

The General Airplanes

Doomed to be the wrong stuff

BY PETER M. BOWERS

In the years before 1927, the U.S. aircraft industry was relatively small and was not very well regarded by the business and financial community. Lindbergh's world-shaking flight from New York to Paris in May 1927 changed all that, and aviation suddenly became a glamour business. By the time the "Lindbergh Boom" was rolling at full speed, capital readily was available for the expansion of existing aviation plants and the establishment of new ones.

In 1928, more than 50 airplane manufacturing organizations were founded in the United States to design and build new models or to build established European designs under license. Some of these fledgling firms prospered, only to succumb to the worldwide economic depression that started with the U.S. stock market crash of October 1929. Others survived after drastic reorganization of their finances and products to adapt to the new technology and the requirements of a greatly diminished market.

One of the firms that was established to cash in on the aviation boom and folded due to the Depression was the General Airplane Corporation of Buffalo, New York, which began business in June 1928. Like many others, General started small and offered a conservatively designed commercial

product. However, this proved difficult to sell even in the seller's market of the time. The competition was fierce, and newcomers such as General were at a disadvantage when the older and larger firms, with their established sales organizations and dealerships, were marketing competitive models. General developed several different airplane designs, but each seemed to be the wrong one at the wrong time, and only one design was produced in quantity.

The firm's first offering was a twin-engine cabin monoplane known as the Model 101 Surveyor. This was a specialized twin-engine design for aerial mapping, but mapping operations apparently found it easier to adapt stock models to the work than to purchase a new single-mission model.

The second General airplane was the Model 102, a three-place cabin monoplane with folding wings that was designed for the private owner. The original concept was not appealing, so the Model 102 was redesigned to the more conventional Model 102A and called the Aristocrat. Designed by the engineering vice president, A. Francis Arcier (who had worked at Handley Page in England during World War I and for the

American Atlantic/Fokker firm in the 1920s), the Aristocrat was a conservative three-seat high-wing monoplane. It often has been referred to as a scaled-down Bellanca because the humped-back fuselage and the peculiar shape of the wing tips were very similar to those details that virtually had become Bellanca trademarks.

The claimed objective of the humped fuselage was to provide an airfoil contour that could generate additional lift. This made a great advertising gimmick but, under critical analysis, it would not perform as a wing. With the fuselage's great length relative to the wing, the travel of the center of pressure throughout the airplane's speed range would, if the humped fuselage were really working as a wing, affect longitudinal trim. Further, a wing with such a fractional aspect-ratio (ratio of chord to span) would have very high induced drag in addition to enormous tip losses, which would more than negate any lift generated.

Construction was thoroughly conventional with welded steel-tube fuselage and tail surfaces. The wood-frame wings used General's own GAC-500 airfoil and contained two 20-gallon fuel tanks. The entire airplane was covered with fabric.

The powerplant was the new 110-hp

continued

Warner "Scarab" seven-cylinder air-cooled radial. This was one of the first new-generation engines to enter the market successfully as a replacement for the ubiquitous war-surplus 90-hp water-cooled Curtiss OX-5, which had been the standard since 1919.

The three-seat cabin, with a large single door on each side, was arranged to seat the pilot in the front at stick controls with two passengers in the rear on a bench seat. When desired, another set of controls could be installed in the rear, but thus equipped, only one person could occupy the rear seat. A further restriction, shared by many other designs before and since, was that no baggage could be carried with full fuel tanks and two passengers. Otherwise, there was a seven-cubic-foot baggage space behind the rear seat, which was removable to permit carrying bulk cargo. The doors were over-size compared to other private-owner designs. Useful load was only 783 pounds out of a gross weight of 2,110 pounds.

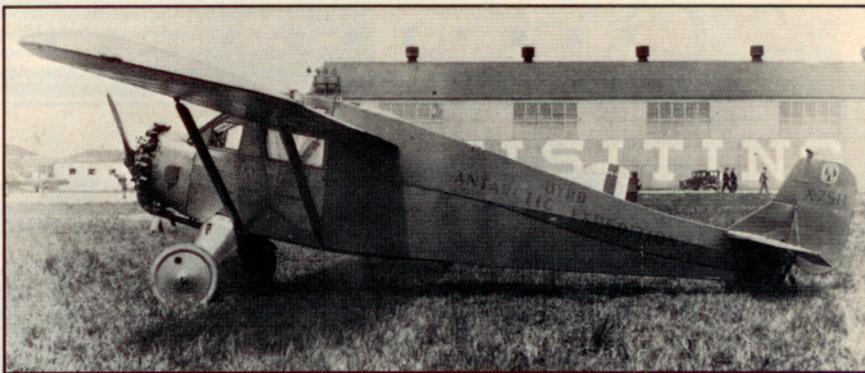
An advanced feature of the time was the single-leg landing gear, a notable improvement over the high-drag, three-leg structures with external shock absorbers in wide use at the time. The single leg on each side was hidden by the wide sheet-metal fairings used to streamline the forgings.

Prototypes of the Aristocrat were flying late in 1928, but approved type certificate (ATC) A-117 was not awarded until March 1929. Selling price then was \$6,000. Production began, but was destined to be short. Some early publicity was generated when General donated a special 102A to the 1928 Byrd Antarctic Expedition, however, that airplane did not go to Antarctica.

The Aristocrat had a hard time fighting the competition for a share of the market. The very similar three-place Curtiss "Robin" with the dirt-cheap OX-5 engine had nearly a year's head start and was underselling the Aristocrat by almost \$2,000. Improved Robins with the 165-hp Wright J-6-5 Whirlwind or the 185-hp Curtiss "Challenger" radial engines were outperforming the Aristocrat for only an additional \$1,500. The 1928 Cessna AW, with the same 110-hp Warner, was not only much faster, but for only \$900 more, it was a four-seater.

Because of the competition, the Aristocrat quickly became a player in the improvement-through-increased-horsepower game. Several were modified on the production line to use the 165-hp Wright J-6-5 engine, and others were offered with the new Floco (later Axelson) and Comet radial engines, but none were produced. The J-6-5 model was designated 102E and received ATC A-210 on August 23, 1929. The increased power did improve the performance, but the tradeoffs were a slight reduction in useful load and a \$1,500 increase in price. Later, the 102A's ATC (A-117) was amended to allow the improved 125-hp Warner Scarab engine to be substituted for the 110-hp Warner Scarab.

A further engine change, this time to the



An early Aristocrat was donated to the 1928 Byrd Antarctic Expedition in an attempt to generate publicity for the company; however, the aircraft did not go on the expedition.



The Model 107 sesquiplane came with a P&W Hornet engine but spent its working days as a testbed for Wright Cyclones. The only detail similar to other General models was the wing tips.

165-hp Continental A-70, resulted in the 102F model. However, this modification did not receive a full ATC. Instead, it received the lesser Category 2, or Memo, certificate on July 3, 1930, which still permitted commercial operations. Only four F models were produced, the Depression now being well under way and the market for airplanes shrinking rapidly.

The largest single sale of Aristocrats was a fleet of eight sold to the General Tire and Rubber Company for a nation-wide advertising tour. While there is no ready evidence to support it, the similarity of names could indicate that General Tire was a major backer of General Aircraft.

With Aristocrat production rolling along in 1929, General introduced two new models. The first was the Model 107 mailplane, which was an oddity in several ways. First, its layout and structure were a break from the manufacturer's previous designs. Usually, a new model by the same firm has a high degree of structural and external detail similarity, but this was not the case with the 107. The only resemblance to the Aristocrat was in the Bellanca-style wing tips—all four of them. The other oddity of the Model 107 was that it was a traditional open-cockpit biplane (actually a sesquiplane because of the short lower wingspan) that was introduced at the very end of the biplane era. The giant Curtiss-Wright firm introduced a similar model at the same time but was able to sell only three; Boeing already had saturated what was left of that market with 25 of its similar Model 95s.

Although obsolete in layout, the General

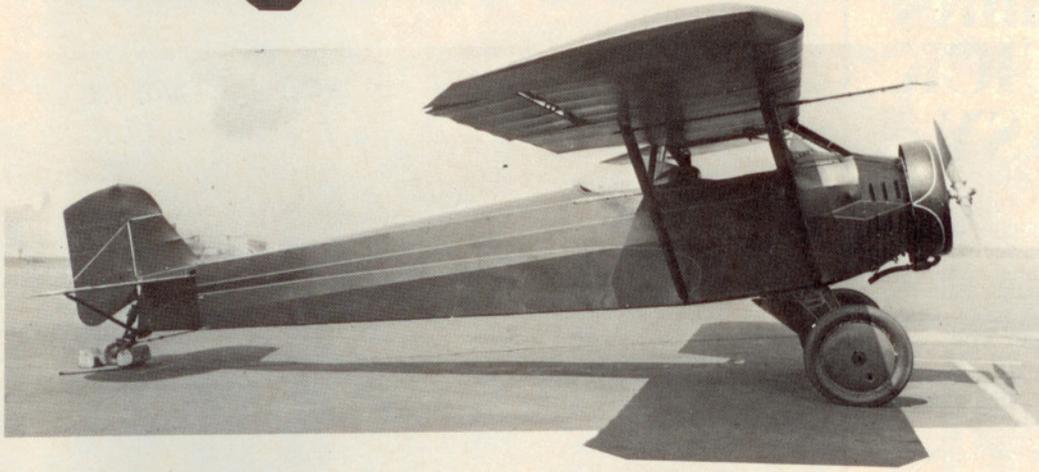
107 was highly innovative in other areas. It had a monocoque sheet-aluminum fuselage when the other manufacturers still were using fabric-covered framework, and its 525-hp Pratt & Whitney radial engine was enclosed in an early commercial offering of the new NACA cowling. In these details, the 107 was ahead of the Boeing Model 200 Monomail, which generally is credited with pioneering both new structure and refined aerodynamics.

Unfortunately for General, there was no place in the market for the 107. The single prototype eventually was sold to the engine division of Curtiss-Wright and saw extensive use as a flying testbed for Wright "Cyclone" engines up to 1,000 hp, a job to which its large size and rugged airframe were well suited.

General's final offering was the Model 111-C Cadet. As an economy measure, this used the basic 102A wing, tail, landing gear and engine on a new fuselage to produce a tandem, two-seat parasol monoplane trainer. The fuel load was cut to 22 gallons. Again, General's timing—entirely aside from the unforeseen imminence of the October debacle—was poor. While the biplane was clearly on the way out as the basic general aviation aircraft, and the Cadet was a monoplane, it was hardly an improvement; a parasol monoplane was, in all respects, a biplane less the lower wing.

Although the Cadet received ATC A-229 on September 17, 1929, it found no buyers, and only two Cadets were to be completed. The initial price was \$5,000.

As it was to do with most other manufac-



turers in the industry, the Depression quickly made itself felt at General. Never having had the time or numbers with which to build a good reputation, the Aristocrat suddenly was very hard to sell—in spite of price reductions, which eventually totaled \$2,250 for the 102E model. Aristocrat production ended with number 43 in 1931. Similar price cuts up to \$1,650 did nothing to help Cadet sales, either.

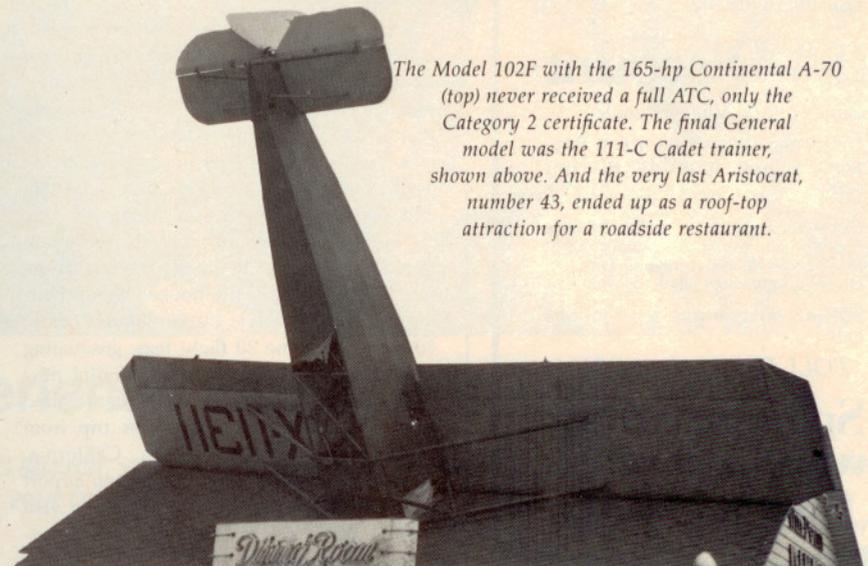
By mid-1930, the financial situation at General was so bad that the Buffalo factory closed, and the firm moved into a single hangar on New York City's Roosevelt Field, where business was carried on for a short period before the General Airplane Corporation shut down altogether.

The last Aristocrat built had an interesting career. Originally a 102-B with a 150-hp Wright J-6-5, it flew mostly as a 102-E with a 225-hp Wright J-6-7. It was sold to the Berliner-Joyce Aircraft Corporation of Baltimore for use as a flying testbed for experimental full-span Zap flaps, which moved rearward as well as down in the manner of the later Fowler flaps. Upon completion of the test, Berliner-Joyce disposed of the airplane, and it ended up, minus the engine, in a crash position on the roof of a restaurant as an advertising gimmick.

Seven 102As and one 102E were still on the U.S. civil register in 1948, but only one Aristocrat is known to survive today. It is listed by the FAA as being inactive. □

Intrigued by airplanes long before his first ride in a Travel Air at age 10, Peter Bowers, AOPA 54408, has since logged more than 4,200 hours.

The Model 102F with the 165-hp Continental A-70 (top) never received a full ATC, only the Category 2 certificate. The final General model was the 111-C Cadet trainer, shown above. And the very last Aristocrat, number 43, ended up as a roof-top attraction for a roadside restaurant.



	ARISTOCRAT 102A	ARISTOCRAT 102E	CADET 111-C
	Specifications		
Powerplant	Warner Scarab 110 hp @ 1,850 rpm	Wright J-6-5 Whirlwind 165 hp @ 2,000 rpm	Warner Scarab 110 hp @ 1,850 rpm
Wingspan	36 ft 4 in	36 ft 8 in	36 ft 4 in
Length	25 ft 4 in	26 ft 6 in	25 ft 5 in
Wing area	195 sq ft	198 sq ft	202 sq ft
Empty weight	1,327 lb	1,514 lb	1,206 lb
Gross weight	2,110 lb	2,300 lb	1,741 lb
Wing loading	10.82 lb/sq ft	11.61 lb/sq ft	8.61 lb/sq ft
Power loading	19.18 lb/hp	13.9 lb/hp	15.8 lb/hp
	Performance		
High speed	109 mph	128 mph	120 mph
Cruising speed	90 mph	110 mph	100 mph
Landing speed	45 mph	48 mph	40 mph
Initial climb	647 fpm	750 fpm	800 fpm
Service ceiling	14,370 ft	16,700 ft	14,000 ft
Range	490 sm	480 sm	325 sm