

WHAT COULD HAVE BEEN...

Bendix Corporation's Abortive Attempt at Entering the Postwar Light Plane Market



By Robert F. Pauley, Artwork by Ted Williams

The Bendix family of personal airplanes lined-up at Willow Run Airport in Ypsilanti, Michigan. From the left is the four-place Model 51 landplane, the two-place Model 55 Tailwind and the four-place Model 51A amphibian. The men in the photo are Bill Mara, left, head of marketing, and A.P. Fontaine, director of the Aircraft Division. (Bendix photo No. 16109, all photos from the author's collection)

Vincent Hugo Bendix was born in 1881 in Moline, Ill., the son of a Methodist Minister. As a youngster Vincent was fascinated by mechanical objects but his father, a strict disciplinarian, disapproved of his son's dream of becoming an engineer. However, Vincent was determined to pursue his dream, so at age 16, he left home to seek his future in New York City.

Bendix worked as a mechanic for a number of different companies in New York while studying engineering at night school. In 1901 he moved to Hammondsport, N.Y., to work for Glenn Curtiss designing motorcycles. Bendix later moved to Chicago to work as sales manager for the Holsman Automobile Co. and in his evening hours designed a two-passenger automobile named the Motor Buggy. Bendix then signed a deal with a Chicago company to manufacture that vehicle and close to 7,000 were built until 1907, when he was forced into bankruptcy.

Early on Bendix had seen the need for a self-starter to eliminate the dangers inherent in hand-cranking an automobile. Applying his talents to the challenge he designed a triple-lead screw device that was superior to existing starter drives of that time. In 1910 he signed a contract with the Eclipse Manufacturing Co. in Elmira, N.Y., to manufacture his Bendix Drive and by 1919 had sold over 1.5 million units.

When Bendix's father was killed by an automobile whose brakes had failed, he focused his efforts on developing an improved braking system. After meeting a French engineer who had patented a four-wheel braking system, Bendix acquired

the patent rights and formed the Bendix Corp. to manufacture the new system. Within four years virtually every American automobile was equipped with Bendix brakes and in 1928 General Motors Corp. became a major investor in Bendix's company.

With his company now on a sound financial footing, Bendix turned his attention towards the rapidly growing aviation industry. In 1929 he changed the company's name to the Bendix Aviation Corp. and in the years that followed bought a controlling interest in a number of major aircraft accessory manufacturers. In addition, to stimulate interest in aviation, Bendix introduced the Bendix Transcontinental Air Race Trophy to encourage engineers to develop faster and more reliable airplanes.

Bendix Aviation survived the stock market crash of 1929 and by 1935 was slowly emerging from the Great Depression. That same year General Motors, then holding 25 percent of Bendix stock, appointed two GM executives to the Bendix board of directors. When Vincent Bendix retired in 1942 one of those GM executives, Ernest R. Breech, was elected president of Bendix. Breech was born in 1897 in Lebanon, Mo., and had attended Drury College and the Univ. of Illinois. After college he joined the Yellow Cab Co. and when that company was taken over by General Motors was named Yellow Cab's president. In 1933, now a GM vice president, Breech negotiated a merger between General Aviation Corp. and North American Aviation, at the time controlled by GM, and was named president of North American. After he became president of Bendix, Breech began



The Bendix Aircraft Division's management, engineering and marketing staff posing in front of the division's office at 261 McDougal St. in downtown Detroit. Key individuals, all of whom had previously worked for Stinson Aircraft, are identified as follows: Second from left is test pilot Al Schramm; seventh is engineer Bill Fredericks; ninth is director of the Aircraft Division A.P. Fontaine; tenth is chief product engineer Vern Biasell; and seventeenth is head of Marketing Bill Mara. At its peak the Aircraft Division employed 50 engineers and about 125 technicians working in the shop. (Bendix photo)

consolidating many of the company's widespread divisions. The company's headquarters remained in South Bend, Ind., but by combining many of the smaller divisions he succeeded in making Bendix a more profitable corporation.

Under Breech's leadership, and as a result of huge military contracts, the Bendix Aviation Corp. underwent a period of tremendous expansion. Bendix made major contributions to the war effort and pioneered in the development of radar, pressure carburetors and aircraft radios. But Ernie Breech was well aware of the challenges he would be facing at war's end - that of converting the huge Bendix empire back to peacetime production. Breech was a private pilot and like many aviation enthusiasts anticipated a boom in private flying following the end of hostilities, including a growing demand for personal airplanes. With that expectation in mind Breech formed the Bendix Aircraft Development Div. in Detroit to prepare for that postwar boom.

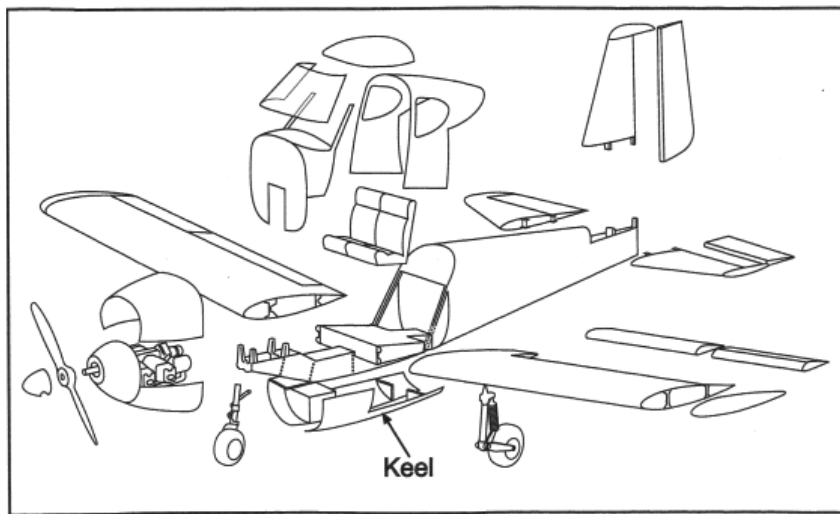
To head the program Breech hired Athanas Paul Fontaine, who at the time was chief engineer at Stinson Aircraft in nearby Wayne, Michigan. Fontaine was born in 1905 in Ludlow, Mass., and in 1930 had graduated from New York Univ. with a degree in aeronautical engineering. After college he worked for Aeronca, Fairchild and Seversky and in 1938 joined Vultee Aircraft in Nashville, Tennessee. There he designed the Vultee O-49 Vigilant, the Army's first STOL-type observation airplane. Later he designed the three-place HW-75 that was introduced in 1940 as the Stinson 105 Voyager. Fontaine then moved to Michigan to join Stinson Aircraft that had become a division of Vultee Aircraft in August 1940.

Fontaine's first task at Bendix was to determine just what type of airplane the postwar private pilot was expected to buy. A Gallup Poll, conducted for a popular magazine of that period, predicted "An airplane in every garage" and a market for 500,000 personal airplanes by 1950. Another optimistic forecast by the U.S. Department of Commerce predicted a postwar demand for 100,000 private airplanes per year. The surveys also revealed that the first choice among potential buyers was for an all-metal two- to three-place monoplane with a four-place design as a second choice.

One of the first to join the program was LaVerne R. Biasell as chief product engineer for the new division. Born in Detroit in 1915, Biasell had been an active model airplane builder in his teens. In 1937 he graduated first in his class from the Univ. of Detroit with an aeronautical engineering degree. He joined Stinson Aircraft after graduating where he supervised the development of the SR-10 Reliant series. He was later transferred to Nashville as chief project engineer on the L-5 Sentinel being developed for the Army Air Corps. Over 4,000 "Flying Jeeps" were built by Stinson and were widely used during WWII. In January 1941 Biasell left Stinson to join General Motor's Research Laboratories. His first assignment was working with GM vice president Ernie Breech to design a two-place private airplane that GM was considering for possible postwar production. The airplane was to be powered by GM's X-250 aircraft engine then in the development stage. Unfortunately the project never progressed beyond a full-size mock-up. After that project ended Biasell worked for GM's legendary "Boss" Kettering to develop a flying bomb that was powered by GM's X-250 aircraft engine. The "Bug," a predecessor of today's cruise missiles, was tested at Muroc and Eglin air bases but never became operational. So when Ernie Breech asked Biasell if he would like to join the new Bendix program Biasell jumped at the opportunity.



A view of the internal structure of Model 55's wing showing the diagonal rib arrangement that kept the part's count to a minimum. The wing ribs, nose and tip ribs and spars were all identical in both wing panels. Not counting the skin each wing panel consisted of only 19 parts. (Bendix photo No. 26142)



An "exploded-view" drawing of the Bendix two-place airplane showing the major components and the "keel" that was the key to assembling the airplane on an automotive-type production line. (Bendix drawing P52-107)

background Ernie Breech insisted that the airplanes be designed so that they could be built on an automotive-type production line. He further emphasized that the engineers should simplify the designs as much as possible to keep costs at a minimum. Breech's goal was to build an airplane that would sell for a base price of \$2,500 when it entered the market in early 1947.

Biasell conceived the "keel" concept that was the key element in building the two-place Model 52 on a production line. As the keel moved down the line the major subassemblies would be added to it, as is done when assembling an automobile. The keel served as the wing center section and also supported the engine, the nose landing gear, the cabin seats and the tail cone. All structural and flight loads were carried through the keel assembly.

Each wing panel was composed of only 19 parts, not counting the skin, and the ribs were arranged in a zig-zag pattern to reduce the number of parts. The airfoil section was the Bendix 416 that was based on the Gottingen 413 but with a pronounced reflex trailing edge. Bendix engineers claimed that this airfoil had very gentle stall characteristics and predicted that the airplane would be virtually spin-proof. In addition, the ailerons could be drooped along with the flaps that reduced the stalling speed from 53 mph with flaps alone to 47 mph. Later flight tests confirmed that with power off, landing gear down and full flaps the airplane would not stall or enter a spin.

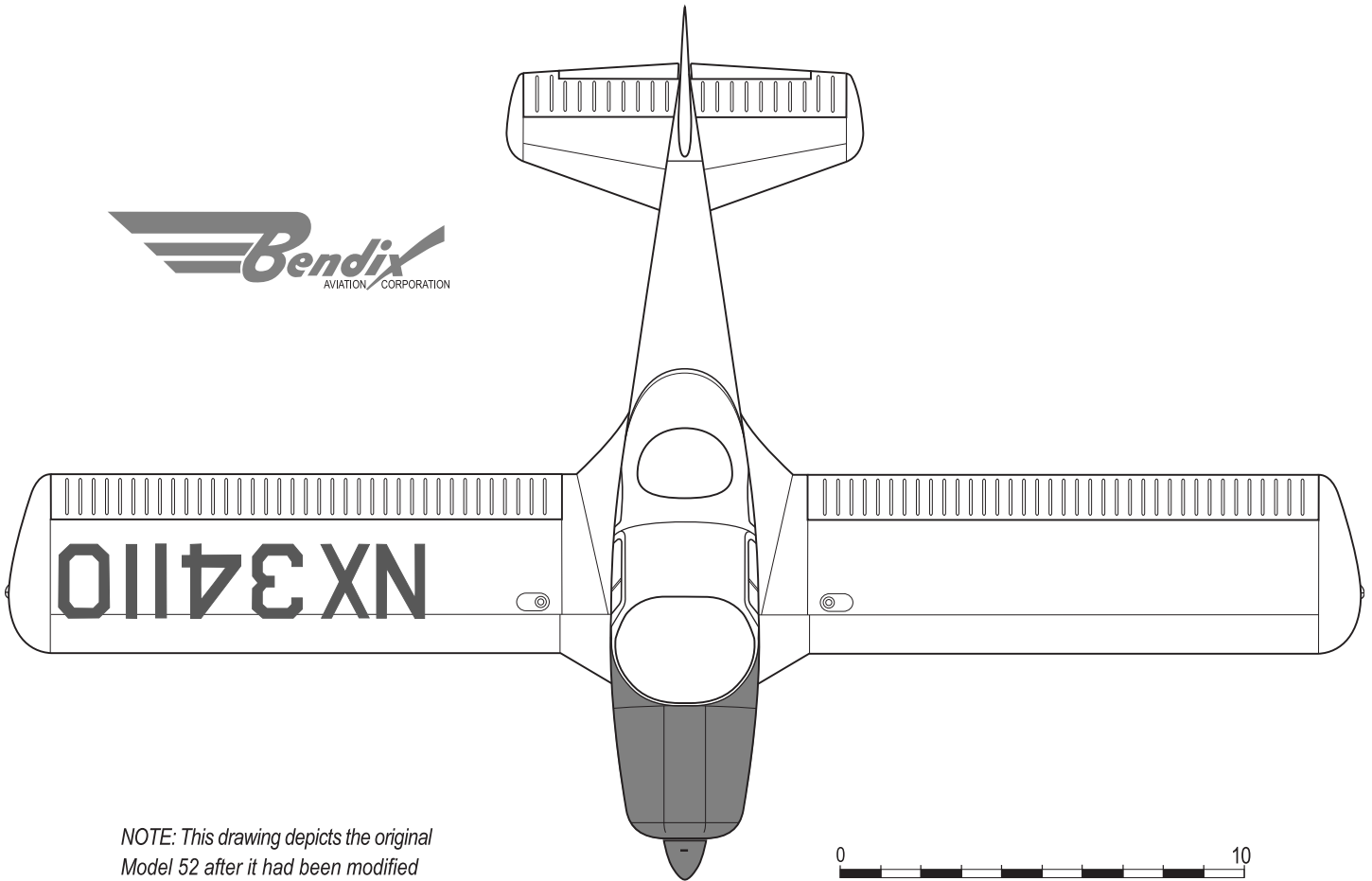
Model 52 & 55

Starting at Bendix in December 1944 Vern Biasell began making concept sketches and preliminary design layouts for two airplanes that would meet the findings of the marketing surveys. Two of his proposals were selected to be built by Bendix for the postwar light plane market. One, Model 52, was a two-place, all-metal, low-wing monoplane with retractable, tricycle landing gear. The design provided for a third passenger sitting crossways behind the front seats. The second proposal, Model 51, was a four-place, all-metal, twin-boom pusher that was similar in appearance to the mock-up that Biasell had designed when he worked in the GM Research Labs.

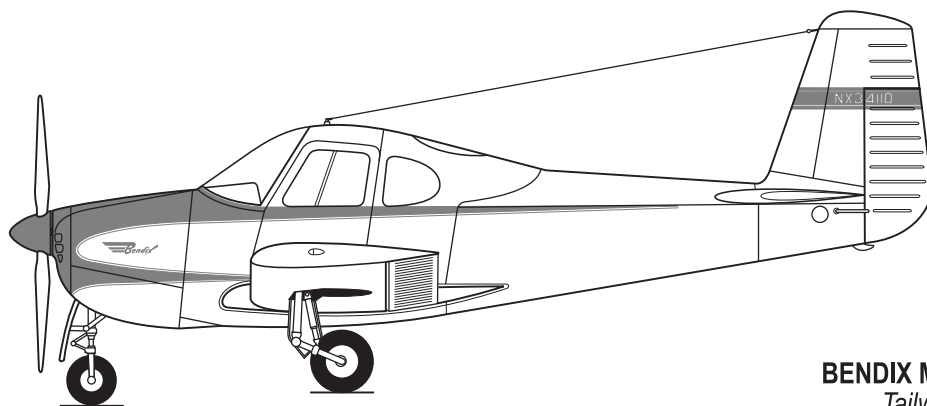
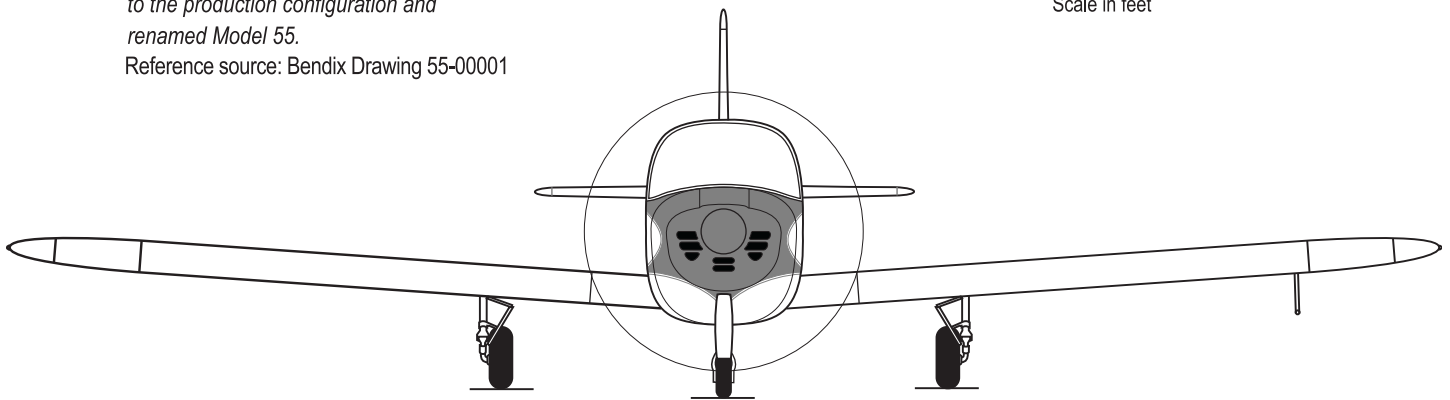
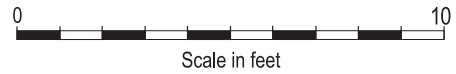
In the meantime Fontaine was hiring engineers, draftsmen and aircraft mechanics to work in a building at 261 McDougal St. in downtown Detroit. The two-place airplane was to be built first and design work progressed rapidly following acceptance of Biasell's preliminary layouts. Based on his automotive



Bendix Model 52, the original prototype (NX34110), at the Windsor Airport, Windsor, Ontario, Canada, in late December 1945 prior to its maiden flight. This airplane was designed and built in eleven months, from February 1945, when engineer Vern Biasell made the original concept sketches, to January 16, 1946, when the airplane was first flown. (Bendix photo)



NOTE: This drawing depicts the original Model 52 after it had been modified to the production configuration and renamed Model 55.
Reference source: Bendix Drawing 55-00001



Ted Williams

BENDIX MODEL 55
Tailwind



Test pilot Al Schramm at the controls of NX34110, the original prototype, after it had been modified to incorporate changes intended for the production airplanes. Those changes included eliminating the propeller shaft extension, a revised nose cowl with a larger air inlet to improve engine cooling and adding a manually-operated hydraulic pump to retract the landing gear. The original airplane was designated Model 52 but after making the modifications the designation was changed to Model 55. (Bendix photo)

Another innovative idea was making the fin and both horizontal stabilizers identical as well as the rudder and both elevators, so that only two basic parts were required to complete the tail assembly. The powerplant was a 100-hp Franklin 4A4-100-B10 driving an Annesley two-position controllable-pitch propeller that was manufactured by Bendix's Eclipse-Pioneer Division. The prototype Model 52 had a four-inch long propeller shaft extension that gave the airplane a very streamlined-looking nose shape.

Work on the prototype progressed rapidly and by December 1945 the Bendix Model 52 (NX34110) was being prepared for its maiden flight. The airplane had been designed and built in less than 11 months. This rapid progress was due to Ernie Breech pushing the program to completion as quickly as possible. But much credit must also be given to C.W. Loomis, the shop foreman, who was another employee recruited from Stinson. Loomis supervised a small crew of sheet metal workers who had previously worked for many of the Detroit aircraft manufacturers and their ability to fabricate parts undoubtedly played a major role in the rapid completion of the prototype.

The individual components of the prototype airplane (NX34110) were taken by truck across the Detroit River to Windsor, Canada, via the Ambassador Bridge. The Windsor Airport had been selected for the first flight not only for its close proximity to the shop in Detroit but also to keep the program hidden from the local press. After the airplane had been assembled Albert H. Schramm, the recently-hired test pilot, made the maiden flight on January 16, 1946. Schramm was another Stinson employee who had been recruited to join the Bendix team. Born in 1909 in rural South Dakota, Schramm learned to fly in 1928. After a number of years barnstorming and charter flying he had joined Stinson as company test pilot. When hired by Bendix Schramm, he had accumulated 8,554



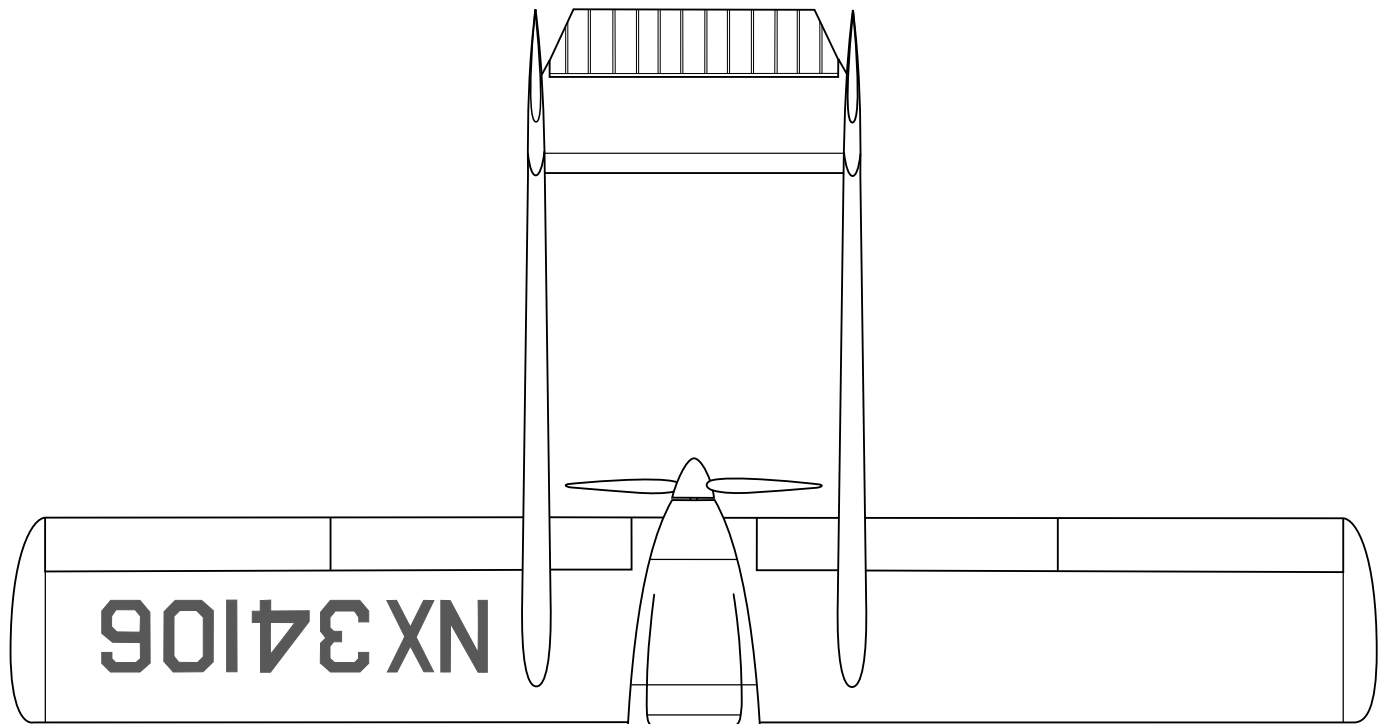
The second two-place airplane (NX34103) after its arrival at Willow Run Airport in July 1946. This airplane retained the propeller shaft extension but the air inlet had been enlarged to improve cooling. (Bendix photo)

hours of flying time but was planning to quit test flying after a near-fatal spin test in the Stinson Model V-76. He agreed to accept the Bendix job provided a new test pilot was hired to continue the flight testing after the airplanes had received their Approved Type Certificates. So in early 1946 Casimir Szmagaj (pronounced Sh-mag-ee) joined Bendix as the second test pilot and would share the flying duties with Schramm.

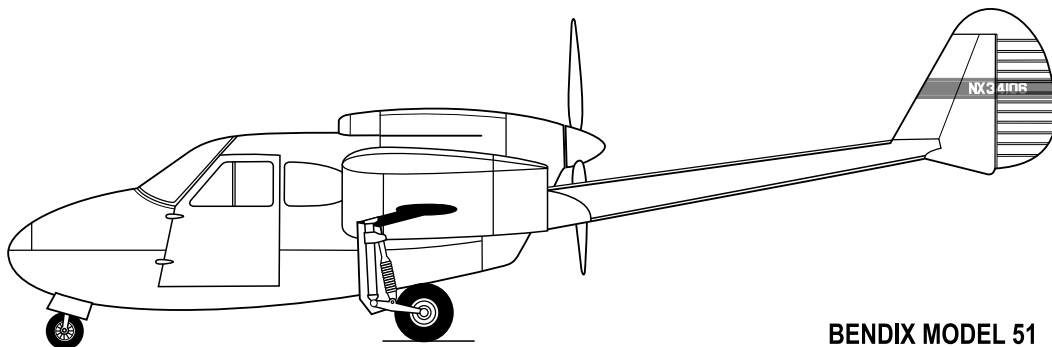
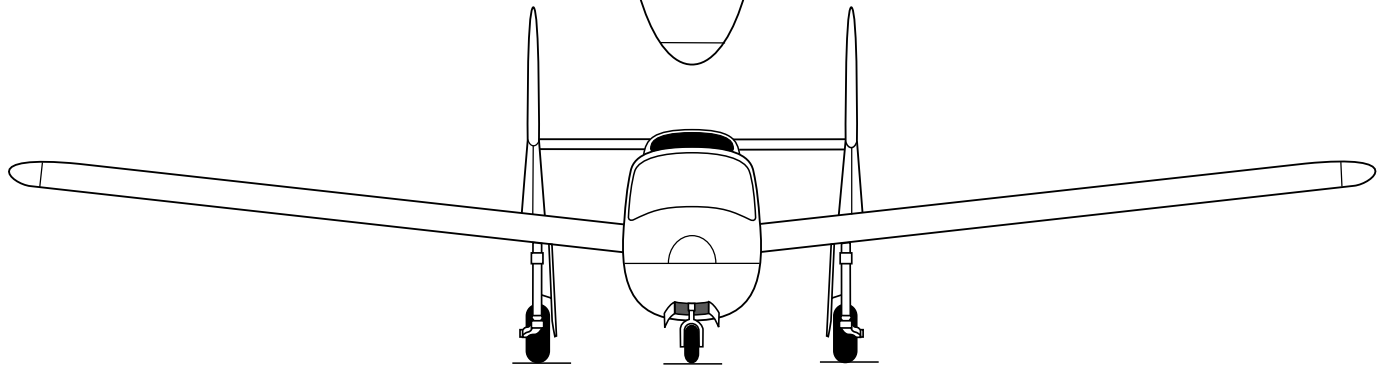
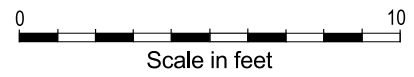
The second Model 52 (NX34103) was completed in July 1946. By that date a new flight test facility had been established at Willow Run airport in Ypsilanti and both airplanes were now based there. The second airplane featured a revised air inlet to help improve engine cooling and was first flown by Schramm on August 5. Meanwhile the original prototype (NX34110) was taken back to Detroit to be modified into the production

Bendix Model 55 Specifications

Wing span	33'-3"
Overall length	22'-6"
Overall height	8'-1"
Wing area	143.9 sq. ft.
Empty weight	1,043 pounds
Gross weight	1,875 pounds
Maximum speed	148 mph
Cruising speed (83% power)	140 mph
Stalling speed	53 mph
Stalling speed (ailerons drooped)	47 mph
Rate of climb	900 ft/min
Fuel (two wing tanks)	33 gallons
Range	650 miles
Service ceiling	19,000 feet
Engine	100-hp Franklin 4A4-100-B10



Reference source: Bendix Drawing 51-00001



Fed Williams

BENDIX MODEL 51



The four-place all-metal twin-boom Bendix Model 51 landplane (NX34106). Powered by a 200-hp Franklin 6AL-500 engine it had a cruising speed of 157 mph. (Bendix photo)

configuration. It had been decided to eliminate the propeller shaft extension and that change required a shorter and flatter nose cowl with an even larger cooling air inlet. Another change involved replacing the manual lever used to retract the landing gear with a hand-operated hydraulic pump. After those modifications the airplane was initially referred to as the Model 52A, but the marketing department later changed that designation to Model 55. Marketing felt that the "A" suffix would suggest that there was an amphibious version available, as was the case with the four-place Model 51A amphibian. After modifying the prototype both airplanes began an accelerated flight-test program at Willow Run.

The year 1946 dawned bright with anticipation at the Bendix Aircraft Div. and all during the early part of that year there was an air of optimism among the employees. The war was over and the GIs were returning home from overseas. Test pilot Schramm had flown the prototype as well as the second airplane and both were undergoing flight testing. Both four-place airplanes were nearing completion in the shop in Detroit. Plus, at a separate location in Detroit, a tool design company was building the production tooling for both airplanes. And finally, to add to the optimism, a building in Garland, Tex., had been leased in which the Bendix airplanes were to be manufactured. Everyone at Bendix was looking forward to 1947 when the airplanes were to be introduced to the aviation world. But in May 1946 a bombshell hit the company - Ernie Breech was leaving Bendix! Breech had been credited for the rapid expansion of the Bendix Aviation Corp. and his business and managerial skills had attracted the attention of Henry Ford II. Ford needed help running his company and offered Breech

the position of executive vice president and director of the Ford Motor Company. It was an opportunity that was hard to refuse and Breech left Bendix that same month.

Models 51 & 51A

Initially, Breech's departure had little impact on the Aircraft Div. and work continued at a normal pace. Construction work on the four-place, twin-boom pusher and on the amphibian was progressing rapidly. Engineer Maurice A. Mills had been placed in charge of developing both four-place airplanes that incorporated many of the cost and labor-saving features used on the two-place airplanes. The four-place airplanes were also designed to be built on a production line but with a different approach. The upper half of the fuselage nacelle was assembled first including the cabin interior and then the engine and tail booms were fitted to the nacelle. As that module reached a key spot on the production line the lower half of the fuselage nacelle would be installed. For the landplane a short lower fuselage would be attached. But if the customer had ordered an amphibian, a boat-like hull would be attached to the module. The outer wing panels were to be attached last with tip floats for the amphibian. That summer the landplane (NX34106) was delivered to Willow Run and first flown by Casimir Szmagaj in early August. But the amphibious version had taken longer to develop because of its more complex features. A seven-inch longer main landing gear strut required modifications to the wing structure and the hull was being tested in the towing tank at Stevens Institute in New Jersey. Furthermore, engineer Mills had left Bendix in July and had been replaced by Bill Lothrop, causing more delays. As things turned out, Model 51A

Bendix Model 51 Specifications

Wing span	36' 0"
Overall length	27' 3"
Overall height	9' 5"
Empty weight	1,550 pounds
Gross weight	2,550 pounds
Maximum speed	168 mph
Cruising speed	157 mph
Stalling speed	58 mph
Stalling speed (ailerons drooped)	53 mph
Rate of climb	1,210 ft/min
Range	550 miles
Service ceiling	21,000 feet
Engine	200-hp Franklin 6AL-500

Bendix Model 51A Specifications

Wing span	36' 0"
Overall length	27' 3"
Overall height	10' 0"
Empty weight	1,700 pounds
Gross weight	2,750 pounds
Maximum speed	149 mph
Cruising speed	138 mph
Stalling speed	61.5 mph
Stalling speed (ailerons drooped)	54.5 mph
Rate of climb	1,050 ft/min
Range	480 miles
Service ceiling	18,500 feet
Engine	200-hp Franklin 6AL-500

(NX40051) was delivered to Willow Run in September and was scheduled to be test flown by Szmagaj in October, but it was never flown.

Preliminary Marketing and Demise

William A. Mara was another Stinson employee who had been recruited by Fontaine. He was a super salesman and is often credited with the sales success of the Stinson Reliants and the later Voyagers. Mara had the advertising know-how and dealer contacts that would be needed when the Bendix airplanes were introduced in 1947. His first advertising approach was subtle. He placed "teaser" pictures of the Model 55 in the background of Bendix advertisements to arouse curiosity. People began asking about that airplane in the ads but it was never identified as a Bendix product. Mara felt that an airplane's interior is important in completing a sale so the responsibility for the design of the cabin interiors was given to GM's Interior Styling Department. With two wide doors and a 42-inch wide cabin, comfortable seats and high quality materials the interior of the Bendix airplanes resembled that of a luxury automobile. And despite growing rumors that the division may soon close down Mara continued promoting the airplanes right to the bitter end. A color painting of the Model 55 appeared on the cover of the January 1947 issue of *Skyways* magazine. That publication date had been planned to coincide with the introduction date of the Bendix airplanes but it was all too late as Mara and others were soon to find out.

Malcolm Ferguson had been named president of Bendix after

Breech had left but he did not share Breech's enthusiasm for the light plane program. Ferguson saw the program as a drain on the company's finances with little chance of showing a profit for many years to come. There were rumors that competing aircraft manufacturers had threatened to boycott Bendix products if Bendix had entered the light aircraft market. That may very well have been true and is the official reason given by Bendix for shutting down the division. But it was obvious that the true reason was the loss of Ernie Breech, who had been the driving force behind the program. His love for aviation and flying plus his enthusiasm and support had kept the program going. Bendix had reportedly spent close to two million dollars on the program by the time Breech left. With Breech gone the "bean counters" had taken over and in mid-September 1946 Ferguson, with approval from his board of directors, announced that the Aircraft Div. was officially closed.

After announcing the closure Bendix management made



The Bendix Model 51A amphibian (NX40051) was essentially the same as the Model 51 landplane above the fuselage split line. At a key point on the production line either a short lower fuselage would be attached to the upper module for the landplane version, or an elongated hull would be attached for the amphibious version. Tip floats had not yet been installed when this photo was taken. (Bendix photo No. 16090)



This photograph shows the Bendix Model 55 Tailwind (NX34110) in the final production configuration. This photo appeared in Bendix advertisements as a “teaser” of things to come although the airplane was never identified as a Bendix product. Note that the final color trim on the nose and Bendix logo differ from the trim and logo in earlier photographs. (Bendix photo)

a serious attempt to sell the design rights and the tooling for the airplanes to another company. A detailed report that was prepared for potential buyers reveals many interesting facts and figures. The report, dated October 16, 1945, reviewed the philosophy behind the designs, the marketing prospects and the costs and manpower requirements. The Bendix sales pitch was very convincing. It explained how the production line concept would minimize the man-hours required to assemble an airplane, an important cost consideration. Time-study estimates predicted that it would require 239 man-hours to assemble the first 5,000 two-place airplanes. By applying a learning-curve factor that figure would be reduced to 156 for the next 5,000 built and to 121 man-hours after building 10,000 airplanes. The report also included some remarkable material costs that included everything from the powerplant and radio to the cost of aluminum sheets and rivets. The “engine, propeller and muffler” group was listed as costing only \$637.50 which included the 100-hp Franklin engine and the Annesley propeller. Bottom line, the total cost for all of the material required to build one two-place airplane was \$1,430. The report further stated that about 10 percent of the tooling and fixtures had been built and were in storage awaiting the decision of a possible buyer. The sales package also included the four airplanes that had been built plus two more that were partially completed. In addition, there were parts to build five more Model 55s that were to be used as demonstrators. The two two-place airplanes had flown a total of 307 hours while the four-place Model 51 had logged 19 hours. And approximately 95 percent of the requirements for the ATC and the Production Certificate for the Model 55 had been approved by the CAA. Bendix was planning to formally introduce its family of light airplanes in early 1947. The price for the two-place airplane, to be known as the Tailwind, was to be \$3,995 and for the four-seat Model 51 at \$5,875. Those prices were later reduced to \$3,495 and \$5,000, respectively, due to declining market conditions. All of the prices listed were subject to a 25 percent dealer discount. But there was little interest and no takers for the rights to build the Bendix airplanes and Bendix management was left with no other option but to scrap the program.

In retrospect, Ferguson had made the correct decision. During 1946 sales of private aircraft were booming and 34,870 units were sold that year giving some credence to the pollster’s optimistic predictions. But by 1947 sales had dropped to 15,600 units, and by 1948 to 7,040. And finally, in 1951, only 2,300 private airplanes were sold in the United States. The predicted postwar light plane boom never did materialize due to a number of factors. The returning servicemen were more interested in raising a family, buying a home or attending college under the GI Bill. Furthermore, the Korean War and the Berlin Airlift had people concerned about the future and buying an airplane was not a high priority item. Yet many aircraft manufacturers failed to heed the warning signs and continued overproducing airplanes even as the demand ceased to exist. By the end of 1947 Stinson Aircraft had 325 unsold Voyagers parked at Willow

Run and other airports in the Detroit area. The following year Stinson’s assets were sold to Piper Aircraft and Stinson ceased to exist.

By the end of September 1946 all of the aircraft division’s employees had been laid off and Malcolm Ferguson ordered scrapping all existing parts and disposal of all four airplanes. The airframes, all skillfully hand-crafted by talented sheet-metal workers, were donated to the aero labs at the Univ. of Michigan, the Univ. of Detroit, Wayne State Univ. and Detroit’s Aero Mechanic’s High School. A few months later the Bendix Aviation Corp. changed its name back to the Bendix Corp. and the company prospered in the postwar years. Bendix was a major supplier of parts to the booming automobile industry and was also heavily involved in the space program, in computers and a popular line of Bendix-King avionics. In 1986 Bendix was involved in a hostile takeover and was eventually acquired by the Allied Corp. and the Bendix name disappeared from public view.

Vincent Bendix had severed all ties with the company that bore his name when he left Bendix in 1942. As a result of his flamboyant lifestyle and questionable investments he had lost millions of dollars and was forced into bankruptcy. But he still retained his entrepreneurial spirit and in 1943 formed Bendix Helicopters to develop a four-place, co-axial rotor helicopter. Only one prototype was built. Vincent Bendix died in March 1945.

Ernie Breech left Bendix in 1946 to assume control of the Ford Motor Co. and is credited with saving Ford from financial disaster. He was an executive with extraordinary talents and energy with the ability to inspire those who worked for him. He retired from Ford in 1960 and later served on the board of directors of Trans World Airlines. Ernie Breech died in 1978.

When the Aircraft Div. closed, A.P. Fontaine was hired as director of the Univ. of Michigan’s Aeronautical Research Center (MARC) at Willow Run airport. In 1951 he left MARC for a position as vice president at Consolidated Vultee Aircraft. He returned to Bendix in 1952 to direct the expansion of the company’s aircraft parts divisions and eventually rose to the

position of president and CEO. Fontaine retired from Bendix in 1972 and died in May 1989.

When the Bendix program ended, LaVerne Biasell was hired as a project engineer at the U of M's Aeronautical Research Center. In 1954 he was hired by the Chrysler Missile Div. as chief engineer of Development and Design. There he supervised the design of the Redstone and Jupiter missiles that launched America's first satellites into orbit. Biasell retired from Chrysler in 1981, moved to Florida and died in March 2006.

Test pilot Al Schramm left Bendix in 1946 to work as a sales representative for a Stinson dealer in the New York area. When the bottom fell out of the light plane market Schramm sold prefab metal buildings and gave up flying after having logged close to 9,000 hours. In 1950 he rejoined Bendix as a field service engineer in South Bend and later in Tulsa, Oklahoma. Al Schramm retired from Bendix in 1972 and died in December 1996.

What could have been the introduction of a complete family of new and innovative private airplanes never reached the marketplace. The airplanes were well designed and well engineered and offered superior performance to airplanes then on the market. Bendix engineers had introduced many unique and innovative manufacturing ideas that would have kept costs to a minimum. But the collapse of the predicted boom in light airplane sales after the war left the Bendix management team with little choice but to kill the program. Today the Bendix Corporation's dalliance into entering the aircraft manufacturing field has faded into the forgotten annals of aviation history.

References:

- A collection of 30 preliminary concept drawings by LaVerne Biasell dated Jan. 21, 1945, through April 10, 1945. These drawings defined the configuration of the three Bendix airplanes.
- Bendix drawing #51-00001 General Arrangement drawing of the four-place twin-boom landplane (Model 51) 1/20 scale.
- Bendix drawing #51-00025 General Arrangement drawing of the four-place twin-boom amphibian (Model 51 A) 1/20 scale.
- Bendix drawing #55-00001 General Arrangement drawing of the two-place low-wing airplane (Model 55) 1/20 scale.
- Preliminary report on wind tunnel test of a 1/6 scale model of the Bendix Project 51 airplane by Charles Milliken. The Guggenheim Aeronautical Laboratories, California. Dated October 18, 1945. Marked Confidential.
- Correspondence with ex-Bendix engineer Robert G. Horstman dated April 7, 1981.
- Telephone interviews by the author with A.P. Fontaine in 1970.
- Interview by author with Jim Biasell (son of LaVerne Biasell) in October 2010.

- Interview by author with LaVerne R. Biasell in October 1970.
- Interview by author with Marion C. Szmagaj in 1997 and 1998.
- "My Life's Journey" by Albert H. Schramm. Privately published autobiography dated 1988. 176 pages.
- Test pilot Al Schramm's log books showing Bendix airplane test flights from January 16, 1946, to the last flight on October 28, 1946. Five pages.
- "The Story of the Bendix Corporation" by A.P. Fontaine. *Bendix Technical Journal* - Spring 1968 issue. Eight pages.
- The Bendix Airplanes - A report prepared by the Bendix Aircraft Div. for potential buyers of the design rights to the three Bendix airplanes. Fifty pages. Dated October 16, 1946.

About the Author:

Robert F. Pauley was born in New York in 1924 and grew up in New Jersey. He joined the Army Air Corps in 1943 and served in the Pacific Theater with the 86th Combat Mapping Squadron as a Photo Interpretation Specialist. Pauley was recalled to active duty with the Air Force in 1951. He soloed in 1948 and holds ASEL and glider ratings. Pauley worked as an engine designer for Mack Trucks, Chrysler Corp. and Williams International where he worked on cruise missile engines and the FJ-44 turbofan engine. He has written numerous articles for aviation magazines and his recently published book on "Michigan Aircraft Manufacturers" reflects his deep interest in Michigan's rich aviation history. Mr. Pauley has been an AAHS member since 1956. Now retired, he lives in the Fox Run Retirement Village in Novi, Michigan.

About the Artist:

Working from his studio overlooking Canandaigua Lake in the Finger Lakes region of upstate New York, Ted Williams has created a focused body of aviation fine art and illustrations. Noted for his stunning realistic approach, he has created paintings and illustrations for a broad clientele, which includes private commissions for aircraft owners, pilots and corporations, as well as historical illustration work for numerous museums and publishers of magazines and books. Williams primarily works in oil for his fine art and in digital media for his illustrations, but he is also proficient with acrylic and watercolor. However, as Williams is known to say, everything begins with a pencil, "Competent drawing skills are the foundation of any good painting." Beginning with his art training at the Rochester Institute of Technology, Williams has followed a career in commercial art that has brought him many awards and accolades. He has expanded his work in aviation history by entering the world of publishing as an author and illustrator of his own books, most notably, his master work is *The American Fighter Plane* (Metrobooks, Barnes and Noble Publishing). The book traces the evolution of U.S. fighter plane development through Williams' full-color illustrations and drawings with text written by his daughter, Amy.