

Book Reviews

UAS INTEGRATION INTO CIVIL AIRSPACE

Policy, regulations and strategy

By Douglas M Marshall

John Wiley & Sons, 2022, 206pp, £62.50 in print, £56.99 e-book.

Aviation technology continues to accelerate apace, never more so than in the field of uncrewed air systems. This useful addition to the RAeS library and e-library examines the current state of UAS airspace access and integration around the world, focusing on the efforts that have produced a regulatory response to the demand for access and an assessment of regulators' objectives behind their responses.

The integration of UAS systems into national airspace has been promised as a transformational service for many years, yet to date has not succeeded in living up to commercial expectations or the vision articulated by regulatory authorities to facilitate the development of what is promised to be a significant commercial market. This well-researched book explores how that vision might be achieved. It gives an excellent oversight of international progress in the integration of uncrewed aircraft into controlled and uncontrolled airspace, focusing on the regulation and technology required to address the many operational and safety issues that need to be overcome for an integrated, assured UAS airspace system.

The author recognises the fast pace of change in the industry and provides a useful framework and associated oversight of the tools required to understand the integration requirements and the challenges ahead from a technical and regulatory perspective in an interesting, stimulating and well thought through approach to the topic.

This rigorously referenced approach provides an interpretation and commentary on the development of regulations, standards and recommended practices, along with the key initiatives and UAS protocols under development by the ICAO, FAA, NASA, EU/EASA and Eurocontrol. Approaches to national UAS airspace integration and regulation are addressed along with commentary on the challenges of operations in international airspace. The book also addresses the challenges of UAS integration in lower airspace levels however, there is only a passing mention of high-altitude operations which are increasingly becoming of note for airspace managers and could perhaps be addressed in a subsequent edition.

The author provides a useful commentary on the challenges of integrating large numbers and varied types of UAS of all categories, including eVTOLs, into current ATM environments and recognises the unique challenges of deconfliction between UAS themselves, in particular at low level below 500ft. It is this low-level environment where there is likely to be the highest density of operations and greatest challenges for UAS integration, in particular where flight over people is required.



▲ The Royal Mail has been trialling BVLOS Windracer delivery drones in the Scottish islands.

Royal Mail

There is a comprehensive overview of the latest regulatory frameworks, including the challenges to existing ATM infrastructure and associated limitations, future architectures, regulatory frameworks, required concept of operations and the practical interpretation of regulatory rules when planning UAS operations.

In addition to the comprehensive overview of international rule-making, there is an insightful behind-the-scenes commentary on the role of these organisations around their areas of research and policy development, along with insights in to how those organisations have been working with the UAS community at a practical level to advance the integration of UAS in varying categories of airspace as they strive for global harmonisation of key regulatory requirements.

Having addressed the work of the main regulatory bodies, the book then moves on to address global UAS integration in the US, UK, China and a further 14 countries. Of particular interest in this section is the vision that each of these countries hold for the use of UAS and how international policies might be accommodated within the local interpretation of UAS policy at a national level.

Finally, there are short chapters on the technology and cyber-security aspects of the airspace integration challenge and a brief oversight on the ICAO recommendations on how regulatory authorities should look to address these areas in policy development.

The book is easy to read, refreshingly so for such a complex subject and is accessible to all readers, even without a detailed technical knowledge. It is a useful reference for everyone in the industry, including regulators who will inevitably determine the pace of adoption of UAS in civil airspace.

Most of the world's aviation authorities, service providers and regulators have engaged in intense efforts since the early 2000s to establish methods and safety protocols to integrate UAS into complex and increasingly busy controlled and uncontrolled airspace. This book provides an excellent oversight of international progress, along with ICAO's oversight and direction of co-ordinating rules and, in my view is the 'go-to' book for UAS operations and by far the best introduction on the subject available to date.

Richard Deakin
FRAeS

The author provides a useful commentary on the challenges of integrating large numbers and varied types of UAS of all categories including eVTOLs, into current ATM environments

HITLER'S AIR WAR IN SPAIN

The rise of the Luftwaffe

By Norman Ridley

Air World Books, 2022. 206pp. £20.00, £8.99 e-pub.

The Spanish Civil War remains a conflict of great fascination so, even though it ended 80 years ago, there remains a constant demand for works on the subject. The air operations have attracted much interest with works by Alpert, Proctor, Ries and Ring, as well as Meredith's sadly uncompleted Phoenix series, especially Volume 2, all setting gold-plated standards. This work could potentially match them because the author has previously taken a unique view of the Battle of Britain through the prism of intelligence so the reader can approach it with high hopes boosted by the book's excellent bibliography.

It starts well with one of the best descriptions of the involvement of Germany, Italy and the Soviet Union that this reviewer has seen but then the author appears to have reached a crossroads with the narrative. Should he pursue an analytical, a descriptive or a personal path? But, in trying to walk down all three, he fails to reach his destination. Only the conclusions provide an example of what might have been and what makes this so puzzling is the apparent failure to use his own sources, notably in studying the notorious bombing of Guernica in April 1937.

Given the title, the reader would reasonably expect the author to focus upon the Condor Legion but he digresses into large sections dealing with the Soviet air presence in Spain which are far beyond the need for comparison. It is significant that the only appendix deals with deliveries of Soviet aircraft and there is no



similar section on German aircraft deliveries, although Howson's book on this subject, which is not in the bibliography, provides an excellent foundation.

There is also an inordinate amount of contemporary text dealing with bombing, especially of cities. At least two pages, for example, deal with the bombing of Barcelona in March 1938, although the author clearly states this was by Italian and not German aircraft. Moreover, although he references Corum's book on Luftwaffe doctrine, he is clearly unfamiliar with German views and the difference between 'Operativ' and Strategic bombing.

This book does have some useful information, and the reviewer learned more about the Tupolev SB in this work than in any other. There is also an excellent description of the oft-neglected role of reconnaissance in the conflict. However, against this there are a number of irritating minor errors by the author which should have been picked up at the proofing stage. A photo caption beginning "A captain of the Condor Legion (seated), who is in conversation with a Spanish officer..." is Condor Legion Chief-of-Staff, and later commander, Wolfram von Richthofen and in the text on pp. 79-80 the author describes how one of the 'He 51s of 3.K/88' attacking a Bilbao fuel dump was shot down and 'The crew escaped by parachute' but the pilot and radio operator were attacked by a mob. Clearly, he means a Ju 52 was shot down.

The title is a misnomer and this is not a study on Luftwaffe operations over the Iberian peninsula. This is very disappointing for it is very much a missed opportunity for the author to cement his reputation.

ER Hooton

Membership & Professional Registration Briefings



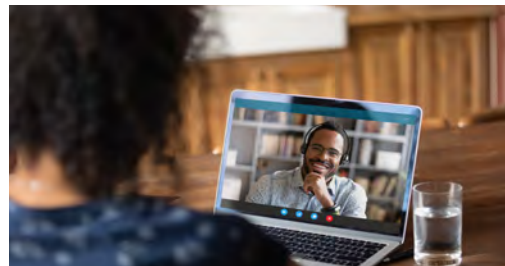
ROYAL
AERONAUTICAL
SOCIETY

Arrange a briefing for staff at your company

Briefings include information on:

- The RAeS and our activities
- Membership benefits and criteria
- Professional development with the Society
- Professional Registration as CEng, IEng or EngTech with the Engineering Council UK

*Briefings can take place online or in person



For more information or to arrange a visit contact: membership@aerosociety.com
or call: +44 (0)20 7670 4384