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## Autobiography of GERALD L. WILES

Modeler since about 1939

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*Gerald L. Wiles submitted the following autobiography in February of 2006*

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### Gerald L. Wiles' Activities in Modeling

My interest in airplanes began at the age of about six. By the time I turned 12 (in 1940,) I rounded up 25 cents and bought an Ace Whitman (Whitman Publishing) *Vultee P-66 Vanguard* rubber-powered kit. Although quite accurate in 3/4-inch scale, this Joe Ott design was rather fragile, especially when it was not constructed properly as in this case. When it was finished, trying to fly it caused me to keep damaging the wing ribs that held the landing gear. I never succeeded in getting it airborne, but bought five or six other similar models, some from Comet. Despite my improving building skills, only one (a Whitman "contest" rubber flier) showed any tendency to fly, though poorly. All these failures were due, almost entirely, to my poor abilities.

I also constructed a Comet 54-inch *Aeronca K* and a 36-inch Curtiss *X503C-1 Seagull*. The latter, another Ott design, was unique in that, in the interests of saving weight and cost of materials, it employed a very complex built-up wing and empennage ribs. Like most of my other models of that period, neither of these actually flew.

Beginning in 1944, I worked on a less-than-successful Vivell .35-powered, very simple, Control Line airplane. It was overly heavy and the engine was very difficult to start, also having rather modest power when compared with my friends' aircraft. They were powered with an O&R 60, Super Cyclone, an OK 60, or a Bunch Tiger Aero engine, all gas-and-oil sparkers.

After joining the Navy in 1945, I was sent to Bucknell University where I joined with a like-minded enlistee and tried to get a kit-built GHQ model airplane engine to run. No dice! In the summer of 1946, I was stationed on a small troop-carrying ship in San Francisco harbor where I bought a Scientific *Cyclone* Control Line kit and an O&R 60 engine. After completion of the model, a companion and I found a clear area on the dock and tried to fly it. Unfortunately, my flying skills were non-existent, leading to a quick and total destruction of the model. This experience, and those with the GHQ, failed to stop me from trying again, but much later.

The O&R was slightly damaged so I returned it to the factory for repairs. They did so and charged me nothing! After my discharge in September of 1946, I came home and resumed trying to build successful Control Line models, usually powered by the O&R. One of the more attractive models was a 1¼-inch scale Beechcraft *Staggerwing* from Capitol with the above engine, inverted, to power it. Not appreciating the importance of the flying and landing wire bracing, I tried to fly the *Staggerwing* before they were installed and succeeded in losing the wings. This came about because the model was tail heavy, and consequentially, instable. This

caused a considerably erratic and destructive flight. The model was beyond repair, but I salvaged the top wing and installed it on a simple control-liner, also powered by the O&R. I managed to use 60-foot lines even though all my hometown modeler friends employed 52½-foot lines. Though it was risky to fly that model in anything other than relatively calm winds, the extra length of lines made it quite easy to fly and maneuver.

A few months later, and under the inducement of a Dyna-Jet owning friend, I bought a Dyna-Jet in 1947 and we created a few relatively simple control-liners. In 1948, I designed and constructed a five-foot wingspan, mildly aerobatic jet model, able to fly inverted even though it made use of a “chin-mounted” tank that was similar to those on the demo models of the engine manufacturer, Aeromarine Company. The wing had no ribs, employing instead strips that curved over two spars and were glued to the balsa leading edge and to each other at the trailing edge. Covered with sheet balsa at the center and tissue elsewhere, the removable wing was attached to the ¾-inch by 1½-inch balsa “fuselage” with rubber bands. The tail surfaces were ¼-inch thick balsa and the model employed a conventional tail wheel and landing gear. Unfortunately, the jet blast singed and eroded the tire on the tail wheel, requiring a replacement after a dozen or so flights.

My father was in the restaurant business in Piqua, Ohio and became acquainted with several men who were starting a new, small airport nearby. He told them of my Dyna-Jet models and they asked that we take part in the airport’s 1948 official opening by flying my five-foot jet for the crowd at Christmas. There were several inches of snow on the airport, so I exchanged skis for the model’s wheels. We were successful and very well received, especially after the spectators finally realized the roaring model posed no hazard even though it proved to be a very effective snow blower.

That airport grew during the ensuing fifty-plus years and is now owned and operated by the Hartzell Propeller Company of Piqua. That company is a very successful supplier of propellers for both turbo-props and piston engines in general aviation. They received accolades for creating the special propellers that enabled the completion of the non-stop, un-refueled flight around the world by Burt Rutan and Jeanna Yeager in the Rutan *Voyager*. This received very little publicity, locally or nationally, but Hartzell executives seemed to accept this neglect.

During the (almost) three years between my departing the Navy and going to work at Aeromarine Company, I was employed at a few other companies in the area, working for a short time at each. The companies included Aeronca, when their *II AC Chief* was being manufactured at the Dayton Municipal Airport, and WACO Aircraft Company at the end of World War II when they were building assault gliders, and later, when they were out of the airplane business and subcontracting to other companies. The jobs did not require any particular skills. I also worked, off and on, at five movie theaters as a part-time projectionist, beginning when I was still in high school and then for another 30 to 35 years.

I went to work for Bill Tenney’s Aeromarine Company in 1949 to help manufacture and test Dyna-Jets, remaining there a total of five years. This included 1½ years at Russell Curtis’ Curtis

Automotive Devices (CAD,) the buyer of Aeromarine in 1952. That firm is still in business, but ownership has changed. Its current identification is Curtis Dyna-Fog, Ltd. Their name indicates that their main business is in insecticidal and other fog-generating equipment. The prefix “Dyna” was the 1946 creation of Tenney and “co-conspirator” Charles Marks.

Aeromarine’s initial fogging product was called the Dyna-Fog. It made use of an enlarged Dyna-Jet-type engine to permit emission of a dense fog from oil injected into the jet’s tailpipe. Except for outward appearances, its valve head assembly is almost identical to that of a Dyna-Jet. While still with CAD, I assisted another Aeromarine alumnus, chief engineer Paul A. Frank, in creating a smaller jet-based fog generator, the Dyna-Fog Junior. The latter is still manufactured, but employs many improvements over our first prototypes that we made in 1954.

I am compelled to add a cautionary note. The “history” of Curtis Dyna-Fog, Ltd. as it appears on their website is not particularly accurate in some of the details of its origins and its development of pulsejet products. Charles Marks, who created the first of what became the Dyna-Jet, is not mentioned, and Bill Tenney’s founding and operation of the company that introduced the Dyna-Jet and Dyna-Fog is not clearly acknowledged. Also not obvious is the fact that Marks and Tenney introduced the earliest so-named Dyna-Jet in 1946, a full year *before* the start-up of Russell Curtis’ first company in Dayton, Ohio. Their pulsejet work actually began immediately after the end of World War II, almost two years prior to the creation of the Curtis Company.

Before getting out of the pulsejet business, Bill Tenney led Aeromarine’s engineers, technicians and toolmakers in developing pulsejet-powered smokescreen generators for the U.S. Navy and Army. The former was first and it used twin pulsejets, each much larger than that in the original Dyna-Fog and was listed by the Navy as their PJ-101. The derivative Army machine (E19R1) used a single, but similar, pulsejet and could turn about 50 gallons of military smoke oil into fog per hour! A similar device is still used by the Army, though it is much more versatile than Aeromarine’s 1951 version and is called the M54A2 generator. Usually paired and mounted on a vehicle such as a HumVee (such as the M157A2,) the M54A2 is similar in concept and design to Aeromarine’s E19R1 of 55 years ago! It differs from the original in its ability to operate on various hydrocarbon fuels, not just gasoline. However, whereas the original was entirely self-contained except for its smoke-oil supply, the M54A2 requires separate fuel and oil pumps, an air compressor, an ignition source, and is not portable. The website of the M54A2 fails to mention Aeromarine as the creator of the above concept and the first-ever 60 examples of 1951. Indeed, it claims the M54A2 is the *first* such device ever used by the Army. Hogwash!

While I was still with Bill Tenney, and before he disposed of Aeromarine, a Control Line contest was held at Wright-Patterson Air Force Base very near the present-day location of the National Museum of the United States Air Force. My co-worker at Aeromarine, Jerry Nolin, attended as a spectator and advisor. With help from family and friends, we entered my Jet Speed model, a design that had the smallest possible fuselage under the top-mounted Dyna-Jet. Because there was no room in the fuselage for the two-line control system, I secured the bell crank to the beefed up spar inside the wing. We soon learned this was a flawed design.

Preferring to launch the model sans a dolly to shorten the take-off run and reduce fuel consumption, I let it slide on its belly skid during launch, a practice that has been very successful many times. Unfortunately, there were tufts of grass sprouting between the concrete runway plates and they were big enough to snag the flying lines that had to drag on the ground until the model became airborne. Being certain I could hold the handle high enough for the lines to clear the ground, I had the crew start and launch the model when my turn to fly came up. The wires did snag and caused the model to turn toward me. Even so, it raised enough to lift the lines free from the ground and fly in a counterclockwise circular path. At this time, the model was not controlled, the lines drooping too much to permit such a thing. However, because the model's wing was symmetrical and the seventy-foot-long wires presented considerable drag on the inboard (left) side of the model, the plane banked to the left and entered a shallow dive. I was unable to back up rapidly enough to regain control, so the model struck the ground with the left wing. This sheared off that panel, including the control system. As was almost inevitable, the Dyna-Jet never ran better! It spiraled away from the circle and me, over the heads of spectators, and into the ground where it burned some feet behind the crowd.

Thankful that no one was injured, we gathered up our equipment and the debris and went home. The next day, Jerry Nolin asked me where we had gone. It seems my model was the only jet to get off the ground and the Commandant of the air base intended to award me first prize in Jet Speed! Boy, I am sure glad we left.

In May of 1954, after one-and-a-half years with Curtis, I was transferred from Research and Development of Dyna-Products to DFG production, a move I did not expect or want. One week later, my wages were cut and no assurances were offered that my R&D work would ever resume. I returned to Ohio two days later, staying at work that long only because I had promised a pulsejet demonstration to a friend's high school class in Tunnelton, Indiana.

My subsequent application for benefits at the Ohio Unemployment Office was accepted because "you were laid off your original job and rehired in another, lower-paying position without your knowledge or approval. Therefore, you are eligible for compensation ... at Ohio's rates, which are greater than Indiana's, because you are a permanent Ohio resident and was hired away from this state."

Since that time, I have continued my aeromodeling hobby, though at a reduced rate. I also have been hired at several different Dayton-area companies as a model maker, work that I very much enjoy though it has little or nothing to do with my main hobby. I designed, constructed, and flew a few modestly successful Sport-Speed jet models and a B Speed model, though none was truly competitive.

By the time I retired in 1993, I had been employed for five to 12 years at each of the following: Aeromarine Company/Curtis Automotive Devices (now Curtis Dyna-Products, Ltd.) United Aircraft Products Company, Lau Blower Company (now Lau Industries,) Gad-Jets Incorporated, and Wright State University. In all those businesses, I worked as a model-maker, though my kindly bosses at Lau promoted me to Project Engineer in Applied Research the last two of my 12

years there. I must admit that at Lau my responsibilities remained unchanged despite my new title.

For a tinkerer like me, all those jobs were especially gratifying, if not particularly rewarding money-wise in view of my limited formal education. Those of us doing similar work were, and are, privileged to wear many hats. In my own case, this has involved wood-working, precision machining, welding, brazing and soldering, tool-making, photography (including several types of stills and 16 mm motion pictures; there were no home-use camcorders at the time,) job setting, electrical and electronic designing and fabrication, drafting, sheet metal working, product testing and report writing, designing and making injection molds, instruction writing, and a few others. This is not to imply that my work or skills were unique. There are many, many other people who can perform such tasks as well as or better than I. My good fortune has been to work at shops where *all* of them were part of the job description *and* the necessary equipment was available.

As stated above, I have been engaged in photography in some of my work and as a hobby. I have movies of model airplane contests, many air shows and several spaceship rollouts and launches at Kennedy Space Center. I also made a time-lapsed movie of the Sun's total eclipse in 1970.

Though I play around with several different still camera systems, my most enjoyable type of photography often appreciated by friends and family is stereoscopic slide photography. The resulting photographs can be viewed through a battery-powered viewer or projected on a special screen. The system is superior to ViewMaster™ because the lenses are better than those in that consumer product are, and the images produced onto 35 mm film are much larger. They are incredibly lifelike and only the lack of movement in them indicates they are photographs. In fact, conventional images of many "busy" subjects can appear confusing because of the complexities in them, but stereo separates everything and renders clarity impossible to achieve any other way.

Unfortunately, my many most worthwhile stereo slides of scenery, people, air shows, rocket launches, etc. were stolen while I was at Wright State twenty years ago. Among them were irreplaceable vertical views of the Apollo-Soyuz Test Project vehicle, taken from the 325-foot level of the service tower on the Transporter. It was a deliberate theft because my name was on some of the slides and I was never notified where I could recover them. I even offered a reward for their return.

One episode in my modeling hobby that I consider noteworthy was winning second place in Jet Speed at a local contest, going 76 mph with a four-foot semi-stunt model! This came about because the flying field was covered in sod, making conventional speed uneven and take-off dollies unusable. Hand launches were sometimes possible with propeller models, but not with jets because of downward forces caused by the position of the jet engines on top of the models. Therefore, I brought out my Martin *ThunderHawk* that had three very large wheels and flew it off the grass with absolutely no problems. I lost my initial first place late in the day when the contest organizers placed several 4-foot by 8-foot plywood sheets on the ground, enabling one

other jet modeler to get airborne and greatly exceed my model's speed.

I also made an all-metal half-wing jet model that employed the jet engine as the fuselage. (Joe Fallo, for Aeromarine, had already made vaguely similar models.) Its fuel tank was a "doughnut" type that encircled the valve-head (the fins removed,) making it very resistant to stoppage due to an uneven take-off surface. Even so, its speed was disgustingly slow, about 100 miles per hour. This was due to a combination of limitations: my engine was the earlier 3½-pound Dyna-Jet, flight trim was poor, and it had many protuberances from the exposed hardware. Another problem with such designs is the tendency of the heated tailpipe to expand during flight and alter the flight trim. The push rod does not expand. I keep reminding myself that this "innovation" preceded, by many years, the European successes of half-wing Control Line Speed models. Of course, U.S. modelers also adopted such designs for certain competitions.

After becoming acquainted with Jim Richmond, Dave Cotton, Glenn Lee, Harry Roe, and many other dedicated and successful Speed modelers, I pretty much stopped my efforts in that category. Most of them work so very hard and were/are so avid in their pursuit of success that I realized my casual approach was out of step and could be a hindrance to them. I have quit all competition but continue to watch such activities and discuss pulsejet engines with modelers like the above, though Jim now concentrates on indoor categories. We all know how his innovations, inventiveness, and very hard work have enabled him to become one of the "winningest" indoor modelers of all time!

As a member of the Springfield, Ohio Strato-Hawks, I helped organize and officiate at a few Ohio and Indiana model airplane contests, sometimes in concert with the Dayton Buzzin' Buzzards. I also took part in the 1976 AMA Nationals at Wright-Patterson Air Force Base, the Springfield airport, and Ohio State Fairgrounds Arena, helping find housing for those few contestants who requested it. My biggest effort at that contest was filming as much interesting activity as possible for the AMA Archives. I shot 3300 feet of 16-mm movie film at sound speed, though it was actually silent. After editing it down to 2000 feet, with a 56-minute running time, I turned it over to then-Executive Director John Worth. His friend, Jay Gerber, was the Chief Editor of NFL Films at the time and Jay made the best duplicate of these movies I have ever seen.

In 1995, I exchanged Christmas cards with Patty Tenney, Bill's widow (he died while on a fishing trip to Siberia in 1993) and asked about the Aeromarine materials Bill kept when he disposed of his company. She still had all of it and I was welcome to almost everything, including photographs, magazines, company records and correspondence, several Dyna-Fog generators, one 8-inch-diameter Navy drone pulsejet and an experimental helicopter pulsejet. I drove to Minneapolis and brought all that material home, stopping at Curtis Dyna-Fog, Ltd. on the way. My offer to sell some of the Dyna-Fog generator equipment (to recover some of my expenses) to the company president was turned down, though he was willing to take much of it off my hands rather than have me trash it. I still have most of it.

In 1996, I donated (in Patty's name) helicopter pulsejets to the National Museum of Naval Aviation in Pensacola, Florida, driving down there to deliver them. They still have them, but I do not know if they are on display.

Inspired by all the Aeromarine paperwork and hardware and under the urging of Don Laird and others I am writing a history of Bill's company, its people, and products. It will contain about 90 photographs and 60,000 words when completed. Incorporating all that material into an intelligible and coherent finished book has proven to be much more difficult than I expected, but I hope to wind it up in the next few months. Jerry Nolin has been instrumental in filling in some of the gaps in my memories of this story. Indeed, Jerry was already an employee of Tenney and was instrumental in my being hired at the Aeromarine Company in 1949. We worked together until Russell Curtis bought out Bill's company, remaining in touch to this day.

My personal investigations into pulsejets led to several significant alterations in their designs, only one of which showed any real promise. Its valve system was completely different from all those based on the Dyna-Jet in that it was vaguely similar to that in the World War II V-1 flying bomb but was less complex. The original of that system was used in Aeromarine's 8-inch-diameter pulsejet mentioned earlier.

Another monstrosity was my attempt to make a pulsejet engine whose thrust could be significantly reduced during flight, almost impossible with most miniature pulsejet engines. It was made up of a Dyna-Jet-sized engine and a modified Tiger Jet, joined together at a single exhaust outlet; a gated port was placed between the two at the front. When closed, that gate permitted the smaller engine to operate independently and produce about 1¼ pounds of thrust. When the gate was slowly opened and fuel was allowed to flow into the larger, it started and became synchronized with the other jet, producing (in theory) about 6 pounds of thrust. I must acknowledge the origins of this concept, the Aeromarine's Navy smoke-screen generator of 1951, the PJ-101.

In my version, the junction of the exhausts was extremely critical if the changeover from low to high thrust was to be consistent. Though the first worked reasonably well, the second, flight-weight version left much to be desired. It never produced the expected thrust, was difficult to shift in power and the location of the gate was not optimum because the valve retainers often were damaged by the impinging exhaust gasses.

After I was unsuccessful at convincing AMA officials that my "2-speed" pulsejet was actually distinct engines, I quit work on it, deciding it would not be allowed in AMA competition because of its size. I had hoped to construct a Radio Control Lockheed U-2 and perform all sorts of impressive maneuvers. With the phenomenal success of present-day turbo-jets, my efforts became a lost cause. These days, however, it is possible my beast would be allowed in certain AMA categories.

Throughout these times, and continuing to the present, I collected all kinds of model engines but have concentrated on pulsejets. Among my regular model engines is a single one-of-a-kind

example, about fifty that are really collectible and in demand, another 50 to 75 that are still worthwhile but less so than the preceding, and about 150 pretty common designs. Among my 36 pulsejets is one that is too large for modeling (a 1956 design from Globe Aircraft for the same Navy application as Aeromarine's unsuccessful 8-inch version.) Originally, I bought three of them and sold one to Bruce Tharpe. Bruce, Jr., his son, is a talented and innovative Radio Control designer, flier, and producer of kits, doing business as Bruce Tharpe Engineering. He also designed, built, and flew many Dyna-Jet-powered Radio Control models, including a twin that employs a bladder-type pressurized fuel system.

In response to an article in an international aerospace magazine a few years ago, I wrote a letter to its editor and offered a suggestion as to how the quarter-million dollar cost for an experimental miniature turbojet engine might be reduced. Namely, start by working with standard model airplane turbo jet engines instead of creating something totally new. The purchase price of most that are available is less than the government's cost of writing the specifications for one! They printed my letter, almost verbatim, in the September 16, 2002 issue of *Aviation Week and Space Technology*, the most prestigious and quoted source for aerospace information available. Indeed, during the heyday of the Cold War, Soviet representatives based in the U.S. subscribed to that publication and often gleaned "secret" information from it and sent it to Moscow as "classified" data!

I benefit a great deal from being an active member of the Model Engine Collector's Association (MECA,) as do most of the other several thousand in this group. We are able to compare and swap information and engines, keep track of prices and other trends, subscribe to Tim Dannels' *Engine Collectors' Journal*, and to the *Model Engine Bulletin* and *Swap Sheet*. Tim and Frank Anderson each individually published single-volume reference works on model engines that are great sources of information for anyone interested in the hobby.

In 2002, I received a call from Dan Paxson of NASA's Glenn Research Center near Cleveland, Ohio. Dan contacted me after seeking advice from people at AMA headquarters. To aid in their research into Pulse Detonation Engines for propelling aircraft, they bought my spare Globe engine and sent it to Wright-Patterson Air Force Base for evaluation. They permitted several friends and me to observe one series of tests; those and others were videotaped and written about for a seminar in Nevada in 2005. That video can be found on the internet at <http://www.innssi.com/pde.aspx>. Also available at the same site are several short videos of various versions of their PDEs, as mounted on a Rutan *LongEze*. In this latter application, Mike Melvill was the "pilot" of the aircraft, though it was not capable of accelerating to take-off speed. Mike is better known as one of the two Scaled Composites (Burt Rutan's company) test pilots who flew the SpaceShip I to 100-kilometer altitudes, helping win the \$10 million prize.

A few years ago, several pulsejet enthusiasts pooled some ideas and formed the "Pulse-Jets Forum" on the internet for the purpose of exchanging ideas and distributing information. This forum expanded to include valve-less and valved pulsejets, pulse-detonation engines, rocketry, off-topic and other subjects. There are no fees, but politeness is greatly appreciated although not always apparent. At this time (February 2006,) there are more than 700 registered members

from all over the globe, one being from Timbuktu in Mali, Africa and another (who is very knowledgeable and articulate) from Zagreb, Croatia!

My early experiences with the Dyna-Jet and other pulsejets interested many of the Forum members, even though most in that group have formal educations on that and other subjects that I lack. It is likely that the Forum group represents at least 50 countries though, of course, most are from the U.S.

I still own many aviation-oriented books and magazines and plan on trying to sell most of them soon. I also have a few classic and new model airplane kits such as Cleveland models, gas free-fighters, and plastic scale. As with the books and magazines, I may try to sell all or most of them to someone who will appreciate them as I have.

-Gerald L. Wiles

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*The following narrative comes from information submitted to the AMA History Program by Gerald L. Wiles in February of 2006.*

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Gerald L. Wiles began modeling over sixty-six years ago, with a few spots of non-modeling mixed in. He started modeling at the age of twelve. His interest came from visiting G.C. Murphy stores. He “admired the many ¾-inch scale kits” for a quarter each “from Whitman Publishing Company.” These were Ace Whitman models, designed by Joe Ott.

His first airplane was a *Vultee P-66 Vanguard* kit by Ace Whitman, which he made on his own. The hardest part of building his first model was attaching the nose because he did not properly assemble the main frame. Installing the stringers was the easiest and for the first time the “fuselage began to look like a real airplane. Most of the 15 or 20 models I worked on were scale. The others were intended for ‘serious’ flying. Only a few flew at all and those flew poorly due to lack of proper balance, strength and trim.”

Wiles, under the urging of G. R. (Jerry) Nolin, joined the Strato-Hawks in Springfield, Ohio, his first modeling club, in 1957. He was Secretary between 1959 and 1962, and President in 1963. His first competition was a regional Radio Control and Control Line competition at Wright Field. This was in the 1950s. He competed with his own design, a Dyna-Jet Speed model. He placed first, but “did not get a trophy because I left.” (See Wiles’ autobiography for more information.)

He entered a jet Speed model at the Dallas 1956 Nats at the age of 29, “but did not fly during competition. Other entrants were so dedicated and serious, I decided against taking up their time. My model was not competitive, but I helped Jim Richmond fly Control Line Speed events. I first met him when we both worked at Curtis’ Dyna-Jet factory in 1953.”

Wiles' publications include Gene Hempel's *Speed* column (*Model Aviation*, May and July, 1988, July 1994, and July 1995) and "abbreviated Dyna-Jet histories" (*Engine Collectors' Journal*, #129-131.) "My letter to the editor concerning the use of model turbo-jet engines in military applications in lieu of special-developed versions was printed in *Aviation Week and Space Technology* magazine, September 16, 2002." He is presently completing *The History of Dyna-Jet*.

In the hobby industry, Wiles helped manufacture Dyna-Jets between 1949 and 1954. He also worked for the Aeromarine Company from May 1949 to November 1952 in Vandalia, Ohio, and Curtis Automotive Devises from November 1952 to May 1954 in Bedford, Indiana. He obtained his Associates degree in Electronics Technology at the University of Dayton in 1973.

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