Australian Government
Civil Aviation Safety Authority

ADVISORY CIRCULAR

AC 173-04
Instrument procedures design - clarification of RNAV criteria

v2.1 – July 2016

Advisory Circulars are intended to provide advice and guidance to illustrate a means, but not necessarily the only means, of complying with the Regulations, or to explain certain regulatory requirements by providing informative, interpretative and explanatory material.

Advisory Circulars should always be read in conjunction with the relevant regulations.

Audience

This Advisory Circular (AC) applies to:

- Part 173 certificate holders
- Instrument procedure designers

Purpose

This AC provides clarification and guidance to the interpretation of the Area Navigation (RNAV) chapter of Procedures for Air Navigation Services: Aircraft Operations (PANSOPS).

Status

This version of the AC is approved by the Executive Manager, Standards Division.

Version	Date	Details
v2.1	July 2016	Accommodate changes that have been made to barometric/vertical navigation design criteria.
(1)	July 2010	This is the second AC to be issued on this subject.
(0)	November 2010	This is the first AC to be issued on this subject.

For further information

For further information on this AC, contact CASA's Flight Standards Branch (telephone 131 757).

Unless specified otherwise, all subregulations, regulations, divisions, subparts and parts referenced in this AC are references to the *Civil Aviation Safety Regulations 1998 (CASR)*.

Contents

1 Reference material

1.1 Acronyms

The acronyms and abbreviations used in this AC are listed in the table below.

Acronym	Description
AC	Advisory Circular
AW	Area Width
CASR	*Civil Aviation Safety Regulations 1998*
FAF	Final Approach Fix
IF	Intermediate Fix
ICAO	International Civil Aviation Organization
MAPt	Missed Approach Point
NM	Nautical Miles
PANSOPS	Procedures for Air Navigation Services: Aircraft Operations
RNAV	Area Navigation
XTT	Cross Track Tolerance

1.2 References

Regulations

Regulations are available on the Federal Register of Legislation https://www.legislation.gov.au/

Document	Title
Part 173 CASR	Instrument Flight Procedure Design
International Civil Aviation Organization (ICAO) Doc 8168 Vol II	Procedures for Air Navigation Services: Aircraft Operations (PANSOPS)

2 Procedures for air navigation services: aircraft operations

2.1 Overview

2.1.1 PANSOPS undergoes regular reviews by both the International Civil Aviation Organization (ICAO) and the Civil Aviation Safety Authority (CASA). During a recent review, one area of possible confusion was identified in the presentation of area navigation (RNAV) segment blending. This AC provides further information regarding this blending.

2.2 Merging of RNAV segments

2.2.1 PANSOPS Vol II, Part III, Section 1, Chapter 1, paragraph 1.5.4 addresses the merging of segments of an RNAV procedure. The first sentence states:

> For arrivals and approaches, at the point where the flight phase and/or cross track tolerance (XTT) changes, the area width is defined using the buffer value of the preceding phase and the XTT value for the subsequent phase.

This statement is clear, but not all three of the calculations at the end of the paragraph can be interpreted using the described method.

2.2.2 The calculation of intermediate segment ½ area width (AW) follows the described method:

*Intermediate segment ½ AW = 1.5*XTT$_{IF}$ + terminal area buffer*

Where XXT = cross track tolerance
Where IF = Intermediate Fix

2.2.3 However, the following two calculations seem to confuse the ½ AW at the final approach fix (FAF) with that in the final segment. This apparent confusion is caused by the need to allow for the reduction in the integrity monitor alarm limit that reduces from ±1 NM to ±0.3 NM at 2 NM prior to the FAF. Accordingly, the following logic applies:

2.2.3.1 At the FAF, the specified calculation is:

*FAF ½ AW = 1.5*XTT$_{FAF}$ + terminal buffer value*

FAF ½ AW applies **at the FAF only** and provides for a ½ AW that is greater than that in the final segment. To achieve this, the XTT value at the FAF and the buffer value for the terminal area are used – per the method described above.

2.2.3.2 In the final segment, the specified calculation is:

*Final approach segment ½ AW = 1.5*XTT_{MAPt} + final approach buffer value*

The final approach segment ½ AW breaks from the method described above by applying the XTT value for the **subsequent phase** (i.e. the MAPt) and the buffer value for the **current phase**. In practical terms, the XTT variation has no effect, as the value at both the FAF and MAPt is 0.3 NM. The reduction in the area half width is brought about by the use of the smaller final approach buffer value in place of the larger terminal buffer value.