

AEROSPACE RECOMMENDED PRACTICE

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Final Approach Spacing System (FASS)

RATIONALE

This is a proposed new Aerospace Recommended Practice to support the development of a Final Approach Spacing System (FASS) for Approach Spacing for Instrument Approaches (ASIA) operations.

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1. SCOPE:

This document recommends criteria and requirements for a Final Approach Spacing System (FASS) for transport aircraft.

This is an Aerospace Recommended Practice to support the development of a Final Approach Spacing System (FASS) for Approach Spacing for Instrument Approaches (ASIA) operations.

1.1 Purpose:

This document recommends design criteria for the flight deck Final Approach Spacing System (FASS). The FASS is a combination of hardware and software that is required to perform the Final Approach Spacing Function. The FASS is designed to enhance the operational efficiency of flight by providing the crew with a means to obtain a precise aircraft-to-aircraft arrival interval at the runway threshold during instrument approach operations. The FASS provides operationally acceptable speed guidance, appropriate crew alerting, and must be highly reliable and thoroughly responsive to the operational requirements and environment.

1.2 Operational Description:

The FASS is designed to enhance runway capacity by precisely controlling the landing interval between aircraft. The FASS is used as part of an instrument approach procedure involving sequential aircraft (i.e., at least two participating aircraft; a leading and a following aircraft). The following aircraft within the pair would conduct the procedure to achieve a defined spacing interval at the runway threshold.

The FASS uses aircraft-to-aircraft data link (e.g., Automatic Dependent Surveillance-Broadcast) information, planned final approach speeds, wind data, and a nominal speed profile appropriate for the intended approach to compute a speed command for the FASS aircraft to obtain a required runway threshold spacing interval relative to a leading aircraft. The designation of the leading aircraft and the required runway threshold spacing interval would be provided by Air Traffic Control. The FASS speed command would provide small speed adjustments relative to the nominal speed profile to correct for spacing errors prior to the FASS aircraft reaching its final approach deceleration point. After the final approach deceleration point, the FASS would provide speed guidance to its planned final approach speed, thus providing guidance for a stable final approach.

1.2 (Continued):

Examples of the operational characteristics are provided in Figures 1 and 2. Figure 1 shows a representative nominal speed profile with two aircraft on the approach. Based on the required runway threshold spacing interval, the planned approach speeds, and the wind conditions, the FASS would compute an adjusted spacing interval that the following aircraft would need to attain at the final deceleration point to achieve the runway threshold spacing interval. Using this adjusted spacing interval and the nominal speed profile (converted to groundspeed), the FASS would compute the desired spacing position relative to the leading aircraft (see Figure 2). In Figure 2, because the following aircraft is behind the desired spacing position, the FASS would provide speed guidance that is slightly higher than the speed of the nominal speed profile to correct this spacing error. When the following aircraft reaches the final deceleration point, the FASS would provide guidance to achieve the planned final approach speed.

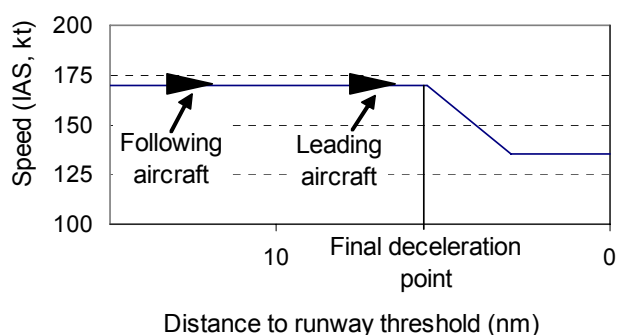


FIGURE 1 - Final Approach Spacing Example

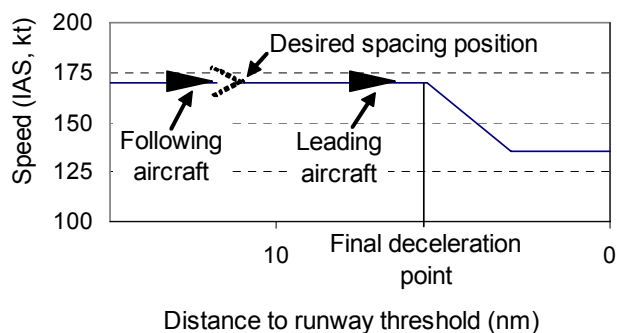


FIGURE 2 - Example Showing the Desired Spacing Position

2. REFERENCES:

2.1 Applicable Documents:

The following publications form a part of this specification to the extent specified herein. The latest issues of all SAE Technical Reports shall apply.

This document should be used in conjunction with the ARP4102 Core Document.

- 2.1.1 SAE Publications: Available from SAE, 400 Commonwealth Drive, Warrendale, PA 15096-0001, Tel: 877-606-7323 (inside USA and Canada) or 724-776-4970 (outside USA), www.sae.org

ARP4102/4 Flight Deck Alerting System

ARP4102/7 Electronic Displays

- 2.1.2 FAA Publications: Available from Federal Aviation Administration, 800 Independence Avenue, SW, Washington, DC 20591, Tel: 866-835-5322, www.faa.gov

AC 25-11 Transport Category Airplane Electronic Display Systems

Order 8400.10 Air Transportation Operations Inspector's Handbook

2.1.3 Other Publications:

ARINC 726 Flight Warning Computer System

RTCA DO-242A MASPS for Automatic Dependent Surveillance Broadcast (ADS-B)

RTCA DO-243 Guidance for Initial Implementation of Cockpit Display of Traffic Information

RTCA DO-286 MASPS for Traffic Information Service - Broadcast (TIS-B)

RTCA DO-289 MASPS for Aircraft Surveillance Applications (ASA)

NASA/TM-2002-211742 Speed Control Law for Precision Terminal Area In-Trail Self Spacing