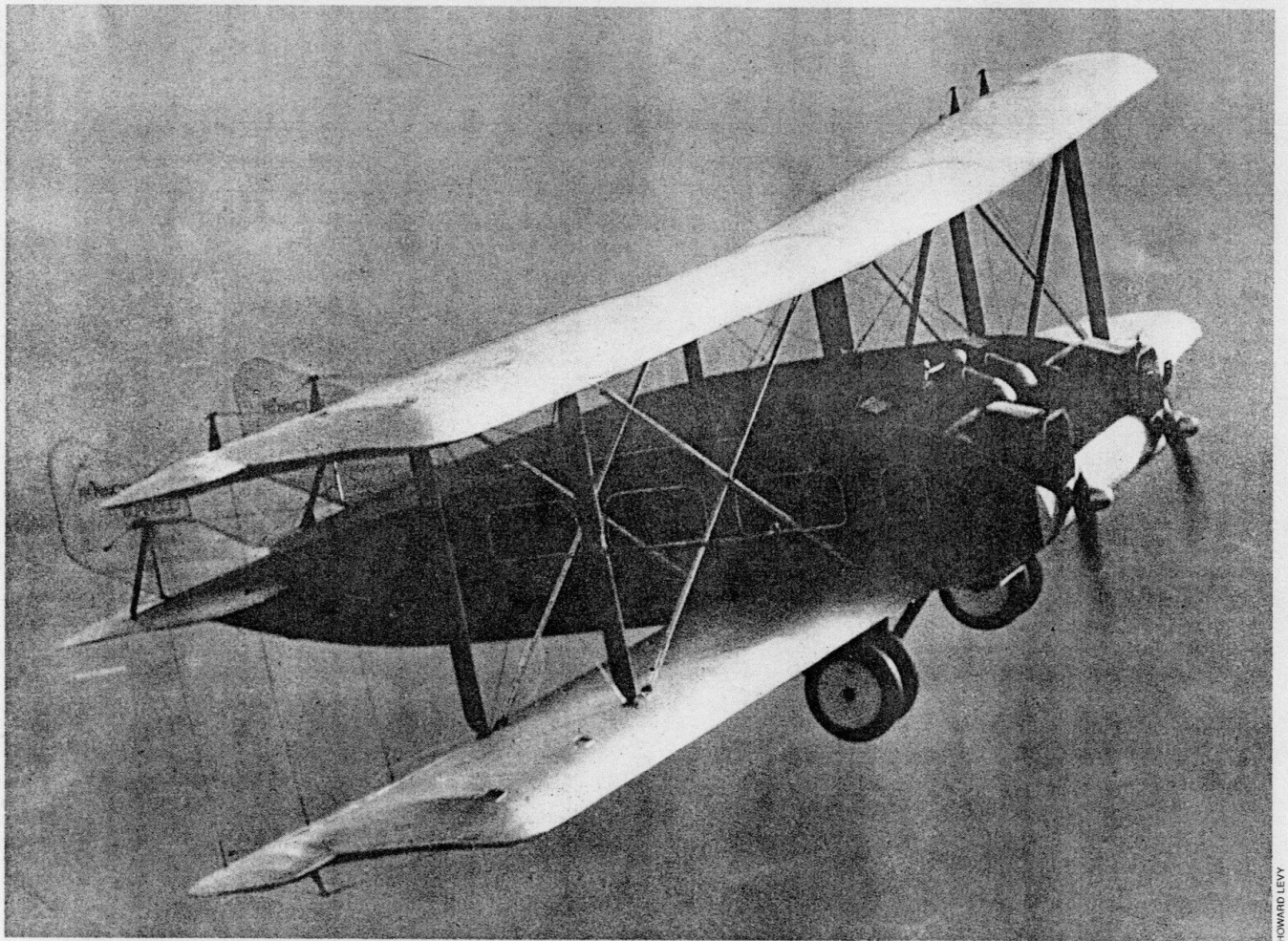


BURNELLI AND HIS



HOWARD LEVY

Vincent J. Burnelli wanted to incorporate maximum efficiency in the realm of air transport. The unorthodox result pioneered the wide-body cabin and the lifting-fuselage design.

By John D. Pelzer

There must have been some odd looks on the faces of the Provisional International Civil Aviation Organization officials on hand to witness the demonstration flight of the Burnelli CBY-3. The different-looking transport plane roared down the runway at Montreal's Cartierville Airport in August 1945 and flew into what would

turn out to be a short history. Like the Douglas DC-3, the most famous transport aircraft of the period, the CBY-3 was a large, twin-engine, all-metal monoplane. There, however, the resemblance ended.

The two engines of the DC-3, like most multiengine aircraft, were mounted in the wings; the engines of the CBY-3 were

mounted side by side on the forward edge of the fuselage. The DC-3 had a conventional single tail section at the rear of the fuselage; the CBY-3 had a twin tail mounted on booms extending rearward from the main fuselage. Most unusual of all, however, was the unique shape of the CBY-3's fuselage. Rather than the circular cross-section main fuse-

FLYING FUSELAGE

lage of the DC-3, the CBY-3 had a rectangular cross-section fuselage, 20 feet wide, in the airfoil shape of a wing when seen from the side.

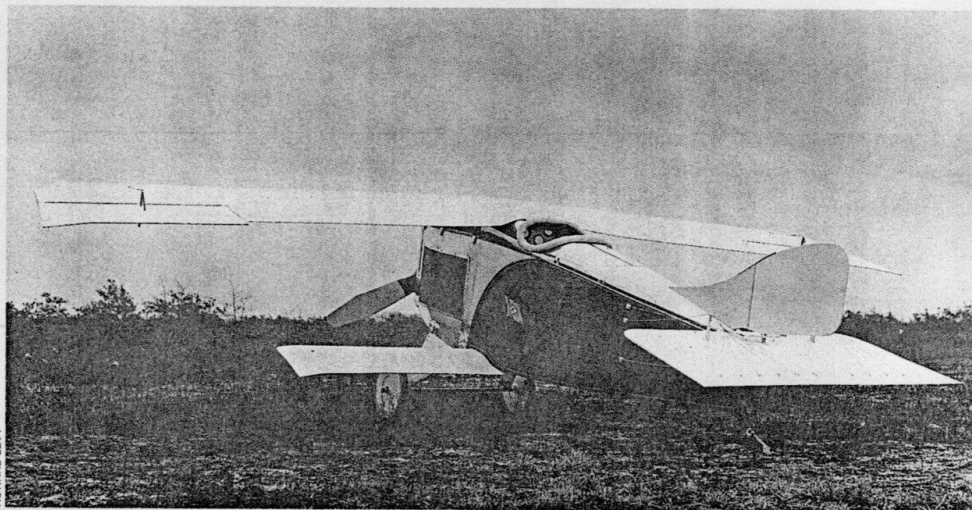
Even more remarkable than the CBY-3's appearance was its performance. It could carry a ton more payload than the DC-3. But the most impressive thing of all was that test pilot Clyde Pangborn guided the CBY-3 into the air with a takeoff run of only 650 feet.

What was the miracle airplane that made its test flight on that Canadian summer day? Why aren't its wondrous capabilities better known? The answers to these questions are only a small part of one of the most interesting stories of the youth of America's aviation industry—that of designer Vincent J. Burnelli.

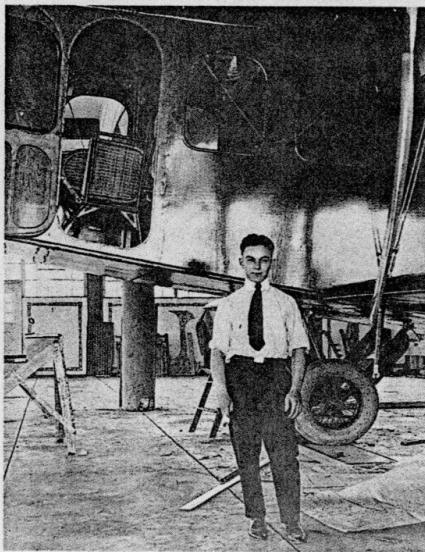
Since the early days of aviation, aircraft designers have dreamed of utilizing the payload-carrying space of the fuselage to create the lift needed to keep the plane in the air. Such a plane could, if the design's problems were worked out, carry more, climb quicker, and stay in the air with less power than aircraft of more conventional design.

The concept is almost as old as manned flight itself. In 1909, Professor Hugo Junkers envisioned a large "flying wing" aircraft capable of carrying hundreds of passengers. Other similar designs followed, from the famed XB-35 and XB-49 flying-wing designs of Jack Northrop during the 1940s and 1950s to the Stealth aircraft of the 1980s, the Lockheed F-117A fighter and the Northrop B-2 bomber. But no one tried harder or spent more years making the concept a reality than Vincent J. Burnelli.

Like his transport, Burnelli was a product of the pioneer days of American aviation. Born in Temple, Texas, on November 22, 1895, he received his education along the southern border of the United States. He attended public schools in Temple and Monterrey, Mexico, before moving east to spend three years studying at St. Peter's College in New Jersey. From his early youth, Burnelli showed an interest in aviation. He first learned to fly gliders at Staten Island, N.Y., in



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1915, and graduated to piloting powered aircraft at Lincoln, Neb., in 1919.

Designing aircraft rather than flying them, however, was Burnelli's greatest passion. Along with friend John Carisi, he first began experimenting with gliders in 1912. By 1915, the pair had produced their first powered design, an open biplane they built in Queens, N. Y. They tested it at the Hempstead Plains Air Field, which was later to gain much greater fame in aviation history as Long Island's Roosevelt Field. Always con-

OPPOSITE PAGE: The Remington-Burnelli RB-1 of 1920, which introduced Vincent J. Burnelli's lifting-fuselage design. TOP: As an engineer for the Continental Aircraft Company in 1918, Burnelli was involved in building Dr. William W. Christmas' disastrous Bullet fighter, both of whose prototypes crashed, killing their pilots. LEFT: Burnelli in 1919, alongside the airliner he designed for the Lawson Aircraft Company.

cerned about practicality, Burnelli and his partner wasted no time putting their creation to work. "We used it for barnstorming," Burnelli later recalled of his first design. "You could make \$500 to \$1,000 in those days working a fair, and that was big money."

World War I created a great demand for aviation know-how, and Burnelli used the opportunity to establish himself in the aircraft industry. During the course of the war, he worked for the International, Continental and Lawson aircraft companies in such varied positions as engineer, designer and superintendent. He also invented an aerial torpedo plane and designed a plane for the Brazilian government.

Burnelli also became interested in designing transport aircraft, and the fascination would follow him through the rest of his life. In 1919, while working for Milwaukee's Lawson Aircraft Co.,

Burnelli designed one of the first commercial transports, a 26-passenger biplane. Despite the project's success, Burnelli was disappointed with the resulting design.

As an engineer, Burnelli believed that all of an aircraft's basic components should be used to help it maintain flight, which was not the case in transports of the time. The fuselage in a conventionally designed plane, he felt, was only a box to carry passengers and cargo and provided no lift. Because the Lawson transport possessed this weakness, he referred to it as a "streetcar with wings."

Burnelli was determined to create a plane where all the parts helped provide the lift needed to keep it in the air. "The air is the roadbed of an airplane," said Lawson, "and I decided I'd leave streetcars on the ground from then on." For the vital task of providing the lift, designers generally relied entirely upon the wings. Burnelli, however, felt a lighter and much more efficient aircraft was possible if the fuselage as well as the wings provided lift. He soon set about designing just such a transport. In 1920, Burnelli

teamed up with T.T. Remington to create his first lifting-fuselage design.

The plane, the RB-1, was a twin-engine biplane that incorporated many of the unique features that would be associated with Burnelli-designed transports for the next five decades.

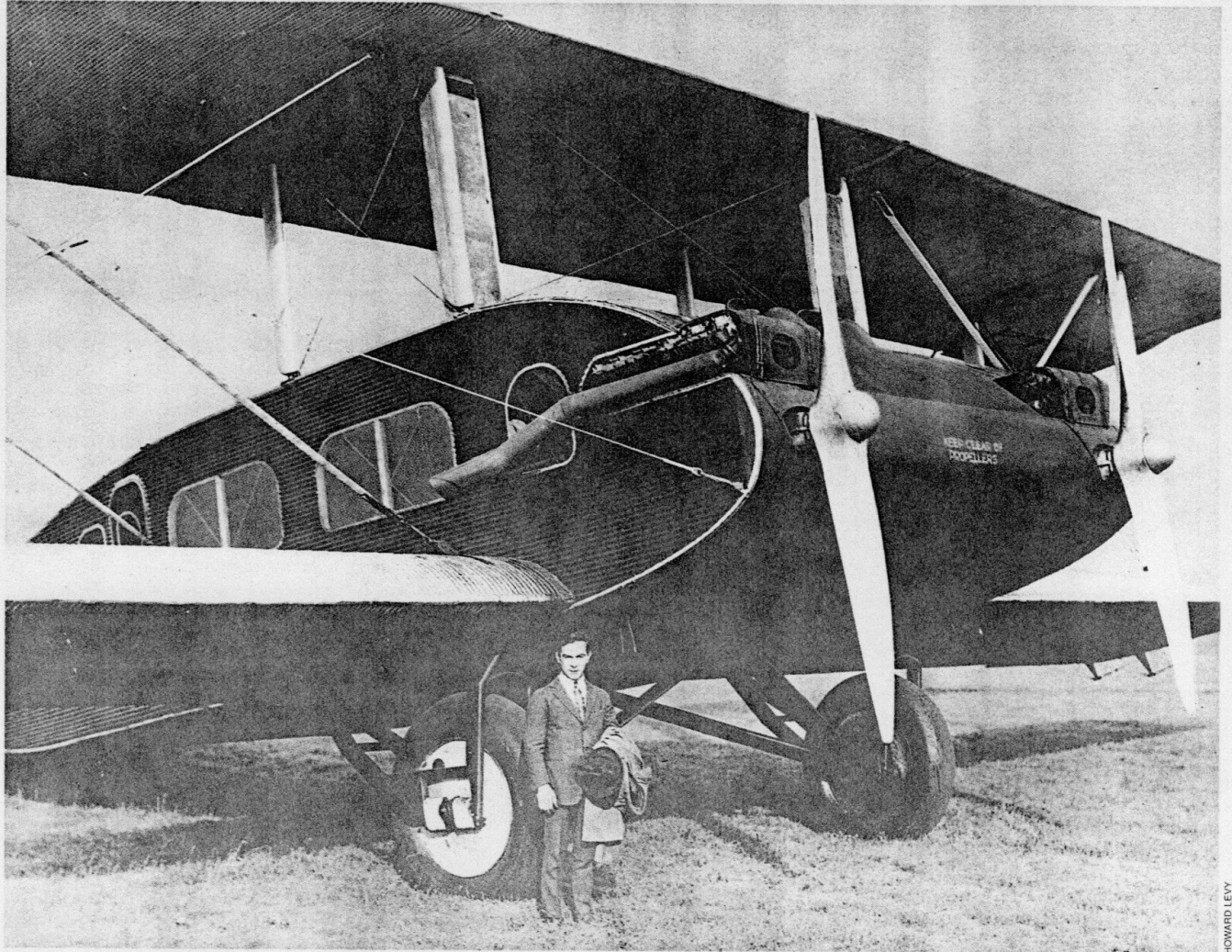
The most recognizable feature of the Burnelli-type transport was, of course, the wide, flat, airfoil-shaped fuselage, a feature that provided an estimated 40 percent of the aircraft's lift. The aircraft's unique engine placement was equally characteristic of a Burnelli design. Rather than placing the engines in nacelles between the wings, as was the custom, Burnelli mounted the twin power plants side by side on the front edge of the airfoil-shaped fuselage.

Burnelli's idea had many advantages over more conventional engine placement. By eliminating the nacelles, Burnelli's made his planes lighter than comparable transports of more conventional design. Burnelli's method also reduced stress in the wings at the points where the engines were mounted and reduced the plane's frontal area. Those changes

decreased drag and improved the aerodynamics of a Burnelli-designed plane.

The design also had safety advantages. Some have claimed that the flat, rectangular fuselage of the Burnelli transport was stronger and provided more protection for passengers than the long, narrow fuselage of a conventional liner. In addition, Burnelli's design placed the engines well in front of the passenger compartment, which, experts agreed, helped absorb shock in the event of a crash. It also kept the propellers well away from the passengers' area, which reduced both noise and danger for the passengers in the case of propeller blade failure. The arrangement even allowed the flight crew partial access to the plane's engines from inside the cabin during flight.

Burnelli and others often referred to his lifting-fuselage aircraft as flying wings. The term, strictly speaking, was not entirely accurate. The fuselage of a Burnelli-design aircraft, although airfoil-shaped, was distinctly not the same component as the wing. In addition, Burnelli transports invariably had a twin tail.



Vincent J. Burnelli stands in front of the Remington-Burnelli RB-2 in 1924. An air freight version of the RB-1 airliner, the RB-2 featured corrugated metal construction. As one demonstration of its potential, it served as a flying automobile showroom, with an Essex coupe inside.

ideal choice to pilot the Burnelli plane. His previous achievements in the air alone would have been sufficient to attract the attention of the aviation world to the flight.

Although the trans-Atlantic flight eventually fell through, Burnelli went ahead with plans for a European demonstration and had the plane disassembled and sent to Europe by ship. Initially, however, things did not go well for Burnelli's European enterprise. The British customs service kept the disassembled aircraft in crates for months at Southampton, England. To make matters worse, the Scottish Aircraft Co., which held rights to build the Burnelli design, had gone into receivership before completing its Burnelli prototype.

Eventually, however, Burnelli's fortunes in Europe began to improve. Finally released from British customs, the UB-14 was reassembled in Holland and, in December 1937, with Pangborn at the controls, made its long-awaited demonstration flight at Hatfield, England.

The flight had the desired effect upon Great Britain's Cunliffe-Owen Aircraft Corp., a new aircraft firm started by Sir Hugh Cunliffe-Owen of the British American Tobacco Co. The firm undertook to build a European Burnelli transport. The resulting plane, the OA-1 Clyde Clipper, briefly saw production in Europe. Burnelli's long-sought success, however, was short-lived. Only one plane



One of the last photographs taken of Burnelli—still steadfastly promoting his designs—shortly before his death in 1964.

was completed when World War II broke out in Europe. With Britain's aircraft industry devoted almost entirely to military aircraft, no more Clyde Clipper transports were built. The sole British Burnelli aircraft was pressed into service by the RAF and was eventually turned over to the Free French Air Force in Africa, where at one point it served as the personal transport of General Charles de Gaulle. Worn out by its wartime service, the Clyde Clipper reportedly met its

end as the centerpiece of a V-J Day (victory over Japan) bonfire.

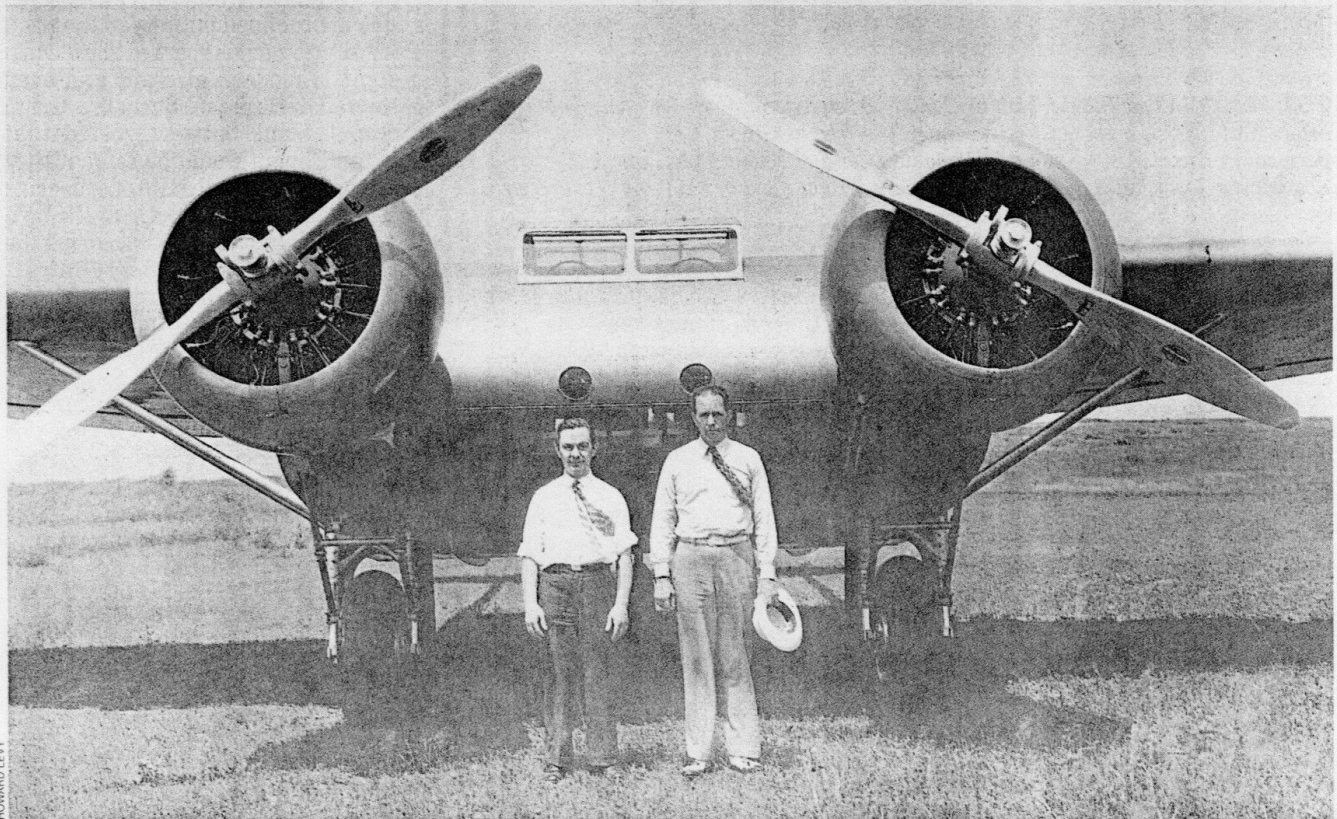
Throughout his career, Burnelli made several attempts to adapt his lifting-fuselage design to military use. Those efforts, however, fared no better than his civilian designs. Rumors circulated that financial backing from a political opponent of President Roosevelt kept Burnelli from gaining the kind of government support enjoyed by many of his competitors. Whatever the reason, Burnelli did not share in the lucrative military contracts enjoyed by other aircraft manufacturers at the time.

In 1935, Burnelli submitted his design for the two-engine bomber, the A-1, to the U.S. Army Air Corps. The design got no further than the mock-up stage.

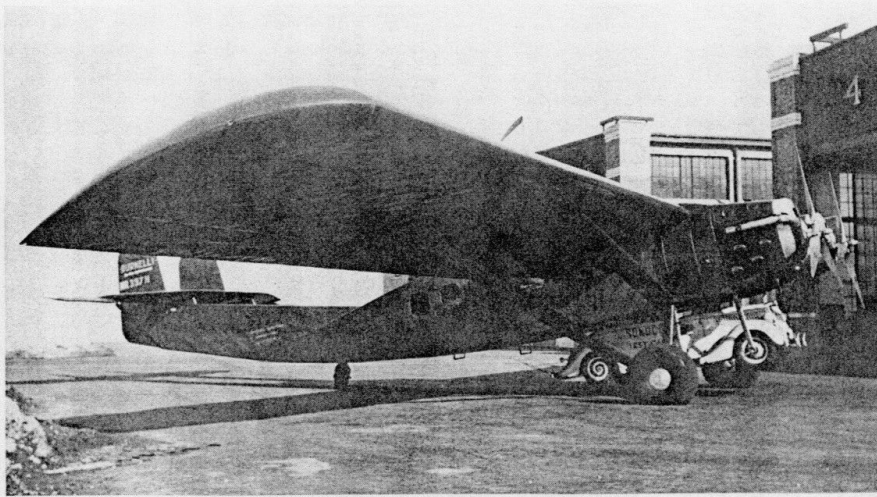
In 1943, Burnelli adapted his A-1 bomber design into a lifting-fuselage glider, the XCG-16, which was capable of carrying 40 troops or 4 tons of cargo. Like his powered aircraft, the glider never saw production. Despite excellent test results, only one prototype of the XCG-16 was built.

The war, however, did not keep Burnelli from trying to build his transports. In 1944, Burnelli joined the Canadian Car and Foundry Ltd. of Montreal. The firm worked to adapt the Burnelli design for sale to the Canadian market.

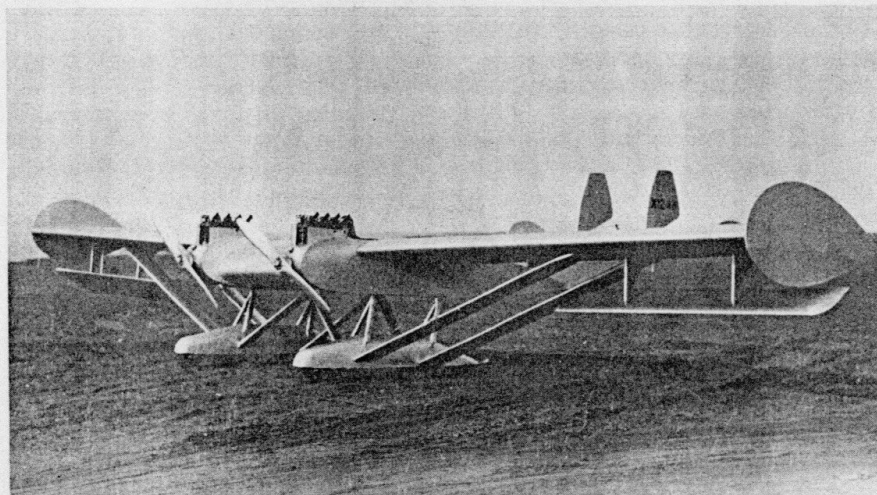
Special problems faced Canadian aviation. Rugged wilderness conditions and primitive facilities were even more com-



Vincent Burnelli and Clyde Pangborn in front of the Burnelli UD-14, which Burnelli wanted Pangborn to fly across the Atlantic as a demonstration to potential European customers. Ultimately, the plane was shipped across in crates and did not fly until December 1937.



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TOP: The Uppercu-Burnelli UB-20 at Floyd Bennett Field, with a Ford roadster slung under the fuselage, during an unsuccessful attempt to prove that Sun Oil Co.'s fuel could start a car even in the low temperatures found at high altitudes. ABOVE: The Uppercu-Burnelli GX-3 arrived too late for the Guggenheim Safe Aircraft Competition.

engine, two-seat, low-wing sport monoplane was relatively straightforward. It was essentially the Aeromarine-Klemm with floats added. Nonetheless, the design of the floats, not the aircraft, upheld Burnelli's reputation for innovation. A set of four retractable landing wheels mounted in the floats permitted the plane to operate on land as well as on water. The plane attracted considerable attention when it made its first public appearance at the Newark, N.J., municipal airport and at Long Island's Roosevelt Field. Those watching were convinced the seaplane would crash as it attempted to land on an ordinary tarmac runway. Instead, the small sports plane made a perfect landing despite the presence of the large set of floats.

In May 1930, after 10 years of trying, Burnelli received a patent for his transport design. With this assurance, Burnelli and his firm redoubled their efforts to obtain sufficient orders to allow the full-scale production of the UB-20. During 1931 and 1932, advertisements ap-

peared regularly in aviation trade publications touting the advantages of the Burnelli design. Such efforts, however, were doomed to failure in those Depression-plagued years.

Despite their cutting-edge technology, the Burnelli transports were not pretty, so gaining acceptance for such an unusual and revolutionary design was not an easy task. Burnelli himself unwittingly contributed to this problem as well. By insisting upon building the lifting-fuselage design himself, he kept other, larger manufacturers from incorporating his ideas into their aircraft. In addition, the rapid development of more powerful aircraft engines in the 1920s and 1930s also worked to the transport's disadvantage. The increasingly powerful engines available on the market often more than compensated for the conventional aircraft design weaknesses that gave a performance edge to the Burnelli design.

Still, Burnelli was tireless in his efforts to demonstrate the practicality and efficiency of his planes to the public

and the aviation industry. During the 1920s, for instance, the RB-2 became a portable showroom for Essex automobiles. Fitted out to carry eight passengers, a fully equipped office, and an Essex coupe, the plane flew a promotional tour of the United States. On another occasion, the Sun Oil Co. wanted to prove that its fuel could start a car even in the cold temperatures found at high altitudes. In an unsuccessful effort to substantiate this claim, the UB-20 flew over Long Island with a Ford roadster suspended beneath the fuselage.

In 1934, Uppercu-Burnelli changed its name to the Burnelli Aircraft Co. Its commitment to perfecting and promoting the Burnelli design never waned. In 1935, a new prototype passenger liner, the UB-14, appeared on the market. The UB-14 retained all the advantages of the UB-20 and Burnelli's other designs. "It is claimed that the cabin space per passenger is much larger than for any conventional type airplane so far built," *Aviation* magazine, the forerunner of the contemporary *Aviation Weekly*, said in September 1935.

The UB-14, like its predecessors, failed to attract sufficient orders or the kind of financial backing necessary to put the plane into full production. Burnelli therefore turned more and more of his attention abroad to seek financial backing for his designs from the European aviation industry. Several European companies expressed interest. In July 1936, Britain's Scottish Aircraft Co. was preparing to build its own version of the UB-14 at its Willesden plant. Holland's Avirolanda Aircraft Co. had also expressed interest in the design. To capitalize upon that foreign attention, Burnelli decided to send the UB-14 to Europe.

Burnelli first planned to send the plane to Europe in a spectacular trans-Atlantic flight. To fly the prototype, Burnelli obtained the services of Clyde Pangborn, a well-known pilot. Pangborn was a longtime supporter of the Burnelli design and had a long association with Burnelli aircraft. A former World War I aviator and barnstorming pilot, Pangborn first achieved national fame in 1931 when he and his partner, Hugh Herndon, flew their specially designed, high-wing Bellanca Skyrocket monoplane from Tokyo to Wenatchee, Wash., covering the 4,600 miles in 41 hours, 13 minutes.

To extend their plane's range, Pangborn and Herndon had jettisoned the landing gear soon after takeoff and made an undignified belly landing upon their arrival in the United States. Nonetheless, Pangborn and Herndon became the first men to fly nonstop across the Pacific, and they collected the \$25,000 cash prize offered for the feat by a Tokyo newspaper. Clearly, Pangborn was an

In his later designs, the tail was mounted on booms at the rear of the plane.

Burnelli was convinced that he had created a truly revolutionary aircraft design, and used his efforts tirelessly to gain its acceptance from a skeptical aircraft industry. From the 1920s until Burnelli's death in 1964, his transports would remain a constant, if largely unappreciated, presence on the U.S. aviation scene.

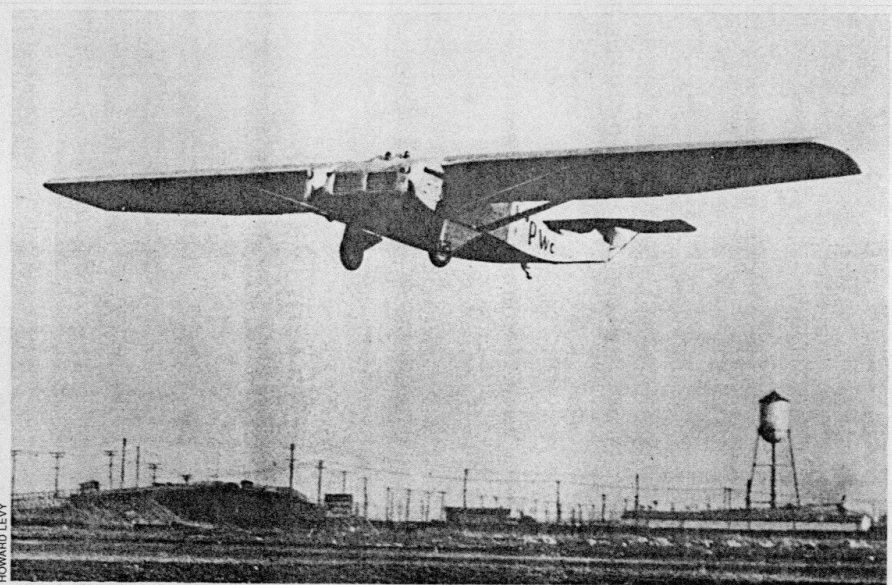
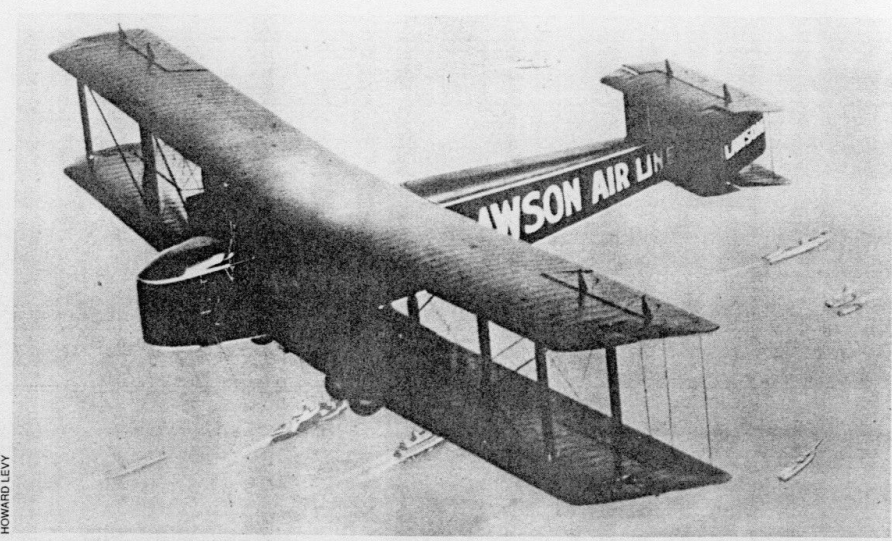
In 1921, Burnelli organized the Remington-Burnelli Co. to help promote his design. Over the next few years, the company set out to produce a series of transport prototypes based upon his revolutionary concept. Each incorporated the most modern features, often before they appeared on more conventionally designed aircraft of the time. In 1924, the RB-2, an air freight version of the RB-1, was introduced. The RB-2 incorporated corrugated metal construction.

By 1928, Burnelli joined forces with banker and Skylines Inc. president Paul B. Chapman to build the CB-16. The plane not only was Burnelli's first monoplane transport but also incorporated all-metal construction and retractable landing gear. In 1929, the aileron cables became crossed during maintenance, and the plane crashed during testing. Both the pilot, Lieutenant George Pond, and his copilot emerged from the wreckage unhurt, a tribute to both the strength and the safety of the Burnelli design.

To build the Chapman Airliner, Burnelli had rented space and tools at Aeromarine's Keyport, N.J., plant. The arrangement led to his next business enterprise in 1929 when Burnelli joined Aeromarine backer Inglis M. Uppercu to form a new company, Uppercu-Burnelli Corp. Uppercu served as the firm's president and sales manager, while Burnelli worked as a vice president and the firm's chief engineer.

The company soon established operations at Aeromarine's Keyport plant. The UB-20 was Burnelli's first offering at Uppercu-Burnelli. The 20-passenger airliner clearly captured the public's imagination when it made its first public showing on February 7, 1930, at the New York Aviation Show. *The New York Times* reported that Burnelli's aircraft was "the largest plane in the show" and "the centre [sic] of airplane interest in the exposition."

Probably the greatest technical breakthrough of Burnelli's UB-20 was its all-metal construction. "The new all-metal Burnelli 20-passenger transport...incorporates a new type of structure possessing important advantages in strength-to-weight efficiency," Burnelli wrote about the liner in *Aero Digest*. "Outstanding advantages of this type of construction are reduction of fabricating expense and greater durability afforded



TOP: Although the Lawson transport was fairly successful, Burnelli described it as "a streetcar with wings." ABOVE: Burnelli's first monoplane, the Chapman-Burnelli CB-16. Built for Paul B. Chapman of Skylines Inc., it may have been the world's first executive transport and the first twin-engine airplane with retractable landing gear.

by the heavy, flat, stressed skin covering," Burnelli observed. Tests at the time substantiated many of Burnelli's claims about the superiority of his design. An article in *Aero Digest* in 1930 stated that the Burnelli transport was 2.76 percent lighter and had a smaller frontal resistance area and greater lift than a conventionally designed twin-engine transport of the same size.

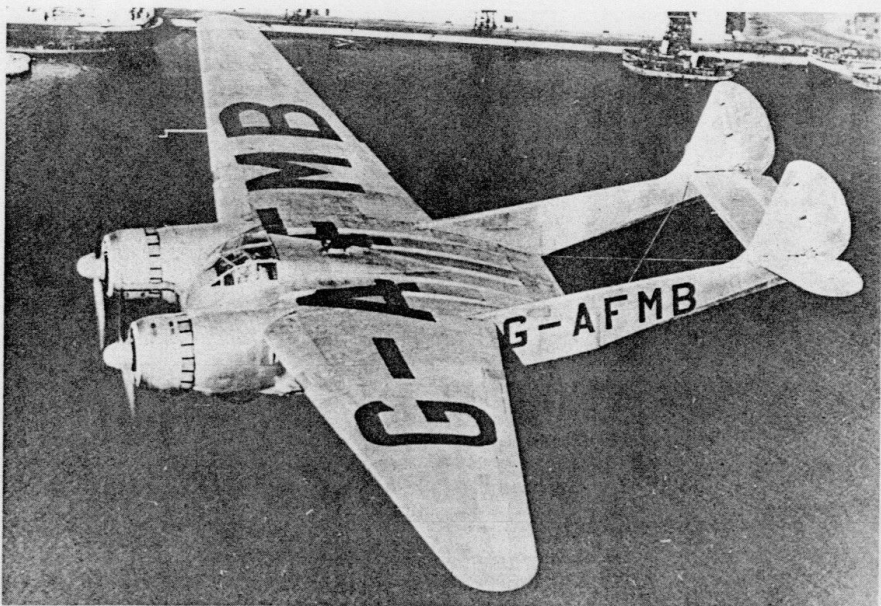
The designer's activities during the period, however, were not confined entirely to large transport aircraft. In 1929, Burnelli designed and built a smaller version of his airplane—called the GX-3, a three-seat, open-cockpit, twin-engine monoplane—as an entry for the \$150,000 Guggenheim Safe Aircraft Competition.

The competition, sponsored by millionaire Daniel Guggenheim, was intended to promote the development of commercial aircraft. Burnelli's aircraft

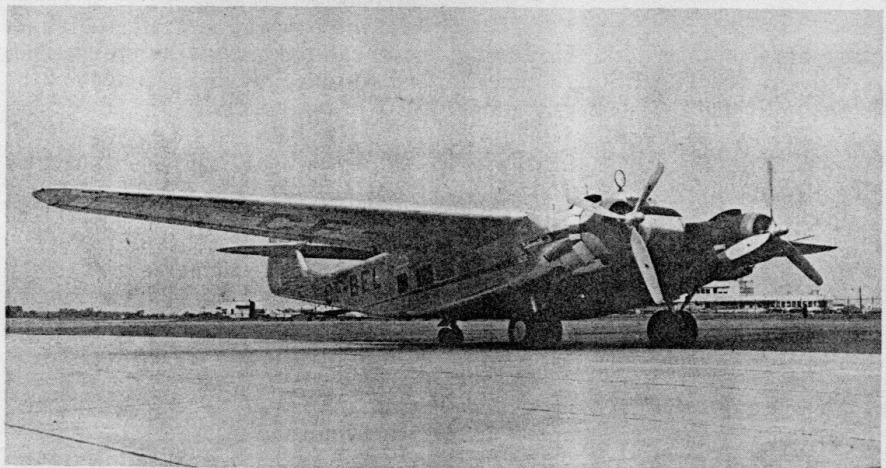
did not win the competition. Although it was clearly one of the most original and innovative entries, it arrived too late at New York's Mitchell Field to take part in the competition's official trials. Despite the setback, the GX-3's performance was reported to have been excellent.

Uppercu-Burnelli Corporation was also involved in building small sport aircraft. The firm produced the Aeromarine-Klemm, a German-designed, personal sport monoplane, under license at its Keyport plant for the American market. In 1930, Uppercu-Burnelli also introduced its own floatplane version, called the Uppercu-Burnelli Amphibian seaplane.

Unlike Burnelli's transports, the seaplane had little that was revolutionary about its design. With a length of 23 feet 5 inches, a wingspan of just over 40 feet, and an empty weight of about 1,300 pounds, the design of the small, single-



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TOP: The OA-1 Clyde Clipper, built by Cunliffe-Owen Aircraft Corp. Only one was built before World War II broke out, and it eventually served as General Charles de Gaulle's personal transport. ABOVE: Built by Canadian Car and Foundry Ltd., Burnelli's CBY-3 Loadmaster 2 was tested by the U.S. Air Force at Wright Field in 1948—but not accepted.

mon in Canada than they were in the United States. Canadian Car and Foundry sought to utilize the advantage of the Burnelli design to meet the heavy demands of wilderness flying. The fruit of this collaboration was the Burnelli CBY-3.

The plane was typical of Burnelli's earlier transport designs. With a length of just over 57 feet, a wing span of 86 feet, and a gross weight of 27,000 pounds, the twin-tailed liner carried 24 passengers. It was powered by a pair of 1,200-hp Pratt and Whitney Twin-Wasp engines.

The test flight, at Montreal in August 1945, with Pangborn at the controls, proved the plane admirably suited to wilderness flying. "With approximately the dimensions and performance of such conventional air transports as the DC-3 it is claimed...an air-foil profile enables the plane to carry another ton of payload," reported one newspaper story. Even more important for its wilderness purpose, the

plane managed to take off and land within 650 feet, a decided advantage when operating on primitive airfields.

Those years following World War II were boom years for civil aviation in the United States—in general, a time of unprecedented growth for both airlines and aircraft manufacturers. In an effort to capitalize on the boom, Canadian Car and Foundry promoted Burnelli's CBY design in the late 1940s under the name "Loadmaster." However, the plane, like Burnelli's designs of the 1920s and 1930s, never fully shared in the industry's general prosperity.

Despite their operational advantages, Burnelli's post-World War II designs faced many problems gaining industry acceptance. Like its predecessors, the Burnelli transport was again hampered by its unconventional design and unusual appearance. More important, however, the designs faced fierce competition.

The end of the war left available large numbers of surplus military aircraft. Such planes had proven service records and were inexpensive. Those were difficult circumstances for even the most promising experimental aircraft design to overcome.

But Vincent Burnelli did not abandon his designs. Until his death in Southampton, N.Y., in 1964 at the age of 69, Burnelli remained tireless in his determination to promote his airfoil-shaped-fuselage transport plane. In 1955, he adapted his Burnelli Loadmaster transport to carry an expedition of 20 passengers and 41 sled dogs, along with their equipment, to the North Pole, but the enterprise was canceled. The Loadmaster also flew regularly as a commercial airliner in South America and languished abandoned for some time at Baltimore's airport in Maryland until it was finally retired to the New England Air Museum in Windsor Locks, Conn., in the late 1960s.

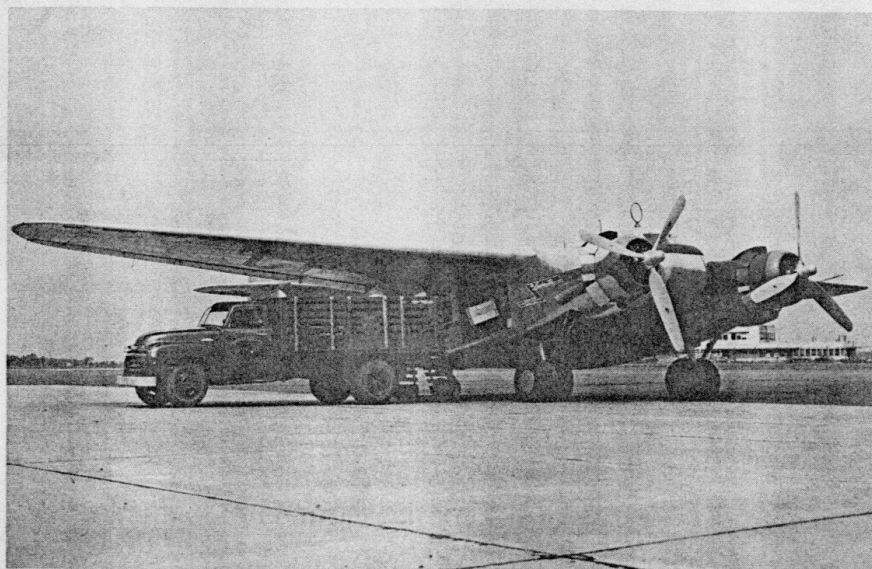
Few figures in the history of American aviation have sparked more controversy than Burnelli did during his lifetime, and the disagreement continues only slightly abated today. Supporters claim that only a shortsighted aviation industry, with a vested interest in preserving conventional designs, kept Burnelli's ideas from revolutionizing aircraft design. Others claim the advantages of the Burnelli design were overstated.

The argument remains unresolved and is not confined entirely to the past. The disagreement is sparked anew when designs of modern aircraft, and even spacecraft, incorporate Burnelli's design concepts. Some have suggested that today's airliners would be safer if they incorporated Burnelli's lifting-fuselage design. Some even suggest that the "lifting body" characteristic that keeps the U.S. space shuttle flying after re-entry is a direct application of Burnelli's lifting-fuselage design.

Aviation magazine, in a 1935 issue, paid high tribute to the design when it said "few people have stuck to an idea that seemed to them inherently good as has Vincent Burnelli with his airfoil fuselage." Three more decades of effort by the designers followed that 1930s tribute. But Burnelli's contribution to American aviation was more than just determination—it was genius as well. Both qualities made Vincent Burnelli a true aviation pioneer. □

John Pelzer of Dover, Del., writes frequently about history when he is not busy teaching the same subject at Wesley College. For additional reading, see the Crown book History of Aviation and "Burnelli's Lifting Fuselages," Aeroplane Monthly, March 1980.

The unsung Vincent Justus Burnelli designed airplanes that were uniquely shaped to help carry the load.



COURTESY OF HOWARD LEVY

Victim of circumstance: Unable to find success in the United States, Vincent J. Burnelli built his last airplane, the CBY-3, in Canada. The plane survives in Connecticut.

Back in the mid-1960s while researching a story at what is now Baltimore-Washington International Airport, I saw what looked like a derelict of an airplane sitting forlornly in a forgotten corner of the airport. When I asked what it was, the name "Burnelli or something" was mentioned.

Burnelli it was, and the name rang a bell that jogged my memory of a twin-engine airplane designed years before to incorporate a wide-body, airfoil-shaped fuselage to contribute some of the lift, allowing greater loads and lower, safer landing speeds. I spent a half hour in awe, peering at a passenger cabin that was more of a square room than a narrow tube as in the conventional airliners of the day, and let my mind project into it the photograph I had once seen of an automobile parked inside to illustrate the roominess of the interior. I touched, reverently, and marveled at the weathered, but still dignified, aircraft that had once promised something new in aviation.

This issue features an article about the lifting-body concept and the man who put the unconventional into practice—plus the hint of a controversy that

still seems to dog his memory long after his death at 69 in 1964.

That controversy concerns whether the failure of Burnelli's concept to gain government contracts, and subsequent public acceptance, can be attributed—as Burnelli proponents have done—to the Franklin D. Roosevelt administration in the early World War II years. The story goes that by 1939 Burnelli designs had achieved enough success to be considered for procurement for military cargo and passenger purposes. A letter written by the Army's Engineering Division at Washington and signed by military aviation chief General Henry H. "Hap" Arnold, stated, "...it is essential, in the interest of national defense, that this procurement be authorized."

Burnelli was invited to Washington for the signing in 1940 of a production contract. As he was about to sign the document, President Roosevelt is reported to have casually asked Burnelli where his financial backing came from. When Burnelli named Sun Oil Company magnate Arthur Pew, a suddenly enraged Roosevelt refused to sign the document and had Burnelli summarily ejected. It seems that the Democrat

president objected to giving a military procurement contract to a company financed by a Republican political rival—Pew had backed the president's political competitor in that most recent election year—Wendell Wilkie.

The result was that not only did Burnelli lose the contract but he also was blackballed from future military consideration. That action, coupled with the postwar flood of cheap surplus conventional cargo aircraft, prevented Burnelli aircraft from breaking into either the military or the commercial markets in a big way. Although a few more lifting-body aircraft of his design were built and flown successfully, Vincent Burnelli did not experience the success that his concept could have enjoyed, and he died in 1964 without seeing his dream realized.

Burnelli's champion in the cause of gaining recognition for the efficacy of his design and his accomplishments is Chalmers "Slick" Goodlin, a zealous crusader and former X-1 test pilot who today is chairman and president of what remains as The Burnelli Company, Inc., in Miami, Fla. Goodlin not only decries the Roosevelt smear but also claims that Boeing Aircraft Co. stole Burnelli's design and then let it languish in favor of more conventional designs. He points out that Burnelli's design concept can be seen in flying-wing designs and other lifting-body applications such as space vehicles that can re-enter the atmosphere and land like aircraft.

And what became of that Burnelli airplane I visited in the weeds near Baltimore? It turns out to be the last Burnelli built, the CBY-3, of which I have an original blueprint in my memorabilia files. The airplane subsequently was donated by Burnelli's widow to the New England Air Museum in Windsor Locks, Conn., where you can visit it today—and maybe even touch it reverently. Happily, it no longer is ragged and forlorn, for, although not yet complete, it is being carefully restored. Perhaps one of these days it will fly again and prove once and for all the efficacy of the Burnelli design—and vindicate an unsung aerial pioneer.

A.H.S.