

Protracted *Project*

Allen Potts' 17-year Marquart Charger challenge

Jack Cox

Allen Potts, then of Kalispell, Montana, came to the attention of the sport aviation world in June 1986 when he displayed his newly completed 150-hp Wag-A-Bond at the annual Merced, California, fly-in. It was a stunning airplane finished in red with gold pin-striped maroon trim. Homebuilders and antiquers alike admired it for Allen's superb workmanship and his many innovations—among them a top-hinged, swing-up cabin door for ease of entry

and egress.

Although the Wag-A-Bond's paint was still curing, Allen was already committed to a new project: a Marquart Charger. He had purchased the plans from Ed Marquart, had bought the metal wing fittings and flying wires from Ken Brock Manufacturing, and had even visited Jim Smith and Remo Galeazzi in California to learn as much as he could about their two Oshkosh Grand Champion Chargers (see *EAA Sport Aviation*, October 1982 and

JIM KOEFENICK



June 1985).

Even though he was a first-time builder, Allen completed the Wag-A-Bond—from scratch, no kits—in three years of typical evening and weekend spare-time work. It would take 17 years to complete the Charger, however, during which time Allen would experience a lot of changes in his life.

Beginning of an Odyssey

Once a maker of classical guitars and having built the Wag-A-Bond wings, Allen started on what he considered the easiest part of the project: the Charger's all-wood wings. Next came the fuselage and all the other welded components.

"Compared to something like the Wag-A-Bond, the Charger fuselage is complicated and difficult to build, but I'm living proof anyone can build it," Allen jokes. "I welded everything, except for some of the Brock wing fittings, which are lovely things. I just took every fuselage station as a project and kept at it until it was completed, then went on to the next one." The stainless steel firewall was a challenge for Allen, but eventually, it too, was soon completed.

Unique among homebuilt airplanes, the Marquart Charger has cantilever main gear legs somewhat

similar in concept to those of the Stinson Reliants of the late 1930s.

Ed Marquart designed them to be welded out of .090-inch thick 4130 steel—tapered box sections with four flat sides.

"Initially, I couldn't figure out just how these four pieces—two wide ones and two narrow ones—should go together. So, I called Ed and asked whether the narrow pieces should go on the wide ones, or the wide ones on the narrow ones. 'Neither,' Ed said. 'Just take a length of angle iron and clamp the pieces to it with the edges just touching, then fill in the ditch with weld. Start out tack welding the pieces together, every 4 to 6 inches, then run the weld seams completely down the entire edges of the gear legs.' What I had feared would be the most difficult weld of the project turned out to be the easiest.

"Welding the axles on was a chore, however. Getting them on straight and true took some careful alignment, but eventually, it was done. Once completed, the airplane tracked perfectly straight, so all the effort paid off. The gear legs both-

ered me a little at first because I didn't understand the geometry, but if you do it right, you fall in love with them."

Once the Charger's primary structure was completed and the secondary components and systems began going in, Allen employed a number of the lessons he had learned from Jim Smith and Remo Galeazzi. The slave struts connecting the upper and lower wing ailerons were made with one size larger tubing than called out on the plans, and all the sheet metal on the fuselage was butted together rather than overlapped. Additionally, a 6-inch wide channel was installed down the side of the fuselage, from the firewall to the rear cockpit, in which the wiring and many of the control mechanisms were neatly mounted. Raising the hinged side panels provides complete access to the back of the channel for inspection and maintenance—as well as admiration of the meticulous workmanship. A full set of flight and engine controls was

mounted in each cockpit, but only basic instruments were installed up front, mainly for symmetry, Allen says.

"When I started building the seats, I called Remo and asked if he had any tips. He said, 'Yeah, widen the rear seat 2 inches.' I asked why, and he said, 'Because you can—there's nothing back there to keep you from increasing the width of the seat by 2 inches.' I followed his advice. The seats were covered with leather, which is the only way to go on a sporty airplane like the Charger."

A Maule tail wheel, which Allen rebushed to new tolerances, was used along with 6:00 x 6 Cleveland wheels and brakes.

On the advice of Ed Marquart, Allen bought a freshly majored 150-hp Lycoming O-320 near the start of the project and had it sitting in his shop through most of the 17 years it took to complete the airplane. He built his own crossover exhaust system, using mild steel pipes rather than stainless steel.

"I had used mild steel on my Wag-A-Bond—just regular car exhaust pipes—and never had a crack. I don't care who builds them; stainless steel pipes will eventually crack. I knew I would suffer a bit of a weight penalty with mild steel, but its crack resistance seemed more important to me."

Allen had used the Stits (now Poly-Fiber) covering process on his Wag-A-Bond and was quite happy with it, but he decided to try something else on the Charger.

"I used Ceconite and both nitrate and butyrate dope, partially because I had never done it and I wanted to have the experience, but partially because Remo recommended it. I thought if he liked it, it was good enough for me. It turned out very nice—the tapes lay down so beautifully with the nitrate dope—but, boy, does it take the time and number of coats! You're basically spraying pure lacquer thinner with a little bit of stuff in it."



Left to right, builder Allen Potts, Jim Claypool, and Monty Montgomery.

A Bit of Background

Allen is a native of Billings and graduated from Eastern Montana College there. He met his wife, Toddy (Claudia), in Billings and lived in the area until the late 1970s when they moved across the state to Kalispell. Allen was in the graphic arts business, and Toddy became the director of special education for three school districts in northwestern Montana. Eventually, they would move to their present home in Lakeside, a small community just a few miles south on Flathead Lake.

Allen says everyone will always remember the infamous 9/11 date, but for him the even more infamous number is 9/13. On that date he suffered a heart attack—from which he recovered, but to date, it's still keeping him out of the pilot-in-command seat.

During the long gestation of his Charger, Allen had many visitors

come through his shop, two of which, Jim Claypool and Monty Montgomery, were so impressed with his workmanship that they put in a bid for first refusal in the event Allen ever decided to sell the Charger. Allen's heart attack changed everything, with the result that the project, then up through silver, was sold to Jim and Monty—with the provision that Allen would work with them to complete it.

Jim Claypool is a native of Vancouver, Washington. He attended college at the University of Washington, and afterward the Peter Kiewit construction company employed him, where, it turned out, he would spend his entire 30-year working career. Based in Seattle, he ultimately became a vice president of the firm and retired in 1987 at age 50. His friends of some 40 years, Monty Montgomery and his wife, had moved to Montana in 1985,

A generous set of flight and engine controls was mounted in each cockpit.



and after visiting them there, Jim and his wife decided to build a house there, also. Today, they maintain homes in Bellevue, Washington, and Marion, Montana.

Monty Montgomery was originally from Ontario, Canada, but moved with his parents to southern California in 1946. He was an auto mechanic for a time, but went to work for his father-in-law in the drilling equipment manufacturing business after he was married. After his father-in-law's death, Monty went into the drilling business, rather than manufacturing the equipment, and specialized in big holes—anything from 2 feet in diameter up to as much as 21 feet. He did a lot of work on the North Slope of Alaska, drilling the holes for bridge supports and some of the vertical support members for the Alaskan oil pipeline. He retired in 1985 and settled in Montana.

The tie that would ultimately bind the lives of Allen Potts, Jim Claypool, and Monty Montgomery together was their need for speed. All love Harleys, snowmobiles, race cars, and airplanes—anything that goes fast in any dimension.

Jim has long been a fan of auto racing and eventually started his

own late model NASCAR Northwest Tour race team. Very successful, the team would win a couple of championships and be in contention every year. Now running a limited schedule, Jim's driver scored two wins, a second, and a third during the 2003 season.

Monty Montgomery began racing motorcycles in the 1950s—and is still at it in his early 70s! Last year he participated in a race on a half-mile track in Missoula—and won. This is the type of flat track racing in which competitors go into a turn at 100 miles per hour and power slide around it with the bike laid over almost flat, supported by the rider's steel-soled boot. Monty also did a lot of desert racing—those wild melees in which as many as 800 riders charge out over the desert as fast as they can.

In the mid-60s he also raced inboard hydroplanes at speeds approaching 130 mph. Those were the days when the driver sat behind the engine, and the aptly named little beasts were as prone to fly as skim the surface of the water.

Both Jim and Monty began flying later in life. Jim learned to fly in Cessna 150s and 152s in 1991 and talked Monty into a partnership building a GlaStar in the mid-1990s.

This prompted Monty to learn to fly (at his wife's insistence), and he and Jim bought a Citabria in 1998. Ever the charger—Jim says he is “72 and going on about 37”—Monty began flying at 65 and has already logged around 700 hours of flying time.

Back to Building—and Flying

After they bought the Charger, Jim and Monty decided to have the long dormant 150 Lycoming rebuilt and upgraded a bit. It was sent to Aero Sport Power in Canada where 9.25-to-1 pistons were installed, along with the replacement of the right mag with a Lightspeed electronic ignition system. A lightweight B&C starter and alternator were also installed. Coupled with the usual hot rod-type internal cleanup and balancing of rotating parts, the upgrades increased the horsepower from 150 to 175, according to Aero Sport Power's dynamometer.

The engine installation included provision for heat to both cockpits. The heat muff was stuffed with stainless steel Chore Boy dish scrubbers to slow down the airflow and allow it to absorb more heat before being piped into the cockpits.

Meanwhile, Allen was completing work on the fiberglass fairings.

“The big lower wing root fillets took four months to complete. Trying to determine where the holes for the flying wires passed through them was a real pain. You just had to do your best estimate on the angles of the wires, cut the holes oversize, and then re-glass them to get a close fit around the wires. I used Cherokee wheelpants, modified to accept Cessna access doors for airing the tires.”

When the airplane was ready for painting, it was trucked to Camas, Washington, to Jim Claypool's cousin, Les Scott, who specializes in painting Stearmans. Jim and Monty have Harley Hawgs with replica 1937 sidecars attached, so Allen talked them into having the Charger painted in matching Harley colors: Sinister Blue Pearl and

Diamond Ice.

“Les did a beautiful job,” Allen says, “and I learned a little something about paint from him. He used a PPG polyurethane base coat, but switched to an Imron clear coat because he could reduce it up to 15 percent, which makes it flow better than the PPG clear, Les says. After we got the airplane back to Montana, I told Jim and Monty it needed just one more touch: Electric Blue pinstriping around the trim. They agreed and flew in a young fellow from Kennewick, Washington, who is the Northwest's premier pinstriper. He freehands the stripes with brushes like they did back in the 1950s and did a beautiful job. He also painted on Jim and Monty's names—and mine as the builder. I got a little choked up when I saw that. It was their airplane now, and they didn't have to do that. They're just great guys.”

When it was assembled for the final time, the wings were rigged using a Smart Level and plumb bobs—and it hasn't needed adjustment since, Allen says.

Monty Montgomery, who was an accomplished taildragger pilot by this time, made the first flight on February 12, 2003, and flew off most of the FAA-required 25-hour test time. The only development work required involved the propeller. A 74-by-56-inch Sensenich metal prop from a 150-hp Super Cub was used initially, but with the Charger's engine boosted to 175 hp, more pitch was needed. A switch was made to a 74-by-60-inch prop from a Piper Pacer, but it too, was short of pitch. Finally, the Pacer prop was re-pitched to 62 inches, and that has proven to be just about perfect, according to Allen.

Since it was built very closely to Ed Marquart's plans, the weights and performance figures for N413AC came out very close to Ed's specs for a 150/180-hp version of the Charger. Best of all, however, it handles as nicely as everyone says they do, according to the owners—



Ed Marquart, EAA 198, holds court around a Charger at an early fly-in.

EAA PHOTO BY ERIC LUNDQVIST

Ed Marquart and His MA5 Charger

Ed Marquart is one of sport aviation's pioneers at the now-famous Flabob Airport in California where he shares inspiration with well-known airplane-building personalities in EAA Chapter 1 such as Ray Stits and Lou Stolp. His first airplane design was strictly a test model—the MA3 Marquart Maverick—that Ed used it to investigate his design ideas.

He opened his shop at Flabob Airport on August 1, 1958—just five years after the founding of EAA—and

designed the model MA4, a single-place biplane he called the Marquart Lancer.

The prototype MA5 Marquart Charger was finished in 1971, and Ed flew it to Oshkosh. Since that humble introduction, Ed has sold more than 400 sets of plans.

Plans for the classic biplane are still available from Ed, who can be reached at P.O. Box 3032, Riverside, CA, 92519-3032, or 909/683-9582.

commendably stable and with beautifully harmonized, light control responses.

Allen says that one interesting little quirk was discovered early in the test period that may be of interest to all tandem-seat, open-cockpit biplane builders. Typically, N413AC had a lot of turbulence in the rear cockpit, an annoyance that is usually attributed to downwash off the top wing. Allen, Jim, and Monty found, however, that when they removed the front windshield and

put a cover on the front cockpit, the turbulence in the rear 'pit was eliminated. The obvious conclusion, they believed, was that the front cockpit's windshield, which was the same height as the rear windshield, was the deflector of the airstream into the rear cockpit, rather than the top wing. As a result, they cut down the height of the front windshield—and, sure enough, the rear seat turbulence went away. It might not be the same on all biplanes, they say, but it works on their

Charger.

Last summer, with Jim and Allen hauling the baggage in Jim's Cessna 182 and Monty flying the Charger, the trio set out for Oshkosh, and except for some gusty wind at a fuel stop at Austin, Minnesota, they had an enjoyable flight to Wisconsin. The Charger was one of the homebuilt sensations at EAA AirVenture Oshkosh 2003 and ended up with a Bronze Lindy on awards night.

It was an evening tinged with

just a touch of bittersweetness for Allen Potts. Not certain that he can get his medical back, he's faced with the possibility that his flying days are over.

"That's okay," he says. "I have no regrets. I've enjoyed every minute of my years of building and flying, plus I know a few guys who will let me ride with them."

One thing was certain. Allen left Oshkosh last summer justifiably proud of his 17-year effort to produce an award-winning Marquart Charger.



LARRY HAWKINS