Vol. 20, No. 42

Newsletter of the China Lake Museum Foundation

Summer 2014

Looking for something to do? Build an airplane! by Paul "Booger" Valovitch

I have always been interested in airplanes but could never afford to fly in a real airplane as a kid growing up in Southwestern Pennsylvania. I was very fortunate to attend Purdue University on a Naval ROTC scholarship from 1961 to 1965 where the Navy paid for my private pilot's license through something called the Flight Introduction Program. After graduation I immediately entered Navy flight training and earned my wings in February 1967. I spent thirty years in the Navy as a carrier pilot and test pilot.

After retirement from the Navy, I worked for the Applied Research Lab at Penn State, then Lockheed Martin. Missing aviation, I quit Lockheed in 2001 and went to work for Advanced Training Systems International (ATSI), flying civilian A-4 Skyhawk in support of the US DOD and foreign allies.

After leaving ATSI and joining DCS in 2004, there was no more flying but the desire to be able to get airborne still remained. I had some friends involved in general aviation; some were involved in experimental aviation and airplane building. I also had a desire to undertake some kind of interesting project that would occupy some of my time living in the desert boonies of Ridgecrest, CA, particularly in winter when snow in the mountains prevented my other passion, backpacking.

So I decided to build a homebuilt airplane.

I decided to build a homebuilt, and then undertook extensive research to determine what I wanted to build. There are hundreds of different airplane kits available from a huge number of manufacturers – some more credible than others.



The decision tree was actually fairly logical. First decision was primary construction material - fabric covered, fiberglass or metal construction. I didn't want to mess with fabric; a good friend warned me against the tedious sanding requirements of building a fiberglass airplane — so I gravitated toward a metal airframe, even though I had never driven a rivet in my life.

Then came the choice of kit manufacturer. Because of my near total ignorance of the processes involved in



airplane construction, and the realization that if the design wasn't robust – or tolerant of a certain level of construction mistakes – bad things could happen, I was drawn to the kit manufacturer who had the most kits completed and flying – Vans Aircraft of Aurora, OR.

At the time Vans produced five different kits (they now are up to nine). Because I'm a pretty big guy, I eliminated the RV-3, RV-4 and RV-6 as too small. That left the side-by-side two-seat RV-7 and tandem 2-seat RV-8. During this time my wife and I had one of those married people "discussions". I knew she didn't like flying – feeling it was

unnecessarily dangerous (I repeatedly pointed out without much effect that by far statistically the most dangerous part of any flight is the drive to the airport), but she also informed me that she had barely tolerated my careers flying airplanes and was quite happy with the assumption my flying days were over. She reluctantly realized that building this airplane was very important to me – and agreed that I could proceed under the following conditions:

She would not help with the building – afraid she would make a mistake that would cause the wings to fall off and I would die.

I would continue to work for DCS in order to pay for what she soon realized was going to be a very expensive "hobby".

Assuming I someday completed the plane, she would never, ever, ever have to fly in the thing.

On the positive side, I also convinced her that I had to start from scratch and acquire the proper high quality metal-working tools and materials. I was like a kid in a candy store online with the various aircraft tool suppliers.

On cross country flights, side-by-side seating – with both having superb views of what's coming up – is far superior to the front–back tandem design. However, the tandem RV-8 with its narrow fuselage flies like a fighter. Since my wife was never going to fly with me, I chose the RV-8. Turns out to be the best decision I made.

The RV-8 comes in two versions – the tailwheel RV-8, and a nosewheel equipped RV-8A. The -8 looks cooler, but is tricky to land in a crosswind – and flying a taildragger, for insurance purposes, requires extra training and a tailwheel endorsement. I had at the time over 7000 hours of flight time – but none of it was taildragger time. I live in Ridgecrest, CA, 86 miles from the nearest "city", with no one here qualified to provide tailwheel training. Also, Inyokern Airport, where I was eventually going to base my plane is notorious for its crosswinds. Therefore I decided to build a Vans RV-8A.



The build sequence is also very logical, except during latter stages where factory direction is relatively sparse and more and more configuration decisions are left to the builder. I ordered the tail kit – horizontal and vertical stabilizers, rudder and elevators. I then signed up for an Experimental Aircraft Association (EAA) 3-day homebuilder course in Corona, CA. I redid my workshop (the 25 x 50 foot detached workshop was the primary reason I purchased my house) to mimic an airplane factory with workbenches, parts and tool storage cabinets, and fixtures for various power tools. I also bought an air compressor to run the various aircraft drills and cutting tools. I built tables to accommodate blueprints, plans and other documentation. I then designed and built the various jigs and fixtures needed to ensure alignment of the various aircraft components.

The tail kit is built first to provide experience with basic tasks such as precise measuring, cutting, deburring, drilling, clamping, countersinking, dimpling, priming, riveting, etc. I very quickly realized that attention to detail was required – and sloppy construction techniques were unacceptable for assemblies that were going to be joined and hopefully not come apart at 3,000 feet.

I then progressed over a long period of time to the wings and fuselage, gaining more skill in riveting and understanding workflow and requirements. I had to choose an engine, engine accessories (starter, alternator, etc.), and avionics suite. More choices in the experimental aircraft world than you would imagine. For example, I started flying A-4's in 1967; A-4 avionics, other than the weapons systems, consisted of a single radio, a Tacan for navigation and an IFF transponder. For a little over \$20K my little experimental homebuilt has two radios, a VOR, GPS, Electronic Flight Information System (EFIS) with moving map, synthetic vision and engine monitor displaying over 16 parameters, transponder, audio panel, and electronic timer. Since it flies like a fighter and is stressed to plus 6 and minus 3 g's, I also have redundant g-meters – just because! There are several versions and several suppliers for all these components with a large range of prices - so configuration decisions were a continual part of the build process.

I decided to install a new Aerosport IO-360 180 HP fuel injected engine (\$29K) – essentially an experimental Lycoming design - and Hartzell constant speed prop (\$7K). I decided to make the cockpit "fighter-basic" without any heavy upholstery or noise suppression materials other than comfortable seats. I also decided to include fighter type stick grips and engine controls.

Before installing the engine I spent a lot of time designing the electrical system and installing wiring. Wiring is pretty much left up to the builder to figure out since the limitless number of design options precludes anything but basic electrical theory to be included in the building instructions. I purchased



several aircraft wiring books, and designed a redundant system with both a main and backup alternator. I designed the lighting system to include wing and tail strobe lights, navigation lights, landing light and very good cockpit lighting coverage. I also had to figure out circuit protection (in airplanes every circuit includes a circuit breaker or fuse) and switch configuration (switches are designed for various current loads). I spent a lot of time thinking about human factors and instrument panel design — another aspect left entirely to the builder. I also decided to include back up instruments —

airspeed, altimeter, vertical speed – even though that information is presented on the EFIS primary flight display. A lot of time was spent analyzing the "what ifs" and answering the question, "What could possibly go wrong?". More time was spent figuring out optimum wiring runs and bulkhead penetration locations.

I am very pleased with the instrument panel design and the human factors involved in flying the plane. Of course, one must remember that the building process involves constant decision making, tradeoffs and compromises. There is no right answer – just the best combination of solutions for your unique design. I made numerous construction mistakes – but all those involving flying qualities seem to have cancelled each other out. She flies like a dream!

After wiring and engine install I moved on to fiberglass work on the canopy support structure, side panels, fairings, engine cowling, and gear fairings. Working with fiberglass permitted me to repeatedly go through my ever growing repertoire of curse words and confirmed the wisdom of the decision to build a metal, not plastic, airplane. A lot of other tedious tasks were completed as the project neared completion – 90% done and 90% yet to go. Wheel pants and fairings, wing tips, control rigging, canopy rigging, brakes, elimination of a zillion fiberglass pinholes – and much more.

With Pappy Fain's help I moved the plane from my workshop to its hanger in December 2010. I completed the hundreds of remaining tasks and one day in late March realized there were no more building tasks – the build was complete. I arranged for an FAA rep to perform the only required certification inspection and received my airworthiness certificate. Experimental airplanes require a 40 flight hour Phase 1 flight test program within a specified test area. I spent considerable time developing a comprehensive flight test plan from FAA, Experimental Aircraft Association (EAA), Navy Test Pilot School and Society of Experimental Test Pilots (SETP) source material. I also put together a 130- page Pilots Operating Handbook (POH) specifically for my unique airplane. Even though it is built from a kit, so many design variables are left to the builder that every homebuilt is unique.

After a series of ground tests, on the morning of April 4, 2011 LuJaRo (named for my three grandsons LUcas, JAcob, and RObby) flew for the first time. Six and a half years of effort, frustration and sweat, 2700 hours of hands-on construction time, and \$125K produced an unbelievable feeling of accomplishment and satisfaction. The plane flies just like a slower-speed fighter. It loves to pull g's and go upside down. I now have over 325 flight hours on the plane including a trip to Texas for painting and two trips to the East

Coast. I take people flying, insisting on only two rules – 1) If you want to go straight and level, buy an airline ticket. 2) If you puke in my backseat, you have to clean it up. In cruise it burns about 9 gallons of avgas per hour, producing a true air speed at 8000 feet of 160 kts. At \$5.90 per gallon for avgas my wife's expensive hobby observation was valid.

And she still refuses to get in the thing – and will not even begin to discuss my desire to build another airplane!



From the CEO

What a difference a few weeks make! After months of meetings with our architect and design professionals, specifically regarding the CLMF building committee's efforts to locate an exterior exhibit on the corner of China Lake Boulevard and Las Flores Avenue, the committee was made aware of the immediate availability of the Marriott professional building on China Lake Boulevard, directly across from Ridgecrest Regional Hospital. We are now in conversation with the property owner regarding a variety of options that could allow the museum to move off base in a prime location years ahead of our previous schedule. Needless to say, funding is the constant obstacle!

The China Lake Museum Foundation and staff are working diligently to seek significant donor/funding sources outside of the Indian Wells Valley to establish the China Lake Museum in Ridgecrest as one of the Nation's premier museums and to create a "micro economic engine" for the community of Ridgecrest.

Please accept our sincere expression of appreciation to all who supported the annual dinner and auction. It is truly amazing that the empty shell of the Kerr McGee Center can transform into one of the Indian Wells Valley's premier events in just a few hours! We look forward with great anticipation to our

upcoming events:

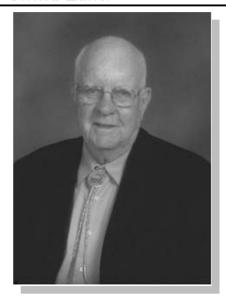
- The Major Donor Appreciation Reception on October 31 (come in costume, if you like)
- The First Annual CLMF Golf Tournament on November 1
- ♦ The New Year's Eve Gala Event at the Marriott



Thanks go to you for your steadfast support of the museum and special thanks to the Raytheon Company, Jacobs Naval Systems, Inc., the Swap Sheet and Marriott Suites for their sustaining corporate sponsorships

Bruce Auld

CEO



Dr. Carl Schaniel

Dr. Carl Louis Schaniel Jr., a former Naval Air Warfare Center Weapons Division physicist, died May 22 in Pacific Grove, California. He was 87.

Schaniel spent 40 years in federal service working for the Navy in San Diego, the Pentagon and China Lake. One of China Lake's highest-ranking civilians, Schaniel invested more than 30 years working at NAWCWD.

Schaniel and his family moved to China Lake in the early 1960s. During this time, he worked at the China Lake Propulsion Laboratory facilities on classified highlevel research and development projects. He also headed several research departments. Although most of his work and subsequent findings remain classified, his scientific contributions to the Navy and our nation were significant.

He received numerous awards during his NAWCWD career including the Commander's Award and the Meritorious Civilian Service Award. The Meritorious Civilian Service Award is commonly the second highest award and medal provided to civilian employees within agencies of the federal government of the United States.

"I worked directly for Dr. Schaniel for a number of years when he was head of the Propulsion Systems Department," said Scott O'Neil, executive director NAWCWD. "He was a great mentor, boss and leader. I recently read Carl's book on his career working for the Navy. It was enlightening and fun. He made huge contributions to our national security and to our Navy."

The Dr. Carl Schaniel Energetic Materials Laboratory complex at NAWCWD China Lake was named in his honor in 2005. The research facility encompasses several buildings. State of the art facilities and equipment allow scientists to research and develop new propellant and explosive formulations. Unlike before, researchers can now concurrently mix and cast new propellant and explosive formulations.

Schaniel's influence is far-reaching. His name is mentioned in David L. Boslaugh's book, "When Computers Went to Sea: The Digitization of the United States Navy." In the book, Boslaugh notes, "Carl L. Schaniel, a civilian scientist from the Naval Ordnance Test Station, China Lake, California, brought expertise in automated target tracking and threat evaluation."

Schaniel is also mentioned in the preface and in the bibliography of Vincent O'Hara's book, "The U.S. Navy Against the Axis: Surface Combat, 1941-1945."

A tribute to Dr. Schaniel will be held at a future date in the CLPL Energetic Materials Research Laboratory that bears his name.



Robert Vargus

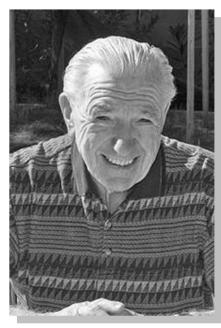
Robert Vargus passed away 9 April 2014 peacefully with family and friends all around him. After being diagnosed with pulmonary fibrosis, he planned his passing just as he planned his life and career. With the able and caring assistance of Hospice, the end of his

life was just as comfortable as he had intended.

Bob was born 16 February 1932 in Oakland, California. He was in the Air Force for four years during which time he spent one full year in Korea operating and maintaining radios and data links. He graduated as an electrical engineer from Chico State College in 1960, where he had met and married his forever wife, Marjorie Anne Russell.

The career of Bob's choice was offered to him by the Naval Ordnance Test Station (NOTS) in 1960 where he had a long and distinguished career both in Electronic Warfare ARM weapons and targets and as a Senior Systems Engineer. He was always challenging himself and all those he worked with. His focus was always on the "Big Picture." His career spanned from 1960 to 1987. He retired to pursue his love of building hot rods and working with "old tin!"

See Vargus, page 7



C. John DiPol

Caesar John DiPol died in Ridgecrest Regional Hospital on June 6, 2014, with loving family members by his bedside. During his nearly 64 years in our valley, he accumulated a lasting legacy of accomplishment and numerous friends on both sides of the China Lake fence.

John was born Sept. 3, 1925, in the small village of Colle Di Arba in Northern Italy. At the age of five, he emigrated with his mother to the US in 1930 to join his father, who had preceded them to work in Pasadena, California.

John started school the following year, learned English very quickly and continued through elementary and secondary schools in the Los Angeles area, graduating from South Gate High School in June 1943. He had enlisted in the Naval Reserve the preceding month and after graduation was ordered to active duty on July 1, 1943. He was commissioned as an officer and received his BSME degree from Iowa State College in March, 1946, upon completion of training in the Navy's V-12 program, followed by several months' duty aboard USS Montpelier (CL-57).

He returned to civilian life in Los Angeles in late 1946, but continued to serve in the Naval Reserve for many years, ultimately being placed on the retired list in 1985. Shortly after his arrival in Los Angeles, he met his future wife, Dolores. They were married in April 1948.

In 1950 John was working for the Sandberg-Serrell Corporation, a small engineering firm in Pasadena, specializing in the design of the nozzle and test sections of transonic wind tunnels. With business slowing down in the latter part of 1950 and with Dolores expecting their first child, John made applications for employment through the Office of Naval Research, which had an office in Pasadena.

Shortly thereafter, he received a phone call from the Naval Ordnance Test Station, Inyokern. John came for an interview and was offered a position which he accepted, all on the same day. He started to work at China Lake in October 1950, with Dolores and infant child joining him in late December when housing became available.

John had a rewarding and productive career at China Lake, progressing through various technical and management positions.

In one of many career highlights, his comprehensive knowledge of the Naval Weapons Center's technical facilities and range and airspace resources led to his appointment by the Joint Chiefs of Staff as a leader of a tri-service task team to report on the military requirements and assets of the southwestern U.S.

That study directly resulted in numerous improvements to the facilities of the Upper Mojave Desert, with new airspace coordination arrangements allowing all services to operate and share range assets in a safer, more productive way. As a result of that study and of his excellence in other aspects of RDT&E leadership, John received China Lake's highest honor, the L.T.E Thompson Award, in 1975.

His other citations included the Michelson Laboratories Award in Management and the Secretary of the Navy's Distinguished Civilian Service Medal, awarded at the time of his retirements in 1981.

After 31 distinguished years at China Lake, he spent the last 33 years of his life popularizing our valley's rich history, playing a central role in the rebirth of Ridgecrest's former County Building as the Historic USO Building and sharing his concept of the roles our valley can and should play in the nation's defense.

Vargus continued

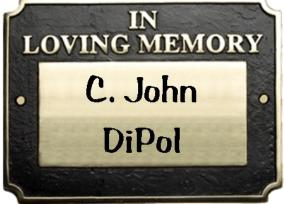
Bob leaves his loving family Marge, Susan and Daniel Hamilton, Tania Vargas and children Christopher, Jessica, and Jeremy Vargus, and Larry and Debie Flentye and children Kevin and Katelyn. Kevin and Sara Bergh's son will be named Nolan Robert in honor of his adopted Great Grandpa. Brian Vargus, who preceded his Dad in death, died from colon cancer 10 September 2010.

Many dear friends, old and new, came to visit Bob

often and he enjoyed the visits and the very wide variety of subjects that kept him challenged.

At the time of his death, Bob was very interested in learning about the life, times and teachings of Jesus, and we are all sure Bob will seek Him out and have some in-depth questions for Him.





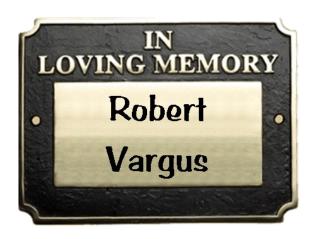
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Contact us for base access 3 weeks prior to tournament.

Mission

The China Lake Museum is the United States Navy's premier science and technology history and heritage exhibit. The Museum's purpose is to inspire, educate, and encourage our present and future generations to achieve success through innovation and exploration and obtain peace through strength. Because of what China Lake did and does, American citizens are free to innovate and create new vistas across the full spectrum of American life.

"China Lake is where America comes for defense."

Vision

China Lake Museum Foundation has a vision to create a self-sustaining, historical, educational, entertaining museum that:

- Shares history of China Lake and the development of Naval Armament and Technology
- Nurtures curiosity in science and engineering in youth
- Is a tourism draw for the Indian Wells Valley
- Is a community resource for social and networking events

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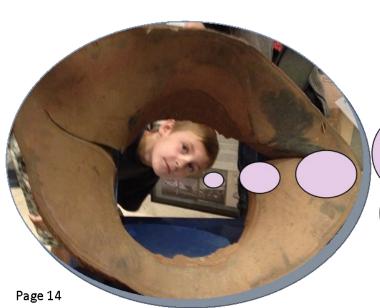


We are co-located at Red Rock Books

Coming Soon!

⇒ expanding the gift shop

⇒ going viral (on-line)!



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Pictured: Christian Raley in the Harpoon Penetration Test

Thank You! You help put the pieces together!

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