

Aerodynamics and aero-acoustics of rectangular planform cavities

Part V: Bibliography (up to 2016)

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Dr M. West	—	BAE Systems, Prestwick.

* Corresponding Member

The construction and subsequent development of the Data Item were undertaken by

Mr P.D. Chappell	—	Independent.
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The person with overall responsibility for the work in this subject area is Mr A.J. Clarke, Head of Aerodynamics Group.

AERODYNAMICS AND AERO-ACOUSTICS OF RECTANGULAR PLANFORM CAVITIES. Part V: Bibliography (up to 2016)

CONTENTS

	Page
1. INTRODUCTION	1
2. THE BIBLIOGRAPHY	2
A. Cavity Aerodynamics	2
B. Cavity Acoustics	30
C. Cavity Drag	44
D. Cavity Acoustic Suppression (or Control)	47
E. Store Separation and Trajectory	76
F. Captive Trajectory System (CTS) and Drop Testing	90
G. Model Scaling	92
H. Aircraft/Stores Compatibility	93
I. Actuators for Suppression (or Control)	96

AERODYNAMICS AND AERO-ACOUSTICS OF RECTANGULAR PLANFORM CAVITIES. Part V: Bibliography (up to 2016)

1. INTRODUCTION

This bibliography consists of a collection of references acquired over the period 1998 to 2016 in relation to the work on cavities, initially on drag and subsequently on the more general aspects concerning aerodynamics and aero-acoustics. The work on cavity drag and the early work on cavity aerodynamics and aero-acoustics was specific to rectangular box cavities, since that was the area in which the great majority of the available experimental and theoretical work had been carried out. The later work on cavity aerodynamics and aero-acoustics was able to widen the scope to include cavities of more irregular shapes typical of weapons bays, but for the sake of consistency the titles of the Data Items retained the term “rectangular planform”. Although large (more than 1300 references), the bibliography is by no means definitive.

In an effort to make the bibliography easier to use, it has been divided into a number of sections, each devoted to a particular subject area. The nine sections are as follows:

- A. Cavity Aerodynamics
- B. Cavity Acoustics
- C. Cavity Drag
- D. Cavity Acoustic Suppression (or Control)
- E. Store Separation and Trajectory
- F. Captive Trajectory System (CTS) and Drop Testing
- G. Model Scaling
- H. Aircraft/Stores Compatibility
- I. Actuators for Suppression (or Control)

The references in each section are listed in date order, one advantage being that it allows the chronological development of a particular subject area to be followed. As an aid to that, the numbering system within each section has three components to identify it. For example: **A.61.2**, where **A** denotes the subject area from the above list, **61** is the last two digits of the year of issue* (1961 in this example), and **2** is a number identifying the particular reference in any given year (number 2 in this example, from a list of 1, 2, 3 ...). This system has a certain flexibility, another advantage being that it allows subsequent entries to be made without the need for any renumbering.

There are, of course, many instances of references which cover more than one of the subject areas A to I. To avoid an extensive duplication of the entries, they have been included in the one section deemed to be of primary interest. Typical examples of this are mentioned following the title of each of sections A to F in Section 2.

Many of the references have been obtained (770), but for those that have not, the title (or abstract, if available) has been used as a guide to the topic of primary interest.

* The first two digits are not given; they are either 19 or 20, and since the earliest reference listed is from 1927, there will be no ambiguity until 2027.

2. THE BIBLIOGRAPHY

A. Cavity Aerodynamics

The references in this section cover all aspects of cavity aerodynamics (see ESDU 02008: A.04.6), such as flow patterns, flow regimes, pressure distributions, heat transfer, and their variations with cavity geometry and flow Mach number. Certain aspects relating to the unsteady nature of the flow in cavities, such as pressure oscillations, vibration and buffeting are also covered. The list includes references concerning cavities of other than rectangular planform, such as circular, for example, together with others of irregular shape more typical of weapons bays. The references deal with experimental (wind-tunnel tests and flight tests) as well as theoretical (including computational and CFD) methods. The presentation in chronological order is particularly useful in following the progressive development of methods, particularly CFD. Many of the references in sections B and C, section D in the absence of suppression and section E in the absence of stores will also be of relevance to cavity aerodynamics.

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B. Cavity Acoustics

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