



*International Civil Aviation Organization*

**Ninth Meeting of the Performance Based Navigation Sub-Group  
(PBN SG/9)  
(Doha, Qatar, 9 - 11 December 2024)**

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**Agenda Item 6: PBN Planning and Implementation in the MID Region**

PBN Charting: SID/STAR

*(Presented by PBN SID AND STAR CHARTING AD HOCWORKING GROUP)*

<p style="text-align: center;"><b>SUMMARY</b></p> <p>This Paper presents the outcome of the PBN SID and STAR Charting Ad Hoc Working Group.</p> <p>Action by the meeting is at paragraph 3.</p>
<p style="text-align: center;"><b>REFERENCES</b></p> <ul style="list-style-type: none"><li>- MIDANPIRG/21 meeting Report</li><li>- AIM SG/10 meeting Report</li><li>- PBN SG/8 meeting Report</li></ul>

**1. INTRODUCTION**

1.1 ICAO Doc 8697 Aeronautical Chart Manual doesn't include specimen charts for SID/STAR procedures based on Performance-Based Navigation (PBN). The only available SID/STAR specimen charts are based on conventional navigation, which cannot be used as a reference for procedures based on PBN.

1.2 In 2022, ICAO MID launched a PBN SID/STAR data collection campaign in MID Region for monitoring purposes. It was identified that PBN information is dispersed across various sections of the published charts in States AIPs, contrary to the specific promulgation principles outlined by ICAO. *(Some examples included in Attachment 1).*

1.3 The Twenty First Meeting of the Middle East Air Navigation Planning and Implementation Regional Group and the Eleventh Meeting of the Regional Aviation Safety Group-Middle East (MIDANPIRG/21 & RASG-MID/11) held in Abu Dhabi, UAE from 4 to 8 March 2024 noted the outcomes of the Eighth meeting of the Performance Based Navigation Sub-Group (PBN SG/8) and of the AIM Sub-Group (AIM SG/10) held respectively in Doha, Qatar, from 10 to 11 December 2023 and in Egypt, Cairo at ICAO MID Office from 28 to 29 February 2024 in particular the PBN Charting issues related to SID/STAR.

## 2. DISCUSSION

2.1 The MIDANPIRG/21 meeting recognized the presence of discrepancies in PBN SID/STAR charts published in the Aeronautical Information Publications (AIPs) of MID States. These disparities were pinpointed through a data collection campaign, encompassing concerns related to chart title, chart identification, and PBN Box.

2.2 It was noted that ICAO State Letter 2023/07 provided requirements in Annex 4 and PANS OPS (Doc 8168) concerning PBN box and charting of PBN SIDs and STARs, however specimen charts were not included. It was noted also that it may still take considerable time until a chart specimen is published in the ICAO Charting Manual (Doc 8967).

2.3 The MIDANPIRG/21 meeting acknowledged that the absence of harmonization in PBN SID/STAR charts poses significant challenges for Airspace Users (AUs), introducing potential confusion for both pilots and Air Traffic Control (ATC). Recognizing the importance of harmonization in enhancing safety, efficiency, and standardization, the meeting decided to the following Decision:

*MIDANPIRG DECISION 21/8: PBN SID AND STAR CHARTING ADHOC WORKING GROUP*

*That, a PBN SID and STAR Charting Ad Hoc Working Group:*

- a) be established to develop guidance/Specimen of PBN SID and STAR Charts, in coordination with the AIM Sub Group.*
- b) be composed of:*
  - Chairpersons of the PBN SG and the AIM SG*
  - Mr. Taha Mohamed Taha (Egypt)*
  - Rohallah Salehi (Iran)*
  - Mohammad Mahanpour (Iran)*
  - Mr. Raed Ghazawi (Jordan)*
  - Mr. Sulaiman Al Salmi (Oman)*
  - Mr. Suwarn Raj Upadhyay (Oman)*
  - Mrs. Pamela Erice (Qatar)*
  - Mr. Muhammad Aljuhani (KSA)*
  - Mr. Ayed Murfat (KSA)*
  - Mr. Saqr Obaid Al Marashda (UAE)*
  - Mr. Kedari Manthanwar (UAE)*
  - ICAO Secretariat*
- c) presents its outcome to the PBN SG/9 and AIM SG/11 meetings.*
- d) be dissolved upon the successful completion of its assigned tasks.*

2.4 The PBN SID and STAR Charting Ad Hoc Working Group officially kicked off its work with a virtual meeting held on 24 September 2024.

2.5 The working group elected Mrs. Pamela Erice, Acting Head of AIM at Air Navigation Department QCAA as the rapporteur, recognizing her active involvement in both the AIM SG and PBN SG subgroups.

2.6 During the first meeting, the working group was apprised of the work that has been done by the ICAO EUR/NAT Office and Eurocontrol on the subject. The meeting noted that PBN information is dispersed across various sections of SID/STAR charts, varying by country or airport in EUR Region, contrary to the specific promulgation principles outlined by ICAO. This inconsistency

prompted Eurocontrol to address the lack of harmonization in European PBN SID/STAR charts in various stakeholder groups. The need for harmonization was agreed, with the support for creating a factsheet.

2.7 The meeting was presented with proposed examples through a factsheet, developed by Eurocontrol.

2.8 The updates provided valuable insights into the progress made so far, allowing the group to align their efforts with the ongoing initiatives and build upon the existing work. This briefing served as an essential foundation for the group's future actions.

2.9 There was unanimous agreement to adopt the Eurocontrol guidance and latest amendments, with the aim of promoting it at the regional level, subject to consultation with relevant stakeholders and feedback from working group members.

2.10 The meeting invited the Ad Hoc Working Group members to review the factsheet and provide comments to the secretariat and the rapporteur by the end of October 2024.

2.11 The meeting acknowledged with gratitude the contribution of the Oman Civil Aviation Authority (CAA) in providing explanatory guidance for the factsheet and agreed that Oman CAA should present a separate WP for the MIDANPIRG subsidiary bodies (AIM SG and PBN SG) as guidance associated with the factsheet providing context and clarity while safeguarding its proprietary elements. This approach enables stakeholders to benefit from the guidance while preserving the integrity of the underlying intellectual property.

2.12 The 2nd meeting of the PBN SID and STAR Charting Ad-Hoc working group was held virtually on 29 October 2024.

2.13 During this meeting, the working group engaged in an in-depth discussion of the content of the working papers related to the outcome of the PBN SID and STAR Charting Ad Hoc Working Group and the factsheet explanatory guidance. Members thoroughly reviewed each section, providing valuable feedback and insights. After careful consideration and collaborative dialogue, the group successfully finalized the documents, ensuring that all perspectives were incorporated and that the papers met the necessary standards for presentation to the relevant MIDANPIRG subgroups.

2.14 Based on the above and with a view to enhance understanding and promote harmonization, as well as to raise awareness regarding the charting of PBN SID/STAR in accordance with ICAO principles, the following Draft Conclusion is proposed:

***DRAFT CONCLUSION 9/X: PBN SID/STAR CHARTS HARMONISED AIP PUBLICATION***

*That, ICAO MID:*

- a) *promotes the PBN SID and STAR Charting factsheet at **Attachment A** to enhance harmonization in the publication of these procedures across the MID Region, ensuring their widespread dissemination among member states; and*
- b) *monitors the implementation status of PBN SID/STAR charts and the harmonized AIP publication, and provides progress reports to the relevant subsidiary bodies of MIDANPIRG.*

2.15 It is important to note that only Oman, Qatar, KSA, Sudan and the UAE have contributed to the work, while several other states have not participated or provided input on the task. To enhance collaboration and drive progress, Ms. Hind A. Almohameed, an AIS Inspector at GACA KSA, has joined the group as a new member.

**3. ACTION BY THE MEETING**

3.1 The meeting is invited to:

- a) note the information provided;
- b) review and discuss, the PBN SID and STAR Charting factsheet at **Appendix A**; and
- c) endorse the Draft Conclusion at paragraph 2.14.

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PBN SID/STAR charts published in the AIPs: Chart Title, identification and PBN Box

Chart Title – Examples

**STANDARD DEPARTURE  
CHART - INSTRUMENT  
(SID) - ICAO  
RNAV**

DEP/ARR  
STANDARD RNAV  
ROUTES - ICAO

**RNAV STANDARD  
DEPARTURE CHART  
INSTRUMENT (SID) - ICAO**

**STANDARD DEPARTURE CHART —  
INSTRUMENT (SID) — ICAO**

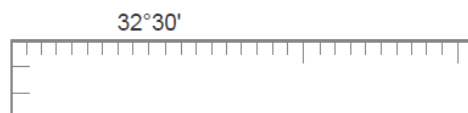


Chart Identification – Examples

**BAHRAIN INTL (OBBI)  
RWY 12L/30R  
KOBOK 1 ARRIVAL (RNAV1)**

**AMMAN/Marka Intl (OJAM)  
STAR RNAV (GNSS) RWY 06**

**DOHA/Hamad Intl. (OTHH)  
RNP RWY 16L  
ALVEN 2M /LUBET 1M /LUBET 1Y  
/TULUB 1M**

**AMMAN/Marka Intl (OJAM)  
SID RNAV (GNSS) RWY 24**

**SAYUN /Sayun Intl. (OYS)  
RWY  
NABUP 1A - NADAK 1A - XALTA 1A - ASLAB  
IVINA 1A - XAGAG 1A - DEMNA 1A**

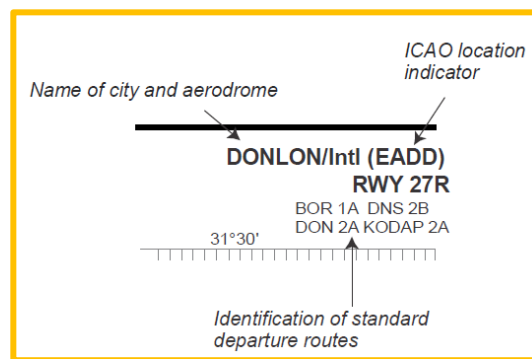
**KUWAIT / Kuwait Intl  
STATE OF KUWAIT  
RNAV (GNSS) SID RWY 15L/15R**

TEHRAN/IMAM KHOMAINI  
RNAV1 RWY 29R  
RADAL 3X  
BOXAM 2X

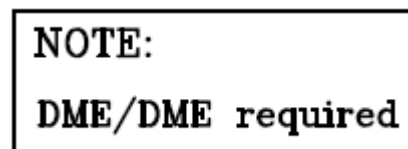
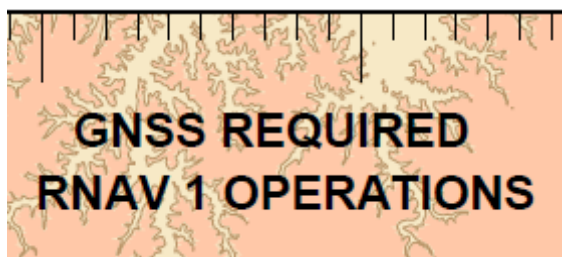
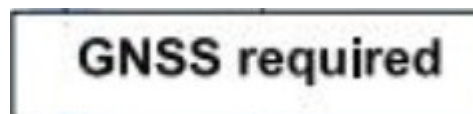
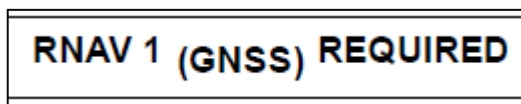
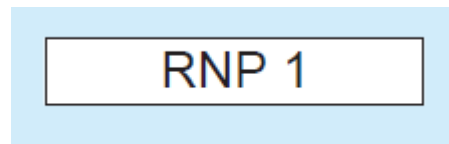
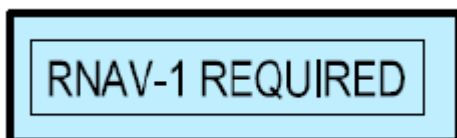
**ASWAN / ASWAN  
RNAV (VOR/DME or GNSS)  
RWY 17**

**RAFIC HARIRI INTL' BEIRUT  
BALMA 1R - KUKLA 1R - ELIKA 1R – LEBOR  
RNAV (GNSS) STAR RWY 21**

**ABU DHABI / Intl  
RNAV 1 STAR RWY 31L/**



**PBN Box – Examples**



# PBN SID/STAR charts Harmonised AIP Publication

v1.0  
29 January 2024





# Introduction

EUROCONTROL monitors the implementation of Performance-Based Navigation (PBN) procedures in ECAC using the [PBN Map tool](#), integrating data from national AIPs and implementation plans derived from PBN Transition plans produced by ATM/ANS providers.

Each AIRAC cycle prompts a thorough examination of national AIPs, with a specific focus on identifying new PBN procedures, particularly Standard Instrument Departures (SIDs) and Standard Instrument Arrivals (STARs).

It was identified that PBN information is dispersed across various sections of SID/STAR charts, varying by country or airport, contrary to the specific promulgation principles outlined by ICAO. This inconsistency prompted EUROCONTROL to address the lack of harmonization in European PBN SID/STAR charts in various stakeholder groups. The need for harmonization was agreed, with the support for creating a factsheet, especially given the mandate by the European PBN implementing regulation (EU 1048/2018) that necessitates the implementation of PBN SID/STAR at every instrument runway where these procedures are published.

This factsheet, designed for specialists responsible for chart origination, includes illustrative examples and corresponding references to ICAO documentation. It is essential to note that this resource is intended to enhance understanding and promote harmonization but does not seek to replace or override state regulations or ICAO requirements regarding AIP publication and charting.



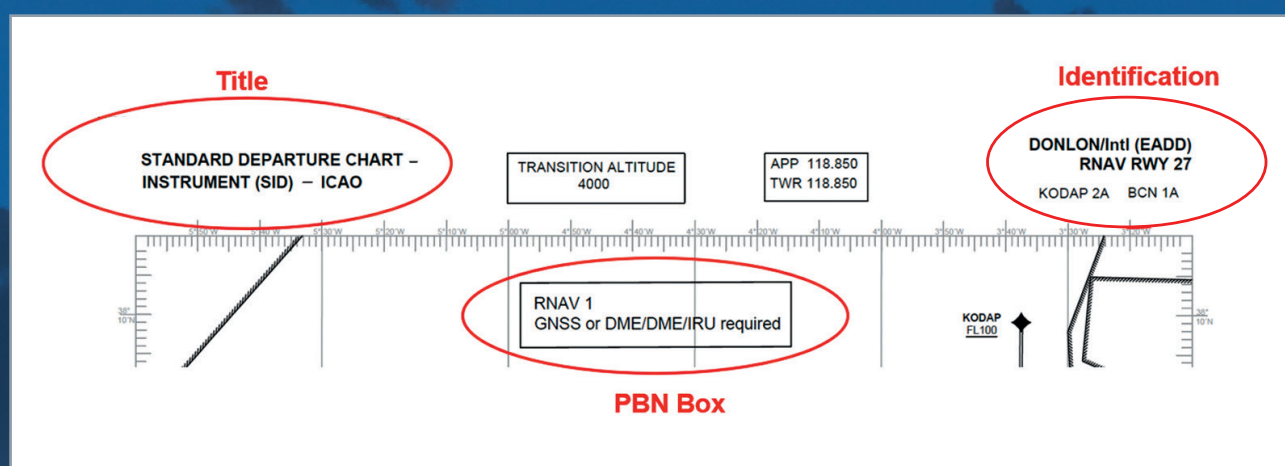


# Objective

The development of this factsheet aims to heighten awareness regarding the charting of PBN SID/STAR in accordance with ICAO principles. The primary objective is to foster harmonization in the publication of these procedures across Europe, especially in anticipation of the increased number of PBN SID/STAR charts due to the PBN Implementing Regulation (EU 1048/2018).

Specifically, this factsheet concentrates solely on three key chart elements:

- Title
- Identification
- PBN box



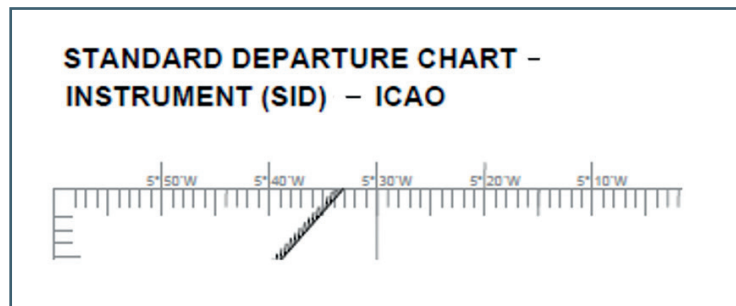
# PBN SID/STAR - Chart Title

According to ICAO Doc 8697 Aeronautical Chart Manual, chapter 7.9 (SID):

## Title

*"The title must be **"Standard Departure Chart - Instrument (SID) - ICAO"**. Such title must not include "ICAO" unless the chart conforms with all Standards specified in Annex 4, Chapters 2 and 9. The chart title is placed at the top left corner of the chart in bold upper-case type."*

Example:

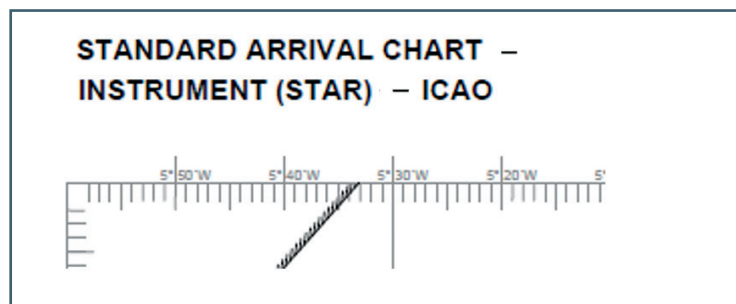


According to ICAO Doc 8697 Aeronautical Chart Manual, chapter 7.10 (STAR):

## Title

*"The title must be **"Standard Arrival Chart - Instrument (STAR) - ICAO"**. Such title must not include "ICAO" unless the chart conforms with all Standards specified in Annex 4, Chapters 2 and 10. The chart title is placed at the top left corner of the chart in bold upper-case type."*

Example:



# PBN SID/STAR - Chart Identification

According to ICAO Doc 8168 PANS-OPS Vol II, Part III, Section 5, Chapter 1.3.2 "Chart Identification":

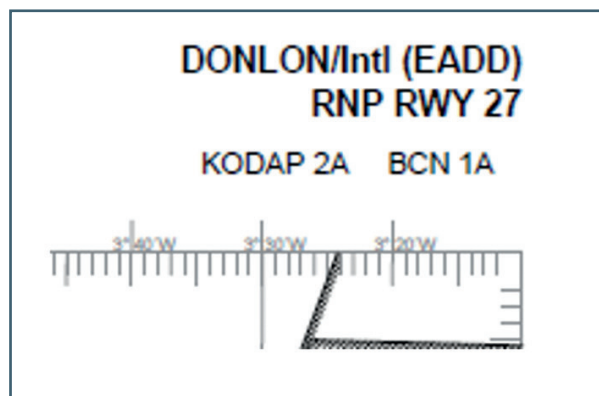
*"The chart shall be identified in accordance with Annex 4, 9.5 for departures and 10.5 for arrivals and **shall include the term RNAV or RNP, depending on the navigation specification.**"*

According to ICAO Doc 8697 Aeronautical Chart Manual, chapter 7.9 (SID) and 7.10 (STAR) "Identification":

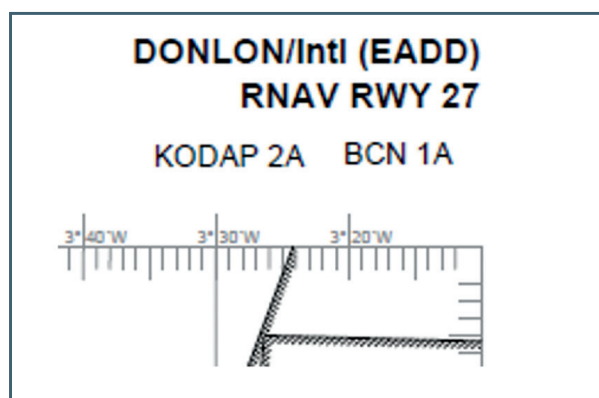
*"The chart must be identified by the name of the city or town, or area, that the aerodrome serves, the name of the aerodrome, and the identification of the standard departure/arrival route(s) — instrument as established in accordance with the PANS-OPS, Volume II, Part I, Section 3. The identification of the standard departure/arrival route(s) — instrument is provided by the procedures specialist."*

*The ICAO location indicator may also be included with the name of the aerodrome. **The chart identification is placed at the top right corner of the chart in bold upper-case type.**"*

Example for PBN SID/STAR based on RNP:



Example for PBN SID/STAR based on RNAV:

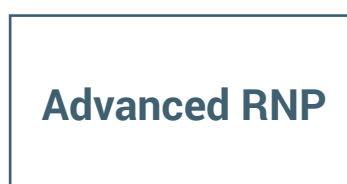
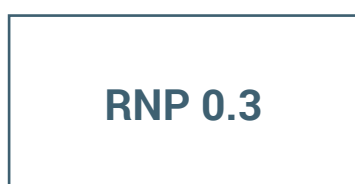
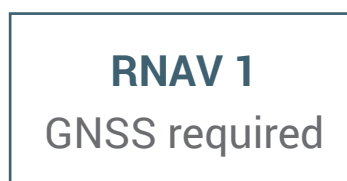
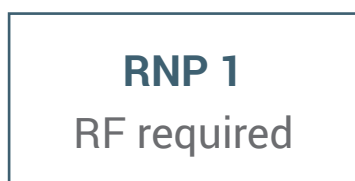


# PBN SID/STAR - PBN BOX

According to ICAO Doc 8168 PANS-OPS Vol II, Part III, Section 5, Chapter 1.3.4 "Chart notes":

*"Additional procedure requirements shall be provided as chart notes. **PBN items shall be separated out and published in a PBN requirements box on the plan view of the chart** immediately below the chart identifier. **The PBN requirements box shall include the identification of the navigation specification used in the procedure design, any navigation sensor limitations (e.g. GNSS required, GNSS or DME/DME/IRU required), and any required functionalities (e.g. RF required)** that are described as options in the navigation specification, that is, not included in the core navigation specification."*

Examples of PBN boxes:



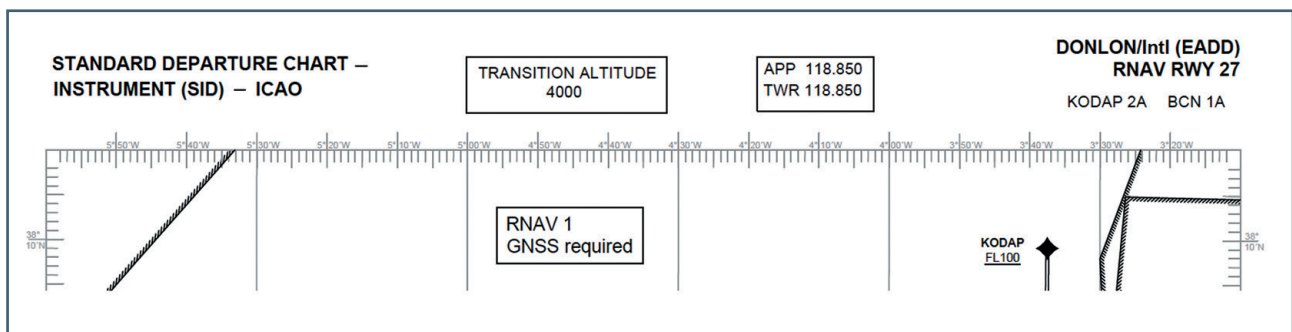


# PBN SID/STAR EXAMPLES

Navigation specification: **RNAV 1**

Navigation sensor limitations: **GNSS required** (DME/DME is not available)

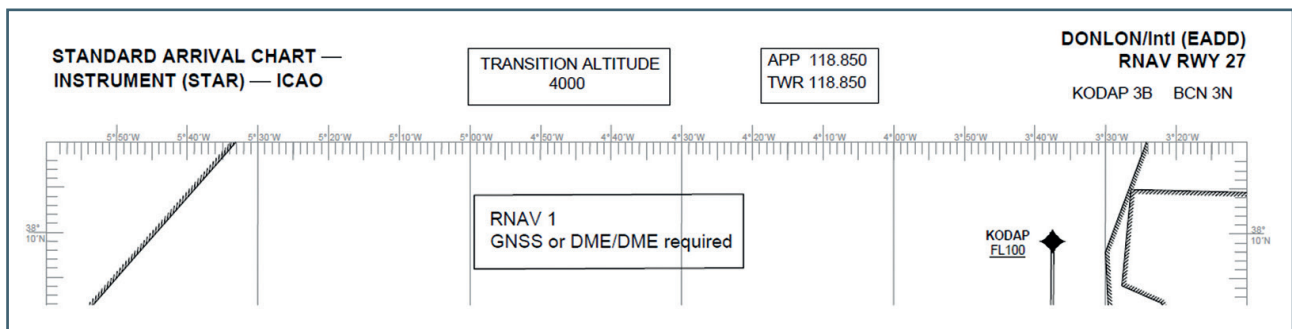
Functional requirement: **None**



Navigation specification: **RNAV 1**

Navigation sensor limitations: **None** (GNSS and DME/DME are available)

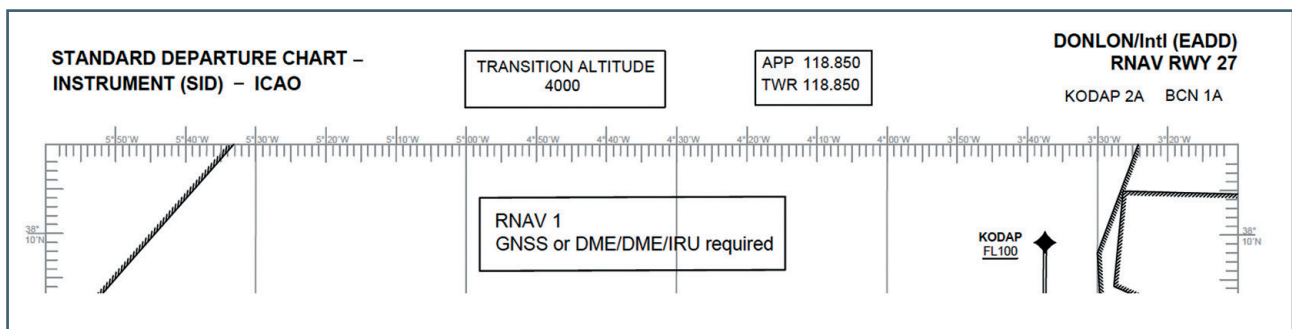
Functional requirement: **None**



Navigation specification: **RNAV 1**

Navigation sensor limitations: **GNSS or DME/DME/IRU required.**

Functional requirement: **None**

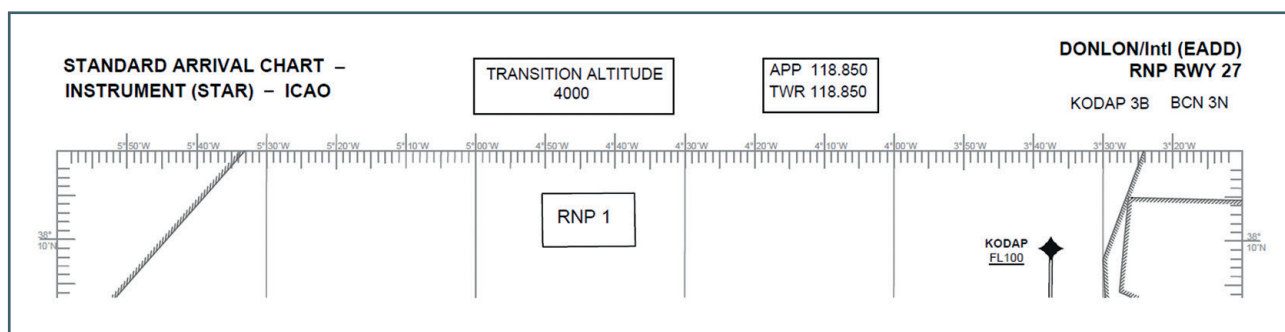




Navigation specification: **RNP 1**

Navigation sensor limitations: **None** (GNSS required)

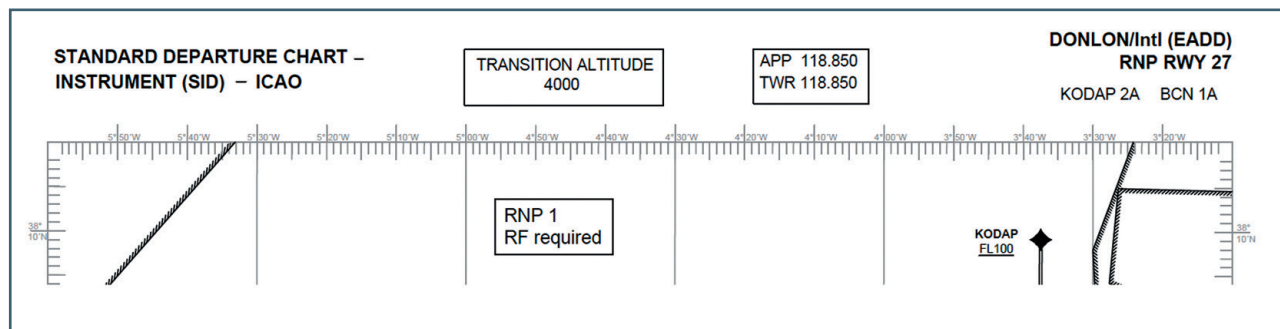
Functional requirement: **None**



Navigation specification: **RNP 1**

Navigation sensor limitations: **None** (GNSS required)

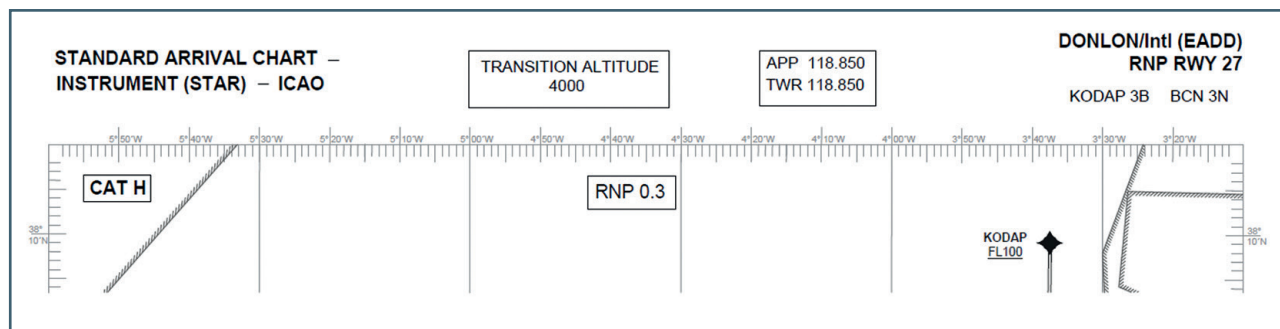
Functional requirement: **RF required**



Navigation specification: **RNP 0.3 (CAT H)**

Navigation sensor limitations: **None** (GNSS required)

Functional requirement: **None**



# Glossary

<b>AIP</b>	Aeronautical information publication
<b>ANS</b>	Air navigation services
<b>ATM</b>	Air traffic management
<b>DME</b>	Distance measuring equipment
<b>GNSS</b>	Global navigation satellite system
<b>IRU</b>	Inertial reference unit
<b>PBN</b>	Performance-based navigation
<b>RF</b>	Radius to fix
<b>RNAV</b>	Area navigation
<b>RNP</b>	Required navigation performance
<b>SID</b>	Standard instrument departure
<b>STAR</b>	Standard instrument arrival

## Further Information

The EUROCONTROL Navigation Steering Group (NSG) coordinates the activities necessary for the implementation of PBN procedures in ECAC.

For more information, please contact the [nav.user.support@eurocontrol.int](mailto:nav.user.support@eurocontrol.int) or visit our website:  
<https://www.eurocontrol.int/communications-navigation-and-surveillance>





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