



The AMA History Project Presents: Autobiography of JOHN A. GARD

Born February 2, 1922 Modeler since the early 1930s
AMA #9720



Submitted by JAG/LPG (11/2005); Transcribed and Edited by JS (05/2006), Reformatted by JS (08/2009)

Larry Gard, son of John Gard, submitted the following in November of 2005. This is a transcript from John Gard's original, hand-written autobiography.

John A. Gard Autobiography

I was born in 1922 and grew up on a farm near Lincoln, Nebraska. As a boy, I was fascinated by the flight of hawks as they soared upward in continuing circles until they were mere specks in the sky above the Nebraska plains. This fascination for flight eventually led me to enjoy a hobby in Free Flight modeling and to select an engineering career in the fields of Aeronautics and Astronautics.

I built my first model airplane in the early thirties, a simple stick model held together by Le Page's glue. My brothers and I later built 24-inch flying scale models from the early 25-cent kits distributed by Megow and Comet. We first discovered the availability of these kits after subscribing to *Air Trails* magazine. A subscription to *Air Trails* also included Dick Korda's world champion Wakefield kit. By building and flying this model, I found I was hooked on rubber-powered endurance models, particularly those of the Lord Wakefield class. Korda, Lanzo, Struck, Cole, Cahill, Copeland, Ritz and many others had a tremendous influence in firing up my enthusiasm for Free Flight modeling.

I have always had a curiosity in wanting to understand the mechanics of flight. This curiosity and desire eventually led me to pursue a career in Aeronautical Engineering. I received my Bachelors of Science in Aeronautical Engineering from St. Louis University in 1948. Two weeks later, I accepted a position as a stress analyst with McDonnell Aircraft in St. Louis, Missouri. Some years later, I attained the position of Project Strength Engineer where I supervised strength, fatigue and fracture analysis on aircraft, helicopters, missiles and spacecraft structures. I took early retirement from McDonnell-Douglas in 1978 after thirty years of employment. For the most three and one-half years, I did contract work at Boeing Wichita as a structural analyst. I now live in semi-retirement in Bella Vista, Arkansas.

Model Contest History

World War II, the pursuit of an engineering degree, marriage and the building of our first home with our own little hands delayed any further modeling activities until 1953. I built two Wakefields of my own design and entered the US Wakefield team eliminations. This experience expanded my interest to include the three FAI international events. In 1959, I was qualified to fly in the Semi-Finals in all three FAI events. I subsequently devoted my time primarily to the Wakefield and Nordic A-2 classes in the FAI competition.

My modeling interests were not entirely limited to the three FAI classes. I designed and built airplanes to compete in many AMA events. Trophies were won in hand-launched glider, A-1 glider, mini cargo, ½ A Gas, A Gas, and Mulvihill rubber events. I loved to compete, and as a result, scheduled vacations to coincide with important Free Flight contests around [the] United States. My family and I visited Florida and the King Orange Internationals seven times, traveled to California and the west coast several times to compete at the Nationals and the FAI Finals, traveled to the Chicago area so many times to compete at the Nationals, the FAI Internationals and their spring and fall contests, and then, of course, attending the many, many local contests centered in and around the St. Louis, Missouri area. We traveled to many other states such as Colorado, Alabama, Texas, Minnesota, Wisconsin, and New Mexico, to compete in Semi-Final FAI team selection programs.

Significant contest accomplishments have been realized primarily in the Wakefield event. These are:

- I set national endurance records at the 1959 Wakefield eliminations, and again at the 1962 King Orange International Contest held in Miami, Florida.
- I won a third place at the 1958 Nats, a second place at the 1959 Nats and a first place at the 1962 Nats.
- I had high time on the USA Wakefield team, which placed third as a team at the 1969 World Championships. My performance placed me fifth in the individual world championship standings.

Model Design History

The great challenge for me in modeling has been the designing of one's own airplanes. All competitors wish to utilize their talents and skills to gain that slight advantage on the contest field. Being an aeronautical engineer, I did attain the knowledge, which could be applied to the designing of endurance models. My desire was to improve the endurance compatibility of glider and rubber-powered models.

I read everything I could regarding airfoils and the affects of low Reynolds Number on aerodynamic performance. I developed three airfoils from this research, which proved to be very successful in improving glider and rubber powered model performance. Those sections are designated as G-6509, G-7195 and G-7510 (coordinates have been published in the literature). In addition, my flight-testing involved experimenting with tabulators. I found that dual tabulators (used on the 1969 Wakefield), located at approximately 7% and 23% of the chord, were the most effective in reducing sink speed. [Many international modelers now use dual tabulators, or an adaptation of them.]

I have to thank Bob Wilder for introducing me to his torque meter. This instrument has proven invaluable in evaluating rubber and rubber-powered model performance. I have spent many hours in controlled flight-testing using this tool to determine rubber powered airplane performance in terms of flight time per foot-pound of energy release and in determining propeller efficiencies. A technical article on this test procedure was published in the *NFFS Symposium* of 1981. Both the Wakefield and Mulvihill classes were evaluated.

In 1968, I developed a numerical method, which would calculate flight path trajectory and flight time of a rubber-powered model. Propeller, rubber and aerodynamic capabilities were assumed (these parameters can now be experimentally found by test procedures previously noted.) This numerical method was published in the 1968 *NFFS Symposium*.

In 1970, I designed the Supreme, a Mulvihill class rubber powered model. The numerical method that I used to calculate expected flight time showed that this class of model should achieve flight times in the range of 12-plus minutes. Flight-testing of this model verified that the design features incorporated into the model did give the Supreme this endurance capability. The plans, construction and testing of this model were featured in a two-part article published in the 1972 *American Modeler*.

In 1971, I designed the Monarch Wakefield model. This model incorporated design features that would maximize flight times under still air conditions. This airplane was later selected as the Wakefield Model of the Year in 1975. Design features and flight capabilities were document in the 1975 *NFFS Symposium*. (The airplane easily maxed all three four-minute rounds at the 1980 U.S. Wakefield team selection finals.) The Monarch basic design has won first place at least five times at the Nats.

In 1973, I designed the Nordic A-2 Glider, *Lazy Bones*. This glider featured a tapered, fully sheeted high aspect ratio (18.5:1) wing utilizing the G-7510 airfoil section. Three minute-plus flights from fifty meters were constantly recorded. Wakefield and Mulvihill events did not give me time to seriously compete in the Nordic event. Consequently, the *Lazy Bones* design has not really had the chance to prove its potential.

This hobby has given me many hours of pleasure over these past forty-five years. I believe I have achieved a better understanding of the mechanics of flight. By applying aerodynamic theory and aeronautical engineering knowledge, I believe I have made a contribution toward increasing the endurance capability of outdoor rubber and glider Free Flight models.

I need to thank the NFFS for recognizing achievements attained in the Free Flight modeling world and for the great effort put forward by its members and officers to keep Free Flight alive and healthy. A big thank you goes to my wife, Jean, and my family for their cooperation and support. Also, to my many modeler friends who have assisted me over the years. Without all of you, this honor would not be possible.

The following is from the original resume of John A. Gard, copied by Larry P. Gard, supplied by Jean Gard.

January 14, 2001

Resume of:

John A. Gard

Structural Analysis Engineer

Summary of Work Experience:

McDonnell-Douglas Corporation

St. Louis, Missouri

In April 1948, I began my employment as an Associate Strength Engineer and have continued working for McDonnell-Douglas making structural analysis my career. I was promoted to Strength Group Leader in 1953 and to Project Strength Engineer in 1966.

As a structural analyst and supervisor, I have learned and applied the many different methods of analysis required to predict strength and life of hardware on the many programs with which I have been associated while working at McDonnell-Douglas. Projects to which I have been assigned have been aircraft (military and transport), helicopter, missile and spacecraft structure. My work has required that I interface with all the other technical disciplines, such as aerodynamics, thermodynamics, structural dynamics, weights, loads, etc. On these hardware programs, those people reporting to me have worked with the design engineer on the board to create efficient structures that can meet strength and life requirements with a minimum of weight. Writing test requests and interfacing with the test lab before and during structural testing has been another one of my responsibilities. Writing and supervising the writing of strength reports has been part of my work experience.

I have preformed strength, fatigue and fracture analysis utilizing many different structural materials. These materials cover the spectrum, from steel and aluminum through titanium, the super alloys and refractory metals. I have built and supervised the construction of finite element models (FEM) utilizing numerous computer programs, such as NASTRAN, STUDL, CASD, etc. My experience as an analyst and supervisor has been in the structural analysis of primary airframe and spacecraft structures, control systems, mechanisms, hydraulics and propulsion systems, high-pressure tankage, high temperature missile structures, heat shields and thermal protection systems, helicopter rotors, offshore drilling rigs and platform structures.

Boeing Aircraft Corporation

Wichita, Kansas

I worked ten months as a contract engineer, performing stress analysis on the B-52. I worked on the design of a new pylon for mounting the cruise missile.

Professional Activity

1948-1978 McDonnell-Douglas Corporation

1948-1953

- Associate Strength Engineer, XP-85, XP-88, P-88, F101 Aircraft
- Strength Engineer, F2H-2, F2H-3 Aircraft
- Senior Strength Engineer, XF3H Aircraft

1953-1962

- Strength Group Leader, Helicopter Division

- F-101 Aircraft
- Model 122 Transport
- Mercury Program

1962-1966

- Senior Strength Group Leader F4C Aircraft
- BGRV Missile

1966-1971

- Project Strength Engineer, BGRV Missile
- ATS Spacecraft, model 227

1971

- Study Manager, L-605 TPS Test Panels, model 227

1972-1973

- Project Manager, Analysis of Offshore Drilling Rigs and Platform Structures

1973-1975

- Project Strength Engineer, Model 227
- Space Shuttle – Aft Propulsion System (APS)
- Advanced Spacecraft

1976-1978

- Senior Technical Specialist, Model 227
- Space Shuttle – Aft Propulsion System
- Advanced Spacecraft and other Diversified Programs

1978-1979 Boeing Aircraft Corporation

- Stress Analysis on B-52 to design a new pylon for mounting cruise missile

Professional Accomplishments

Publications

- Several Technical Articles pertaining to Aero-modeling

Awards

- AIA Award for graduating with top scholastic honors in Aero-Engineering class

Outside Activities

Member of AIA

Member of United Methodist Church, having served in many leadership roles

Member of [the Academy of Model Aeronautics] USA Wakefield Team in 1969

Member of the [Academy of Model Aeronautics] (AMA) Hall of Fame

[Academy of Model Aeronautics] National Champion

Education

- Bachelor of Science Degree, Aeronautical Engineering

St Louis University, St. Louis, Missouri
AIA award for highest scholastic grades, 1948

- Applied Mechanics
Washington University, St. Louis, Missouri, 1950

Personal Information

Birth Date: 2 February 1922
Birth Place: Beaver Crossing, Nebraska
Age: 79 years old (currently)
Marital Status: Married
Residence: Bella Vista, Arkansas

Below is a list of publications associated with John A. Gard.

Publications associated with John A. Gard

- Article by John A. Gard, September 1972, *Model Aircraft Magazine* (part 1)
- Article by John A. Gard, October 1972, *Model Aircraft Magazine* (part 2)
- Article by John A. Gard, July 1983, *NFFS Symposium*
- Article by John A. Gard, August 1981, *NFFS Symposium*
- Review about John A. Gard models and tests, August 1968, *NFFS Symposium*

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