



The AMA History Project Presents: Biography of LUDWIG (LUD) J. KADING

January 3, 1916 - February 25, 2011



Written and submitted by LK (1984, 1994, 04/2005), RC (10/2005, 01/2006), LK (01/2006); Formatted & edited by JS (11/2005, 01/2006), Reformatted by JS (09/2009)

The following was written by Royce Childress for Lud Kading's Model Aviation Hall of Fame nomination form. Lud was inducted into the Hall of Fame in 2004.

Lud started flying models in the mid-1930s and soon was building and flying his own designs. He was flying in competition as early as 1938 with his own original airplanes. He later was one of the founders of the Thermal Thumbers in the Long Beach area of Southern California, which later became a wing of the Los Angeles Aero Modelers.

In 1943, he started his own machine shop, Kading Specialty Company, with \$500.00 borrowed from his girlfriend, Eleanor. They were later married, and still are, living in Cedarpines Park, California. Later, John Broadbeck invested in the company and the name was changed to the K&B Manufacturing Company.

In 1945, having no idea what they were, Lud machined 365 hollow balls, about 2" [in] diameter, from the purest aluminum available at the time. They had extremely close tolerances and several large, well-known machine shops had tried, without success, to make them. An inspector came every day to check on progress and make sure there were no pictures drawn and no scrap resembling the finished part left there. After WWII was over, this inspector came back to tell Lud he had made the cores for the **FAT-MAN atomic bomb**.

In 1946, the Bill Atwood-designed engines, Torpedo and Bullet, names and tooling were for sale. K&B bought the rights to the Torpedo and Lud went to work redesigning it to be made from aluminum castings instead of the original, very expensive and dangerous magnesium. He updated the tooling and in many cases designed and built completely new jigs and fixtures for improved ease of production and for use on the machines available at the small company. The K&B Torpedo 29, and soon the 32, were selling well, and K&B engines were gaining a reputation for reliability not previously enjoyed by the older magnesium engines.

In 1947, the glow plug took the model airplane hobby by storm. Lud saw the potential for a very small engine which would no longer be handicapped by the same heavy coil, condenser, batteries, and wiring needed by all ignition engines, no matter what the size. He tried several bore and stroke combinations and found the bore of .281 and stroke of .331, which gave a piston displacement of .020 cubic inches, worked very well. The only major problem he found with the small engine was the glow plug. Heat would not transfer to the plug fast enough because of the engine's small size. He designed a new system which incorporated the glow element into an aluminum body which was also the top of the combustion chamber. This was held down by a finned nut which resembled a normal head. A modified version of this design is still used today on many 1/2 A engines. Demand for the .020 Infant Torpedo was so great that for the first run of 5,000, K&B was shipping only 10% of orders while 90% were on backorder.

The Infant Torpedo was the first successful production engine smaller than .09 offered to the model industry. There was no class designation for these tiny engines and after much debate “1/2 A” was selected.

The Infant was a breakthrough in another category also. K&B was a small company and could not afford the enormous cost of new dies that die cast parts would require. Lud designed the K&B ½ A engines to use all automatic screw machine parts. The engines, being machined from solid aluminum, had been built before but never in the tens of thousands. All the design work on K&B’s small engines, as well as all tooling required to build them, was designed and built by Lud alone.

Shipments of the Infant Torpedo began in mid-December 1948. This was the beginning of a new era in powered model flight. I’m sure someone would have built an engine smaller than .090 eventually, but Lud Kading did it first.

The following information was researched and compiled by Royce Childress, and written by Lud Kading. The first item is a letter to Royce from Kading about a notebook with engine information.

April 27, 2005

Hi Royce:

Since I last wrote to you, I did a lot of looking and nosing around in my garage where most everything I have done regarding engines, airplanes, K&B, the Torpedoes, Infants, etc. in the past 11 years [is stored] ... I gave information to Tim Dannels to do the Infant Engine Story.

Well a few days ago, I found this notebook with one of the stories about what I did in the early days, 1936 to 1953-1954... [Between] 1953 [and] 1957, you know that last few years as well as I do.

I also shortened up the Infant story Tim Dannels published, to where the three journals covering the ... are nothing but that Infant story. I think between the Original notebook story [and] new version of the Infant story ... most of the things anyone would want to listen to [will be covered].

Pick out the highlights of all of this and let me know what you think of it
[Signed] Lud’

The following remembrances are from Lud Kading’s journal. He writes about the “early days.”

1936

My very first airplane was a Reginald Denny Cabin-type Kit. This was the first gas powered plane I built and flew with the Bunch Mighty Midget. I think the Denny Kit was one of the better at that time. It flew OK, but I wanted to have something with more performance.

After this, I built a couple more of my own designs with a Brown Jr. engine. I gradually came up with a cabin type design that performed quite well, even up to having nightlights in the wing.

I flew this plane quite a few times at night at the Western and Rosecrans field. It almost looked

real with the wing lights.

After this, I gradually built some two or three performance-type planes for the Bunch engine Torpedo Ohlsson 23 – Arden .19 and .09.

I had to take time out for the war effort shortly after Eleanor and I ... married [on April 2, 1940].

By the way, the plane with the lights on the wing ... was taken [from] my mother's backyard in 1936.

1945

As you already know, in 1944 I made some parts for the Manhattan Project, but didn't know at the time what I had done. I found out on VJ day what I had been making; the spheres for the Fat Man "Atom Bomb" that took out Nagasaki.

The original run was twelve of these spheres, but I made a total of 365 spheres for the Manhattan Project

The Inspector came and told me what I had made. We went and had a cup of coffee, and parted [as] friends.

Starting at 1936
(Put together in 1984)

My original engine was a Dan Bunch Mighty Midget. I bought this engine in 1936 and used it in, of all things, a low-wing Free Flight. Kind of far fetched, wouldn't you say?

My second engine was a Brown Jr. At that time, I really wanted a Hurelman, but couldn't afford it. I think the Brown Jr. sold, at that time, for about \$10.95, and [the] Hurlman was approx \$21.00 to \$23.00 dollars. This was also in 1936.

In 1937, I bought my first Atwood Torpedo with the magnesium case with a black crackle finish.

It was a pretty good running engine, very fragile.

I don't think anyone free flying in those days, that owned a magnesium case Torpedo, didn't snap a crankshaft, as well as split a case open. [Those who didn't were] either very lucky or didn't fly much.

This first Torpedo 29 was purchased at a little Hobby shop located on upper Central Avenue [in] L.A., about 40th or 42nd Street North.

Guess who operated this shop, and lived in the back of the shop?

Well, it was no one less than Tony Nacaratto and family. Tony and I got to be good friends from this original meeting. Isn't it ironic that we would be furnishing him [with] engines about ten years later? He got us a record in the 1940s; 101mph in Class B Control Line, and I am quite sure that it was done with a Torp 29 ignition engine.

The magnesium case Torp I bought from Tony was #508.

This engine was also one of the early tank models ... a threaded knurled-type tank filler-type, almost like the old-fashioned cargos cap.

The tank was also the type that had a little base up front with a small hole, and a wire with a little cork that showed how much gas you had in the tank. Clever little gimmick, but really wasn't necessary.

I also need to mention in the early engine days after the Atwood Torpedo I bought an Ohlsson 23, then a 19 Arden, as well as an Arden .09.

That Ray Arden was also one smart man, as well as an everyday person to talk with. I was lucky on one of my trips to Dallas to be able to talk to Ray several times.

We were both there representing our engine companies at the Dallas Nationals. I think it was either 1949 or 1950.

Tony Nacaratto and family were real nice people. He was one of those rare kinds, always willing to help anyone that would ask.

Tony at this point in time was also known to be able to get all there was in an engine to the prop, where it counted. In other words, he was very handy in the engine hop-up department.

We tried to help Tony as much as possible, and he in turn helped us when he was able to. His record run of 101 didn't hurt us any. But, mainly, Tony was just a nice, happy little guy that had a great outlook and was a pleasure to know.

I still have this Atwood Black Torpedo 29 and it is complete and [in] mint condition. The original price was 11.95, I think.

In my box of very early K&B engines (29), in looking for something else, I ran across a 29 Ring engine. It is the one and only of the early Torpedo 29 engines to have a handmade cylinder, piston, and rings. I made this one engine in either late 1946 or early 1947. It was just like a spare coin you put in a secret pocket in case you needed it at a later date.

I also found what I believe is the first converted 29 Glo to a 32 Glo engine. I will have to take it apart to be sure. If I find a handmade piston and an over-bored cylinder, then I know I have another one and only.

I also have another one of a kind, and this one is real special. I ... just forgot to mention it, with all the other things going on. I have been trying to concentrate on the Infant mostly. But now and then, when I get into my goodie box I have had stored for 40 years, I find something real good in the collectors department.

This item is a 29 early K&B engine that I quarter-sectioned, even to the Champion spark plug, in late 46 or early 47.

Originally, I sectioned this engine to use as a display when we would go to trade shows. I used a geared down electric motor and a couple of pulleys with a long rubber band to show people how

the engine looked in slow motion

At the time, I had a special plastic mount to which I had the engine fastened. Over the years, the mount got broken and I think the electric geared motor gave up. But the sectioned engine is intact. The tank and engine are the early type with the tank Ball–Detent-type fuel filler. The Gits cap followed on the later engines, and was much better...

You know, Tim, it is really a shame we are so far apart. I would love to get you some real good black and whites of all this stuff, but at the moment, I just don't have the way to do it.

Again, one of these times I will gather all this early torpedo engine stuff and put on another video tape so you can begin to see what we could do if you want to delve into the early 29s, 32s, and 24s, plus some experimental things I have available.

I believe if I put my best effort forward, and I don't run out of time, I think I could come up with a lot of torpedo history. Early ancient history, that is.

Now I would like to spend a few pages talking about the Thermal Thumbers Free Flight Club. There is quite a lot of history there, also. We used to hold meetings in our shop in Bell Gardens for at least two or three years

As you can see by the picture I sent you of the TT club, they were a great bunch of guys, as well as some great builders and flyers.

In the center of the picture, as I noted, is Mr. Wright. He was an AMA President at that time, and also a very genuine person.

Right next to him is Thermal Thumber Frank Cummings who, at that time, was world champion titleholder for indoor microfilm airplanes. I believe for a couple years he held both classes "A" and "B." Frank was a flawless builder and a great person to call a friend.

This Thermal Thumber group had members from all phases of flying in those years - in the mid to late 1940s, as well as into 1951.

I got a little mini car-racing group started in 1949 and 1950. It was mostly for fun. We made up a bunch of little trophies and raced the cars on our shop floor. We would do this about a couple nights a month. It was a fun way to relax and let your imagination run away.

It ended up that we all went over to what we called mini air cars at that time. We tried to keep them all within limits, as far as size, weight, and engine sizes

At first, we all used Infants, then as we came out with the .035, then the .049, we got some real red-hot cars.

We ran the cars on about [70-inch wire – so we could easily convert from the 70 ft speed tables]. We finally got the cars going fast enough that they became a blur, so we had to devise a little make and brake switch and light that the cars would run over so we could check them with a stopwatch. [We did this because several of us ended up with a bunch of little slices across the back of our index fingers. A perfect way to check propeller efficiency.

We finally got these little, approx 8" wheelbase prop driven pusher cars to approx 60 mph with the Infants (with a little help from nitrated fuels). The .049 prop driven cars made it up to approx 80 mph. Not bad for a bunch of homemade toy cars, and also a bunch of adult kids having a lot of fun.

Most all the guys running the prop driven cars were Thermal Thumbers, just doing something different.

There are not too many of the original T.T.s left. About half of them are deceased or gone from [this] part of the country. Right now I can only think of about a half-dozen of the original bunch that I know where they are.

Those days, and [the] few years [of] flying with the guys a couple of times a month [and] getting together with their families were memories very dear to me... When I look back, we Thermal Thumbers were quite a group.

One other thing: we used to sift a few engines into the hot-rodders of the club. This gave us first hand information on what each of our original engines could do.

We did not hand pick the engines. In most cases, we just let the guys pick one out of a bunch of engines. We got back some real straight answers, some good, and some had questions, but all the responses [were] helpful to use and the group enjoyed it too.

“The Thermal Thumbers,” a real great group of model builders and serious flyers.

End of T.T. story

About ballpoint pens we made early in our days at Bell Gardens...

Our assembly ladies did somewhere over a hundred-thousand of these little pens. They were an advertising gimmick from some company, the name I don't remember.

Our employees in the machinery department did outside contracts that John had made arrangements for us.

All the early months at B.G., we were tooling up for a water sprinkler I had developed. We got a blue ribbon patent on this item because of the way it functioned.

We made about 70,000 of these, and then farmed out the assembly, painting, etc. for about another 70 or 80 thousand.

This sprinkler was one of the bread and butter items of our own that helped us to be able to make dies, tooling, etc. for our K&B Torpedo 29 in mid- to late-46.

[Hand-written note running up side of page: “Made die casting dies, etc.]

In 1953, I bought back the sprinkler dies and patents from K&B, and later in 1954 ... did the hose sprinkler dies. [I] had a G-cavity pop-up sprinkler die to go into what I thought at the time

was going to get me going again.

After about 30 to 40 thousand hose sprinklers, and equal amounts of pop up sprinkler heads, all hell broke loose.

A company in Japan started importing sprinklers to [the] U.S. at a price I couldn't even buy the materials to build my patented product.

I guess I don't have to tell the rest. It was quite drastic. I sold almost everything I had in equipment, even the property and shop I had built in Rialto, California, and paid off all of my bills so I could go out with a clean slate.

In 1957, I went to work for Rohr Aircraft in Riverside as a machine shop foreman for 10 years, then into manufacturing engineering for 4 years. I left Rohr in 1971.

I lost it all, Tim, in 1956, but after paying all my outstanding bills I still could look in a mirror and not be ashamed, plus I had a very understanding wife and a couple of children that somehow or other still believed in me. I guess when you look back, you could say I didn't end up with much money, but I still had my family and memories of how they helped me through this crisis.

I realize I have wandered in and out of the K&B early history, mixing it with some of my own doings. Maybe some of this could be usable at some time or other.

Now to get off that subject completely, I will get to some of your current questions and doubts in your last nice letter to me.

The picture of my older boy and me in my mother's yard is from a black and white photo. If you can use this one or the one of my other boy and me with the "Munster" or the larger plane with the Torpedo 32 ignition engine, let me know. I don't have the negs, but I have the copies and can get them done on that Cannon machine.

These pictures were done on an old brownie camera back in 1938.

Just today, 8-4-94, I ran across something you need to see. It is a 29 case that I was going to use later on, and later on did not happen.

I altered this case again, in 1947. It was changed in the transfer area. I had built a bulged condition that looked weird, and was held on with a couple handmade wire-type hose clamps.

Looking in the inner area, you could see that I was on the edge of Schunerel-type porting, and had not realized it yet at that time. I was too busy with keeping the shop going. My after hours time also had to spread very thin.

A person in our shop on Washington Blvd., then Bell Gardens, then Palmer Ave., Compton, that I must not forget is:

Harry Redrick.

This man was John's brother-in-law. He worked part time with us on Washington Blvd., L.A.

during [the WWII] days.

He stayed with us in the Bell Gardens time and then to Palmer Ave., Compton.

Harry and I worked very closely together all those years, and when we got in the engine business, he was one of those rare people that could almost sense your thoughts. I could go on for several pages talking about Harry, and it would be difficult to say anything but good for him. Harry was a great person. I heard he died a few years ago. He deserves a lot of credit [for] helping K&B to be what it is today in 1994.

Also, Bill Sweet was in with us at Bell Gardens from 1947 to mid- to late-1949. I believe he was in on a 10% ownership basis.

Bill acted as our sales rep. He left after a little more than two years.

Bill was a good guy and also a good sales rep, but I guess the best to say is that it just didn't work out.

One of his favorite sayings at a contest as he would go around and talk to the guys was "What's up, Doc?" If you were not with the modelers (free flight) a lot, it wouldn't be funny at all, but in those days, explaining your airplane engines, etc., the question of down, side, or up thrust came in the conversation almost every time. So Bill's little curie was almost always as he would look at the engine, and firewall, and say, "What's up, Doc." All the people that knew Bill would answer, "I don't know, what's up, Doc?"

Bill Sweet came from San Diego in 1947. His wife followed a few months later after Bill found a house. Bill lived with us those few months. He really was a likeable person.

You will have to put up with me, as I just can't help giving a little credit to those that really thought they were trying to help us.

When giving credit, I think it is only right that I give credit where it is due and rightfully earned.

This credit will go to our faithful employees that were 25 at our peak time in Bell Gardens.

We had thirteen female employees that did everything from the small machining jobs to assembly, packaging, repair of engines, and almost any job they were asked to do.

The male employees were twelve, and they did lathe work, milling machine, tunnel lathe work, and all specialized equipment work.

Then we had our engine run-in and testing young men that were very important to us. You see, we were very truthful when we said, "We run, and check every engine we sell."

That slogan meant a lot to us, and this method of running and testing continued as long as I [was] with K&B Mfg. Co.

All in all, we had a great little business at that time. We had orders to fill, happy employees, and a good future to look forward to.

What else could you ask for? I thought we had it all.

Lud Kading 1994

This group of subjects is a lot of memories that I have written down as I have thought of them. You may have to read it over a second time to make some sense out of it.

As I have said a time or two in this group of subjects, this is really sort of a resume of some of what I consider the highlights of a big share of my working years and the good people I was fortunate enough to have as fellow workers and friends.

If you aren't asleep by now, maybe it is time.

Lud

P.S. Some other time I would like to go in more detail about the "Timit," Go-Jets, Sprinklers, Ever-Glo (shielded Glo-plug), etc, if you would like to listen. Also, maybe a bit on our part of the Cal -Tech A-Bomb.

About here, I need to jump in and tell a little story of four grown-up kids that spent a weekend at our little cabin in Cedarpines Park.

Royce Childress, Lew Mahieu, Tiff Acosta, and I spent a real fun weekend.

Eleanor cooked us a large pot of chili beans, and the four of us adult kids came up to do something different.

We ate chili 'til we couldn't eat anymore, then we decided to make some fly-powered microfilm airplanes.

By the way, this happened in about 1954.

Back to the microfilm, we all came up with something different. The planes were approx 4 or 5" wingspan

The frames were made from approx 1/32 balsa strips. The microfilm we made in the old bathtub using old wire clothes hangers to dry the film on.

We tried using flies to power them, but I guess our glue was too powerful and most of the flies died. The few that lived weren't too powerful, and so we went to moths. It was the right time of the year, so getting the moths was easy.

After a while of trial and error, we found that if we put the moths in a jar and chilled them just enough to put them to sleep, we could get them glued onto our airplanes before they woke up.

After this, we really had some high-powered bug airplanes. All of us kid grown-ups had a blast with these little bombs. Finally, we had some more chili and then went to bed.

The next morning it was calm outside, so we took what was left of the little microfilm planes outside to fly them. It didn't take long to either get one caught in a tree or thermal, or just break them up.

The four of us had a great time just being kids again. These are real fond memories for one, and just show, at the right time and place, you can really let it all hang out and just have fun. It sort of brings you back to reality. Thanks for listening to my little true story.

Lud”

Lud Kading wrote the following in January of 2006 as a conclusion to the above journal entry.

Royce Childress and I have been friends for sixty years now, but more than that, we worked together close to 20 years.

Royce went on to become a master machinist and toolmaker.

I am very proud to have a true friend like Royce Childress.

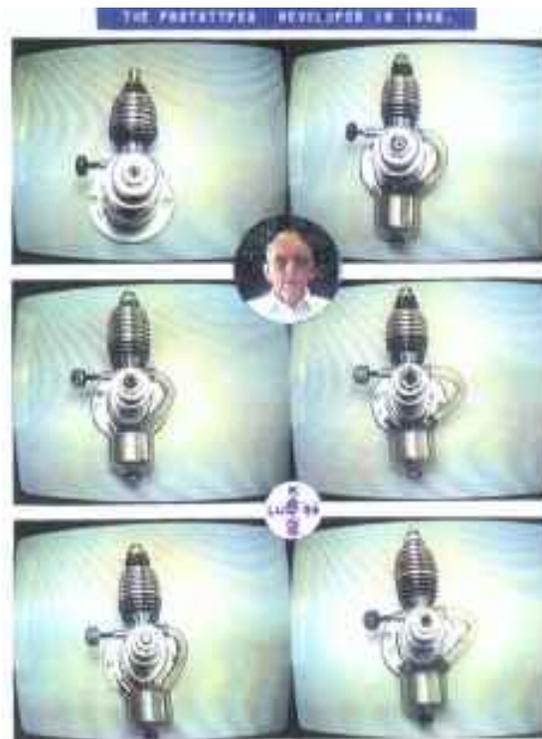
Thank you and Royce for all of your help.

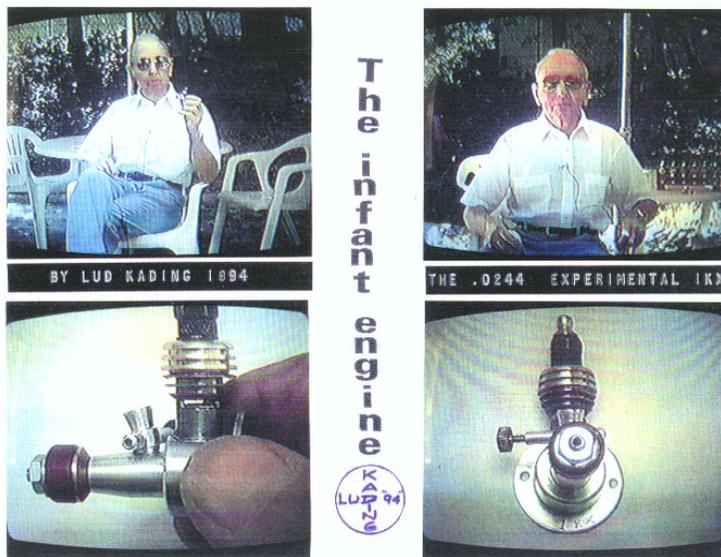
Lud Kading 1-22-06

The following update is by Royce Childress, friend of Lud Kading, concerning the trip to the cabin in Cedarpines Park.

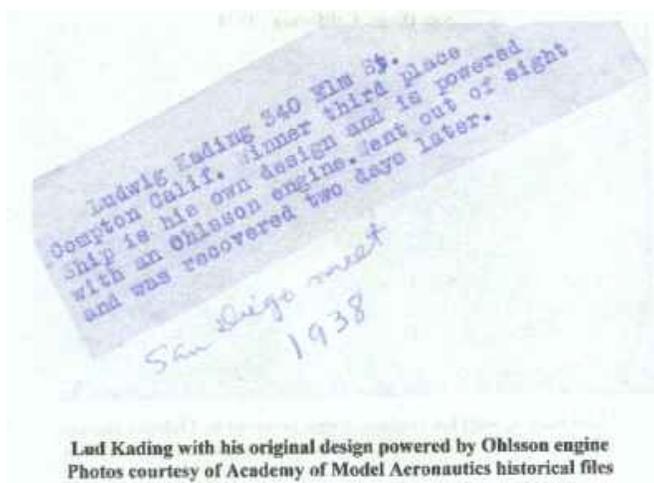
“Lud left one thing out of the cabin story. He, Tiff, and I were awakened the first morning by Lew standing out on the rear deck and screaming as loud as he could. We ran out to see what was trying to kill him, but he just said his shrink told home to do that whenever he could, so all four of us tried it and it really does make you feel good, and of course, a little nuts.”

(Right) Photographs of Lud and prototypes of his Infant engine, ca. 1948.





1994: Lud Kading and his Infant Engine.



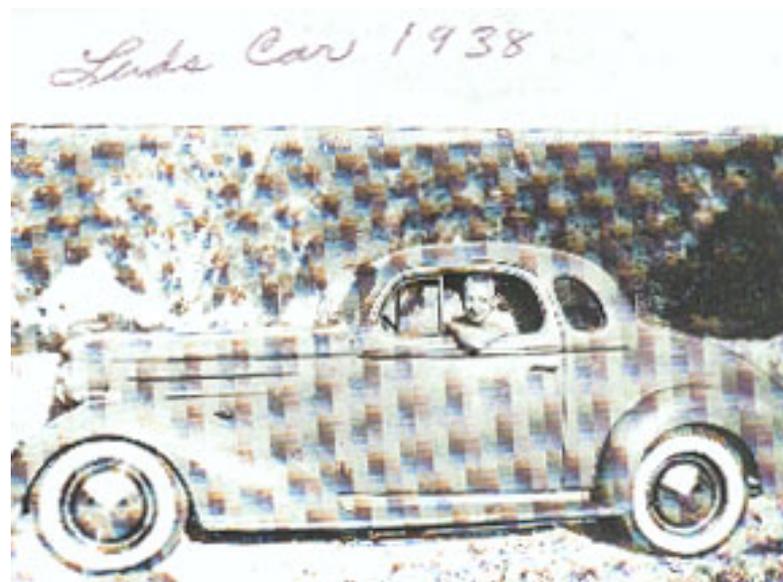
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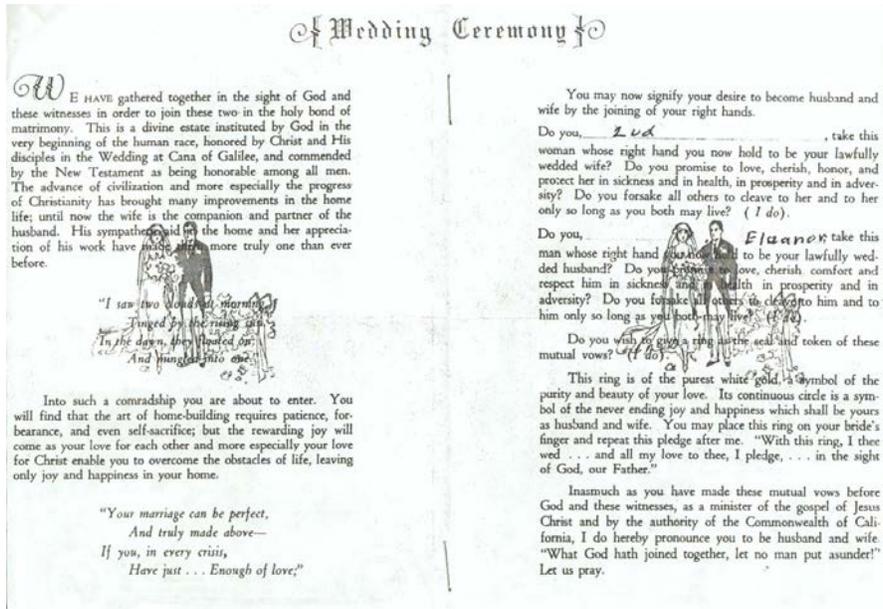
(Top) 1938: San Diego, California - Lud Kading launching his original design ROG (Bottom) Lud Kading with his original design, powered by an Ohlsson engine.



*(Left) 2002: Lud and Eleanor Kading at Dance Point.
(Right) Newspaper article, engagement announcement for Lud and Eleanor (Way) Kading.*



1938: Lud Kading's in his car



Page from Lud and Eleanor's wedding.



(Left) Newspaper article, wedding announcement for Lud and Eleanor Kading.



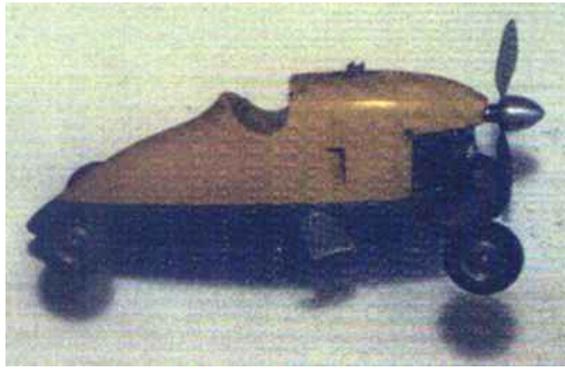
(Right) 1940: Car belonging to Lud and Eleanor Kading (Eleanor in driver's seat)



1938: Lud and son (Note: lights in the wing)



Lud and Jim Kading with Infant Funstar



“One of my fun air cars.” – Lud Kading



Group photograph of the Thermal Thumbers with accumulated trophies.

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