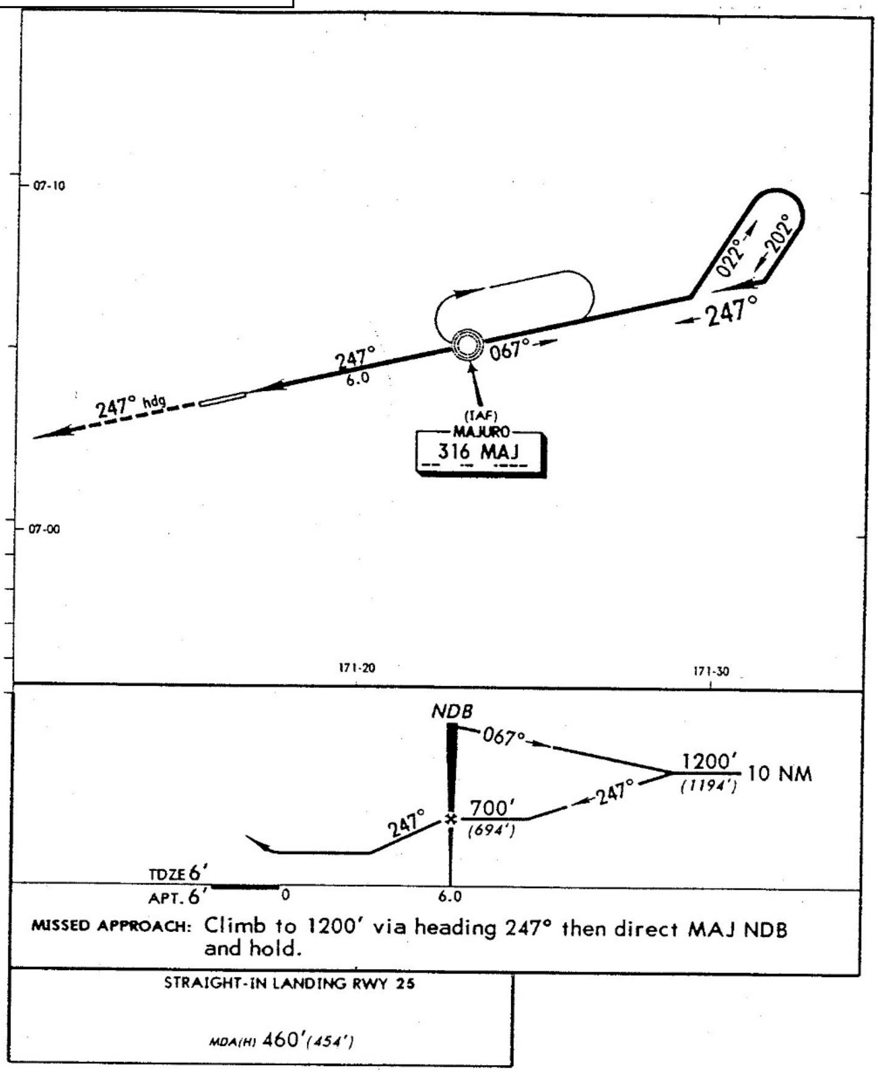

APP ID	SEQ NR	FIX ID	P/T	RECD NAV	W/P DESC	RHO	MAG CRS	DIST	ALT	VERT ANG
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N25	020	MAJ	CF	MAJ	E_ F		2470	0035	00700	
N25	030	RW25	CF		G___		2470	0060	00056	-300
N25	040		CA				2470		01200	
N25	050	MAJ	DF		E___					
N25	060	MAJ	HM		EE_H		2470	001T		

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NDB CODING EXAMPLE 2

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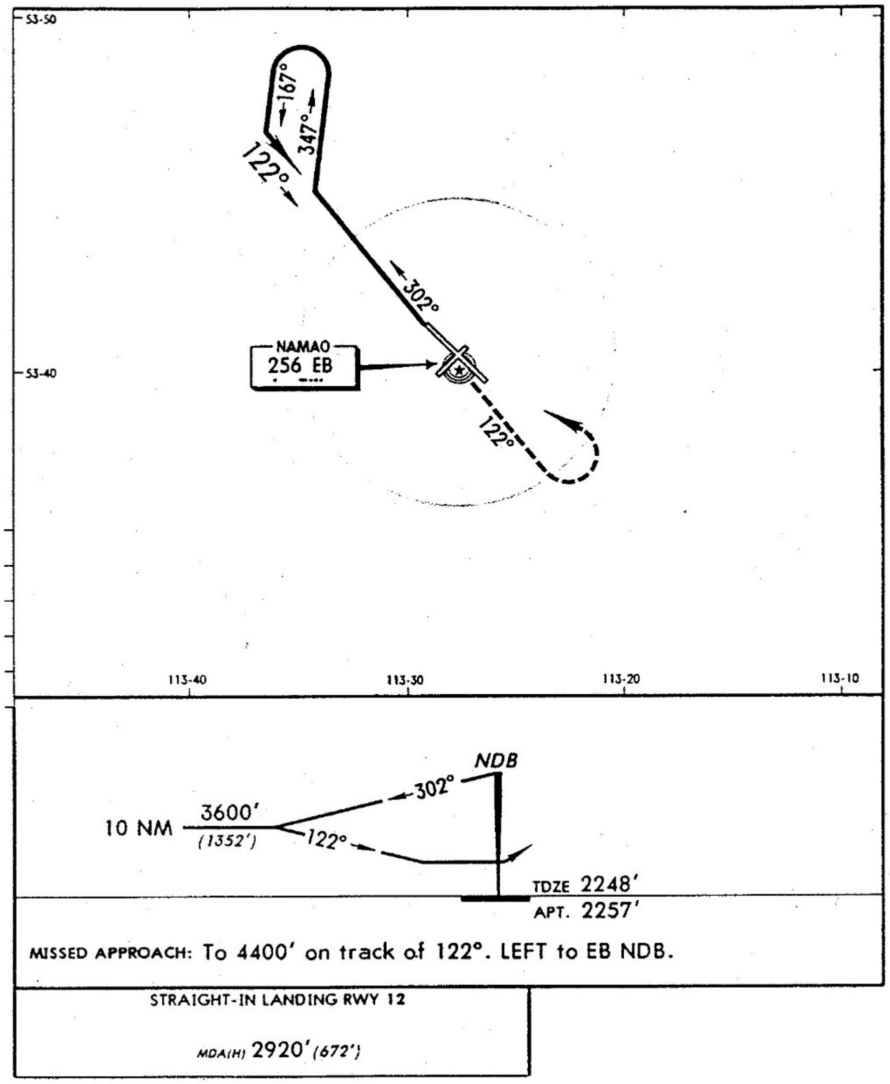

APP ID	SEQ NR	FIX ID	P/T	RECD NAV	W/P DESC	RHO	MAG CRS	DIST	ALT	VERT ANG
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N11	030	RW11	CF		G___		1220	0055	02298	-300
N11	040	EB	CF	YEG	E_M_	0325	1220	0015	02657	
N11	050		CA				1220		04400	
N11	060	EB	DF	EB	EE__					

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NDB CODING EXAMPLE 3

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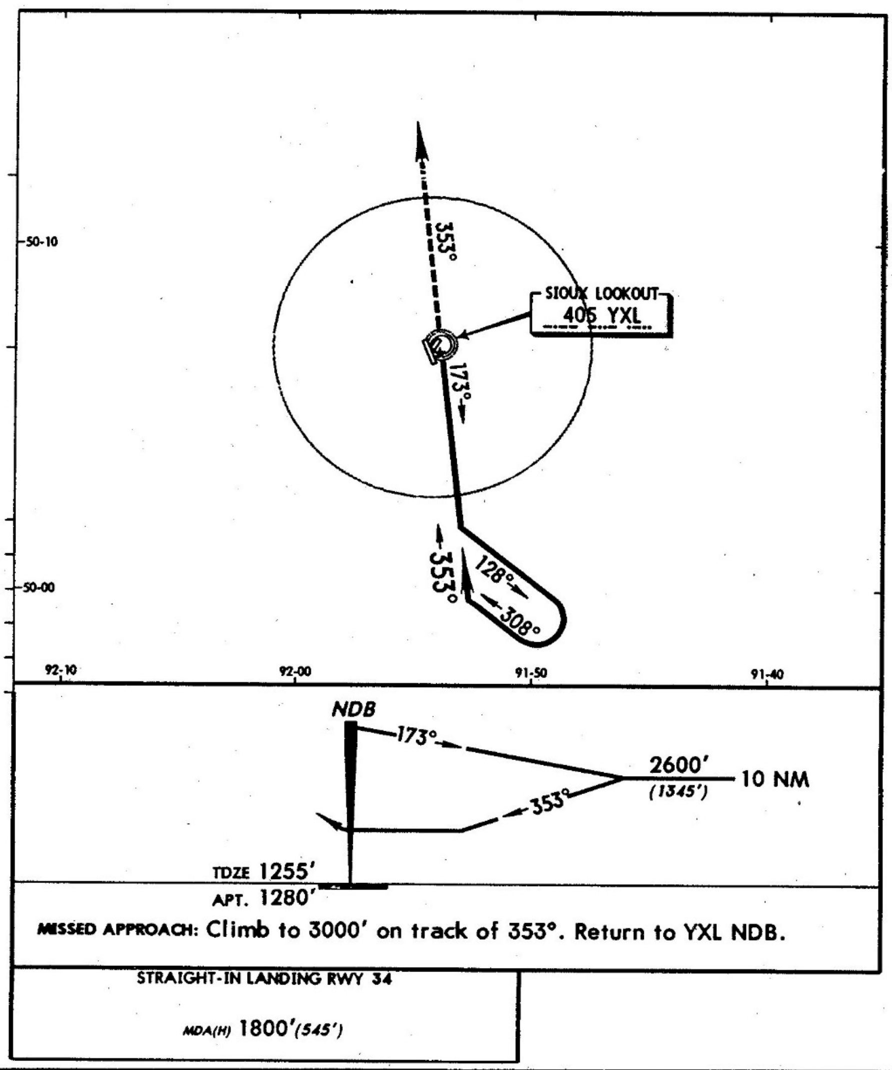

APP ID	SEQ NR	FIX ID	P/T	RECD NAV	W/P DESC	RHO	MAG CRS	DIST	ALT	VERT ANG
N34	020	FF34	IF	YXL	E_F				02600	
N34	025	RC34	CF	YXL	R L		353	0045	01621	
N34	030	YXL	CF		E_M		3530	0015	01800	000
N34	040		CA		_M_		3530		03000	
N34	050	YXL	DF	YXL	EE__					

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NDB CODING EXAMPLE 4

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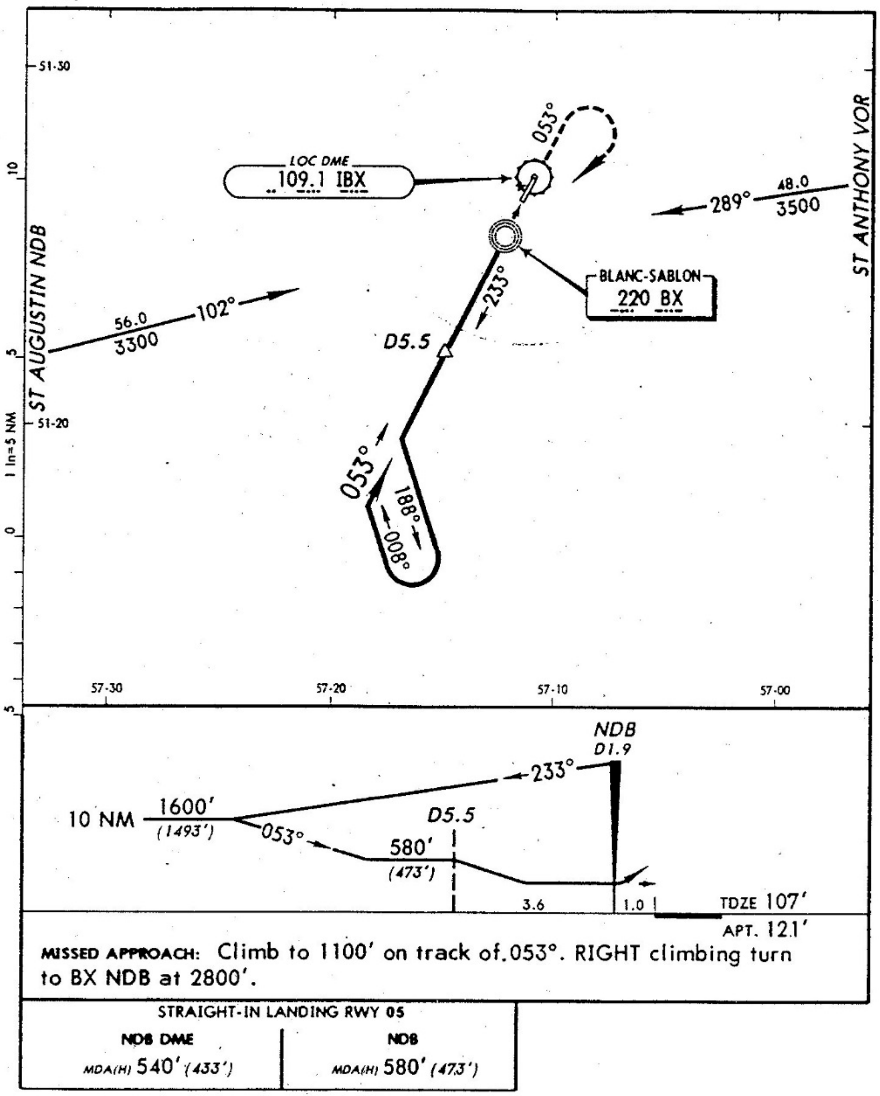

APP ID	SEQ NR	FIX ID	P/T	RECD NAV	W/P DESC	RHO	MAG CRS	DIST	ALT	VERT ANG
N05	020	FF05	IF	BX	E_F				00580	
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N05	040		VA		_M_		0530		01100	
N05	050	BX	DF		EE_					

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APPROACH AND APPROACH TRANSITION CODING RULES

7.0 Precision Approach Procedure Coding

7.1 Final Approach Segment

The following rules apply to the Final Approach Coding of full ILS Localizer based approach procedures. These procedures may include full ILS (localizer and GS), converging ILS, and those IGS (Instrument Guidance System) that are full ILS equivalent. These rules will be applied to the final approach coding of LDA and SDF procedures when those procedures include reference to an electronic glideslope and to all types of MLS Approach Procedures.

7.1.1 All such approach procedures must begin at the FACF. They must consist of a FACF, FAF and missed approach point fix and all step-down fixes published in the vertical path.

7.1.2 For localizer based procedures, the FACF is defined as a fix located on the localizer beam center, 8NM or less from the FAF or within the reception range of the Localizer. This may be a source document provided fix or a fix created using these positioning rules.

7.1.3 The FACF is coded as an IF leg. An altitude will not be assigned to the FACF unless specified in government source documents.

7.1.4 The track from the FACF to the FAF is coded as a CF or TF leg with altitude constraints as indicated for the specific procedure types below.

7.1.5 The recommended navaid must be the procedure reference localizer. Theta and Rho must be provided from that navaid for each sequence of the Final Approach Coding, including any step-down fixes, the runway or helipad fix and/or missed approach point.

7.1.6 The Outbound Magnetic Course field in all sequences must be equal to the localizer magnetic bearing or MLS course, derived from official government source.

7.1.7 For approach procedures with an electronic glideslope, the vertical angle must be coded in both the Final Approach Fix and the fix, which carries the missed approach point coding, except when the altitude 1 and altitude 2 at the FAF are identical, in which case the vertical angle is omitted on the FAF.

7.3 GLS Precision Approach Procedure Coding

7.3.1 The rules for coding GLS Approach Procedures are understood to be identical to those of Localizer coding as found in Section 7.1 of this attachment with the exception listed below.

7.3.2 The Final Approach Coding of GLS Instrument Approach Procedures does not require the coding of a FACF waypoint.

7.3.3 The track from the FACF to the FAF, when a FACF is coded, will be coded as a TF leg with altitude constraints as indicated for the specific procedure types below.

7.3.4 The recommended navaid must be the procedure reference ground station.

7.3.5 The Outbound Magnetic Course field in all sequences must be equal to the course derived from official government source.

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7.3.6 The lateral and vertical leg data coding from the FAF inbound will be in accordance with the data contained in the GLS Path Point Record.

7.4 MLS Approach Procedure Coding

MLS Approach Procedure Code utilizing raw azimuth and elevation data is limited to those procedures that are designed as a localizer equivalent. If such a procedure is coded, the rules for the Final Approach Coding are to be identical with those stated in Rule 7.1 above. The Route Type of such approaches must be coded as M in column 20 of the primary approach record. Approach procedures predicated on the use of MLS Area Navigation (MLS/RNAV) must be coded with a W or Y in column 20 of the primary approach record. MLS/RNAV approaches are coded as described below.

There are three types of MLS/RNAV approach, listed in increasing levels of complexity, computed lateral/raw vertical guidance, computed lateral and vertical guidance and curved path.

7.4.1 Approaches using computed lateral path and raw vertical path guidance, also referred to as Type A, will be used primarily where the MLS azimuth transmitter cannot be located on the extended runway centerline, but the elevation transmitter is sited normally abeam the touchdown point. All legs will be straight and aligned with the inbound course. They must be codes with Route Type W in column 20 of the primary approach record. Path definition will be the equivalent of a full ILS approach (Rule 6.4.2) with the exception that the leg from the PFAF inbound will be a TF leg, terminating at the runway or helipad waypoint, with the published final approach source in the Outbound Magnetic Course field. The PFAF will be coded as the Final Approach Fix in the Waypoint Description field and the first fix prior to the PFAF will be coded as the Final Approach Course Fix.

7.4.2 Approach using computed lateral and vertical guidance but no curved legs, also referred to as Type B, must be coded as Route Type Y in column 20 of the primary approach record. All legs will be straight and aligned with the inbound course. Path definition will be the equivalent of the full ILS approach (Rule 6.4.2) with the exception that the legs from the PFAF inbound will be a TF leg, with the published final approach course in the Outbound Magnetic Course field. The altitude of the PFAF and all waypoints inbound from it must be the glide path altitude at that point. The PFAF will be coded as the Final Approach Fix in Waypoint Description field and the first fix prior to the PFAF will be coded as the Final Approach Course Fix.

7.4.3 MLS/RNAV approaches using curved legs, also referred to as Type C, will be used for a variety of reasons, including parallel sidestep approaches, separation of different categories of aircraft, noise abatement, etc. These must always be precision approaches. They must be coded a with a Route type of Y in column 20 of the primary approach record. The following rules apply:

7.4.3.1 The first leg of an MLS/RNAV approach with curved legs must be an IF/TF leg combination. All other straight legs must be coded as TF legs. All TF legs in an MLS/RNAV with curved legs procedure must have the published course included in the Outbound Magnetic Course field.

7.4.3.2 All curved legs will be code as RF legs. Every leg preceding or following the RF leg will be tangent to the RF leg at that point.

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7.4.3.3 The initial portion of a MLS/RNAV approach with curved legs may be an IF/RF combination, provided a straight leg approach transition is coded to the point in the IF and Rule 7.4.2 are complied with.

7.4.3.4 The PFAF will be coded as the Final Approach Fix in the Waypoint Description field and the first fix prior to the PFAF will be coded as the Final Approach Course Fix. If there is not a fix at the glide path intercept, then the first fix after the intercept will be the PFAF. There must be one and only one PFAF for each MLS/RNAV approach with curved legs.

7.4.3.5 The last leg of an approach transition prior to an MLS/RNAV approach must be one of the following types CF, CI, HF, PI, RF or TF, except as indicated in Rule 6.5.3.3. If the leg type is CF, CI, RF or TF, then the Recommended Navaid must contain the identifier of the MLS used for the approach. If the leg type is PI or HF, then the Recommended Navaid must contain the VHF Navaid that defines the PI or HF leg.

7.4.3.6 If the last leg prior to the approach is a CI leg, the intercept angle will be 30° or less, and the intercept point must be between the first and second terminator fixes in the approach, but no closer than 2NM to the second fix.

7.4.3.7 The PFAF and the FACF altitudes must be coded according to Precision Approach Procedures Rule 6.4.2.

7.4.4 The PFAF will be used in precision MLS/RNAV approaches. It is defined as that fix along the lateral path where the published barometric altitude intercepts the glideslope. Prior to the PFAF, the aircraft is expected to fly barometric altitude to intercept the glide path. All waypoints up to the PFAF should be coded using the published barometric crossing altitude. The PFAF and all waypoints after it should be coded using the true altitude of the glide path at those points.

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APPROACH AND APPROACH TRANSITION CODING RULES

8.0 Non-precision Approach Procedure Coding

8.1 General

8.1.1 For approach procedures without an electronic glideslope, the Final Approach Fix will be that designated by government source. If no FAF is established in the government source, one will be computed according to Rule 6.2.5.*3* of this attachment. The fix, whether published or established, must carry the Final Approach Fix Waypoint Description code of F in position four of that code field. Note that only one record in a coded approach procedure can carry the F in position four of the Waypoint Description. Altitudes for this fix are coded in accordance with Rule 6.2.10.1 of this attachment.

8.1.2 A vertical Angle must be coded in the Missed Approach Point, Runway Threshold or Final End Point, whichever occurs first, for each approach procedure. A Vertical Angle may be coded in the Final Approach Fix Segment for each approach that includes a FACF. Vertical Angles will be from official government source or computed. This Vertical Angle will only be repeated on all step-down fixes on the segment FAF to MAP. The government source Vertical Angle will also be repeated on fixes associated with an RF Leg as the start or end of the arc, when these fixes are not at procedure fix locations and the RF Leg is in the FAF to MAP portion of the final approach coding.

8.1.3 Missed Approach Point (MAP) Location. The MAP location will be as published on the non-precision approach procedure by the appropriate government authority. See also Rule 8.10 of this attachment.

Note: If the source document states that the MAP and the LTP are not at the same location even if the distance is 0.1 mile or less, the MAP will not be placed at the LTP.

8.2 Final Approach Path Coding - Localizer-based Procedures

The following rules apply to the Final Approach Coding of non-precision Localizer-based approach procedures. These procedures may include Localizer Only, IGS (Instrument Guidance System) LDA, Localizer Directional Aid) and SDF (Simplified Directional Aid) procedures.

8.2.1 All such approach procedures must begin at the FACF. They must consist of a FACF, FAF and missed approach point fix and all step-down fixes published in the vertical path.

8.2.2 The FACF is defined as a fix located on the localizer beam center, 8NM or less from the FAF or within the reception range of the Localizer. This may be a source document provided fix or a fix created using these positioning rules.

8.2.3 The FACF is coded as an IF leg with an altitude only when assigned by government source.

8.2.4 The track from the FACF to the FAF is coded as a CF or TF leg with altitude constraints as indicated for the specific procedure types below.

8.2.5 The recommended navaid must be the procedure reference localizer. Theta and Rho must be provided from the localizer for each sequence of the Final Approach

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Coding, including any step-down fixes, the runway or helipad fix and/or missed approach point.

8.2.6 The Outbound Magnetic Course field in all sequences must be equal to the localizer magnetic bearing, derived from official government source.

8.3 Final Approach Path Coding - VOR-based Procedures

The following rules apply to the Final Approach Coding of non-precision VOR-based approach procedures. These procedures may include VOR, VORDME, VORTAC, TACAN, and RNAV Area Navigation procedures.

8.3.1 Final Approach Coding must be coded using IF and CF or TF[1] legs only.

8.3.2 Final Approach Coding must include both a FAF and missed approach fix. The missed approach fix may be a runway or helipad fix or a designated missed approach point. Coding of a FACF is defined in Rule 6.2.5.

8.3.3 The recommended navaid must be the procedure reference VOR or TACAN. Theta values must be provided from that facility in all Final Approach Coding sequences, including any step-down fixes that are included.

8.3.4 When the reference facility is VORDME or VORTAC or TACAN, the following applies:

8.3.4.1 Final Approach Coding must be accomplished using IF and CF or TF[1] legs only.

8.3.4.2 Final Approach Coding must include a FAF and a missed approach point that may be a missed approach point fix, a runway fix or a helipad fix, and all step-down fixes published in the vertical path. The Final Approach Coding will include an FACF when one is required by Rule 6.2.5.

8.3.4.3 The recommended navaid must be the procedure reference VORDME or VORTAC or TACAN. Theta and Rho values must be provided from that facility in all Final Approach Coding sequences, including any step-down fixes that are included.

8.3.5 When the procedure reference is RNAV (VORDME), the following applies:

8.3.5.1 Final Approach Coding must be accomplished using IF and CF or TF[1] legs only.

8.3.5.2 All RNAV- Area Navigation approach procedure missed approach points must be at or prior to a runway threshold or helipad alighting point. These points may be a source defined named waypoint.

8.3.5.3 The recommended navaid is not required unless specified by source or if required by the leg type. The recommended navaid must be the procedure reference VORDME or VORTAC. Theta and Rho values must be provided from that facility in all final approach sequences where the recommended navaid is coded, including any step-down fixes. The Recommended Navaid, Theta and Rho are never provided on fixes associated with the start and end of a precision arc (RF) leg used in the final approach coding sequences.

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[1] In general CF legs are used in final approach coding. TF legs are used in FMS and GPS Approach Procedures, some types of MLS Procedures and in other procedure types where the determination has been made that a TF will work better than a CF.

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8.3.6 Rule deleted by Supplement 17.

8.3.6.1 Rule deleted by Supplement 17.

8.3.6.2 Rule deleted by Supplement 17.

8.3.6.3 Rule deleted by Supplement 17.

8.4 Final Approach Path Coding - NDB-Based Procedures

The following rules apply to the Final Approach Coding of all NDB based approach procedures. NDB based approach procedures include procedures using a NDB or Locator as the reference facility and procedures using a NDB or Locator and a DME (NDB + DME) as reference facilities. NDB approach procedures not requiring DME, but using the DME for reduced minimums, will be coded as NDB with DME required D in Qualifier 1.

8.4.1 NDB Final Approach Coding must include a FAF and a missed approach point that may be a missed approach point fix, a runway fix or a helipad fix, and all step-down fixes published in the vertical path. The Final Approach Coding must include a FACF when one is required by Rule 6.2.5.

8.4.2 Rule deleted by Supplement 17.

8.4.3 NDB + DME Final Approach Coding must include a FAF and runway or helipad fix or missed approach point fix and all step-down fixes published in the vertical path. The Final Approach Coding will include a FACF when one is required by Rule 6.2.5.

8.4.4 Coding must use IF and CF or TF[1] legs only through to the runway or helipad fix or missed approach point fix. The IF leg must be at the FAF (or at the optional FACF) for NDB procedures or at the FACF for NDB + DME procedures.

8.5 Intentionally Left Blank

8.6 Final Approach Path Coding - Circle-to-Land Procedures

Procedures that only have Circle-To-Land operating minimums may be included in the database. When they are included, they are identified with the Route Type (Section 5.7) appropriate to the reference facility and with the Route Type Qualifier Two set to C. The following rules apply to such approach procedures:

8.6.1 The last segment in the Final Approach Coding must be the missed approach point fix.

8.6.2 For Circle-To-Land Procedures that are to a runway or helipad, or published missed approach point, all the rules listed above in Sections 6, 7 and 8 apply, as well as the rules for Missed Approach Procedure coding in Section 9.

8.6.3 For Circle-To-Land Procedures that are not to a runway or helipad, or published missed approach point, the missed Approach Point will be established at the center of the airport or heliport.

8.6.4 A Vertical Angle must be provided on the missed approach point fix , or, when the procedure meets the criteria specified in Rule 6.10.2.1, on the Final End Point fix

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[1] In general CF legs are used in final approach coding. TF legs are used in FMS and GPS Approach Procedures, some types of MLS Procedures and in other procedure types where the determination has been made that a TF will work better than a CF.

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when such as fix is coded for the approach. Vertical Angle information must be in accordance with the rules in Section 6, 7 and 8 of this attachment for the type of reference facility on which the procedure is based.

8.7 Final Approach Path Coding – RNAV Procedure

This section provides coding guidelines for RNAV Approach Procedures. The term RNAV Approach Procedure is defined as an approach procedure that was designed to provide lateral and vertical path guidance using criteria that do not rely on radial, bearing, arcs or glide paths from ground-based navaids. As such, a RNAV Approach Procedure will not include references to ground-based navaid associated information such as VOR radial, NDB bearings, DME distances, ILS course, MLS Azimuth and ILS or MLS glideslopes. Exceptions to this standard may be outlined in the rules that follow. Navaids may be referenced as waypoints in the coding of the RNAV Approach Procedures.

8.7.1 The Final Approach Coding must include a Final Approach Fix (FAF) and a Missed Approach Point fix (Runway Threshold or Missed Approach Point). The Final Approach Coding must include a Final Approach Course Fix (FACF) when such a fix is required by Rule 6.2.5.

8.7.2 The FAF (or optional FACF) is coded as an IF leg with an altitude only when assigned by government source.

8.7.3 The track from the FACF (when coded) to the FAF is coded with TF or RF legs. The RF leg is not allowed as the first leg of the approach coding according to the Beginning/Ending Leg Table. The preferred coding when an approach starts with a precision arc is the use of an IF leg at the FACF or FAF, followed by RF to the FAF or MAP. According to the rules on RF legs, this must require that a straight line, fix terminated, approach transition to the FACF or FAF has been included. The track in the transition must be tangent to the arc. The rule also does not exclude the use of an RF leg in between FAF and the final TF leg to the missed approach point. Such RF legs must be coded with the 4th character of the Waypoint Description field blank.

8.7.4 The Final Approach Coding of RNAV Approach Procedures covered by this Section 8.7 do not require a Recommended Navaid except as governed by other rules in this attachment.

8.7.5 RNAV Approach Procedures coded as GLS Procedure according to Section 5.7 must reference the GLS facility as a Recommended Navaid.

8.8 Final Approach Path Coding - Helicopter Approach Procedures

Helicopter Approach Procedures will be coding using the rules in Sections 6, 7 and 8 and 9 of this attachment, appropriate to the type of sensor required for the procedure, such as VORDME or ILS or RNAV or GNSS. This includes rules for Recommended Navaid, FACF requirements, beginning and ending leg types, etc.

The Lateral Path Rules for the sensor related procedure coding reference a missed approach point fix, a runway fix or a helipad fix as the missed approach point. Those same rules apply to the coding of helicopter procedure.

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8.9 Vertical Navigation Path (VNAV Path) or Descent Gradient Considerations

If the government source provides, vertical path angle or other suitable information that can be used to determine a vertical path angle, it must be used. The only exception is when the source provides more than one angle for the Final Approach Coding segment FAF to MAP. If more than one angle is provided for this segment, the highest angle will be used.

The following guidelines have been developed for the coding of the vertical angles on the Final Approach Coding when vertical path information is not provided by the government sources. Rule 8.9.1 through 8.9.8 applies to the FAF to MAP segment only. Rule 8.9.9 applies to the FACF to FAF segment only.

8.9.1 The descent angle is to be calculated from Landing Threshold Point elevation plus the published procedure TCH (if no procedure TCH is specified by source use 40 or 50 feet [see Section 5.67 of this specification]) to the altitude at the Final Approach Fix (FAF). The curvature of the earth should not be used in the calculations of the descent angle. Refer to example 1, 7, and 8. The descent angle must always be rounded up to the nearest one hundredth of a degree.

Examples of Rounding:

- 3.111 = 3.12
- 3.346 = 3.35

8.9.1.1 The published TCH for a procedure used in these calculations is the procedure TCH (if no procedure TCH is specified by source use 40 or 50 feet). TCH is further defined in Chapter Five, Sections 5.67 and 5.265 of this document.

8.9.1.2 The lateral distance used in the descent angle calculation is to be the along track distance of the path from the coded Final Approach Fix to the Landing Threshold Point. The distance resolution used in this calculation will be 0.1NM.

8.9.2 If the calculated angle is less than three degrees, it will be raised to a minimum of three degrees.

8.9.3 If a step-down fix is included in the Final Approach Coding segment to FAF and MAP and it is determined that the calculated descent angle will be above the step-down fix altitude, that calculated descent angle will be used. If it is determined that the step-down fix altitude is above the descent path, the descent angle will be calculated from the LTP plus TCH to the altitude at the step-down fix. Refer to Examples 3 and 4.

8.9.4 Deleted by Supplement 20.

8.9.5 If the final approach course does not cross over the runway threshold, a position abeam the landing threshold point on the final approach course will be calculated and coded as a Final End Point. The descent angle must be calculated using distances that start at the FEP fix and an altitude equal to the LTP elevation plus the published procedure TCH (if no procedure TCH is specified by source use 40 or 50 feet [see Section 5.67 of this specification]) to the altitude at the Final Approach Fix (FAF). Refer to Examples 6, 9, and 10.

8.9.6 If the missed approach point is prior to the runway threshold, the descent angle will be computed from the LTP elevation plus the published procedure TCH (if no procedure TCH is specified by source use 40 or 50 feet [see Section 5.67 of this

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specification]) to the altitude at the FAF. Altitude will be specified at the MAP fix and will be the altitude where the calculated descent angle passed through the MAP. Refer to Examples 7 and 8.

8.9.7 When circling-to-land minimums are the only landing minimums and the runway is in alignment with the Final Approach Coding segment FAF and MAP, a descent angle will be provided. The descent angle will be computed from the LTP elevation plus the published procedure TCH (if no procedure TCH is specified by source use 40 or 50 feet [see Section 5.67 of this specification]) to the altitude at the FAF. Refer to Examples 11 and 12.

8.9.8 When circling-to-land minimums are the only landing minimums and the runway is not in alignment with the Final Approach Coding segment FAF and MAP, a descent angle will be provided. The descent angle will be computed from a point on the final approach course Abeam the LTP of the nearest landing runway to the altitude at the FAF. Refer to Example 13.

8.9.9 If one or more step-down fixes are published in the official government source in the intermediate approach segment of the procedure, and the intermediate approach segment can be included in the final approach coding, the fixes and the appropriate altitudes will be included as part of the Final Approach Coding. A vertical angle will be coded on the FAF waypoint that will ensure that any step-down fix altitude in the Final Approach Coding, FACF, to the FAF is cleared by that angle. Vertical angle information is not provided in Approach Transitions. However, any such fix will be included in the coding, along with the government source supplied altitudes.

8.9.10 If the Missed Approach Point (MAP) is at a Point-in-Space, the descent angle will be computed from the altitude at the MAP to the altitude at the Final Approach Fix (FAF).

8.10 VNAV Coding of Non-Precision Approach Procedures With Missed Approach Points - Other Than Landing Threshold

Coding standards for Non-Precision Approach Procedures that have a published missed approach beyond the Landing Threshold Point have been developed. These standards are included in the three VNAV coding scenarios in the following paragraphs. In these scenarios, the term final approach course crosses over the landing threshold is used as a qualification for the three scenarios. This attachment does not define with any precision what is meant by this qualification. The intent of this wording is that the published final approach course will lead to the landing threshold without course changes or corrections.

8.10.1 Missed Approach Point beyond the landing threshold and the published Final Approach Course crosses the landing threshold. The ARINC 424 rules for this case call for inserting the Landing Threshold Point as a fix in procedure coding. See VNAV Coding Example A.

8.10.2 Missed Approach Point beyond the landing threshold and the published Final Approach Course does not cross the landing threshold. The ARINC 424 rules for this case call for inserting a Final End Point as a fix in the procedure coding. See Coding Example B.

8.10.3 Missed Approach Point is a Navaid beyond the landing threshold. The published final approach course does not cross over the landing threshold but the navaid is located equal to or less than 0.1NM from that threshold. The ARINC 424 rules for

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this case call for coding the navaid as the missed approach point, no insertion of an additional fix. See Coding Example C.

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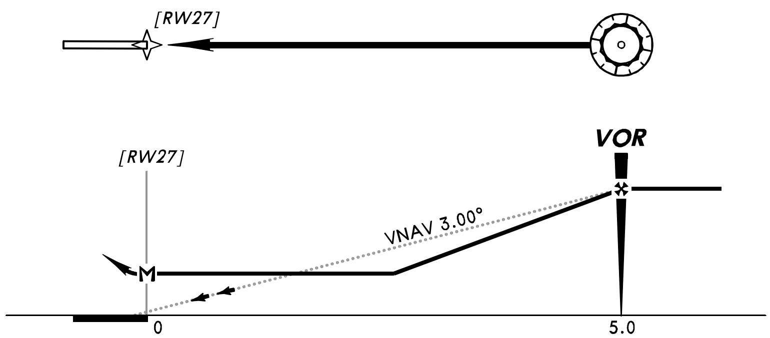
NON-PRECISION APPROACH CODING EXAMPLE 1

This example shows a Final Approach Fix (FAF) to Missed Approach Point (MAP) at Landing Threshold Point (LTP) final approach course with Straight-In landing alignment. The VNAV Path angle, when not provided in official government source, is calculated from LTP elevation + TCH (if no procedure TCH is specified by source use 40 or 50 feet [see Section 5.67 of this specification]) to the FAF altitude and coded in the MAP sequence.



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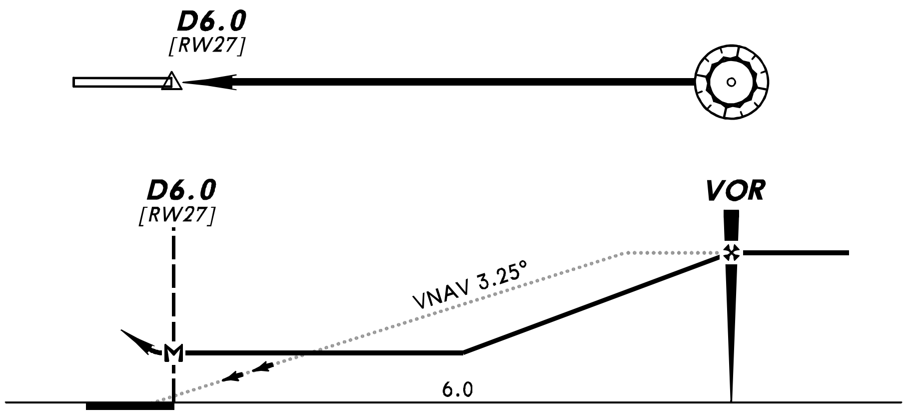
NON-PRECISION APPROACH CODING EXAMPLE 2

This example shows a Final Approach Fix (FAF) to Missed Approach Point (MAP) at Landing Threshold Point (LTP) final approach course with Straight-In landing alignment. The VNAV Path angle is calculated from LTP + TCH elevation (if no procedure TCH is specified by source use 40 or 50 feet [see Section 5.67 of this specification]) to the FAF altitude, and raised to an optimum angle of 3.00 degrees or to an angle matching the VASI/PAPI angle. This adjusted angle is coded in the MAP sequence.



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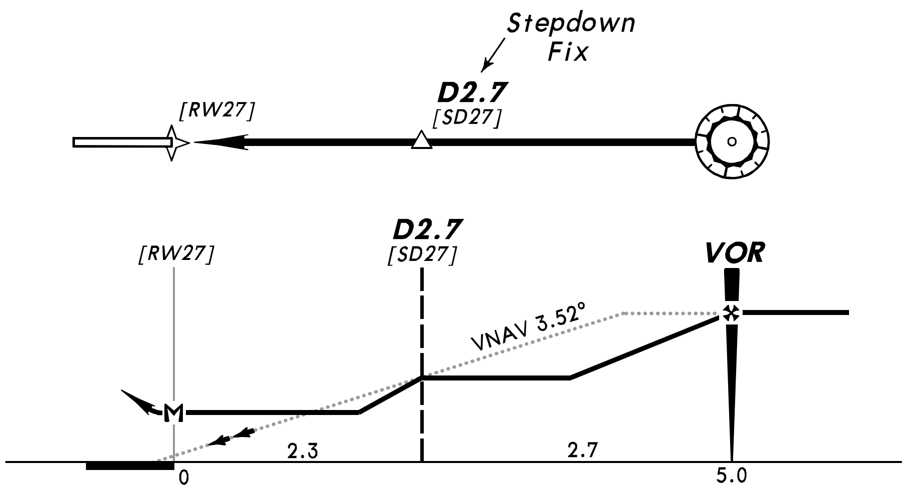
NON-PRECISION APPROACH CODING EXAMPLE 3

This example shows Final Approach Fix (FAF) to Missed Approach Point (MAP) at Landing Threshold Point (LTP) via Step-down Fix final approach course with Straight-In landing alignment. The VNAV Path angle is calculated from LTP + TCH elevation (if no procedure TCH is specified by source use 40 or 50 feet [see Section 5.67 of this specification]) to the FAF altitude and coded in the MAP sequence. If the Step-down penetrates VNAV path calculated from the LTP elevation + TCH (or LTP elevation + 50 feet if no TCH is published) to FAF altitude, as shown in this example, the VNAV angle is raised to clear step-down and this revised angle is used for entire Final Approach Coding.



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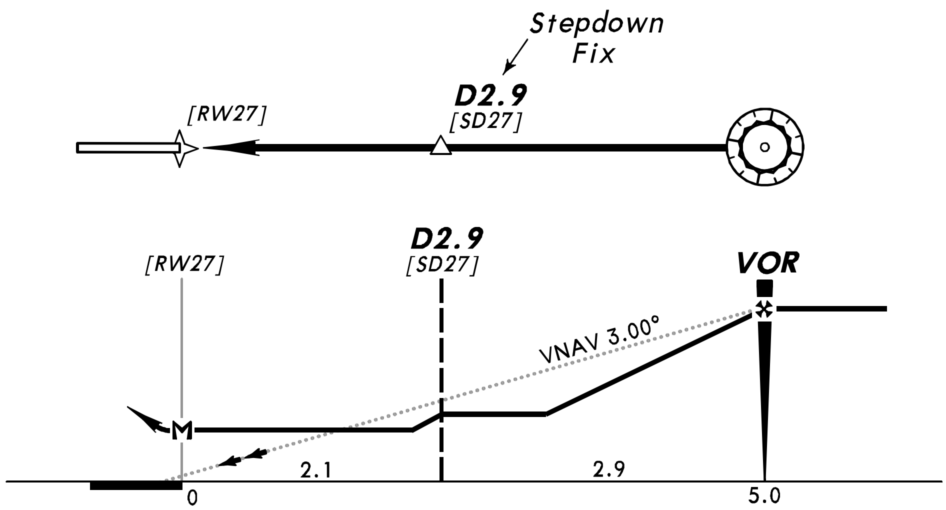
NON-PRECISION APPROACH CODING EXAMPLE 4

This example shows a Final Approach Fix (FAF) to Missed Approach Point (MAP) at Landing Threshold Point (LTP) via Step-down Fix final approach course with Straight-In landing alignment. The VNAV Path angle is calculated from LTP + TCH elevation (if no procedure TCH is specified by source use 40 or 50 feet [see Section 5.67 of this specification]) to the FAF altitude and coded in the MAP sequence. When the Step-down does not penetrate VNAV path of LTP + 50 feet to FAF altitude, there is no requirement to raise angle.



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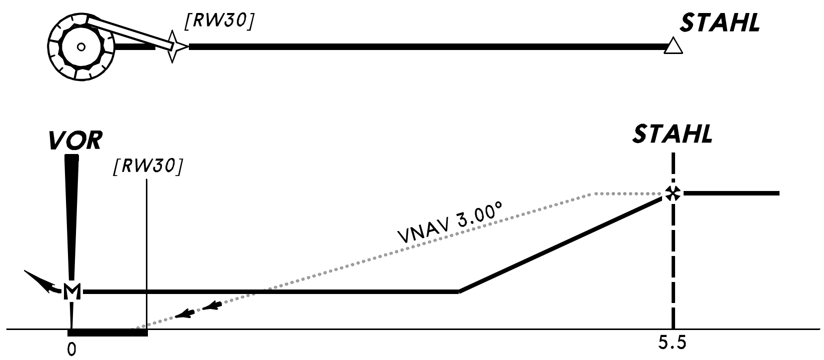
NON-PRECISION APPROACH CODING EXAMPLE 5

This example shows a Final Approach Fix (FAF) to Missed Approach Point (MAP) beyond Landing Threshold Point (LTP) final approach course with Straight-In landing alignment. The MAP position is the officially published government source position and is beyond the LTP. A LTP Fix waypoint (runway) is required in the correct coding of this example. The VNAV Path angle is calculated from LTP + TCH elevation (if no procedure TCH is specified by source use 40 or 50 feet [see Section 5.67 of this specification]) not the MAP, to the FAF altitude, and coded in the LTP sequence.



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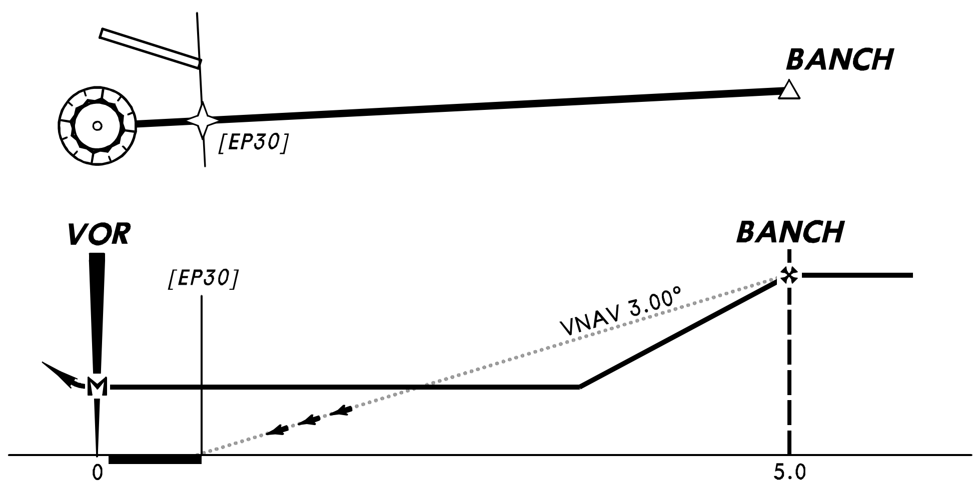
NON-PRECISION APPROACH CODING EXAMPLE 6

The example shows a Final Approach Fix (FAF) to Missed Approach Point (MAP) beyond Landing Threshold Point (LTP) final approach course. This final approach course does not cross the landing threshold. The MAP position is the officially published government source position. A Final End Point (FEP) waypoint is required. The procedure does meet straight-in alignment criteria. The VNAV Path angle is calculated from the LTP elevation + TCH (if no procedure TCH is specified by source use 40 or 50 feet [see Section 5.67 of this specification]) to the FAF altitude, using the FEP position and along track distance in determining the distance used in the calculation. The VNAV Path angle is coded in the FEP sequence.



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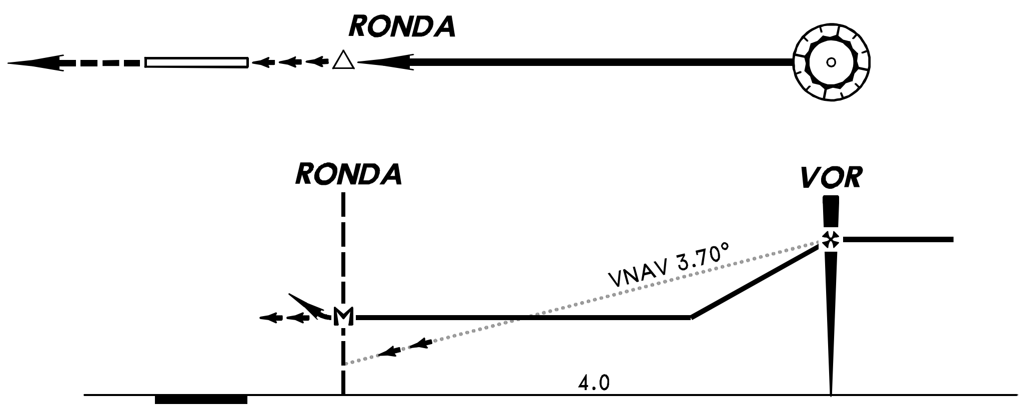
NON-PRECISION APPROACH CODING EXAMPLE 7

This example shows a Final Approach Fix (FAF) to Missed Approach Point (MAP) before Landing Threshold (LTP) final approach course with Straight-in landing alignment. The MAP position is the officially published government source position. The VNAV Path angle is calculated from the LTP + TCH elevation (if no procedure TCH is specified by source use 40 or 50 feet [see Section 5.67 of this specification]) to the FAF altitude, and coded in the MAP sequence. The Altitude in the MAP sequence is assigned based on computation, using the calculated angle. The LTP is not included in the coding as a waypoint. The Missed Approach Procedure is coded as straight ahead over runway.



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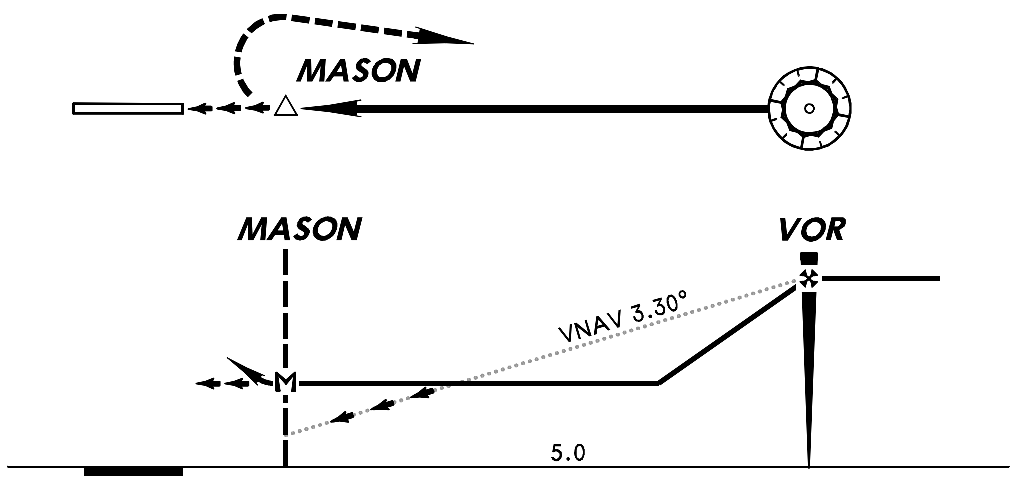
NON-PRECISION APPROACH CODING EXAMPLE 8

This example shows a Final Approach Fix (FAF) to Missed Approach Point (MAP) final approach course meeting Straight-in landing alignment criteria with the MAP before Landing Threshold Point (LTP). The MAP position is the officially published government source position. The VNAV Path angle is calculated from the LTP + TCH elevation (if no procedure TCH is specified by source use 40 or 50 feet [see Section 5.67 of this specification]) to the FAF altitude, and coded in the MAP sequence. The Altitude in the MAP is assigned based on computation, using the angle. The LTP is not included in the coding as a waypoint. The Missed Approach Procedure includes immediate turn at the MAP.



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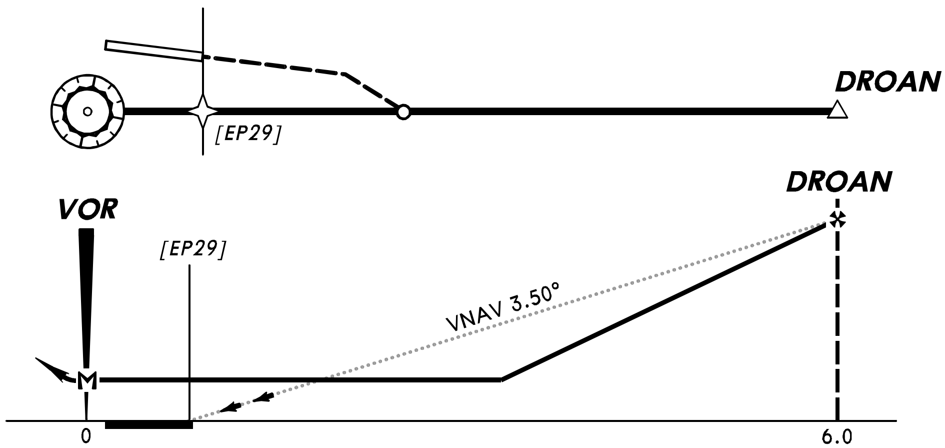
NON-PRECISION APPROACH CODING EXAMPLE 9

The example shows a Final Approach Fix (FAF) to Missed Approach Point (MAP) beyond Landing Threshold Point (LTP) final approach course. This final approach course does not cross the landing threshold. The MAP position is the officially published government source position. A Final End Point (FEP) waypoint is required. The procedure does meet straight-in alignment criteria. The VNAV Path angle is calculated from the LTP elevation + TCH (if no procedure TCH is specified by source use 40 or 50 feet [see Section 5.67 of this specification]) to the FAF altitude, using the FEP position and along track distance in determining the distance used in the calculation. The VNAV Path angle is coded in the FEP sequence.



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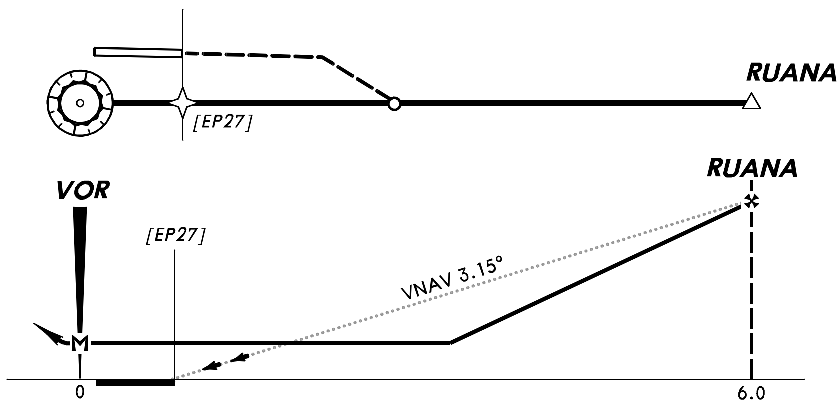
NON-PRECISION APPROACH CODING EXAMPLE 10

The example shows a Final Approach Fix (FAF) to Missed Approach Point (MAP) beyond Landing Threshold Point (LTP) final approach course. This final approach course is parallel/near parallel to the runway alignment. The MAP position is the officially published government source position. A Final End Point (FEP) waypoint is required. The VNAV Path angle is calculated from the LTP elevation + TCH (if no procedure TCH is specified by source use 40 or 50 feet [see Section 5.67 of this specification]) to the FAF altitude, using the FEP position and along track distance in determining the distance used in the calculation. The VNAV Path angle is coded in the FEP sequence.



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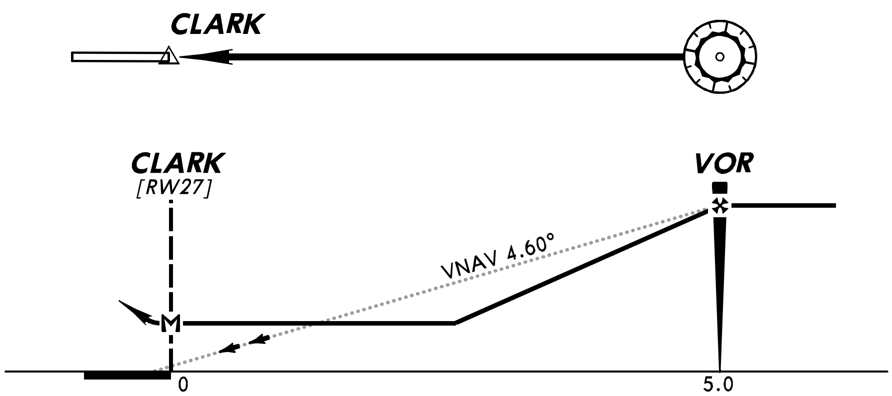
NON-PRECISION APPROACH CODING EXAMPLE 11

This example shows a Final Approach Fix (FAF) to Missed Approach Point (MAP) at Landing Threshold Point (LTP) final approach course. The procedure is published with Circle-To-Land weather minimums although the straight-in landing alignment criteria are met. The MAP position is the officially published government source position. The MAP is a published waypoint at the LTP. The VNAV Path angle is calculated from the LTP + TCH elevation (if no procedure TCH is specified by source use 40 or 50 feet [see Section 5.67 of this specification]) to the FAF altitude, and coded in the MAP sequence.



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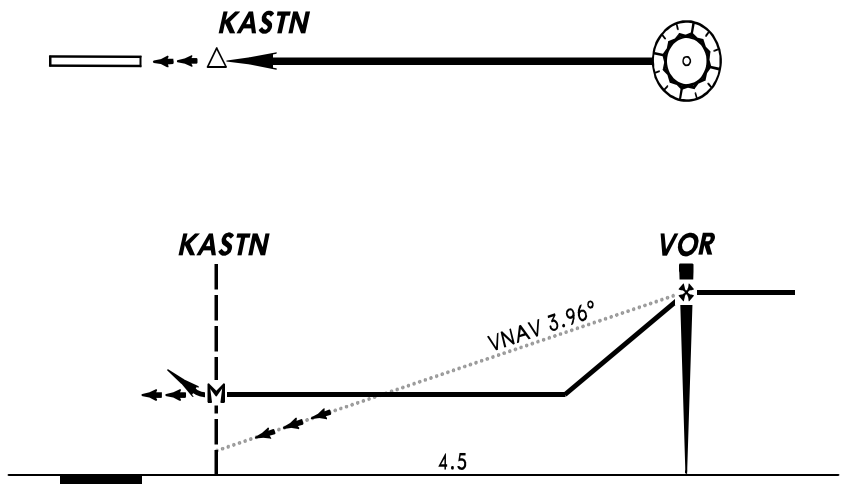
NON-PRECISION APPROACH CODING EXAMPLE 12

This example shows a Final Approach Fix (FAF) to Missed Approach Point (MAP) final approach course where the MAP is before the Landing Threshold Point (LTP).

The procedure is Circle-To-Land weather minimums although Straight-in landing alignment criteria are met. The MAP position is the officially published government source position. The LTP is not included in the coding. The VNAV Path angle is calculated from *a* LTP + TCH elevation (if no procedure TCH is specified by source use 40 or 50 feet [see Section 5.67 of this specification]) to the FAF altitude and coded in the MAP sequence.



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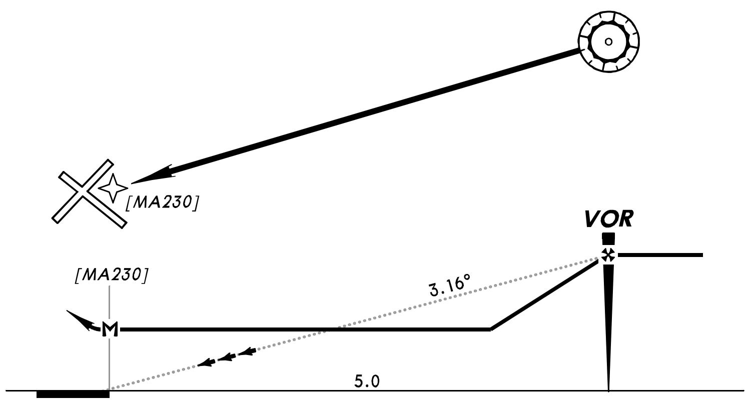
NON-PRECISION APPROACH CODING EXAMPLE 13

This example shows a Final Approach Fix (FAF) to Missed Approach Point (MAP) that is other than the Landing Threshold Point (LTP), and is not before, beyond or abeam the Landing Threshold Point. The procedure is published with Circle-To-Land weather minimums. Straight-in landing alignment criteria are not met.

The MAP position is the officially government source position or, if not published, established as a point abeam the nearest landing threshold on the Final Approach Course. The VNAV angle is calculated from the airport elevation to the FAF altitude and coded in the MAP sequence.



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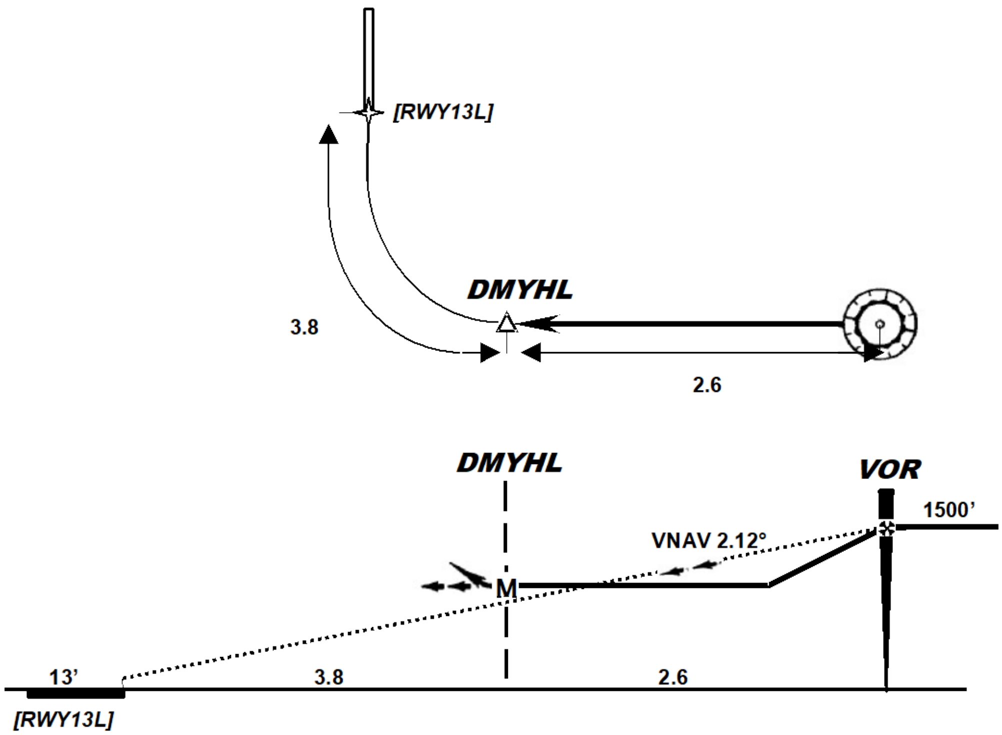
NON-PRECISION APPROACH CODING EXAMPLE 14

The example shows a Final Approach Fix (FAF) to Missed Approach Point (MAP) before the Landing Threshold Point (LTP) final approach course. This final approach course does not cross the landing threshold. The MAP position is the officially published government source position. The procedure does not meet straight-in alignment criteria. The VNAV Path angle is calculated from the LTP elevation + TCH (if no procedure TCH is specified by source use 40 or 50 feet [see Section 5.67 of this specification]) to the FAF altitude, using the LTP position and along track distance from FAF in determining the distance used in the calculation. The altitude at the MAP is assigned based on computation, using the calculated VNAV angle. The VNAV Path angle is coded in the MAP sequence.



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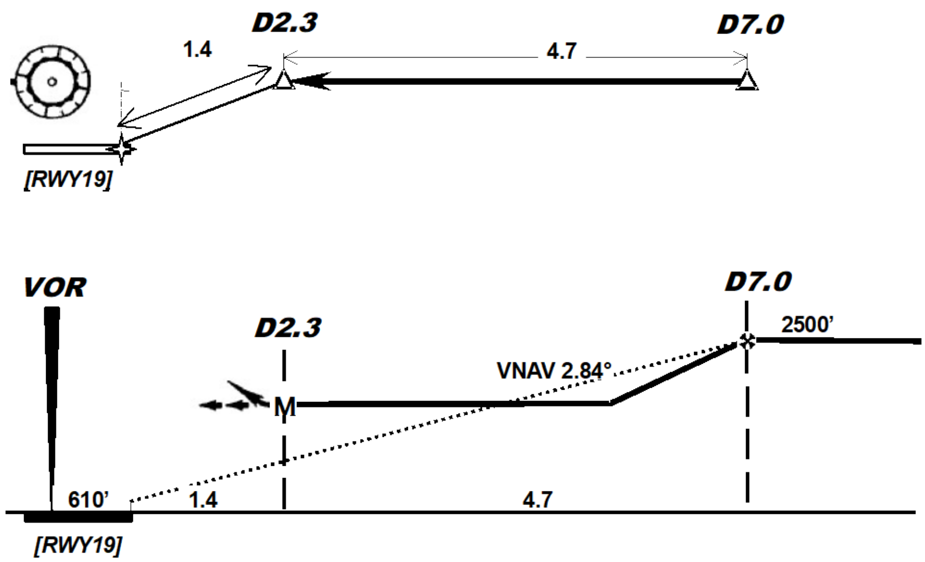
NON-PRECISION APPROACH CODING EXAMPLE 15

The example shows a Final Approach Fix (FAF) to Missed Approach Point (MAP) before the Landing Threshold Point (LTP) final approach course. This final approach course does not cross the landing threshold. The MAP position is the officially published government source position. The procedure does not meet straight-in alignment criteria. The VNAV Path angle is calculated from the LTP elevation + TCH (if no procedure TCH is specified by source use 40 or 50 feet [see Section 5.67 of this specification]) to the FAF altitude, using the LTP position and along track distance from FAF in determining the distance used in the calculation. The altitude at the MAP is assigned based on computation, using the calculated VNAV angle. The VNAV Path angle is coded in the MAP sequence.



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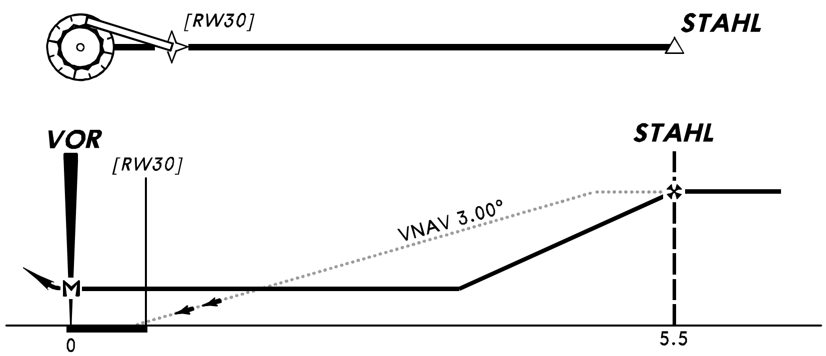
ATTACHMENT 5
PATH AND TERMINATOR

CODING EXAMPLE A
VNAV APPROACH CODING EXAMPLE

Inserted Runway Fix (Rule 8.10.1)

This example shows a procedure published as Final Approach Fix (FAF) to a Missed Approach Point (MAP) beyond the Landing Threshold Point (LTP). The Final Approach Course (FAC) crosses over the landing threshold. The landing alignment is straight-in. As the officially published MAP position is beyond the LTP, a runway fix waypoint [RW30] is inserted as an additional waypoint into the Final Approach Coding of this example. The VNAV Path angle is calculated from the LTP elevation + TCH (if no procedure TCH is specified by source use 40 or 50 feet [see Section 5.67 of this specification]) using the LTP and the FAF to determine the distance used in the calculation, to the FAF altitude and is coded in the Runway Fix sequence. The missed approach procedure is not included in the graphic. It is included in the coding sequence example. The inserted runway fix is coded as the MAP. The coded first leg of the missed approach path is a continuation of the FAC from the inserted Runway Fix to the officially published MAP. The flyover code is set in position 2 of the waypoint description field. The first leg of the published missed approach path is a climb on the FAC to an altitude of airport elevation plus 400 feet, or as specified by source, followed by a direct to a fix at the FAF.



Inserted Runway Fix Coding:

APP ID	SEQ NR	FIX ID	P/T	WAYPOINT DESCRIPTION				MAG COURSE	DIST	ALT DESC/ALT	VERT ANGLE	ARINC 424 REF.
D30	020	STAHL	IF	E			F	0.0	0.0	At or Above Procedure Altitude		Attachment 5, Rule 8.1.1
D30	030	RW30	CF	G	Y		M	Published FAC	4.7	At LTP + published TCH (if no procedure TCH is specified by source use 40 or 50 feet)	-3.00	Attachment 5, Rule 8.1.2 Rule 6.2.9.3 Rule 6.2.10.2.c
D30	040	VOR	CF	V	Y	M		Published FAC	0.8			Attachment 5, Rule 6.2.10.2.c Rule 9.2.3
D30	050		CA					Published FAC		At or Above Airport Plus 400 feet		Attachment 5, Rule 9.4.1.4
D30	060	STAHL	DF	E	E					At or Above Procedure Altitude		

Waypoint Description:

Column One - Fix Type: E = Waypoint, G = Runway, V = VHF Navaid

Column Two - E = End of Final Approach Coding, Y = Flyover waypoint

Column Three - M = First Leg of Missed Approach Procedure

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Column Four - Fix Function in Coding: F = FAF, M = Missed Approach Fix

Note: FAF Altitude Description may be at when this is prescribed by source documentation. The altitude in sequence 050 may be a source provided value for the first leg of a missed approach or may be regionally adjusted to 500 feet above the airport. The At or Above Airport Plus 400 feet is the minimum requirement.

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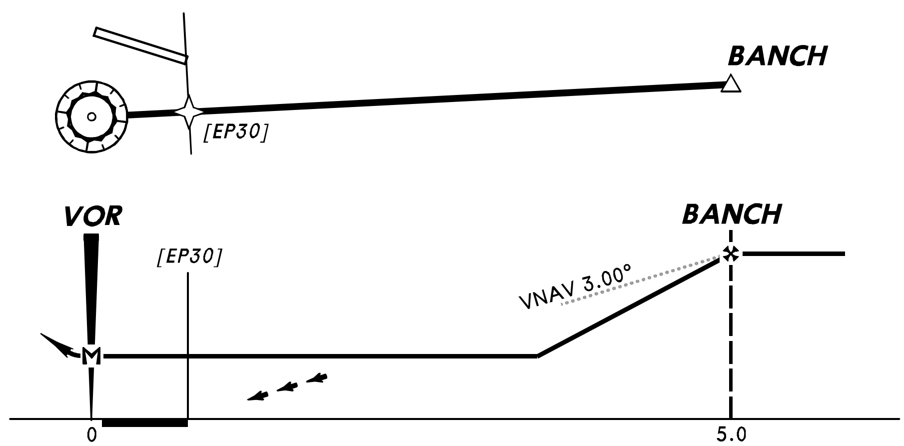
CODING EXAMPLE B
VNAV APPROACH CODING EXAMPLE

Inserted Final End Point Fix (Rule 8.10.2)

This example shows a procedure published as Final Approach Fix (FAF) to a Missed Approach Point (MAP) beyond the Landing Threshold Point (LTP). The Final Approach Course (FAC) does not cross over the landing threshold. The landing alignment is straight-in. As the MAP is located beyond the landing threshold, a Final End Point Fix (FEP) waypoint [EP30] is inserted as an additional waypoint in the Final Approach Coding of this example. The VNAV Path angle is calculated from the LTP elevation + TCH (if no procedure TCH is specified by source use 40 or 50 feet [see Section 5.67 of this specification]) using the FEP and the FAF to determine the distance used in the calculation, to the FAF altitude and is coded in the FEP Fix sequence. The missed approach path is not included in the graphic. It is included in the coding sequence example. The inserted FEP Fix is coded with its designated unique code in the last position of the Waypoint Description on the FEP sequence. The coded first leg of the missed approach path is a continuation of the FAC to the officially published MAP. The flyover code is set in position 2 of the waypoint description field. The first leg of the published missed approach path is on the FAC to an altitude of airport elevation plus 400 feet, or as specified by source, followed by a direct to a fix at the FAF.



Inserted Final End Point Fix Coding:

APP ID	SEQ NR	FIX ID	P/T	WAYPOINT DESCRIPTION				MAG COURSE	DIST	ALT DESC/ALT	VERT ANGLE	ARINC 424 REF.
D30	020	BANCH	IF	E			F	0.0	0.0	At or Above Procedure Altitude		Attachment 5 Rule 8.1.1
D30	030	EP30	CF	E	Y		E	Published FAC	4.1	At LTP + published TCH (if no procedure TCH is specified by source use 40 or 50 feet)	-3.00	Attachment 5 Rule 8.1.2 Rule 6.2.9.4 Rule 6.2.10.2.d
D30	040	VOR	CF	V	Y		M	Published FAC	0.9	At or Above Airport Plus 400 feet		Attachment 5 Rule 6.2.10.2.d Rule 9.2.3
D30	050		CA			M		Published FAC		At or Above Airport Plus 400 feet		Attachment 5 Rule 9.4.1.4
D30	060	BANCH	DF	E	E					At or Above Procedure Altitude		

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Waypoint Description:

Column One - Fix Type: E = Waypoint, V = VHF Navaid

Column Two - E = End of Final Approach Coding, Y = Flyover Waypoint

Column Three - M = First Leg of Missed Approach Procedure

Column Four - Fix Function Coding: F = FAF, E = Final End Point Fix, M = Missed Approach Fix

Note: FAF Altitude Description may be at when this is prescribed by source documentation. The altitude in sequence 040 and 050 may be a source provided value for the first leg of a missed approach or may be regionally adjusted to 500 feet above the airport. The At or Above Airport Plus 400 feet is the minimum requirement.

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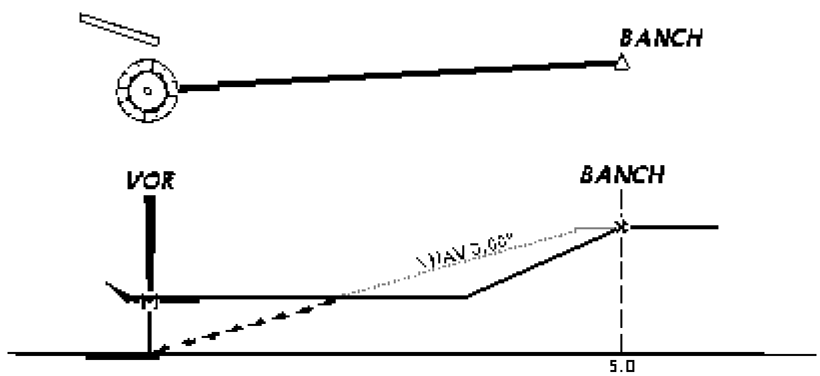
CODING EXAMPLE C
VNAV APPROACH CODING EXAMPLE

MAP is Navaid within 0.1 NM of LTP (Rule 8.10.3)

This example shows a procedure published as Final Approach Fix (FAF) to Missed Approach Point (MAP) beyond the Landing Threshold Point (LTP). The Final Approach Course (FAC) does not cross over the LTP. The landing alignment is straight-in. As the MAP is a Navaid located equal to or less than 0.1 NM from the LTP, coding is to the Navaid as the MAP and no waypoints are inserted into the Final Approach Coding. The VNAV Path angle is calculated from the MAP to the FAF altitude so as to ensure an LTP elevation + TCH (if no procedure TCH is specified by source use 40 or 50 feet [see Section 5.67 of this specification]) over the threshold, references the MAP position for distance portion of the calculation and is coded in the MAP sequence. The missed approach path is not included in the graphic. It is included in the coding sequence example. Final Approach Coding is to the officially published MAP. The coded first leg of the missed approach path is a continuation of the FAC as a climb on that course to an altitude of airport elevation plus 400 feet, or a specified by source, followed by a direct to fix at the FAF.



No inserted fixes, MAP is Navaid, beyond threshold but within 0.14NM Coding:

APP ID	SEQ NR	FIX ID	P/T	WAYPOINT DESCRIPTION				MAG COURSE	DIST	ALT DESC/ALT	VERT ANGLE	ARINC 424 REF.
S29	020	BANCH	IF	E			F	0.0	0.0	At or Above Procedure Altitude		Attachment 5, Rule 8.1.1
S29	030	VOR	CF	V	Y		M	Published FAC	5.0	See Note Below	-3.00	Attachment 5, Rule 8.1.2, 6.2.5.3
S29	040		CA			M		Published FAC		At or Above Airport Plus 400 feet		Attachment 5, Rule 9.4.1.4
S29	050	BANCH	DF	E	E					At or Above Procedure Altitude		

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Waypoint Description:

Column One - Fix Type: E = Waypoint, V = VHF Navaid

Column Two - E = End of Final Approach Coding, Y = Flyover Waypoint

Column Three - M = First Leg of Missed Approach Procedure

Column Four - Fix Function in Coding: F = FAF, M = Missed Approach Fix

Altitude/Altitude Description of MAP Sequence: Will be an At altitude, calculated on the path that continues over the LTP at the published procedure TCH (or 50 feet if no TCH is published). The altitude for the MAP sequence will not be less that the LTP elevation. The FAF Altitude Description may be at when this is prescribed by source documentation. The altitude in sequence 040 (first leg of missed approach path) may be a source provided value or may be regionally adjusted to 500 feet above the airport elevation. The At or Above Airport Elevation Plus 400 feet is the minimum requirement.

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ATTACHMENT 5
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COMMENTARY

Final End Point (FEP)
Output File Delivery Options

The purpose of all of the rules on vertical navigation coding for non-precision approach procedures contained in the Attachment 5 to ARINC 424 is to ensure that standards are established that will allow for the provision of a VNAV Path Angle for every approach. These standards have been broken into four groups that are the result of the location of the missed approach point for the procedures as published in official government source documentation. These groups are defined in Rule 8.10 of this attachment and are illustrated as Coding Examples 1 through 15 following that paragraph. The primary group is Missed Approach Point at Landing Threshold Point and Missed Approach Point Prior to Landing Threshold Point. The other three groups cover the situations when the published missed approach point is beyond the Landing Threshold Point. These three groups are further illustrated in Coding Examples A, B and C associated with Rule 8.10.

One of these three groups are the situation where the published missed approach point is beyond the Landing Threshold Point and the published Final Approach Course does not pass through a defined area related to the Landing Threshold Point. This situation is commonly referred to as Inserted Final End Point Coding, Coding Example B.

Coding Example B represents the best possible solution for providing the intent of the government source procedure and encoding the data necessary for execution of the procedure within the avionics. During the iterations required for the development of this encoding standard and its rules, it was identified that not all existing avionics would be able to process this new data in a manner compatible with their operational software. The required modifications to that operational software would more than likely result in a need to re-certify that software. As it is not within the scope of ARINC 424 to refined new avionics requirements or impose data configurations that would result in new avionics requirements; methods were reviewed that would ensure that the vertical navigation benefits of FEP Coding could be made available to the broadest possible user base.

This review effort resulted in identifying four data encoding versions for non-precision approach procedures that are designed such that they would make FEP data available to the largest number of users and negate the impacts of a single solution on operational software. Format one is specified as the ARINC 424 standard. The other options may be used when specified between avionics supplier and data provider. To ensure that the process and result of any option specification would result in an identical implementation by all data providers to any given supplier, it was agreed that all four encoding versions would be incorporated into ARINC 424 as Delivery Format Options One through Four. An illustration of the four FEP Format Delivery Options is provided on the pages that follow this Commentary.

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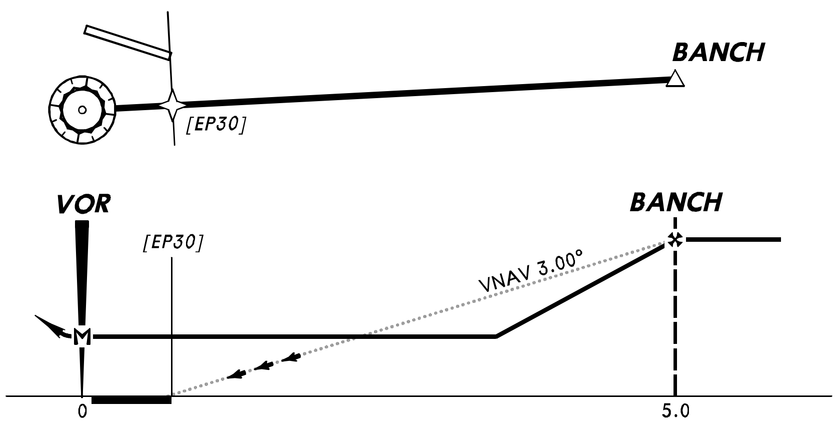
FEP Delivery Format One – ARINC 424 Standard Coding
VNAV Approach Coding Example Inserted Final End Point Fix

This example shows a procedure published as Final Approach Fix (FAF) to a Missed Approach Point (MAP beyond the Landing Threshold Point (LTP). The Final Approach Course (FAC) does not cross over the landing threshold. The landing alignment is straight-in. As the MAP is located beyond the LTP and the FAC does not cross over the landing threshold, a Final End Point Fix (FEP) waypoint is inserted as an additional waypoint in the final approach coding of this example. The VNAV Path angle is calculated from the LTP elevation + TCH (if no procedure TCH is specified by source use 40 or 50 feet [see Section 5.67 of this specification]) to the FAF altitude. It is included in the coding sequence example. The inserted FEP Fix is coded with its designated unique code in the last position of the Waypoint Description on the FEP sequence. The coded first leg of the missed approach path is a continuation of the FAC to the officially published MAP. The flyover code is set in position 2 of the waypoint description field. There is an indication in the coding of the officially published missed approach point. The leg from the FEP Fix to the MAP is not coded as the first leg of the missed approach path, meaning no indication in position three of the Waypoint Description. The first leg of the missed approach path is the published first leg and is a climb on the FAC to an altitude of airport elevation plus 400 feet, or as specified by source, followed by a direct to a fix at the FAF.



Inserted Final End Point Fix Coding:

APP ID	SEQ NR	FIX ID	P/T	WAYPOINT DESCRIPTION				MAG COURSE	DIST	ALT DESC/ALT	VERT ANGLE	ARINC 424 REF.
D30	020	BANCH	IF	E			F	0.0	0.0	At or Above Procedure Altitude		Attachment 5 Rule 8.1.1
D30	030	EP30	CF	E	Y		E	Published FAC	4.1	At LTP + published TCH (if no procedure TCH is specified by source use 40 or 50 feet)	-3.00	Attachment 5 Rule 8.1.2Rule 6.2.9.4Rule 6.2.10.2.d
D30	040	VOR	CF	V	Y		M	Published FAC	0.9	At or Above Airport Plus 400 feet		Attachment 5, Rule 6.2.10.2.d Rule 9.2.3
D30	050		CA			M		Published FAC		At or Above Airport Plus 400 feet		Attachment Five, Rule 9.4.1.4
D30	060	BANCH	DF	E	E					At or Above Procedure Altitude		

Waypoint Description:

Column One - Fix Type: E = Waypoint, V = VHF Navaid

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Column Two - E = End of Final Approach Coding, Y = Flyover Waypoint

Column Three - M = First Leg of Missed Approach Procedure

Column Four - Fix Function in Coding: F = FAF, E = Final End Point, M = Missed Approach Point

Note: FAF Altitude Description may be at when this is prescribed by source documentation. The altitude in sequence 040 and 050 may be a source provided value for the first leg of a missed approach or may be regionally adjusted to 500 feet above the airport. The At or Above Airport Plus 400 feet is the minimum requirement.

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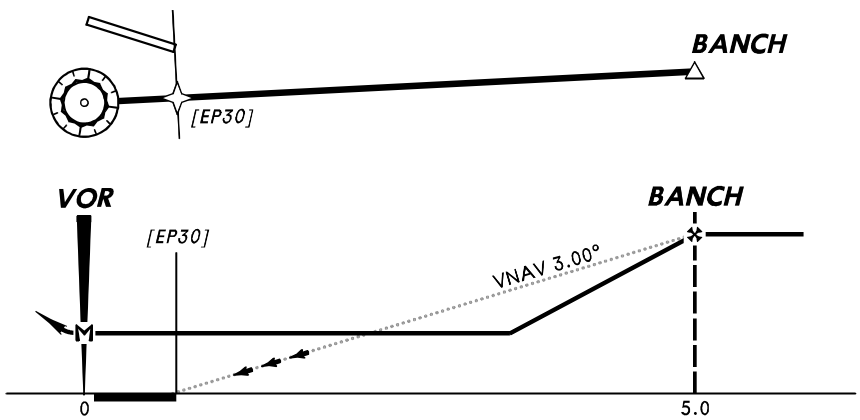
FEP Delivery Format Two - FEP Coded as MAP
VNAV Approach Coding Example Inserted Final End Point Fix

This example shows a procedure published as Final Approach Fix (FAF) to a Missed Approach Point (MAP) beyond the Landing Threshold Point (LTP). The Final Approach Course (FAC) does not cross over the landing threshold. The landing alignment is straight-in. As the MAP is located beyond the LTP and the FAC does not cross over the landing threshold, a Final End Point Fix (FEP) waypoint is inserted as an additional waypoint in the final approach coding of this example. The VNAV Path angle is calculated from the LTP elevation + TCH (if no procedure TCH is specified by source use 40 or 50 feet [see Section 5.67 of this specification]) to the FAF altitude, references the FEP position and is coded in the FEP sequence. The missed approach path is not included in the graphic. It is included in the sequence example. The inserted FEP Fix is coded with the missed approach point code in the last position of the Waypoint Description. The path from the inserted FEP fix is coded as the first leg of the missed approach path and is a continuation of the FAC to the officially published missed approach point. The flyover code is set in position 2 of the waypoint description field. There is no indication that the fix in sequence 030 is an FEP or that the fix in sequence 040 is the officially published MAP. Although no code indication is provided, the first leg of the published missed approach path is coded from the published missed approach point and is a climb on the FAC to an altitude of airport elevation plus 400 feet, or as specified by source, followed by a direct to a fix at the FAF.



Inserted Final End Point Fix code as Missed Approach Point Coding:

APP ID	SEQ NR	FIX ID	P/T	WAYPOINT DESCRIPTION				MAG COURSE	DIST	ALT DESC/ALT	VERT ANGLE	ARINC 424 REF.
D30	020	BANCH	IF	E			F	0.0	0.0	At or Above Procedure Altitude		Attachment 5 Rule 8.1.1
D30	030	EP30	CF	E	Y		M	Published FAC	4.1	At LTP + published TCH (if no procedure TCH is specified by source use 40 or 50 feet)	-3.00	Attachment 5 Rule 8.1.2 Rule 6.2.9.4 Rule 6.2.10.2.d
D30	040	VOR	CF	V	Y	M		Published FAC	0.9	At or Above Airport Plus 400 feet		Attachment 5, Rule 6.2.10.2.d Rule 9.2.3
D30	050		CA					Published FAC		At or Above Airport Plus 400 feet		Attachment Five, Rule 9.4.1.4
D30	060	BANCH	DF	E	E					At or Above Procedure Altitude		

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Waypoint Description:

Column One -	Fix Type: E = Waypoint, V = VHF Navaid
Column Two -	E = End of Final Approach Coding, Y = Flyover Waypoint
Column Three -	M = First Leg of Missed Approach Procedure
Column Four -	Fix Function in Coding: F = FAF, M = Missed Approach Point

Note: FAF Altitude Description may be at when this is prescribed by source documentation. The altitude in sequence 040 and 050 may be a source provided value for the first leg of a missed approach or may be regionally adjusted to 500 feet above the airport. The At or Above Airport Plus 400 feet is the minimum requirement.

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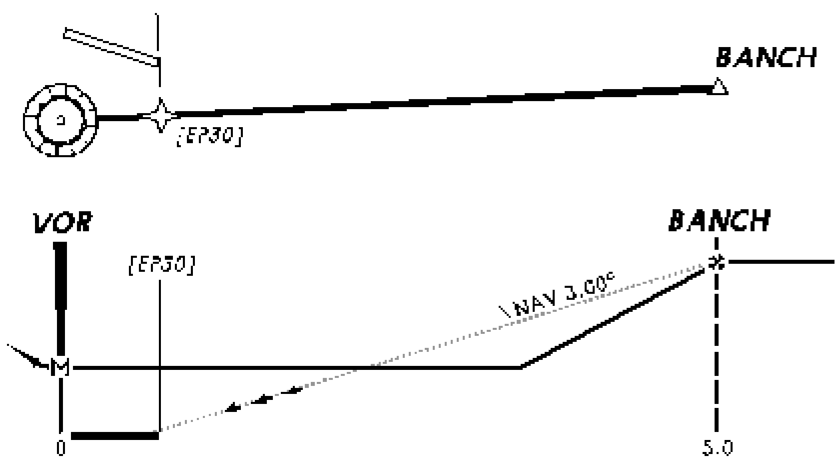
FEP Delivery Format Three - FEP Coded as MAP FEP Waypoint Indication Provided

VNAV Approach Coding Example Inserted Final End Point Fix

This example shows a procedure published as Final Approach Fix (FAF) to a Missed Approach Point (MAP) beyond the Landing Threshold Point (LTP). The Final Approach Course (FAC) does not cross over the landing threshold. The landing alignment is straight-in. As the MAP is located beyond the LTP and the FAC does not cross over the landing threshold, a Final End Point Fix (FEP) waypoint is inserted as an additional waypoint in the final approach coding of this example. The VNAV Path angle is calculated from the LTP elevation + TCH (if no procedure TCH is specified by source use 40 or 50 feet [see Section 5.67 of this specification]) to the FAF altitude, references the FEP position and is coded in the FEP sequence. The missed approach path is not included in the graphic. It is included in the sequence example. The inserted FEP Fix is coded with the missed approach point code in the last position of the Waypoint Description and a unique waypoint type code in the first position of the Waypoint Description, indicating that this MAP is at an FEP location. The path from the inserted FEP fix is coded as the first leg of the missed approach path and is a continuation of the FAC to the officially published missed approach point. The flyover code is set in position 2 of the waypoint description field. There is an indication provided that the fix in sequence 030 is really an FEP but none that the fix in sequence 040 is the officially published MAP. Although no code indication is provided, the first leg of the published missed approach path is coded from the published missed approach point and is a climb on the FAC to an altitude of airport elevation plus 400 feet, or as specified by source, followed by a direct to a fix at the FAF.



Inserted Final End Point Fix coded as Missed Approach Point Coding:

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APP ID	SEQ NR	FIX ID	P/T	WAYPOINT DESCRIPTION				MAG COURSE	DIST	ALT DESC/ALT	VERT ANGLE	ARINC 424 REF.
D30	020	BANCH	IF	E			F	0.0	0.0	At or Above Procedure Altitude		Attachment 5 Rule 8.1.1
D30	030	EP30	CF	F	Y		M	Published FAC	4.1	At LTP + published TCH (if no procedure TCH is specified by source use 40 or 50 feet)	-3.00	Attachment 5 Rule 8.1.2 Rule 6.2.9.4 Rule 6.2.10.2.d
D30	040	VOR	CF	V	Y	M		Published FAC	0.9	At or Above Airport Plus 400 feet		Attachment 5, Rule 6.2.10.2.d Rule 9.2.3
D30	050		CA					Published FAC		At or Above Airport Plus 400 feet		Attachment 5, Rule 9.4.1.4
D30	060	BANCH	DF	E	E					At or Above Procedure Altitude		

Waypoint Description:

Column One - Fix Type: E = Waypoint, V = VHF Navaid, F = FEP Waypoint

Column Two - E = End of Final Approach Coding, Y= Flyover Waypoint

Column Three - M = First Leg of Missed Approach Procedure

Column Four - Fix Function in Coding: F = FAF, M = Missed Approach Point

Note: FAF Altitude Description may be at when this is prescribed by source documentation. The altitude in sequence 040 and 050 may be a source provided value for the first leg of a missed approach or may be regionally adjusted to 500 feet above the airport. The At or Above Airport Plus 400 feet is the minimum requirement.Note: The code F for FEP Fix Waypoint is not included in Section 5.17 of ARINC 424 as a valid code. It is used only in this FEP Delivery Format option to indicate that the fix coded as the MAP is not the officially published MAP but rather a fix located at the FEP position.

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ATTACHMENT 5
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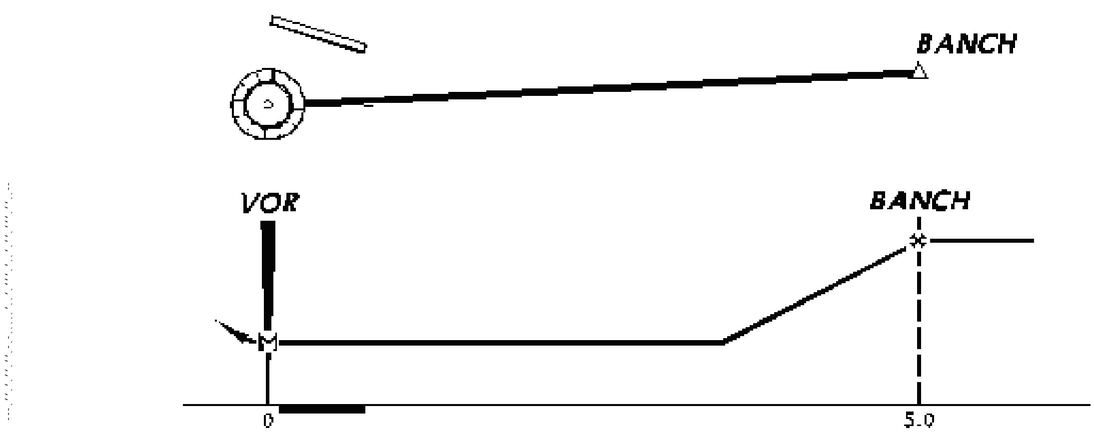
Delivery Format Four - No FEP Provided
No VNAV Provided

(The ARINC 424 Standard prior to FEP Coding Rules)
VNAV APPROACH CODING EXAMPLE

This example shows a procedure published as Final Approach Fix (FAF) to a Missed Approach Point (MAP) beyond the Landing Threshold Point (LTP). The Final Approach Course (FAC) does not cross over the landing threshold. The landing alignment is straight-in. The MAP is located beyond the LTP and the FAC does not cross over the landing threshold, no VNAV data is provided. The missed approach path is not included in the graphic. It is included in the coding sequence example. The officially published MAP is provided with the appropriate code in the last position of the Waypoint Description. The coded first leg of the missed approach path is the officially published missed approach path and is from the published missed approach point. It is a climb on the FAC to an altitude of airport elevation plus 400 feet, but never lower that the altitude coded in previous leg or as specified by source, followed by a direct to a fix at the FAF.



Inserted Final End Point Fix Coding:

APP ID	SEQ NR	FIX ID	P/T	WAYPOINT DESCRIPTION				MAG COURSE	DIST	ALT DESC/ALT	VERT ANGLE	ARINC 424 REF.
D30	020	BANCH	IF	E			F	0.0	0.0	At or Above Procedure Altitude		Attachment 5 Rule 8.1.1
D30	030	VOR	CF	V			M	Published FAC	5.0	Note 1	0.00	
D30	040		CA			M		Published FAC		At or Above Airport Plus 400 feet Note 2		Attachment 5, Rule 9.4.1.4
D30	050	BANCH	DF	E	E					At or Above Procedure Altitude		

Waypoint Description:

Column One - Fix Type: E = Waypoint, V = VHF Navaid

Column Two - E = End of Final Approach Coding

Column Three - M = First Leg of Missed Approach Procedure

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Column Four - Fix Function in Coding: F = FAF, M = Missed Approach Point

Note: FAF Altitude Description may be at when this is prescribed by source documentation. The altitude in sequence 040 may be a source provided value for the first leg of a missed approach or may be regionally adjusted to 500 feet above the airport. The At or Above Airport Plus 400 feet is the minimum requirement.

Note One: For a published Missed Approach Point beyond the landing threshold and no Landing Threshold Fix or Final End Point Fix has been include in the lateral path, the altitude in the MAP sequence will be an at altitude equal to the lowest MDA published for the procedure. The Vertical Angle for this Delivery Option will be provided on the MAP sequence and will be 0.00.

Note Two: The altitude coded will be the airport elevation plus 400 feet or the FEP MDA from previous leg whichever is higher, or a source provided altitude.

Note: Add Y to column two on the MAP Fix sequence to indicate flyover required and update the Waypoint Description information to include the Y = Flyover Waypoint

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APPROACH AND APPROACH TRANSITION CODING RULES

9.0 Missed Approach Procedure Rules Valid For All Procedure Types

Missed Approach Procedure coding must be accomplished as an integral part of the Approach Procedure Coding and will be provided for each approach procedure contained in the database. Specific coding must be incorporated to facilitate identification of where the Missed Approach Coding starts within any given approach procedure.

The structure of the procedure records included in this specification as defined in this attachment is such that multiple missed approach procedure paths may be coded for a single approach procedure. This will accommodate those procedures with alternative missed approach paths based on aircraft climb performance. Coding for multiple missed approach paths for a single approach procedure must commence at the same missed approach point. Identification of multiple missed approach procedures, when coded, will be accomplished through the coding of a specific Transition Identifier which closely aligns with published information.

9.1 Missed Approach Point

9.1.1 All Approach Procedure coding must have a segment that identifies the Missed Approach Point Fix. Such a fix must be the published Missed Approach Point, either a IFR Landing Threshold or a Helipad Alighting Point or a dedicated Missed Approach Point (MAP Fix).

9.1.2 Identification of the fix within a sequence of procedure records and the type of fix, must be accomplished through code in the Waypoint Description field (see Section 5.17).

9.1.2.1 When the Missed Approach Point Fix is a Runway or Helipad Fix, Waypoint Description Position One, must carry a character G and the M in Position Four.

9.1.2.2 When the Missed Approach Point Fix is MAP Fix, Waypoint Description Position One will carry a code equal to the type of fix such a Navaid or waypoint and must carry a character M in Position Four.

9.2 First Leg of Missed Approach Procedure

9.2.1 The first sequence of the Missed Approach Procedure must always be coded with the character M in Position Three of the Waypoint Description field.

9.2.2 Coding of the Missed Approach Procedure assumes that the procedure will be flown commencing at the Missed Approach Point Fix.

9.2.3 For Non-Precision Approach Procedures that have a published missed approach beyond the landing threshold (see rules in Section 8.10), and the procedure design intent is to overfly the published MAP (see Section 6.2.12), a Y in position 2 of the waypoint description field must be coded in the coding sequence that contains the source provided missed approach fix.

9.3 Vertical Path of Missed Approach Procedure

9.3.1 If the published Missed Approach Point Fix is a Runway fix or a Helipad Fix, then the following rules apply:

9.3.1.1 The Altitude 1 value in the Missed Approach Point sequence must be equal to Runway Threshold or Helipad Alighting Point Elevation plus the published TCH. If

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no procedure TCH is specified by source use 40 or 50 feet [see Section 5.67 of this specification].

9.3.1.2 The first leg of a Missed Approach Procedure will contain any government source provided altitude constraints. These altitudes may be provided as At, At or Above, At or Below, At or Below to At or Above, dependent on the government source documentation and coded in accordance with Section Five, Subsection 5.29 of this specification. Except as indicated below, if the government source does not provide an altitude constraint for the first leg of the Missed Approach Procedure, none will be coded

9.3.1.3 In precision approach procedures such as Full ILS or GLS, the Decision Height (DH) value at which the Missed Approach Path would normally be commenced is not included as part of the Final Approach Coding. Other portions of this attachment define what altitude data is included in the coding of the procedure for the missed approach point and the first leg of the missed approach path.

9.3.1.4 In non-precision approach procedure, the Minimum Descent Altitude (MDA) value at which the missed approach decision would normally be made is not included as part of the Final Approach Coding. Other portions of this attachment define what altitude data is included in the coding of the procedure for the missed approach point and the first leg of the missed approach path.

9.3.1.5 When an immediate turn is specified in an ILS, MLS, or GLS missed approach, or if the source describes a turn greater than 15 degrees from the final approach course, without an altitude specified before the turn, as the first leg of a missed approach, a course from or heading to an altitude (CA, FA, VA) leg must be coded as the first leg of the missed approach and must include a command to climb before the turning leg, using the final approach course for the leg heading or course. The altitude will be coded as a minimum altitude, at least 400 feet above the airport elevation and the leg will terminate at that altitude.

9.3.1.6 For a PinS approach procedure, a course from or heading to an altitude (CA, FA, VA) leg will be coded as the first leg of the missed approach only if required by source documentation.

9.4 Rule deleted by Supplement 17.

9.4.1 Rule deleted by Supplement 17.

9.4.1.1 Rule deleted by Supplement 17.

9.4.1.2 Rule deleted by Supplement 17.

9.4.1.3 Rule deleted by Supplement 17.

9.4.1.4 Rule deleted by Supplement 17.

9.4.1.5 Rule deleted by Supplement 17.

9.5 Other Missed Approach Procedure Considerations.

9.5.1 Opposite end runway or helipad fixes must not be used in the coding of missed approach procedures.

9.5.2 The procedure reference Navaid must be used as the Recommended Navaid when required, with the following exceptions:

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9.5.2.1 The first leg of a Missed Approach Procedure may be a CD, FD, or VD leg. For these legs, a DME may be used as the Recommended Navaid, with the Theta field left blank and the DME distance entered in the Rho field.

9.5.2.2 Rule deleted by Supplement 17.

9.5.2.3 The first leg of the Missed Approach Procedure may be a CR or a VR leg. For these legs, a VOR facility (without or without DME) may be used as the Recommended Navaid. When the facility has no DME, the Rho field is left blank and the VOR radial is entered in the Theta field.

9.5.2.4 When the first leg of a Missed Approach Procedure is coded as a HA or HM leg, the coding will also include a government source provided altitude.

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ATTACHMENT 5
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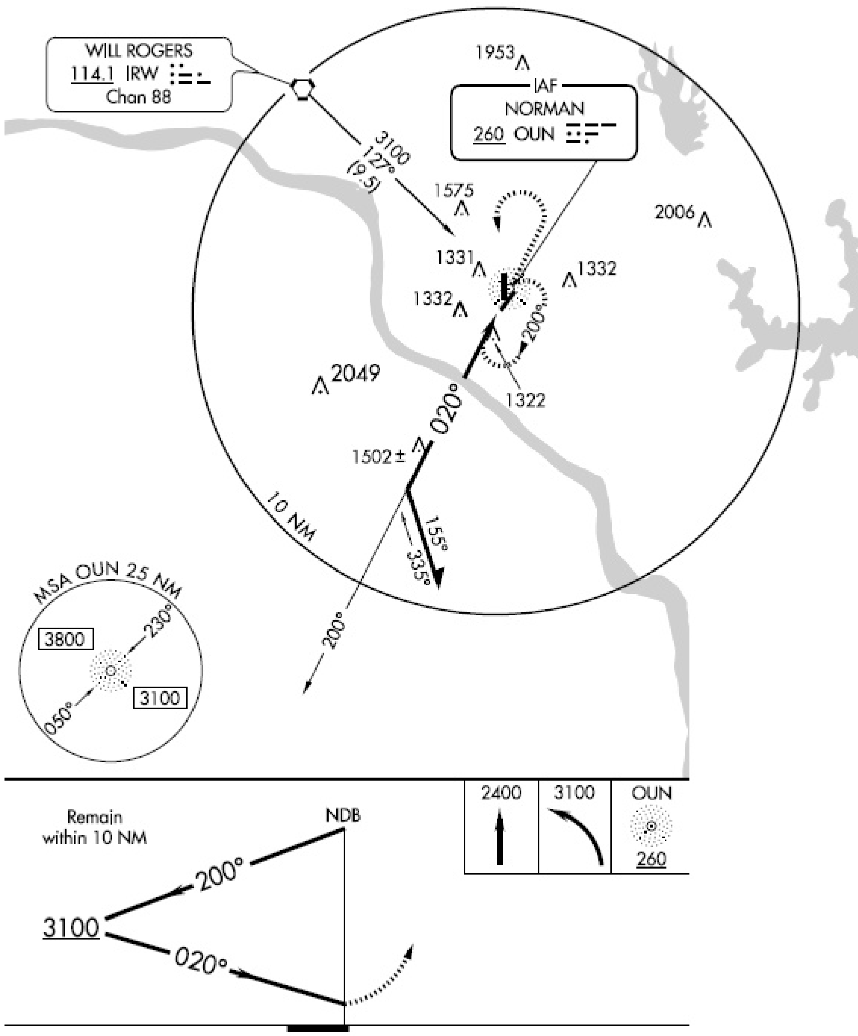
MISSED APPROACH CODING EXAMPLE 1

Not for navigational or other operational use. For example, only. Please consult current navigation charts.

NDB RWY 3



APP IDENT	RTE TYPE	TRANS IDENT	SEQ NBR	P/T	WAYPOINT DESCRIPTION				MAG CRS	DIST	ALT1	R/Q 2
N03	N		020	IF	E			F			03100	S
N03	N		030	CF	N	B		M	0200		01860	S
N03	Z	OUN	010	CA			M		0200		02400	A
N03	Z	OUN	020	DF	N						03100	A
N03	Z	OUN	030	HM	N	E			0200	T010	03100	A

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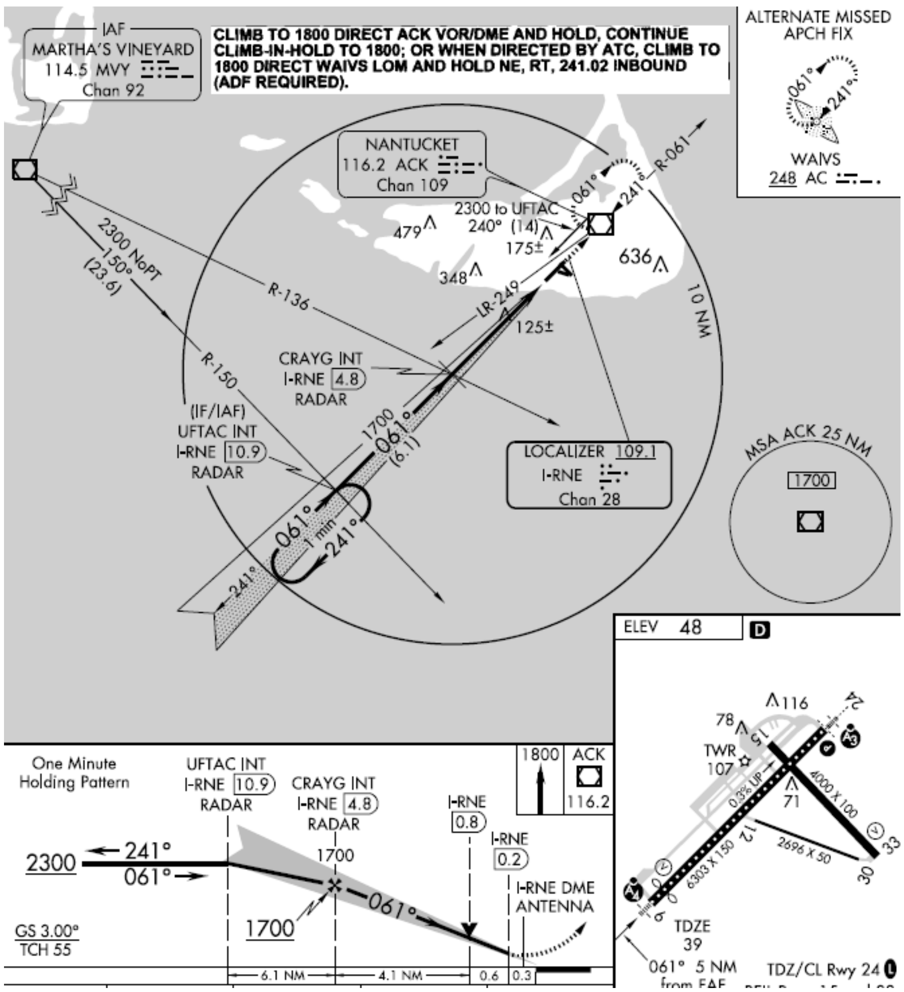
MISSED APPROACH CODING EXAMPLE 2

Not for navigational or other operational use. For example, only. Please consult current navigation charts.

ILS or LOC/DME RWY 19R



APP IDENT	RTE TYPE	TRANS IDENT	SEQ NBR	P/T	WAYPOINT DESCRIPTION				MAG CRS	DIST	ALT1	R/Q 2
I03	I		010	IF	E			I			00083	S
I03	I		020	CF	E			F	0610	0061	01700	S
I03	I		030	CF	G	B		M	0610	0050	00083	S
I03	Z	AC	010	CA			M		0610		00448	B
I03	Z	AC	020	DF	N						01800	B
I03	Z	AC	030	HM	N	E			2410	T010	01800	B
I03	Z	ACK	010	CA			M		0610		00448	A
I03	Z	ACK	020	DF	V						01800	A
I03	Z	ACK	030	HM	V	E			2410	T010	01800	A

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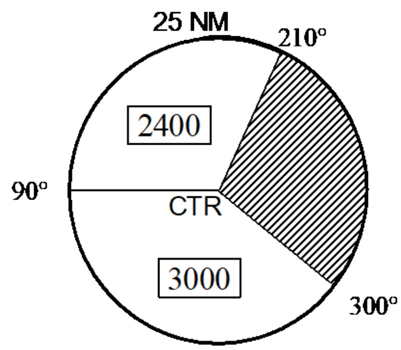
10.0 MSA Coding

The purpose of this attachment is to define the coding rules for MSA sectors, especially when the whole circle is not defined and when different radii are used.

10.1 MSA with one Radius Only



The MSA record must contain the minimum altitudes for all sectors. If a sector is forbidden or not drawn on the chart, its altitude must be coded '999' (99 900 ft.), as the altitude field must be numeric. This value is consistent with forbidden areas as the aircraft cannot fly such an altitude.

The sectors must be coded in the clockwise order, starting with the sector having the smallest start bearing.

Coding Example:

Sector #	**1**	**2**	**3**	**4**	**5**	**6**	**7**
Start bearing	090	210	300				
End bearing	210	300	090				
Altitude	024	999	030				
Radius	25	25	25				

Corresponding PS record (col 43 to 75): 090210024252103009992530009003025

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SUPPLEMENT 22
TO
ARINC SPECIFICATION 422
NAVIGATION DATA BASE

Published: July 23, 2018

Prepared by the AEEC

Adopted by the AEEC Executive Committee: April 24, 2018

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A. PURPOSE OF THIS DOCUMENT

This document proposes revisions and additions to the body and attachments of ARINC Specification 424. The majority of the changes were added to support level of service based on published procedure operating minimums information for sensor independent approach procedures.

B. ORGANIZATION OF THIS SUPPLEMENT

In this document, **blue bold** text is used to indicate those areas of text changed by the current supplement only.

C. CHANGES TO ARINC SPECIFICATION 424 INTRODUCED BY THIS SUPPLEMENT

This section presents a complete listing of the changes to the document introduced by this supplement. Each change is identified by the section number and the title as it will appear in the complete document. Where necessary, a brief description of the change is included.

1.5 Associated Electronic Files

New section added.

2.2.2 Procedure and Route Terms

The following definitions were updated for consistency throughout the document:

- Final Approach Course Fix (FACF)
- Final Approach Fix (FAF)
- Initial Approach Fix (IAF)
- Intermediate Fix (IF)
- Missed Approach Point (MAP)

2.2.4 Precision RNAV Terms

Final Approach Segment (FAS) Data Block: the text was updated to replace GBAS with GLS to coincide with ICAO definition.

3.2.2.1 VHF Navaid Section (D), Subsection (Blank)

Updated to reflect current relations between files and include a section for each section/subsection.

3.2.2.2 NDB Navaid Section (D), Subsection (B)

Updated to reflect current relations between files and include a section for each section/subsection.

3.2.2.3 TACAN Duplicates Section (D), Subsection (T)

New section was added.

3.2.3.1 Enroute Waypoint Section (E), Subsection (A)

Updated to reflect current relations between files and include a section for each section/subsection.

3.2.3.7 Special Activity Areas Section (E), Subsection (S)

New section added.

3.2.3.8 Preferred Routes Section (E), Subsection (T)

New section added.

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3.2.4.1 Airport Reference Points Section (P), Subsection (A)

Updated to reflect current relations between files and include a section for each section/subsection.

3.2.4.2 Airport Gates Section (P), Subsection (B)

Updated to reflect current relations between files and include a section for each section/subsection.

3.2.4.3 Airport Terminal Waypoints Section (P), Subsection (C)

Updated to reflect current relations between files and include a section for each section/subsection.

3.2.4.7 Airport Runway Section (P), Subsection (G)

Update to reflect current relations between files and include a section for each section/subsection.

3.2.4.8 Airport and Heliport Localizer/Glideslope Section (P), Subsection (I)

Updated to reflect current relations between files and include a section for each section/subsection.

3.2.4.9 Airport and Heliport MLS Section (P), Subsection (L)

Updated to reflect current relations between files and include a section for each section/subsection.

3.2.4.13 Airport and Heliport Terminal NDB Section (P), Subsection (N)

Updated to reflect current relations between files and include a section for each section/subsection.

3.2.4.16 GNSS Landing System (GLS) Section (P), Subsection (T)

Updated to reflect current relations between files and include a section for each section/subsection.

3.2.4.19 GBAS Path Point Section (P), Subsection (Q)

This section was previously Section 3.2.10.

3.2.7.3 Communication Type Translation Table Section (T), Subsection (V)

New section added.

3.3.2 Jointly and Specifically Used Sections/Subsections

Updated to reflect current relations between files and include a section for each section/subsection.

3.3.3 Heliport Section (H), Subsection (A)

Updated to reflect current relations between files and include a section for each section/subsection.

4.1.6.1Enroute Airways Primary Records

Column 121-123 added Rout Qualifier 1, 2, and 3 and the associated note 1.

4.1.9.2 Airport SID/STAR/Approach Primary Extension Continuation Records

Column 122 thru 123 deleted the reference to 5.293.

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4.1.10.1 Runway Primary Record

Column 99, Runway Accuracy Compliance Flag, was added.

Column 100, Landing Threshold Elevation Accuracy Compliance Flag, was added.

4.1.10.2 Runway Continuation Records

Added fields for TORA, TODA, ASDA, LDA, and Runway Usage Indicator, columns 102-122.

4.1.25.3 Controlled Airspace Primary Extension Record

New section added.

4.1.28.2 Path Point Continuation Records

Added column 62-thru 65 for SBAS Final Approach Course.

4.1.29 GLS Record (PT)

GBAS acronym was inserted in place of GLS to coincide with ICAO definition.

4.2.3.1 Heliport SID/STAR/Approach Primary Records

Added Note 4 to column 45 thru 47.

Added Note 3 to column 113 thru 116.

Added Note 2 to column 119 thru 121.

Added column 121, Route Qualifier 3.

Updated Note 2 to reflect proper columns and added qualifier 3.

4.2.3.2 Heliport SID/STAR/Approach Primary Extension Continuation Records

Added column 121, Route Qualifier 3.

Updated Note 1 to reflect proper columns and added qualifier 3.

4.2.3.3 Heliport SID/STAR/Approach Flight Planning Continuation Records

Added Column 119, Route Qualifier 1.

Added Column 120, Route Qualifier 2.

Added Column 121, Route Qualifier 3.

Added Note 1.

4.2.3.5 Heliport Procedure Data Continuation Record

Added Column 121, Route Qualifier 3.

Updated Note 1 to reflect proper columns and added qualifier 3.

5.3 Customer/Area Code (CUST/AREA)

The text was updated to numeric and airline subsets or other customer codes.

5.5 Subsection Code (SUB CODE)

Updated Table 5-1 and removed subsection code N, RNAV Table.

5.7 Route Type (RT TYPE)

Table 5-2: added RNP and ICAO PBN Nav Spec.

Table 5-3: was added to support Route Qualifier Content, other tables were renumbered.

Table 5-6: Airport and Heliport SID Record, deleted Note 6.

Table 5-6: RNP 1 or RNAV 1 PBN Nav Spec to Qualifier Description.

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Table 5-7, Airport STAR (PE) and Heliport STAR (HE) Records, the following updates were made:

- Added Note 2 to RNAV PBN Nave Spec under Qualifier 2.
- Added an RNP PBN Nav Qualifier Description and reference Note 3.
- Deleted Note 4 in the RNP AR PBN Nave Spec Qualifier.
- Added RNP 1 or RNAV 1 PBN Nav Spec to Qualifier Description.

Table 5-8, Airport Approach (PF) and Heliport (HF) Records, the following updates were made:

- The Qualifier Description GBAS Procedure was deleted. This update was completed to coincide with the ICAO definition.
- Note 2 was updated to remove reference to GLS procedures.

5.29 Altitude Description (ALT DESC)

Deleted Field Content V, X, Y, and the associated Note.

5.30 Altitude/Minimum Altitude

Removed the reference Field Content V.

5.53 Transition Altitude/Level (TRANS ALTITUDE/LEVEL)

This section was revised to clarify that the Airport/Heliport value should be blank, not the procedures value.

5.57 Runway Length (Runway Length)

Source/Content text was updated to support added fields for runway usage.

5.144 Center Fix (Center Fix)

The text was revised to allow RF center fixes.

2.59 Length Offset (OFFSET)

Clarified the Definition/Description by revising the text if the length Offset is not provided by source the value should be set to blank.

5.72 Speed Limit (SPEED LIMIT)

Section was updated to reference the speed limit in Controlled Airspace Record.

5.73 Speed Limit Altitude

Section was updated to reference the speed limit in Controlled Airspace Record.

5.275 Level of Service Name (LSN)

Updated the text and Note 2 to remove SBAS authorization statement and added the official level of service based on published procedures operating minimums information for PBN RNP APCH or A-ARNP approach procedures.

5.301 Procedure Design Aircraft Category or Type

Section was updated to reference the speed limit in Controlled Airspace Record.

Aircraft Type Turbojet and Turboprop only was added to Aircraft Category or Type table.

5.313 TORA

New section was added for runway declared distances.

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5.313 TODA

New section was added for runway declared distances.

5.313 ASDA

New section was added for runway declared distances.

5.313 LDA

New section was added for runway declared distances.

5.313 Runway Usage Indicator

New section was added for runway declared distances.

5.18 Runway Accuracy Compliance Flag

New section was added.

5.319 Landing Threshold Elevation Accuracy Compliance Flag

New section was added.

5.320 SBAS Final Approach Course

New section was added

8.0 XML Documentation

New chapter was added supporting the implementation of XML.

ATTACHMENT 5 PATH AND TERMINATOR

1.0 General Rules

1.2 Beginning and Ending Leg Types

The following changes were made.

SID Runway Transition	Note 1 deleted against VM Beginning leg. HF Leg added to ending leg.
SID Common Route	HF[9] added Beginning leg. HF and HM added to ending leg.
SID Enroute Transition	HF added to Beginning leg. HF and HM added to ending leg.
STAR Enroute Transition	HF added to Beginning leg. HF and HM added to ending leg.
STAR Common Route	HF added to Beginning leg. HF and HM added to ending leg.
STAR Runway Transition	DF and IF[8] added to ending leg. IF[8] was deleted.
Final Approach Coding	Superscript Note 6 associated with TF Leg was deleted.
Missed Approach	Superscript Note 7 associated with AF leg was deleted.

Notes 1, 2, 6, and 7 were deleted.

Note 9 was added.

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2.0 Coding Rules Applicable To All Procedures

Rule 2.3 was deleted.

3.0 Path and Termination Related Rules Valid For All Procedure Types Except RNAV Terminal Procedures That Do Not Reference Ground-based Navaids

Rule 3.13 was updated to use AF or RF legs, so that for non-DME arcs specified in source the RF leg must be used.

4.0 Standard Instrument Departure (SID) Coding Rules

Rule 4.14 was deleted to remove the requirement that a PinS Departure must begin with an IF Leg at the initial departure fix.

6.0 Approach Procedure Rules Valid For All Procedure Types

Rule 6.2.4.2 was added to support PI Leg Coding Requirements.

Rule 6.2.4.3 was added to support PI Leg Coding Requirements.

Rule 6.2.5.3b was updated for clarity.

Rule 6.3.6.4 was updated to allow for intercepts of greater than 90 degrees when provided by source.

Rule 6.9.4 was deleted. This update was completed to coincide with the ICAO definition for GLS/GBAS term usage.

Rule 6.11.2 was updated to remove the overfly requirement from the end of the approach transition.

7.0 Precision Approach Procedures Coding

Rule 7.1.7 deleted repeating text that is defined in other parts of the document.

8.0 Approach and Approach Transition Coding Rules

Rule 8.7.3 was updated to remove the overfly requirement from the end of the approach transition.

--`,,`,,,`,,`,`,`,,,`,`,`````-`-`,,`,,`,`,,`---

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ARINC Standard – Errata Report

1. Document Title

(Insert the number, supplement level, date of publication, and title of the document with the error)

2. Reference

Page Number: ______ Section Number: ______________ Date of Submission: ______________

3. Error

(Reproduce the material in error, as it appears in the standard.)

4. Recommended Correction

(Reproduce the correction as it would appear in the corrected version of the material.)

5. Reason for Correction *(Optional)*

(State why the correction is necessary.)

6. Submitter (Optional)

(Name, organization, contact information, e.g., phone, email address.)

Please return comments to standards@sae-itc.org

Note: Items 2-5 may be repeated for additional errata. All recommendations will be evaluated by the staff. Any substantive changes will require submission to the relevant subcommittee for incorporation into a subsequent Supplement.

[To be completed by IA Staff]

Errata Report Identifier: ______________ **Engineer Assigned:** ________________________

Review Status: ____

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ARINC Project Initiation/Modification (APIM)

1.0 Name of Proposed Project **APIM #: ___________**

(Insert name of proposed project.)

1.1 Name of Originator and/or Organization

(Insert name of individual and/or the organization that initiated the APIM)

2.0 Subcommittee Assignment and Project Support

2.1 Suggested AEEC Group and Chairman

(Identify an existing or new AEEC group.)

2.2 Support for the activity (as verified)

Airlines: (Identify each company by name.)
Airframe Manufacturers:
Suppliers:
Others:

2.3 Commitment for Drafting and Meeting Participation (as verified)

Airlines:
Airframe Manufacturers:
Suppliers:
Others:

2.4 Recommended Coordination with other groups

(List other AEEC subcommittees or other groups.)

3.0 Project Scope (why and when standard is needed)

3.1 Description

(Insert description of the scope of the project.)

3.2 Planned usage of the envisioned specification

Note: New airplane programs must be confirmed by manufacturer prior to completing this section.

New aircraft developments planned to use this specification yes ☐ no ☐

Airbus: (aircraft & date)
Boeing: (aircraft & date)
Other: (manufacturer, aircraft & date)

Modification/retrofit requirement yes ☐ no ☐

Specify: (aircraft & date)

Needed for airframe manufacturer or airline project yes ☐ no ☐

Specify: (aircraft & date)

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Mandate/regulatory requirement yes ☐ no ☐

Program and date: (program & date)

Is the activity defining/changing an infrastructure standard? yes ☐ no ☐

Specify (e.g., ARINC 429)

When is the ARINC standard required?
______(month/year)__________

What is driving this date? _______(state reason)_____________________

Are 18 months (min) available for standardization work? yes ☐ no ☐

If NO please specify solution: _________________

Are Patent(s) involved? yes ☐ no ☐

If YES please describe, identify patent holder: _________________

3.3 Issues to be worked

(Describe the major issues to be addressed.)

4.0 Benefits

4.1 Basic benefits

Operational enhancements yes ☐ no ☐

For equipment standards:

(a) Is this a hardware characteristic? yes ☐ no ☐

(b) Is this a software characteristic? yes ☐ no ☐

(c) Interchangeable interface definition? yes ☐ no ☐

(d) Interchangeable function definition? yes ☐ no ☐

If not fully interchangeable, please explain: _________________

Is this a software interface and protocol standard? yes ☐ no ☐

Specify: _________________

Product offered by more than one supplier yes ☐ no ☐

Identify: (company name)

4.2 Specific project benefits (Describe overall project benefits.)

4.2.1 Benefits for Airlines

(Describe any benefits unique to the airline point of view.)

4.2.2 Benefits for Airframe Manufacturers

(Describe any benefits unique to the airframe manufacturer’s point of view.)

4.2.3 Benefits for Avionics Equipment Suppliers

(Describe any benefits unique to the equipment supplier’s point of view.)

5.0 Documents to be Produced and Date of Expected Result

Identify Project Papers expected to be completed per the table in the following section.

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5.1 Meetings and Expected Document Completion

The following table identifies the number of meetings and proposed meeting days needed to produce the documents described above.

Activity	Mtgs	Mtg-Days (Total)	Expected Start Date	Expected Completion Date
Document a	*# of mtgs*	*# of mtg days*	*mm/yyyy*	*mm/yyyy*
Document b	*# of mtgs*	*# of mtg days*	*mm/yyyy*	*mm/yyyy*

Please note the number of meetings, the number of meeting days, and the frequency of web conferences to be supported by the IA Staff.

6.0 Comments

(Insert any other information deemed useful to the committee for managing this work.)

6.1 Expiration Date for the APIM

April/October 20XX

Completed forms should be submitted to the AEEC Executive Secretary.

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