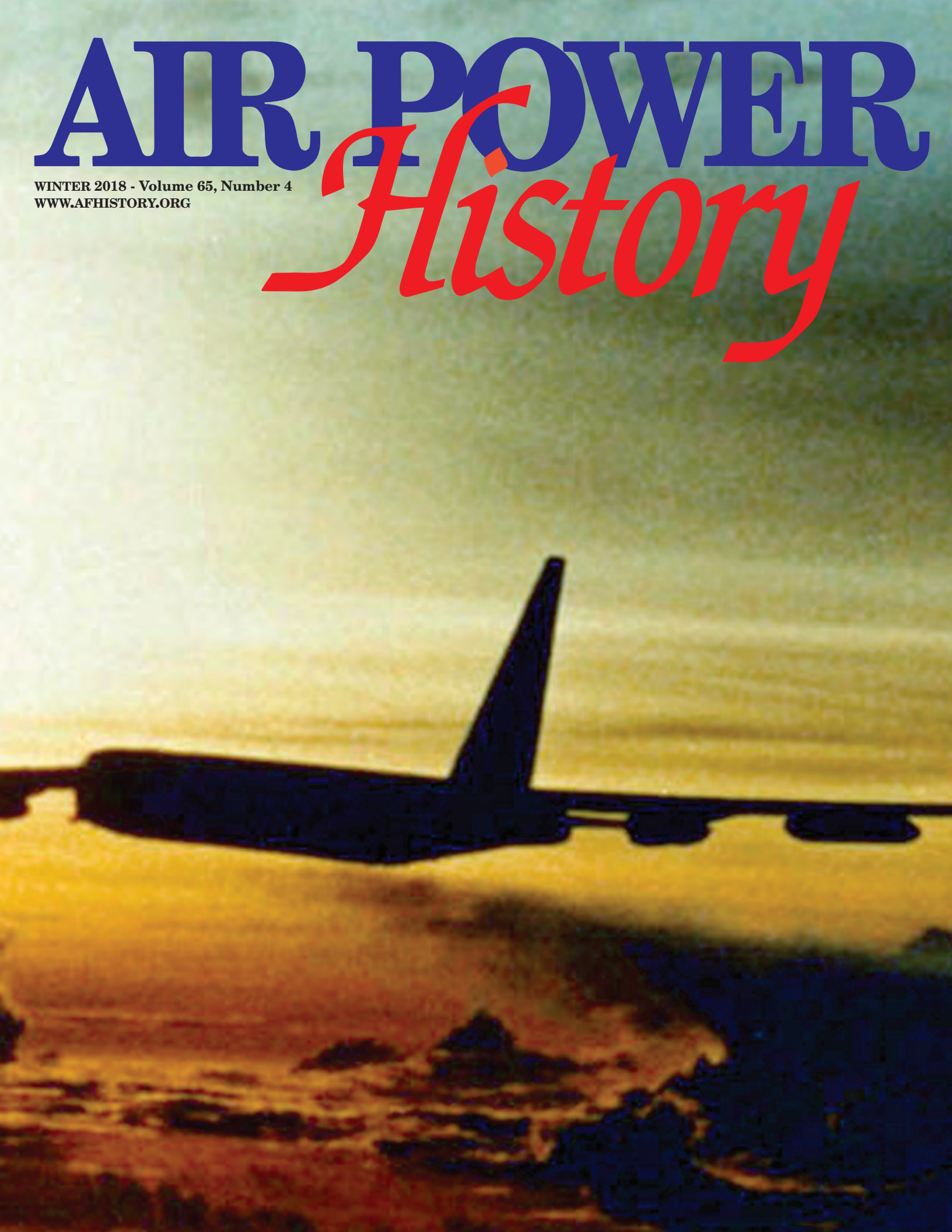
AIR POWER History

WINTER 2018 - Volume 65, Number 4
WWW.AFHISTORY.ORG



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COVER: A B–52D of the 307th Bomb Wing flies off into the sunset and operations. *(USAF photo)*

Stories such as *Operation Linebacker II 1972* renew my admiration for historians' abilities to recreate events from long ago. The summer issue of *Air Power History* contained a piece of history that perfectly closes the circle for Michel's work. In it, Darrel Whitcomb wrote about "Rescue Operations During Linebacker II," an account of helicopter missions that recovered thirty bomber and fighter crewmen. Both are must reads.

Lt Col Henry Zeybel, USAF (Ret)

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Bossart: America's Forgotten Rocket Scientist. By Don P. Mitchell. San Bernardino CA: Mental Landscape, 2016. Illustrations. Footnotes. Acknowledgments. Index. Pp. viii, 200. $10.57 Paperback ISBN: 978-0-9983-3050-2

Few scholars would contest that Wernher von Braun, a skillful rocket engineer in his own right, managed to promote and establish himself as the preeminent rocket scientist in American history. From historian Michael Neufeld's prizewinning biography to archivist-editor Irene Powell-Willhite's collection of several dozen speeches, von Braun continues to reign as the foremost U.S. rocket expert and top contender for the title "father of U.S. spaceflight," eclipsing even Robert Goddard. Despite von Braun's well-deserved reputation, it would be a distortion of history to neglect or deny the significant contributions of other brilliant rocket engineers.

Computer scientist Don Mitchell makes precisely that point in this book. The long-overdue biography of Karel "Charlie" Bossart, a Belgian aeronautical engineer who immigrated to the United States in April 1930, clearly broadens the pantheon of leading U.S. rocket designers. It places him squarely at the apex of intercontinental ballistic missile (ICBM) development by the U.S. Air Force from the immediate post-World War II period through the 1950s, and with Centaur upper-stage development into the 1960s. It cements Bossart's reputation as a cutting-edge innovator—an extraordinary visionary who designed a weapon for war but favored its use as a launch vehicle for peaceful exploration of outer space.

Upon his arrival in America, Bossart joined Sikorsky Aircraft and worked initially as a stress analyst on the team building the largest seaplane to date: the S-40 amphibious passenger liner. Mitchell provides a thoroughly comprehensible, highly technical description of how Bossart went about designing a strong, lightweight wing structure for that aircraft. With work on the S-40 complete, Bossart joined several different aircraft companies before taking a position as a stress analyst, in March 1937, with Fleetwings, a small company that produced some of the first stainless-steel airplanes and had mastered fabrication of a stainless skin no more than twice the thickness of a piece of paper. Within three months, however, he accepted a better position—as chief research engineer in the aircraft division—at E.G. Budd, the company that had perfected techniques for welding stainless steel. At Budd, under contract with the Army Air Corps, he designed an experimental stainless-steel version of the P–36 wing.

During World War II, Bossart moved to Consolidated Vultee Aircraft (Convair), where he contributed to the XP–92 delta-wing, point-defense interceptor design before shifting to management of the Army Air Forces MX–774 experimental long-range rocket program in 1946. Applying the stainless-steel welding and fabrication techniques he had learned at Fleetwings and Budd, he designed what ultimately became the Atlas ICBM. In December 1958, that missile, carrying SCORE, the world's first communications satellite, would go into Earth orbit. In the 1960s, the Atlas would send John Glenn and other Mercury astronauts into orbit.

Mitchell has delivered a thoroughly researched, thoughtfully written account of an amazingly insightful rocket pioneer. Melding personal recollections from Bossart's family members with technical explanations from corporate reports, scholarly histories, and assorted other source material, Mitchell presents the richness of one man's life and times in nearly seamless combination with his path-breaking aerospace engineering accomplishments. He manages to control techno-babble in ways that contribute to understanding Bossart's historical importance, both in his own right and compared to von Braun. Mitchell's *Bossart: America's Forgotten Rocket Scientist* is a well-crafted book that deserves more than a single cover-to-cover read.

Dr. Rick W. Sturdevant, Deputy Director of History, HQ Air Force Space Command

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EMB–312 Tucano: Brazil's Turboprop Success Story. By João Paulo Zeitoun Moralez. Houston TX: Harpia Publishing, 2017. Maps. Tables. Illustrations. Photographs. Appendices. Glossary. Index. Pp. 253. $64.95 ISBN: 978-0-9973092-3-2 and **EMB–314 Super Tucano: Brazil's Turboprop Success Story Continues**. By João Paulo Zeitoun Moralez. Houston TX: Harpia Publishing, 2018. Illustrations. Photographs. Appendices. Glossary. Pp. 94. $29.95 paperback ISBN: 978-0-9973092-4-9

Moralez is a Brazilian reporter and documentary producer who is currently the Chief Editor at Hunter Press in Sao Paulo, Brazil. In these two volumes, he has put together an excellent story of not only a great airplane, but also the company behind its success.

The first, and by far the larger, of the two books covers the rationale that led to creating what would become the EMB–12 Tucano, the aircraft's development, and it oper-

ational life. Equally important is the story behind the creation and growth of Embraer, Brazil's leading aerospace company and the third largest builder of commercial aircraft in the world behind Boeing and Airbus. Embraer and Bombardier have pretty much sewn up the small and regional airliner market around the world. That story, in itself, would make for another very interesting book.

Tucano is the product of a Brazilian Air Force need for a trainer. It had been flying older Embraer designs and Cessna T–37s. But, in the early 1970s, the Cessnas were difficult to support; and, in the aftermath of the oil crises, they were expensive to operate by a government that was having economic difficulties. What was needed was a trainer that could provide the experience of flying higher-performance combat aircraft but do so with far greater economy. The Air Force turned to the country's indigenous manufacturer to develop an aircraft unlike anything they had experience with. As with most aircraft designs, this one experienced new and modified requirements as the work progressed. What finally emerged was a turboprop-powered trainer and light attack aircraft that made its first unofficial flight on August 16, 1980. Test flying resulted in the usual changes to the aircraft, but the machine was ready for its international debut at the Paris Air Show in 1981.

Moralez details the introduction of the aircraft to the air force's demonstration unit, the Smoke Squadron. It then went into service with the Air Force Academy as a trainer and saw operational service primarily in the northwestern part of the country countering drug interdiction and raids from across the border with Columbia.

Tucano became Embraer's first major international success with eventual sales to 15 other countries including France, the UK, Egypt, Iran, and Iraq. The UK deal involved partnering with Short Brothers in Belfast. To meet RAF requirements, a considerable number of major and minor changes were made to the plane. The aircraft was also a competitor (teamed with Northrop) for the USAF's JPATS program in the 1990s that resulted in the T–6 Texan II (Beech teamed with the Swiss Pilatus PC–9). Between Embraer, Shorts, and license production in Egypt, 640 aircraft were eventually built.

Competition, primarily from the PC–9, drove redesign. As with any aircraft that is going to remain competitive and able to handle new requirements, Tucano needed to be upgraded. The result is covered in the second of Moralez's books. The EMB–314 Super Tucano kind of looks like the EMB–312, but it really is an entirely new aircraft: higher-power engine, modern avionics and weapon systems, new structure for greater g loads, beefier landing gear, even-better visibility, and more armor; and it comes in either a single- or dual-seat configuration. The plane can serve in a number of diverse roles: advanced or fighter lead-in trainer, attack, escort, air defense, close air support, or ISR. It serves in nearly a dozen countries, including Afghanistan after winning the USAF Light Air Support competition over the T–6 II. Embraer took an older design and ended up producing another winner.

Both books share a number of features. Harpia produces only top-quality publications. They use gloss paper, and the photographs are clear and hi-res. The appendices are first-rate. Every EMB–12 airframe is listed in one including current status. Detailed specifications and system descriptions are included in each book. All of the operational units throughout the world are shown along with their badges. In the text, each of the using countries' operations are well described, thus giving readers a sense of the versatility of the Tucano's design. I've read a number of books written in a foreign language and then translated. Many are hard to follow with difficult grammar and spelling. With the exception of a few spelling errors, Moralez and Harpia have put out two easy-to-read books. Finally, the illustrations are all first-class and will be particularly appreciated by modelers.

The bottom line is that for anyone interested in this remarkable aircraft produced by a latecomer to the aeronautical engineering world stage, these two books are the only reference sources you need on your bookshelf.

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The Habsburgs' Wings 1914: From the Balkans and the Adriatic to Galicia — Austro-Hungarian Aviation in The First Campaigns of the Great War, vol. 1. By Andrzej Olejko. Lublin, Poland: Kagero, 2018. Tables. Illustrations. Photographs. Notes. Pp. 154. 24 Euros. ISBN: 978-83-65437-79-2

Very rarely are serious historical aviation studies translated from eastern European languages (in this case, Polish) to English. Here in the west, students of early World War I aviation on the Eastern Front will benefit from the exceptional research conducted by Andrzej Artur Olejko. A prolific author and producer of historic radio and television series, Olejko rightly points out that compared to the Western Front, much less is available on the Eastern Front (especially in English).

Olejko's attention to detail is almost overwhelming, making this work a challenging read. It probably is best used as a reference guide for a number of important topics. In fact, the title is somewhat misleading, as a significant portion is devoted to the events leading up to the beginning of the Great War. One shortcoming with the book is the unfortunate absence of any maps. These would be of great use for those of us far less familiar with the geography of eastern Europe. A map clearly defining the Austro-Hungarian Empire's borders and its subordinate states would have been most helpful.