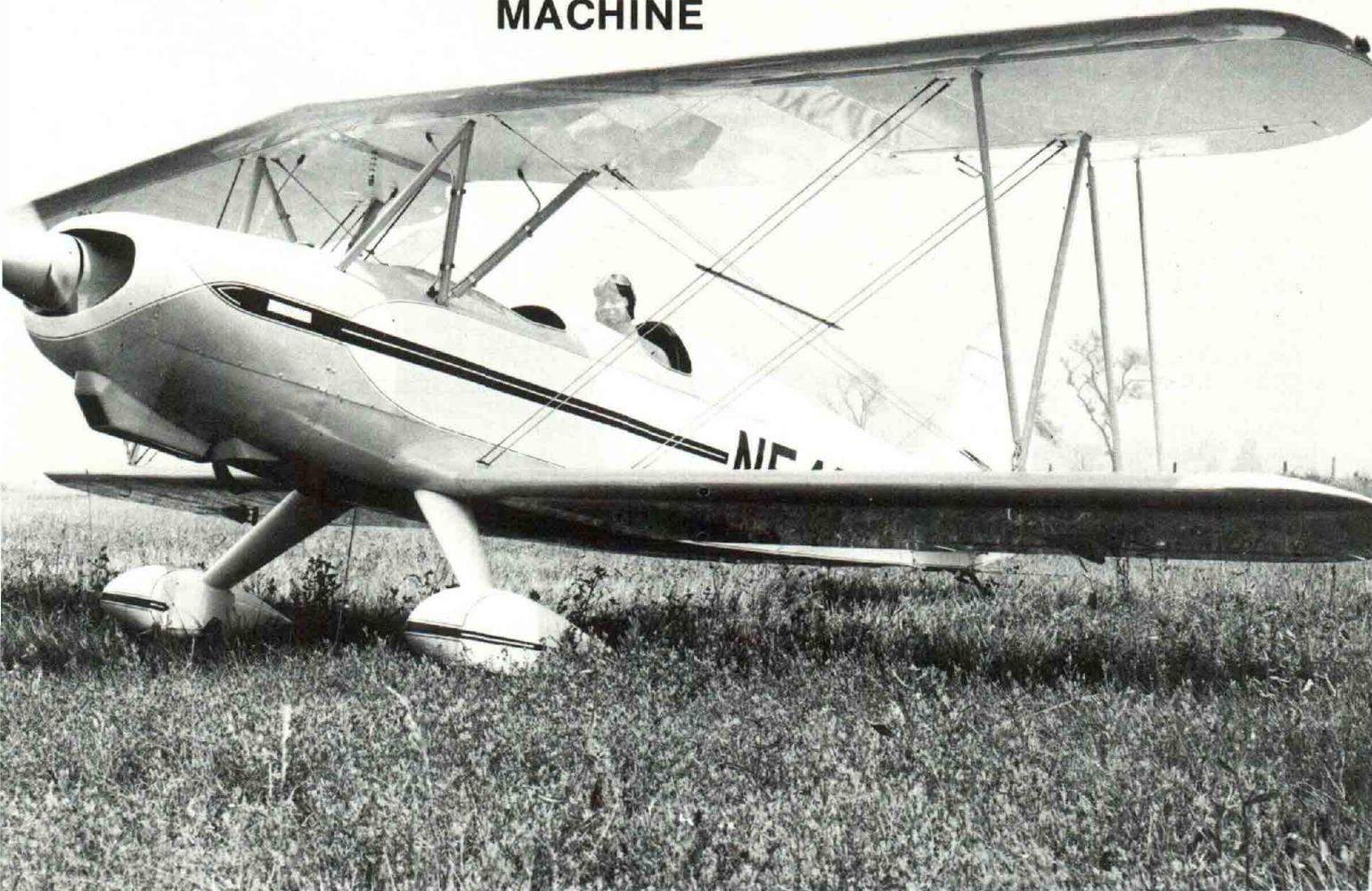


THE MARQUART MA-5 THE HAPPINESS MACHINE



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I HAVE BEEN somewhat reluctant to do an article on the Marquart MA-5 Charger, because it has to be the finest airplane that I have ever flown! That may sound like a strange reason for not wanting to make a report, but I think the answer lies around the point of my credibility. I have been known to rave about outstanding airplanes, and usually I can get other pilots to pretty much agree with me on most of the points, but not all of them. The exception to that rule is the MA-5. To back up my enthusiasm, here are a few quotes made by some pretty authoritative people. In the 1973 winter issue of *Sport Planes Annual*, contributing Editor Don Dwiggin says about the Charger:

"By the time this book goes to print, you are going to be able to make one of the most exciting investments of your life. Think of it, a few lousy bucks, cash or credit, gets you started on your way to a rich, new life in the sky. Horizons unlimited, a veritable fun machine that can take you back through time to the good old days when aviators were helmeted Supermen!

Pardon my enthusiasm, but that's the way the ad copy should read when Ed Marquart markets plans for his exciting MA-5 sport biplane, the Charger. What's so exceptional about the Charger? You might as well ask what

(Photo by H. A. Troxel)

Regarding the streamline wires Marquart says, "FAA specifications call for redundant bracing on all critical wires, so I doubled up on each load panel. This also balances the pull equally on each side of the spar."

is so exceptional about the Mona Lisa — the gal with the funny smile. Both hold a secret and you will never be satisfied until you know what it is — but you never will. Thus, each flight is a challenge, to find out the secret of why you are so darn happy up there, the cares of the world gone. If you have troubles, don't spend money on a shrink, put it on a Charger — the secret of happiness."

Paul Poberezny — After flying Ray Stephen's Charger at the 1974 Watsonville, California fly-in, stated, "I have now flown over 100 homebuilt airplanes and the Charger ranks right at the top, along with the very best."

Butch Pfeifer, a United Airlines pilot and restorer of World War I aircraft under the guidance of his famous father, Joe Pfeifer, is known for his Ned Sparks like wry humor and rarely allows the outside world to perceive through facial expression that he is pleased with something. However, after flying the MA-5, he crawled out with a smile that went from ear to ear, and commented: "This is the way everyone has been trying unsuccessfully to get the Great Lakes to fly ever since they built the first one!"

I could ramble on through the log books of the three Chargers which are now flying quoting remarks similar to those above. Paraphrasing Will Rogers' statement



(Photo by H. A. Troxel)

The 10 degree sweepback of both upper and lower wings is evident here. Besides affording excellent directional stability, the sweepback also permits the passenger to stand up while entering the front cockpit. Four ailerons produce a quick response to light stick pressures.

about never meeting a man he didn't like, I have never met a man or a woman who has flown the MA-5 and didn't like it. When I read Dwiggins' comments about it being a happiness airplane, I began to reflect on my experiences in flying all three of the Chargers which are currently air-worthy, and I must agree that he hit the nail right on the head. It is an aircraft which works hard at pleasing its pilot. It has no bad characteristics and, indeed, will do a much better job of flying itself if left more or less to its own devices, than if the pilot tries to ham-hand it into some attitude which the airplane inherently knows is wrong.

I had an opportunity to prove that statement not too long ago. Ray Stephen of Santa Clara, California built the third Charger to take to the air. It only had about 4 hours on it when Ray gave me the chance to give it a go. I climbed rapidly out from the MA-5's home base airport at Morgan Hill, California and was sitting there wearing the "Charger Smile," when I began to have the sensation that my eyes were going bad on me. It became increasingly more difficult to focus through the windshield. The happy expression on my face began to fade as I came to the realization that the problem was not my eyes, but an ever thickening coat of oil on the windshield. Not being basically too clever, the next move I made was to stick my head out into the slipstream and I was immediately rewarded by having my glasses covered with the gooey substance.

While cleaning off the lens, I squinted at the instrument panel, observing that everything seemed to be operating normally. I pulled the throttle back, and as a precautionary measure to prevent possible damage, I shut the engine down and headed for the runway. There was absolutely no way to observe anything in front of the airplane since the windshield was now completely opaque and I had already learned not to peek around it! I oriented myself out the left side of the cockpit making a carrier type approach keeping the runway in view by maintaining a constant radius turn to the runway. When I straightened out and flared, I let that magnificent Charger take over for the actual landing and it plopped us right down in a firm three-point position.

The exterior lubrication job had been caused by an oil plug in the center of the hollow crankshaft working itself loose. Ray installed a fixed pitch, Fahlin wooden propeller, and consequently there is no need for an oil supply as required by a constant speed prop that would usually be fitted to this Lycoming. With the plug not in position, there was nothing to stop a steady flow of oil out to the point where the propeller acted as a sling and threw the slippery lubricant into the slipstream.

I am not an aeronautical engineer, nor a licensed mechanic, so I am incapable of giving detailed flight analysis from the point of a statistician. An airplane to me has

always been an emotional experience and, in spite of years of flying for the United States Navy, the Brazilian Air Force and several thousands of hours civilian time, I am still awed over the miracle of flight. Any reports I make on these beautiful products of man's technology are purely from a standpoint of my reaction to a given machine. I can only relay to the reader my sensations, but for a detailed analysis, you will have to talk to those possessing the capability of creating good airplane designs.

The first Charger that I flew was the prototype built by the designer, Ed Marquart, and Dan Fielder, who, because of his investment of finances and time, was the actual owner of the initial ship. It took seven long years from concept to first lift-off. One of the reasons for this extensive investment of time can be summed up by quoting Dennis Shattuck, editor of *Private Pilot*. The August 1973 issue of that magazine carries a story on several biplanes, one of which is the Charger. Besides being completely entranced by the airplane, Shattuck was also extremely perceptive in noting that, "A craftsman of infinite skill and remarkable oratorical powers, Marquart is much sought after for restorations as well as homebuilt designs." The good editor hit at two problems in regard to the lack of haste in the project. One, "the oratorical powers," and two, Ed's being "sought after" for assistance with everybody's airplane. Marquart has, without a doubt, the greatest memory I have ever observed in any human. He remembers every detail of every aircraft he has ever worked on, seen, read about or even heard of. He is more than pleased to gather an audience of extremely interested aviation enthusiasts around him for the purpose of lecturing on any subject. The second work stopping feature revolves about his complete sincerity and desire to assist anyone with a problem. The standard word at his home base, Fla-Bob Airport, Riverside, California, for anyone seeking assistance is, "Go see Ed." This is not, by any means, a criticism of Ed Marquart, for his formula of life has produced the ultimate in personal satisfaction. He will help anybody, anytime and his reward is true happiness and a list of good friends which stretches to the far corners of the globe. How many of us can say that?

Now, just what is his creation? Well, as anybody can see who has looked at the pictures accompanying this article, it is a biplane. It seats two people, very comfortably, irrespective of size, and I am one who can really attest to this since I weigh well over 200 pounds and top 6'5". The prototype is equipped with a 125 h.p. Lycoming GPU. This powerplant produces a cruise speed of about 115 mph at 2400 rpm, with a top speed of 125 mph at 2650 rpm. The stall speed is listed on the specification sheet as 42 mph, but I can assure you that with an average wind and ground effect, the passenger can almost step out of the cockpit and walk along side while the pilot completes the landing. The rate of climb, with just one aboard, is a little over 1100 feet per minute. The range exceeds the ability of most people to sit still over extended periods. With careful nursing, the conservative pilot can stay aloft for over 4 hours.

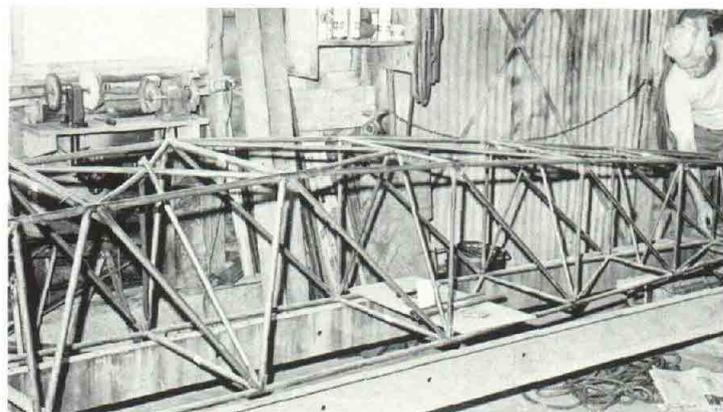
The dimensions place the aircraft in the middle-size biplane class, if you put examples like Pitts and Smith Miniplanes on one end of the spectrum and Wacos and Stearmans at the other. Its wing span is 24 feet with a constant chord width of 45 inches. The airfoil is the NACA 2412. The total wing area is 170 sq. ft. The fuselage length is 19'6" and the top wing stands 7'6" at its highest point. The empty weight is about 1000 lbs. with a gross of 1550 lbs.

The fuselage incorporates two seats in tandem and the construction is of conventional 4130 steel tubing. Dual controls are provided with solo flight accomplished from the rear cockpit. The wings are of equal span and equal chord with a sweep back of 10 degrees. Construction is



(Photo by Don Dwigings)

Designer and co-builder of the Charger, Ed Marquart, looks over the neat 125 h.p. GPU installation. Both sides of the fuselage are hinged and fastened in the same manner as the cowl thus affording easy access for maintenance as far back as the pilot's cockpit.



(Photo by H. A. Troxel)

Ed has welded up 15 fuselages for builders. His shop will also provide tail surfaces, engine mounts, landing gear, cabane and interplane struts. This still leaves more than the FAA required 51% of the work to be done by the owner.



(Photo by H. A. Troxel)

The landing gear legs are welded up from .090 flat steel with rubber donut-type shock absorbers installed at the upper ends. The hollow box leg is tapered and is fully cantilever.



spruce spars and built-up ribs, with almost all of the ribs emanating from only one jig. Four slotted ailerons are used. Both rudder and elevators are aerodynamically balanced which contributes to the beautiful, light touch required to fly this airplane. Their construction is also of 4130 tubing and trim is by an adjustable stabilizer. Landing gear is cantilever with individual donut type shocks and is constructed of sheet 4130 steel, forming a tapered box. The designer suggests that engines from 100 to 200 h.p. may be used but points out that his object in designing the Charger was to gain maximum performance from relatively low horsepower.

Most of the people whom I have quoted as being very much enamored of the Charger are high-time pilots with experience in many different types of aircraft. I was curious as to just how someone with virtually no experience would react when confronted with the Charger. My wife, Gail, is at long last in the process of getting her pilot's license. At the time I exposed her to the Charger, she had only about 10 hours in a 1946 Luscombe 8-A. The experiment was performed through the courtesy of Ray Stephen who really wanted me to try the plane again anyway since my first ride had been rather short!

I made the initial take-off, climbed up to about 2500 feet, then turned the controls over to Gail. The excellent intercom system made communications a breeze and I jotted down notes of the conversation. It went something like this:

"Does this airplane have more horsepower than my Luscombe?"

"Yes, this is a 160 h.p. Lycoming, which is almost three times as much as your Luscombe."

"Hey, this thing climbs so fast it scares me."

"O.K., then don't climb and it won't scare you."

"Bill, are you on the controls with me?"

"No, why?"

"It feels as if there is some sort of a power assist. I just push the stick real lightly to the left and it wants to roll right around. Hey, am I doing a slow roll?"

"No, I would call it more of a vertical spiral. You better level off."

"Can I try a stall?"

"You're the pilot, I'm just riding."

"Has it stalled yet?"

"Yes, didn't you feel the slight buffet?"

"No, I didn't feel anything. What's it doing now?"

"It is just sinking in a stalled condition."

"What should I do about it?"

"Well, you can just sit there until we hit the ground, which won't be too long, or you can release the back pressure on the stick and add some power."

"Oh, yeah, gee, it's flying again."

Gail was most willing to try a landing and, had the airplane been mine, I would have agreed to let her do it by herself, but as it was I followed through on the controls, which probably did more to throw her off than give



Master craftsman, Ray Stephen, smiles while contemplating the pleasures of owning a Charger. Ray maintains and pilots the antique aircraft owned by Irv Perch, which are on display at the Hill Country Aviation Museum, near Morgan Hill, California.



Student pilot, Gail Turner, wears the "Charger Smile" after successfully completing her first flight in Stephen's version of the MA-5.



The first (N5491) and second (N7148) Chargers fly together during initial flight test periods. Both airplanes were at this time equipped with 125 h.p. engines. Tomblato (7148) later switched to a 160 h.p. Lycoming for air show work.



The third Charger to fly belongs to Ray Stephen, Santa Clara, Calif. The highly identifiable paint job and slightly altered vertical fin are the only visible differences between it's sister ships.

assistance. Again, the exceptional landing characteristics of this airplane brought us down without mishap.

It was interesting to watch a complete novice pilot perform all of the essential steering operations with some degree of smoothness. Gail actually turned in a better job of flying the Charger on a first encounter than she did in the Luscombe on the return flight to our home base at San Carlos from Morgan Hill airport where we had made the test. It proved to me a point that I had made in regards to Chargers and the advisability of using one as a training plane. It seems to me that it would not make a good primary trainer. The student who learned exclusively on this amazing airplane could get into trouble with less forgiving aircraft after completing a course in the MA-5. I have insisted on Gail's learning to fly in a Luscombe because I think that it is one of the most difficult light-planes to fly really well. Once she masters it, others will seem relatively simple. This is the reverse of the Charger situation.

For some odd reason, most people who like biplanes are also interested in aerobatics. Before the Charger, it was a completely unfathomable position as far as I was con-

cerned, since I have never had any great desire to put my stomach in an inverted position. Back in Navy days, I had to, but when I finally hung up my wings of gold I promised myself never to get past a 10 degree bank again. I stayed with that philosophy for quite some time, feeling happy and smug in my secure decision and then that cotton pickin' Charger went and done it to me. It is absolutely irresistible. There is just no way to sit there and fly it straight and level. Those easy, responsive controls just won't let you. It rolls, loops, snaps, spins, slides and glides with an ease that lures one into trying it out time and time again. This does not mean, and I am not advocating, that a person with absolutely no aerobatic instruction should jump in a Charger and race out all alone to try the maneuvers he or she has seen at an air show. First, find out how to do it with a qualified instructor, then go out and have a ball. The airplane is strong and unless you do something really stupid, it will get you back home again. Don't expect to win international aerobatic competitions with a Charger, it just is not designed to compete with an Acro Sport or Stephens Akro or Acroduster or any of the airplanes specifically designed for aerobatics. The Charger is a compromise between a very pleasant bit of transportation in the nostalgic biplane philosophy and a truly aerobatic machine.

The Charger is a relatively new design and, consequently, there are not too many of them around. Marquart reports that there are approximately 40 under construction at the moment, several of which are getting rather close to completion. As already indicated, there are three MA-5's airborn to date. Serial No. 1 is that which was built by Marquart and Fielder.

Serial No. 6 was the second Charger to take to the air, just shortly after the prototype flew. Oscar Tombolato of Upland, California was its builder and he accomplished the feat by watching the progress on the prototype, taking measurements and then going back to his nearby shop and duplicating what he saw. Oscar named his plane "My Little Chickadee," a most appropriate appellation for a ship owned by a man who is a wholesale egg dealer. The "Chickadee" originally had a 125 h.p. Continental but Oscar wanted a little more steam and so installed a 160 h.p. Lycoming.

The third Charger to hit the airways was Ray Stephen's and it carries plans Serial No. 25. Ray set what will probably remain an all-time record by completing his Charger in one year.

The rapid construction time performed by Ray Stephen should not be construed as evidence of a simple airplane to build. The Charger does not fall into the category of "kit" airplanes that require only the assembly of components. The plans are complete and well done but it takes knowledge and skill to do a job that will be pleasing to the owner. Be ready for some long, hard work if you tackle this project. But, oh, the rewards.

I would also suggest that, unless one has a great deal of experience and knowledge, the builder adhere closely to the plans. Part of the Marquart genius is his ability to design for maximum strength with minimum weight. A correctly built MA-5 is a light, responsive piece of equipment. I have observed some projects under construction where the builder has felt that a particular area needed beefing up or that a little more weight here and an extra piece there won't really hurt the performance. This is a fallacy which will produce unhappy results when a plane does not live up to the already proven performance record.

There is almost a schizophrenic urge on the part of some builders to keep stuffing bigger and bigger engines in to smaller and smaller airplanes. I am not sure that there is any great advantage in putting anything more powerful than a 125 h.p. in a Charger. The larger engine forces sacrificing other more pleasant aspects of the MA-5, while gaining very little in cruise speed and losing a great deal in gasoline economy — a factor which will be influencing both our automotive and airplane thinking considerably in the future. Let me again quote Editor Dwiggins on this subject. He makes reference to Oscar Tombolato's airplane when he states that it "now carries a 160 h.p. Lycoming and a constant speed prop, bringing its gross weight up 60 lbs. This point is interesting because it is typical of what happens when somebody tries for more performance by hanging a bigger powerplant up front — the weight increase often outweighs the advantage of the extra horsepower and all you gain is a better climb rate. The extra weight means higher wing loadings and the whole beautiful balance of a clean design can be thrown off." Oscar, however, does not agree with Don and is very pleased with the conversion.

I have flown all three of the Chargers and find that with the exception of the horsepower difference, I could close my eyes and not know which one I was actually in. Oscar and Ray are outstanding craftsmen and have duplicated the prototype with infinite skill, thus the similarity in the handling characteristics. Both of the larger engine planes, naturally, climb a great deal faster, in fact, about 400 to 500 feet per minute faster, and cruise about



(Photo by Don Dwiggins)

Note the wide tread and clean configuration of the landing gear, a plus factor in using the tapered box method of construction. Cuffs over the protruding brake calipers is the type of detail that adds to the ease with which the Charger slips through the air.



(Photo by H. A. Troxel)

The Charger carries its disposable weight directly on the center of gravity, which includes the passenger, thus, as indicated in this shot of the rear cockpit, solo must be accomplished in the aft seat.



(Photo by H. A. Troxel)

Light, simple yet strong construction is the Marquart theory of engineering. Before plans were released to the general flying fraternity, a thorough flight test program was completed.



(Photo by H. A. Troxel)

Although the fuel caps cut into wing lift, to change this feature would make construction more complex because the center section is so shallow. Marquart doesn't believe it is worth the time and effort to go scuppers and overflow drains.



(Photo by Robert Duricka)

130 mph, as opposed to the 115 with the 125 Lycoming in the prototype. The lower powered Charger will go a great deal farther without landing but, if like most of us older pilots, you suffer from TB (Tiny Bladder), this may not be a factor worth considering. You pay your money and you take your choice. It is just whatever turns you on. You will love flying it with either engine.

I can hear some people saying, "What's Turner up to? Is he getting a cut on these plans or is it just because Marquart is a friend of his and he is trying to help him out?" Believe me, such is not the case. In heralding the virtues of Marquart's airplane, I am really doing myself a great disservice. Ed is building my 1931 Gee Bee Model Z replica and I know that for every set of plans sold, there will be many hours spent on the telephone while the new builder discusses various phases of his construction problems. Actually, I would be much happier if nobody would build the Charger until my Gee Bee is completed but I really can't be that mean to a group of great guys and gals like we have in the EAA membership. Oh, the sacrifices I make for the good of the sport.

I could say a lot more but it would just be gilding the lily. By now the reader must have gathered that I, and everyone who has flown "The Happiness Machine," agree that it is one hellav an airplane. If you don't believe me, call Oscar Tombolato (714-985-6533) or Ray Stephen (408-296-0448), then send Ed Marquart \$85.00 for a set of plans and start hacking away. His address is P. O. Box 3032, Riverside, Calif. 92509.

Now, for this nice thing I have done for you by bringing "Happiness" into your life, will you do a favor for me? DON'T CALL ED! I want my Gee Bee before I'm too old to fly it.

Tombolato's version of the MA-5 after conversion to a fuel injected 160 h.p. Lycoming. Note the different in cowling lines without the underside air intake. Oscar has won eleven first place trophies and has logged about 400 happy hours with his Charger.

