AFHF NEWSLETTER

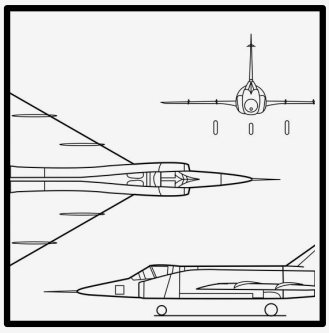
Winter 2024

WELCOME TO OUR INAUGURAL ISSUE!

IN THIS ISSUE

NEWSLETTER NAMING CONTEST

Read More



FEATURE ARTICLE: THE AREA RULE

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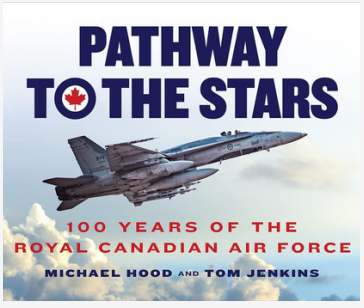

BOOK REVIEW

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ABOUT US

THE AFHF Newsletter is a quarterly e-mail newsletter by the Air Force Historical Foundation, a private non-profit organization dedicated to preserving the history and traditions of American air and space capabilities.

Join AFHF or renew your membership

https://www.afhistory.org/

Editor: Eileen Bjorkman, newslettereditor@afhistory.org

In This Issue

Chairman's Corner

Welcome to the inaugural issue of the AFHF Newsletter! We're excited to offer this newletter as an informal companion to the *Journal of the Air Force Historical Foundation*. In this first issue, you'll find a feature article, "Richard Whitcomb and the Area Rule," a book review of *Pathway to the Stars: 100 Years of the Royal Canadian Air Force*, and several regular columns I think you will find informative and entertaining, including a quiz, member and unit spotlights, and a question answered by one of our member historians.

We want the newsletter to reflect the needs of our membership, so the first thing we're doing is asking you to help name it. And the winner gets a free one-year membership to the AFHF! See details on the next page. I look forward to seeing your suggestions.

Announcements

- **2023 Symposium now available on website** Learn More
- **May 9, 2024: Annual Member Meeting, Board Meeting & Awards Banquet at the Army-Navy Country Club, Arlington, VA**
- **Please participate in the 9/12 project! Our latest additions include A-10 pilot Tammy Barlette** Learn More
- **Many thanks to our Symposium partner, the Super Sabre Society**

Quiz

The first jet aircraft in the US, the XP-59, first flew on what date?

a. February 4, 1943

b. January 8, 1944

c. March 15, 1945

See the answer on the last page of the newsletter!

Newsletter Naming Contest

Your chance to win a free one-year membership to the Air Force Historical Foundation!

US Air Force retirees have a newsletter named *The Afterburner*, and the Air Force Museum Foundation has *Airmail.* What will the newsletter of the Air Force Historical Foundation be called? You get to decide!

We're looking for a catchy name such as *The Afterburner*, an Air Force term that reflects that the newsletter readers are in the second stage of military life.

The person who submits the winning name will receive a free one-year membership to the Air Force Historical Foundation!

Contest Rules:

1. Submit your suggestions to xd@afhistory.org by March 1, 2024.
2. Each person may submit up to three names.
3. If more than one person submits the winning name, the winner will be determined by a drawing, but all people who suggested the name will be recognized in the Spring newlsetter.

For ideas, click here to check out our website!

Richard Whitcomb and the Area Rule

John D. Anderson, Jr.

USAF Photo

In 1943, a young engineer passed through the front gate of the National Advisory Committee for Aeronautics (NACA) Langley Aeronautical Laboratory at the outskirts of the sleepy tidewater town of Hampton, Virginia. Richard T. Whitcomb, an honors graduate from Worcester Polytechnic with a degree in mechanical engineering, had just been hired by the NACA to work as a wind-tunnel engineer. He came with a fertile background. Born in Evanston, Illinois on February 21, 1921, Whitcomb was influenced by his grandfather, who had known Thomas A. Edison. Much later, in an interview with the *Washington Post* on August 31, 1969, Whitcomb stated that: "I used to sit around and hear stories about Edison. He sort of developed into my idol." Whitcomb, with an already intense interest in aeronautical engineering, had read a *Fortune* magazine article on the research facilities at the NACA Langley Laboratory, and decided that was where he belonged. Little did he know, as he began his first work day at the Laboratory, that he was destined to become one of America's most innovative aerodynamicists.

In the late 1940's, the Langley wind tunnels were busy with research on high-speed flight. Chuck Yeager in the Bell X-1 had broken the sound barrier in 1947, and supersonic flight was, by far, the dominant aspect of NACA's research programs. Whitcomb was assigned to the Langley 8-foot transonic wind tunnel, where in a few years he developed a reputation as an "idea person" for his combination of knowledge and intuition about aerodynamic flows. By 1950, he was deeply involved with a study of the large drag increase that an airplane experiences as it approaches the speed of sound. He realized that the physics of the airflow changed dramatically as it expands from subsonic to supersonic speeds. He began to intuitively visualize that the shape of the fuselage in the vicinity of the wing should have a reduced area to help smooth this expanding flow and to mitigate the formation of shock waves that served to increase the drag. Whitcomb also knew that ballistics engineers had been designing artillery shells and machine gun bullets for years with a smooth distribution of cross-sectional area in order to reduce the wave drag at supersonic speeds. To better understand this concept, imagine taking a tube of sausage and cutting it into a number of thin round slices. The area of each slice is essentially the same. Similarly, if you slice an artillery shell the same way, the area of the slices will smoothly vary with distance along the shell, good for reducing drag. In contrast, if you slice a conventional airplane in the same way, you will find a smooth distribution (*cont. on next page*)

This article is reprinted from USAF: A Complete History, *2006.*
It has been lightly edited from the original.

(*cont. from page 4*) of cross-sectional area along the fuselage until you get to the wing. There the cross-sectional area of the wing suddenly adds to that of the fuselage, creating a sudden and discontinuous change in the area. Whitcomb reasoned that to preserve a smooth distribution of area in the vicinity of the wing and thus reduce drag, the area of the fuselage would have to be reduced accordingly, giving the fuselage a type of "coke-bottle" shape. This concept later became known as the area rule.

Whitcomb's concept first encountered some skepticism from his colleagues. Then Adolph Busemann, a famous and respected German aerodynamicist then working for the NACA, heard Whitcomb give a seminar on the area rule concept. Busemann called it "brilliant." Whitcomb was allowed to pursue the idea, carrying out a number of wind tunnel experiments in early 1952 that proved its validity. Indeed, the data showed that the large drag rise near Mach 1 was reduced almost 60 percent when the fuselage was sufficiently indented in the vicinity of the wings. These dramatic results, however, were not immediately appreciated by the aircraft industry.

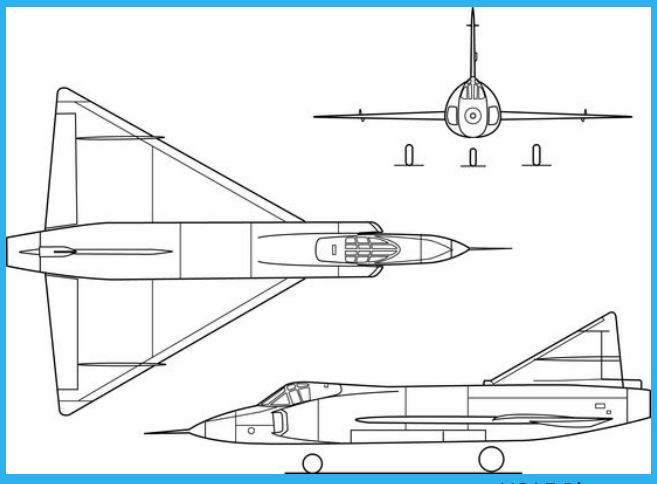
Serendipity stepped in. At the same time that Whitcomb was spending long days and nights in the wind tunnel conducting his research, Convair was designing one of the new "century series" fighters intended to fly at supersonic speeds. Designated the YF-102, the aircraft had a delta-wing configuration and was powered by the Pratt & Whitney J-57 turbojet, the most powerful engine in the U.S. at that time. Aeronautical engineers at Convair expected the YF-102 to fly supersonically.

On October 24, 1953, flight tests of the YF-102 began at Edwards Air Force Base, California, and a production line was being set up at Convair's San Diego plant. As the flight tests progressed, however, it became painfully clear that the YF-102 could not fly faster than sound – the transonic drag rise was simply too great for even the powerful J-57 to overcome. Then the Convair engineers began to pay attention to Whitcomb's research results. After consultation with Whitcomb and other NACA aerodynamicists at Langley and inspecting the area-rule findings that had been obtained in the Langley 8-foot tunnel, the Convair engineers modified the airplane to become the YF-102A, with an area-ruled fuselage. On December 20, 1954, the prototype YF-102A left the ground at Lindbergh Field, San Diego, and exceeded the speed of sound while still climbing. Whitcomb's area rule had increased the top speed of the airplane by 25 percent. The production line rolled, and 870 F-102As were built for the U.S. Air Force. The area rule made its debut in dramatic style.

Whitcomb's area rule remained classified until September 1955. Two months after his work became public, Whitcomb was awarded the Collier Trophy, the most prestigious award in aeronautics. The Collier Trophy citation read: "For discovery and experimental verification of the area rule, a contribution to base knowledge yielding significantly higher airplane speed and greater range with the same power." Richard Whitcomb had made aeronautical engineering history.

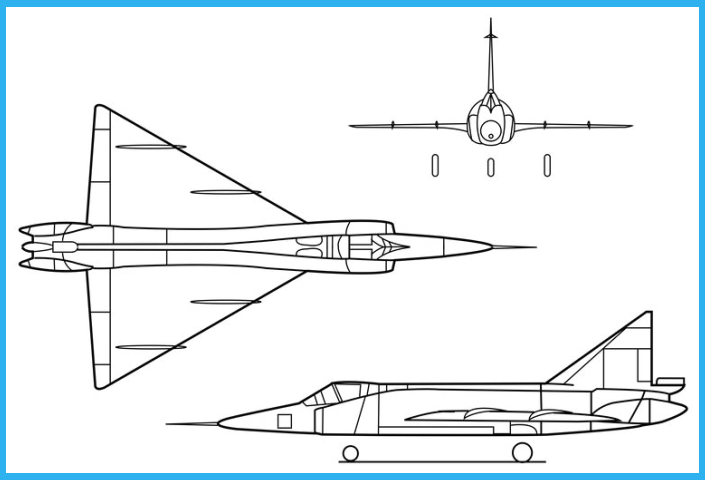
John D. Anderson, Jr., is the Curator of Aerodyanics at the National Air and Space Museum.

Original F-102 fuselage



USAF Photo

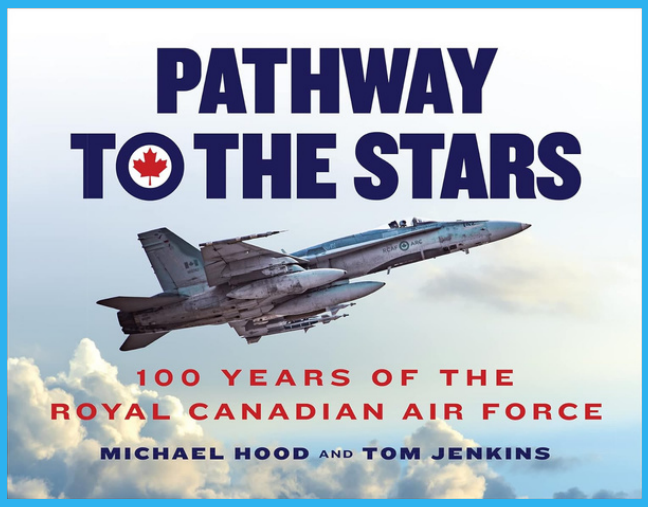
Modified F-102 fuselage



NASAPhoto

Book Review

Scott Willey



This is a beautiful book in both appearance and content. On April 1, 1924, the Royal Canadian Air Force was officially founded. The book tells the story of that illustrious organization and is a fitting tribute to its first century of operations.

And who better to tell this story than former (2015-2018) Commander of the RCAF, Lt-Gen Michael Hood and his co-author—a man with 50 years' affiliation with the RCAF—Tom Jenkins. Between them, they have experienced many varied facets of the service over nearly half of its existence.

The story really begins during the Great War. With no formal air force, thousands of young Canadian men went to the UK to serve in the Royal Flying Corps, Royal Naval Air Service, or the combined Royal Air Force. Anyone vaguely familiar with that war knows the names of Bishop and Barker—2 among 82 Canadian aces—and both awardees of the Victoria Cross.

A small Canadian Air Force was created after the war, but the RCAF was born when "Royal" was added. For the next 15 years, it was primarily involved in developing the huge country: map making, photography, rescues, transporting people and goods to the remote wilderness, and assisting law enforcement all helped open up Canada. A long association with the National Research Council began that successfully led to many technical aerospace innovations.

In the Second World War, Canada was determined to field its own forces. RCAF units served under the umbrella of the RAF but fought as Canadian units. No. 6 (Bomber) Group flew missions from ten bases in the UK. Another 15 squadrons flew fighter and attack missions. However, the RCAF also had to defend Canada's vast coastline, and it provided what may have been the country's greatest contribution to the war effort: the Commonwealth Air Training Program that trained over 130,000 Allied pilots.

The Cold War brought new responsibilities. Not only did the RCAF maintain an air presence in the skies over NATO territory, but it also became and remains a full-fledged partner in continental defense against incoming bombers and missiles. Radar picket lines, manned interceptors, surface-to-air missiles, and joint manning of the North American Air Defense Command (NORAD) fell within the purview of the RCAF.

In the years since the end of the Cold War, the RCAF has become a fully expeditionary force. It has participated in numerous humanitarian and peacekeeping operations and has been a close ally with the US military in many major operations.

But this isn't just the story of weapons and operations. It is the story of people: men, women, Indigenous Peoples, minorities, and LGBTQ members have all shared in the history of the RCAF. The authors tell some stories; the people themselves tell others. In fact, this book centers around the people who have made the RCAF the formidable force that it is today. It is filled with high-quality pictures of all facets of RCAF life—and the majority of them are of people.

Hood and Jenkins have written a book that honors our neighbor and partner to the north. Happy birthday RCAF! May you enjoy many more decades of success.

Col. Scott A. Willey, USAF (Ret), is the Book Review Editor, Journal of the Air Force Historical Foundation, *and a former National Air and Space Museum docent.*

Click here to see books by AFHF members

Member Spotlight

Senior Master Sgt. Dave Diehl, USAF (Ret)

Military background or connection: I served in public affairs during my 22-year Air Force career, including UK Bureau Chief for European *Stars & Stripes*, NCOIC the Defense Information School's Journalism Department, and Public Affairs Advsior to CMSAF Eric Benken.

Why I joined AFHF: Col. (Ret) Eileen Bjorkman encouraged me to look into AFHF. The Air Force public affairs community was all about telling the Air Force story, and for 22 years its history was integral to my career. I haven't been able to shake it off!

Favorite military history book: Too many to mention, but Michael Shaara's Civil War classic, *The Killer Angels,* comes to mind and Winston Grooms's *The Aviators,* a rich compendium of the not-so-often told adventures and exploits of Eddie Rickenbacker, Jimmy Doolittle, and Charles Lindbergh.

Current research project: I am writing the story of Richard E. "Van" VanGrusven, the founder of Van's Aircraft and the RV line of experimental kit airplanes. Raised on a 44-acre Oregon farm, Van hoped to be a USAF pilot, but colorblindness disqualified him. Assigned to Kincheloe AFB in the early 1960s a a communications officer, he also ran the aero club and tinkered with and flew a Stits Playboy, which led to the company that bears his name. The book will be published in 2024.

When I Served

Lt. Col. Dik Daso, USAF (Ret)

Unit: 560th Flying Training Squadron "Chargin Cheetahs"

Unit Dates: Activated Decemeber 24, 1942, as 560th Bombardment Sq. Reactivated May 1, 1962, as 560th Tactical Fighter Sq. Reactivated May 1, 1972, as 560th Flying Training Sq.

Dates I Served in Unit: August 1998 to September 2001

My Unit Memories: During my time as a T-38 Instructor Pilot, I flew a lot, and it was always terrific! I once piloted a photography mission with aviation artist Rick Herter in the rear cockpit. He took dozens of photos of our beautiful gray on gray camo T-38s in formation. The photos & resulting art (samples at left) were spectacular.

Each year, we hosted the Freedom Flyer Reunion, and a former Vietnam POW enjoyed a real "Fini Flight" in the T-38. Most of the former POWs had not flown since their return from Hanoi, making their flight emotional for all involved. Super patriotic! The back cover of the *Summer Special Journal of the Air Force Historical Foundation* features a portrait of Col. Jay Hess after his flight.

I created a unit history display throughout the squadron corridors. The rich history of the 560th continues to remind students and instructor pilots of the proud heritage of the "Chargin' Cheetahs."

Current Unit Status: Advanced fighter training in T-38s at Randolph.

Ask a Researcher

Dr. Phil Meilinger

Question: One comment often made by military historians is that the Air Corps Tactical School (ACTS) at Maxwell Field in Alabama was dominated by a "bomber mafia" between the world wars, and these airmen heavily weighted the curriculum to reflect their views. Thus, the story goes, they pushed the theory of strategic bombardment to the detriment of all other ideas, so tactical airpower was slighted. They conclude that this alleged imbalance led to problems in World War II. Truth or myth?

Answer: Historians like to track down facts to find the real story, because assertions are often made with little or no proof. These assertions then become accepted as fact. So, we dig deeper. Often that means finding "primary sources:" the original letter, report, or interview with a participant. Primary sources can be difficult to find, but rooting around in dusty bookshelves and archives is part of the enjoyment!

ACTS papers are held in the Air Force Historical Research Agency. The archives are wonderfully complete: most of the lectures given by the instructors over the years were saved, so one can follow the thread of how air doctrine evolved. Also in these archives are course syllabi—the curriculum for the entire year.

ACTS was an Army branch school and was required to master details about that branch and to also teach the other Army branches and the Navy. In addition, students had to understand basic staffing procedures —writing, briefing, logistics, intelligence, administration, etc. As a consequence, over half the curriculum in the 1935 ACTS class taught subjects not even involved with the air.

The air part of the curriculum was divided into three main divisions along with map exercises and "tactical problems:" bombardment, pursuit (fighters and attack operations), and observation. Following these was a capstone course titled "Air Force," which tied it all together to fit into a theater commander's operational plan.

Of 494 hours of class time that year, 44—only 8.9 percent—were devoted to bombardment, about the same amount as devoted to other air functions. Pursuit was hardly slighted; four notable instructors were Hoyt Vandenberg, George Kenney, Earle Partridge (all later four stars), and Claire Chennault.

When one examines these primary sources it becomes obvious that ACTS was not dominated by a bomber mafia intent on denigrating the importance of tactical airpower. It's time to put an end to the canard about a dominant bomber mafia.

Dr. Phillip S. Meilinger served 30 years in the USAF as a command pilot, Pentagon staff officer, Dean of the School of Advanced Airpower Studies, and professor at both the Naval Air War College and the Air Force Academy.

Submissions

This is your newsletter; we need content from you!

Please send submissions to newslettereditor@afhistory.org

Feature Articles: Less than 1,500 words. Submit full articles or ideas to editor.

Book Reviews: Less than 500 words. In addition to traditional airpower and aviation history books, we welcome young adult and children's books with aviation themes.

Ask a Researcher: Send questions or let us know if you would like to answer questions.

When I Served: Answer the five questions and submit. We are interested in anyone who has served in any USAF or USSF unit at any time.

Quiz Answer: Jan 8, 1944