

It's a Marquart Charger!

Get to know this classic-style plansbuilt biplane.

BY HOWARD LEVY



The engine swings a 72-inch Hartzell propeller.

Whenever a sweptwing Marquart Charger biplane flies into an airport, it draws people like bees to nectar, and you will hear many admiring comments. But it also brings forth remarks from the uninformed: "Is it a Pitts?" and "I bet it's a Starduster." Of course, this is wrong in both cases, but it is understandable as there are not as many Chargers as some other biplanes, so the airplane is not as well known. However, according to designer Ed Marquart, during the airplane's 20 years of existence, he has shipped close to 350 sets of construction drawings worldwide, welded more than 30 fuselages for customers, and he believes that at least 50 of the tandem two-seaters are flying. The majority are in the United States, but there is one flying in England and another under construction, and others are flying and/or being built in Canada, Japan, Brazil, Australia, New Zealand, West Germany and Portugal.

Ed Marquart—an aircraft designer-builder and restorer *par excellence*—has had his Marquart Aircraft Repair shop at Fla-Bob Airport, Riverside, California since 1955. Before the

MA-5 Charger, he had designed, built and flown two smaller, straight-wing, single-seat biplanes: the MA-3 Maverick with a six-cylinder, 125-hp Continental out of a Globe/Temco Swift, first flying in September, 1957, and the 80-hp Franklin-powered MA-4 Lancer, which first flew in 1963. Both airplanes had a span of approximately 20 feet and were designed for inexpensive flying with engines in the 65- to 125-hp range. The Lancer is still flying but the present owner has installed a 150-hp Lycoming. There was also an MA-1 and MA-2, but they never got beyond the drawing board, although some design concepts were incorporated in the MA-3. Marquart notes that the MA-3 was only intended to be one-of-a-kind. When the MA-4 first appeared, other single-seat biplanes had already saturated the market, and only five or six Lancers were built from his plans, most of them in California. Marquart then turned to designing the slightly larger tandem two-seat Charger. Friend Dan Fielder quickly decided that he wanted that airplane, so he put up the necessary money for its construction, helped build it and wound up owning it.

The prototype Charger was powered by a military surplus 125-hp Lycoming O-290 GPU (converted ground power unit), many of which were used in post WW-II and 1950s homebuilts. Design and construction of the Charger required seven years for various reasons, including the need to draw the plans as construction progressed, but primarily because Marquart wanted to be sure everything that was designed was aerodynamically correct and strong enough. The Charger is stressed for +9 to -6 g and is fully aerobatic, but is not considered to be truly competitive with aircraft designed specifically for aerobatic competitions.

Marquart's prototype had a speed of 125 mph at 2650 rpm and cruised at 115 mph with the 125-hp Lycoming turning 2400 rpm. The airplane first flew in October, 1970, in chromate and silver primer dope and was tested that way through February, 1971, before receiving its final paint in March. After Marquart and Fielder put about 300 hours on the Charger, it was sold. The new owner added another 100 hours or so, and at last report, it sits dismantled in northern California.

Oscar Tombolato, a skilled tool and die maker and WW-II Air Corps primary/advanced flight instructor, visited Marquart's facility while the

Mostly, Ernie McOdrum flies his MA-5 locally, but he has occasionally flown to EAA events. His Charger is powered by an IO-320 with inverted fuel and oil systems.

PHOTOS: HOWARD LEVY



CHARGER

continued

prototype was under construction. He was looking for an airplane to build, and when he saw the Charger, it sparked a consuming desire to fly one, so Tombolato set up shop in an adjacent hangar. This permitted him to check continuously on the prototype's construction, Marquart and Fielder's techniques, and to discuss the whys and wherefores face to face with the designer before applying the acquired knowledge to his own Charger. Tombolato used a fuselage welded up by Marquart. He had the aircraft about 75% completed when he decided to quit for a year to launch a new business, an egg distributorship called Chick-a-Dee Products, in Upland, California.

In 1970, Tombolato returned to work on his Charger, N7148, which was licensed on February 10, 1971. Initial flights were carried out in February with Walter Cable chosen as test pilot because of his vast flying



experience. Tombolato had not flown for 24 years and only recently had logged some 36 hours of taildragger time. At any rate, Charger serial number 006, called *My Lil Chick-a-dee*, displayed no adverse flying or handling characteristics. According to the logbook, the first flight included the takeoff and pattern flying, during which Cable conducted coordinated turns and familiarization maneuvers. These were followed by six takeoffs and landings—wheel and three-point—and the only work required on the

This Charger's owner describes his MA-5: "A super airplane for the weekend pilot."

airplane was some tightening of the flying and landing wires.

Tombolato attended various fly-ins and received numerous awards for his Charger and in March, 1972, he replaced the 125-hp Lycoming O-290D with a 160-hp Lycoming IO-320 and a 72-inch Hartzell HC-C2YL4 constant-speed propeller combo from a



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Twin Comanche in order to undertake airshow work. At the time, the airplane was also equipped with an inverted fuel and oil system.

Many additional trophies and grand champion awards were garnered by builder-pilot Tombolato, but not everything can run smoothly forever. At about 370 hours, Tombolato had a power failure during takeoff from Corona Airport, resulting in damage to the right axle, left wing leading edge, rudder and prop blades. A plugged fuel line had caused the problem. Tombolato repaired the airplane and flew it for several additional years before selling it during the summer of 1976 to Dave Jameson of Oshkosh, Wisconsin, who is a very active EAAer and vice president of the EAA Aviation Museum Foundation.

Ownership of the Charger transferred to the hands of Delaware-based Russell Sprague in August, 1977, then to Hart Beaver of Lancaster County, Pennsylvania, and finally to Ernie McOdrum of Califon, New Jersey. McOdrum had run into the airplane



sitting relatively unused in a hangar at Farmer's Pride Airport, Pennsylvania. Contacting owner Beaver, he learned that although the airplane was initially flown quite extensively, during the past couple of years Beaver had only logged 2 or 3 hours per year, so when McOdrum approached Beaver with checkbook in hand, a sale was quickly consummated.

McOdrum took delivery of the Charger on July 20, 1989, with 540 hours on the airframe. As of June 10, 1990, when I got together with

Like the fuselage, MA-5 empennage parts are made of welded steel tubing.

McOdrum, the total time had risen to 635 hours. He notes that the airplane has required very little work—only enough to keep it polished and the fluid levels up. It has Randolph dope colors topped with clear Aerothane to make it shine. The engine has run 640 hours since new and hasn't been touched mechanically except for the accessories. However, McOdrum has

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36 KITPLANES



CHARGER

continued

added a Narco AT150A transponder and an ARK encoder.

The MA-5 Charger is a conventionally constructed aircraft with wood wings, steel-tube fuselage and Ceco-nite fabric covering. Its design is standard for a biplane, while incorporating Ed Marquart's ideas of what is correct for his airplane. The wings, which are of equal span and constant chord, employ a NACA 2412 airfoil with both upper and lower wings sweptback 10°. Upper wing incidence is 1°; lower, 2°.

Spars are solid spruce with the forward spar located at about 16% chord, measuring 0.75-inch thick and 4.75-inches high. The rear spar—at the 70% chord position—is 0.75-inch by 2.9 inches. Built-up truss-type ribs—11 per wing panel—are of spruce and mahogany plywood construction and because of the constant 45-inch chord, the wings are fabricated in a single jig. The wing leading edge is rounded with Alclad aluminum.

Ailerons are also spruce spars with truss rib construction, with an 18° up/12° down travel, and measuring 5 feet in span and 11 inches in chord. Because strength was a prime con-





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More than 50 MA-5 Chargers are flying by now. About 350 sets of plans for the two-seater have been sold.

sideration, the wings are braced by seven streamlined stainless steel flying wires per side. The wires are doubled on each load panel, which provides an equal pull from both sides of the spars.

The fuselage is a welded 4130 tubular structure, with wood stringers and bulkheads providing the shaping. All of the tail surfaces are made of welded steel tubes without airfoils. An adjustable stabilizer is used instead of elevator trim tabs, and the stabilizer movement is via a jack-screw, as found on a Piper Cub. Elevator travel is 25° up and down, and the rudder moves 30° left and right. The rudder and elevator are aerodynamically balanced. The tail spans 8 feet, with the elevator having a mean chord of about 15 inches, and the stabilizer 13 inches. The rudder stands 53-inches high and has an 18-inch mean chord. Fin and stabilizer are braced by single struts on the

The Charger rear panel has plenty of room for VFR instruments. The plane is soloed from the rear cockpit.

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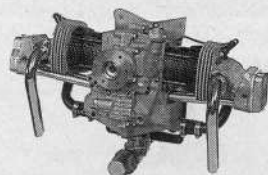
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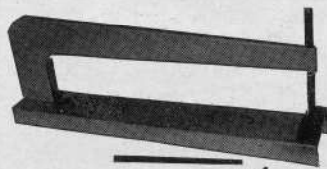
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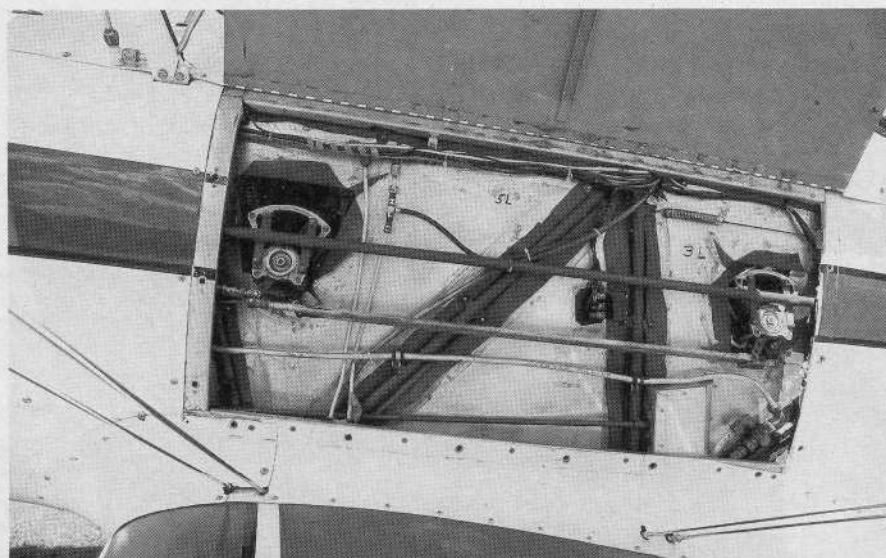
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CHARGER

continued

bottom, with wires on top. Ailerons are also balanced, and pushrods move the ailerons and elevators "as smooth as glass," according to McOdum.

The wide 6-foot-tread landing gear employs tapered hollow box legs welded from 0.090 flat 4130 steel, with rubber donuts at the upper ends for shock absorption. Wheels and brakes are Bodell and the 6.00x6 tires are from Goodyear. The steerable tailwheel is a 6-inch Scott system. Mainwheels are enclosed in streamlined fiberglass pants that also include an added inboard covering over the brake calipers. To keep the plane's belly clean, the crankcase breather and battery drain lines run within the left leg fairing, with the ends at the inboard bottom of the wheel.

The airplane is fitted with dual controls and brakes, but is flown solo from the rear seat, which is 24 inches wide. The forward cockpit is 27 inches wide. Flooring is plywood. A formed-wood, 27-inch-long turtle-deck and lower compartment behind the rear seat accommodate a total 30 pounds of baggage. Five gallons of fuel are carried in each root tank in the upper wing panels, with 20 gallons in the main fuselage tank forward of the front cockpit.

Ernie McOdum does most of his flying within a 2-hour range of home, although he did attend Sun 'n Fun '90, which was a 13-hour trip over a two-

day span. He is quick to establish that the Charger is a good cross-country airplane: a hands-off flyer on calm days. "However," he says, "a cover over the front cockpit is a must for winter solo flying, or the wind comes in the front and back into your face." He then added, "The Charger can prove to be a bit of a challenge during landing for a pilot not accustomed to a taildragger, and particularly a pilot transitioning from something like a Cessna, because you can't see the runway over the nose when you flare for the touchdown.

"Flying the Charger solo or with two aboard provides very little variance in performance numbers. Takeoff from hardtop is in about 500 feet with a rotation speed of 55-60 mph, followed by a climb rate of 1500 fpm at 80 mph. I normally fly locally below 3000 feet, obtaining a 112-mph cruise at 75% power. Approach is made at 75-80 mph. Then I bleed off to 60-65 mph as I come over the fence, touching down at 55 mph in ground effect and rolling out in 800 feet. The airplane stalls at 45 mph power-off, and with the nose held high, it mashes in at 500 fpm."

Now priced at \$125, plans are still available for the MA-5 Charger. Marquart can also provide a pre-welded fuselage and tail feathers, the engine mount, landing gear and struts should the builder want to somewhat simplify construction and knock down building time. McOdum, who is an experienced aircraft builder and restorer himself, looks at the Charger as a \$40,000

This MA-5 has hinged access panels on both sides of the fuselage.

airplane in today's market—providing you do not count your labor. Average plans-only construction time is about three years, although one builder completed his aircraft in 14 months. Others have taken as long as 13 years, according to Marquart. If you use all of his prefab components, time can be cut to an average 18 months, but of course building time greatly depends on the individual's ability and the number of hours per week he puts into it.

Most of the homebuilt Chargers have been powered by 150-hp Lycomings, but a few also have 125-hp or 145-hp, six-cylinder Franklins up front. Several builders have used 180-hp Lycomings, and one has even installed a 200-hp Lycoming IO-360. The high-time Charger, flown by John Mathews of Atlanta, Georgia, has some 1300 hours on its airframe since a 1976 first flight, and Dave Davidson, based in Garland, Texas, has flown his Charger to Alaska, Venezuela, the Bahamas and Baja California.

Earlier we noted that the MA-5 Charger is fully aerobatic, but McOdrum points out that he only undertakes basic aerobatics such as rolls, loops and the like. He is 51 and has been flying since 1966—all sport flying—with commercial/multi-engine/instrument ratings. Previously owned aircraft include a 1938 and a 1946 Taylorcraft, a 1955 Cessna 170 and a 1968 Citabria. He is presently building a Pietenpol with a Model A Ford engine, targeted to fly four years from now, but he expects to get a 1938 Taylorcraft rebuild project back in the air within a year. The McOdrum workshop is, needless to say, a busy place.

Regarding the Marquart Charger, Ernie McOdrum says, "It is a super airplane for the weekend pilot." Others—builders or just owners—who are flying 'em, seem to agree. □

YOU CAN CONTACT designer Ed Marquart about the plans for his MA-5 Charger at Box 3032, Riverside, CA 92519; call 714/683-9582.

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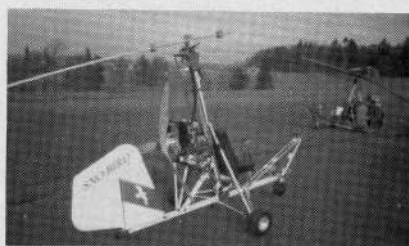


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