PHOTOGRAPHY: BRAD SHEPHERD

The Magnum .75 gives this 66-inch aerobat (above left) that extra umph for the unlimited vertical maneuvers. Simple cut-away cowl isn't hard to fashion. A "Y" shaped pushrod connects the two elevator halves (above right). Rudder, in this case, is set up push-pull. Tail wires are optional.

Not much can be said that hasn't already been said by some of the well known authors of full scale aviation activities about the exploits of Leo and his *Laser*. The rendition offered here fills a spot in the medium-sized engine category with readily available model supplies resulting in a light sport/aerobatic model that is inexpensive to build, maintain and fly.

Frank Fanelli no doubt has a good story in this issue with a memorial to one of the greatest aerobatic pilots to engage in the sport. I will give some personal thoughts on my memory of meeting Leo and I have to include his flying buddy, Jim Roberts, who was always there with him. At one of the national IAC championships, flown in Sherman, Texas, I had the pleasure of talking with both men and looking over their aircraft. The accusation was made by some that Leo was too aloof, not mixing it up with the other flyers. Maybe so, but if one could see him retire to the hangar that his mount was resting in to concentrate on the next schedule, they would understand why this man went all the way to a world championship, beating the best there was.

His was a total concentration focused on perfecting the art of aerobatics, and it was done in an airplane that he developed for that very purpose. Jim, on the other hand, was a guy who in his outgoing personality and constant smile was very approachable and patiently answered all questions. I suspect that is why these two made a great friendship.

Jim also had a *Laser* built for his use in competition; there are a few minor differences that are evident: cowl bumps are a different shape, wing tips were slightly rounded, paint scheme is different and I suppose there are others that are not visible. While this article was also done as a tribute to Leo, Jim's *Laser* can be built from these plans.

One other thing about Leo's that may not be well known is the fact that his *Laser* was nicknamed *Beautiful Obsession*, another way of showing his undying determination to be the best in the world.

A .60 Size Replica of Leo Loudenslager's:

LASER 200

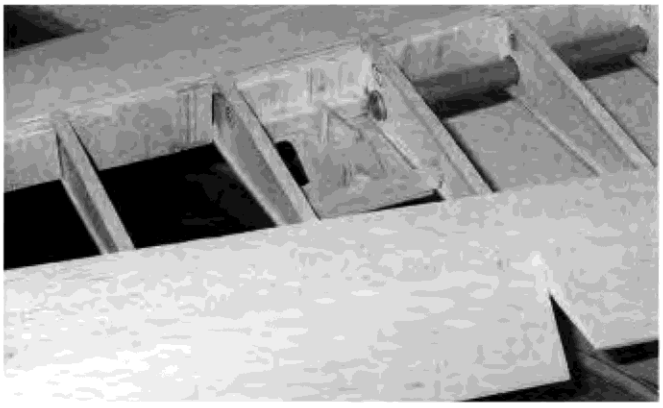
R/C Design & Construction By Brad Shepherd

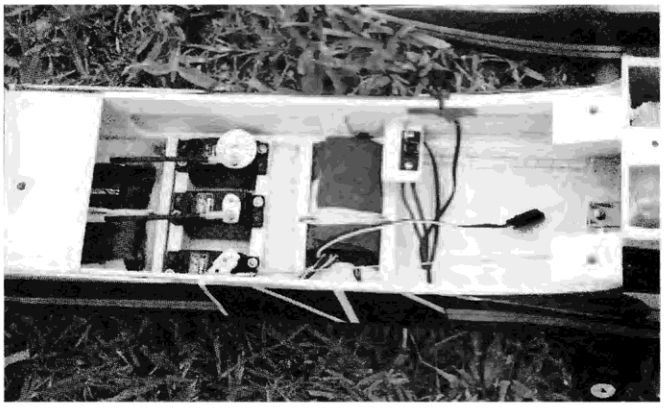
In honor of the legend, this special airplane has been rejuvenated for the more popular class of engines.

Brad's .60 size *Laser 200* was developed with the co-operation of Steve Teerlinck at Linck Models. A combination of light weight design and proven airfoil technology together make this Loudenslager rendition a true performer. Vinyl Graphics and custom hardware package for this version of the *Laser 200* is available through LINCK Models.

Brad Shepherd's *Laser 200*

Wing is initially framed upside down. Using a long metal ruler **(above left)** helps to check for straightness of the leading edge. Building of the removable cockpit can be completed after the wing is solidly mounted **(above right)**. ⅛-inch balsa doublers stiffen the box sides. Individual aileron servos are mounted at about the center of each wing panel **(below left)**. Radio compartment area includes the receiver mounted in front of the servos **(below right)** while battery is secured aft.





Building the *Laser*

It is time well spent studying the plans after receiving them and comparing them to the photographs in the magazine. It takes about three hours to cut out the parts. If your choice is to save the plans, make tracings of the parts, using light tack spray contact cement, place the tracing on the respective wood and cut out. Lay out the engine mount on F-2, drill the mounting holes, and install 6–32 blind nuts. This procedure is done first, as the position of F-2 will be determined by the engine type and size to be used. Four strokes require a further aft position than a .65–.90 two-stroke, so make this determination now before the ply doublers are cut out.

Wing. Since the wing is built in one piece and upside down, start by splicing two ¼ × × ⅜ × 36-inch pieces of hard balsa at the center line, using a 15° scarf joint. Pin down firmly over the plans as the top spar. Then pin ¼-inch jigs in place. Pin the ribs, top down, for one panel onto the spar, slip the ½-inch servo lead tube into the holes. You can make these out of regular letter size paper. Pin down the ribs for the remaining panel, slipping the tube in place as you go. Check the fit of the bottom spars in the rib slots, and trim where necessary.

If all looks well at this point, glue all joints with CyA. Check the trailing edge of all ribs with a straight edge, and trim any rib that is too long. Then glue the ¼ × ⅜-inch trailing edge in place on the ribs. Cut two pieces 33 inches long by ⅛-inch thick, that taper from ⅝ inch wide to ⅜ inch wide for the inner leading edge pieces. Check the nose of the ribs with a straight edge to confirm their trueness, and trim any rib that is too long.

Pin the ⅛-inch inner leading edge to rib #1 and rib #10, then check with a straight edge. Pin the inner L.E. to rib #5 making sure it is still straight and glue it with CyA. Repeat the process with the other panel. Glue the 3/32-inch shear webs to the spars. Use a small plane and long sanding block to shape the inner L.E. to the rib curvature for a good fit of the 3/32-inch sheeting. Cut the 3/32-inch leading edge sheet to shape leaving a little excess over the inner L.E. for removal later.

Aliphatic glue in one of those Sig mini-glue guns comes in very handy when attaching the leading edge sheeting, and also the T.E. sheet over the ribs. The method of choice used on this sheeting is to run a bead of aliphatic on each rib, run a bead of slow setting CyA along the spar, then run a bead of this CyA along the ⅛-inch inner L.E. piece. Lay the sheet down at the spar juncture then roll the sheet over the ribs before the spar glue takes hold, pin the sheet to the ⅛-inch leading edge, roll it back over the ribs and using the straight edge hold the sheet down over the spar for a few moments till the glue sets.

Brad Shepherd's *Laser 200* at a glance

Wing span	66 inches
Fuselage length	53½ inches
Airfoil	symmetrical
Wing area	709 square inches
Stab area	168 inches
Finished weight	7½ pounds
Wing loading	24.4 ounces per square foot.
Power required	.61–.80 two-cycle .65–.91 four-stroke
Radio requirements (ail, elev, rud, pwr)	4 channel minimum 5 standard servos

Sand the ¼ × ⅜-inch trailing edge piece to conform to the camber of the rib then glue the 3/32 × 1½-inch T.E. sheet in place along with the cap strips and servo frame. Remove the wing from the bench, turn it over and pin it down at the center section. Shim the T.E. and tip ribs per the plan. Glue the bottom leading edge sheet, trailing edge sheet and caps in place. Relieve the R1 and R2 ribs, ⅛ inch behind the spars to install the long dihedral brace. Cut the ½ × 2-inch tapered trailing edge stock to length inside the ailerons, and glue in place. The L.E. of the aileron stock is trimmed to wedge shape and the hinges installed. Last, glue the outer ⅛ × ⅝-inch leading edge and contour it to its proper shape.

Fuselage. Lay the fuselage sides out on ⅛-inch medium balsa sheet using the thrust line as a bench mark. A ball point pen works well for this job. When sides have been cut out, glue the doublers to them. Remember to make a right and a left side. Glue the ¼-inch square strips in place, and also the ⅛ × ¼-inch along the top edge as per plans. Pin former F5 over the top view of the plans. Be sure you overlay the plans with wax paper.

Lightly score the sides at former 5 location and crack, so the sides can taper to the tail. Pin the sides down at F5 and check alignment. Insert F3 and F2 formers into the slots of the doublers, check the sides with a 90 degree triangle, then pull together with rubber bands. Run thick CyA along formers where they meet the sides, and glue the tail post. Double glue the formers with epoxy.

Install formers F6 and F7 and the ⅛ × ¼-inch top longeron to the formers. Glue the ¼-inch balsa horizontal stab anchor plate to the fuselage. Cut the ⅛-inch turtledeck sides and glue in place on the formers and ⅛ × ¼-inch side longeron on the side. It will be necessary to sand the longeron slightly to get a good fit of the side sheet.

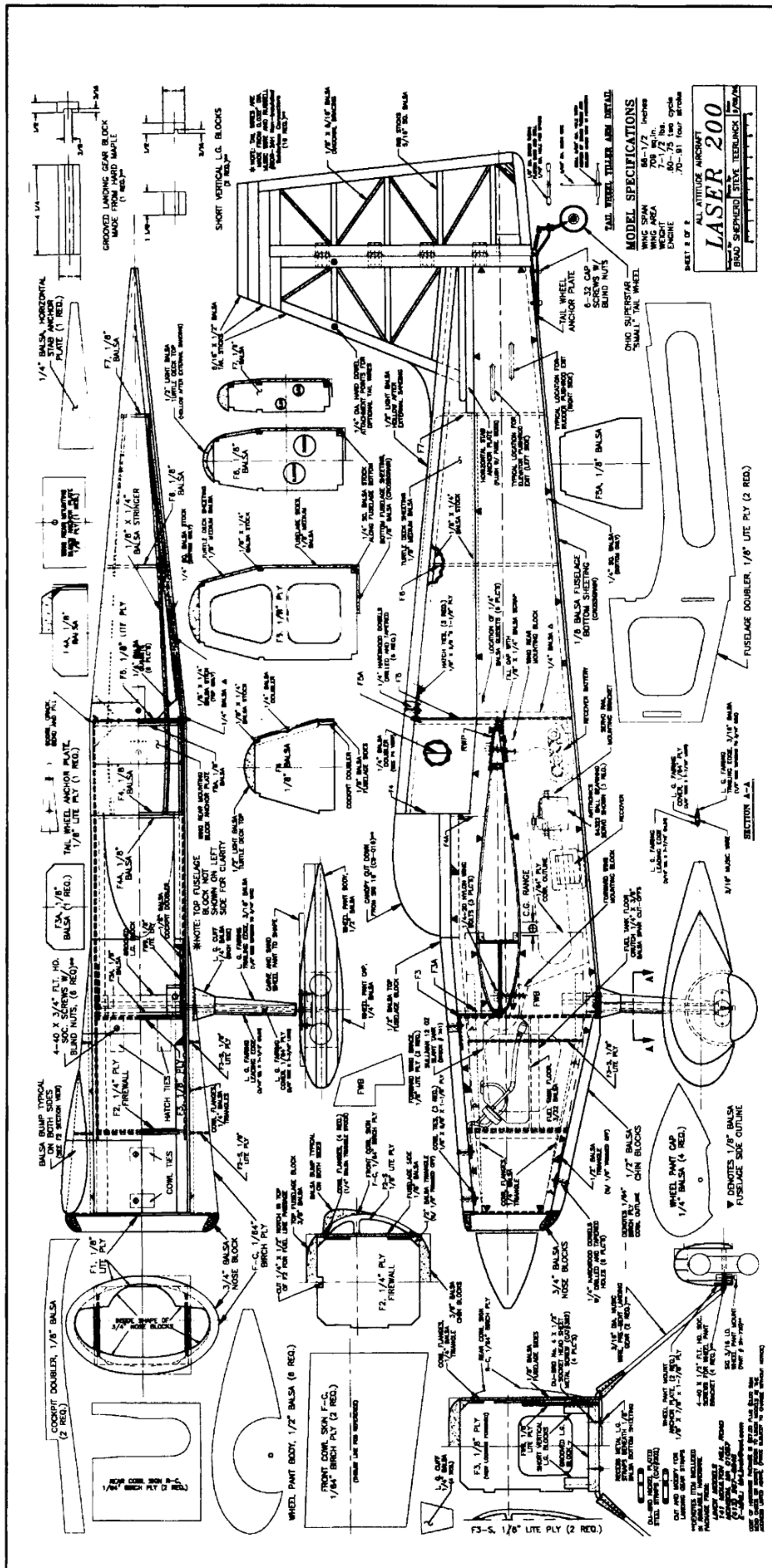
Sand the top of the turtledeck side sheet flat on top to accept the ½-inch (or two ¼-inch) thick top of the turtledeck, then glue the top to the sheet and formers. Rough sand to a round shape, but leave the top flat at the juncture of the fin and do not sand too much from the side where the fin will go. That will be done later after the fin is fitted.

Cut the side away in front of F2 to allow the engine to be installed. Install the engine and mount. Assemble your choice of tank and piping to suit your preference; glue the tank floor in place and install the tank with silicone glue. Install the throttle pushrod.

Glue ½-inch triangle stock in place, then the ½-inch thick top and bottom front planks. Sand the front of these planks square and mark center lines on the face of the planks, and then align and glue F1 in place. Glue F2-S and F3-S in place, check with a straightedge and trim where needed. Check the fit of the 1/64-inch ply cowl skin pieces, trim it to fit over all the cowl formers. Take time to do a good job of fitting before any gluing. You might want to try making paper templates before you do this.

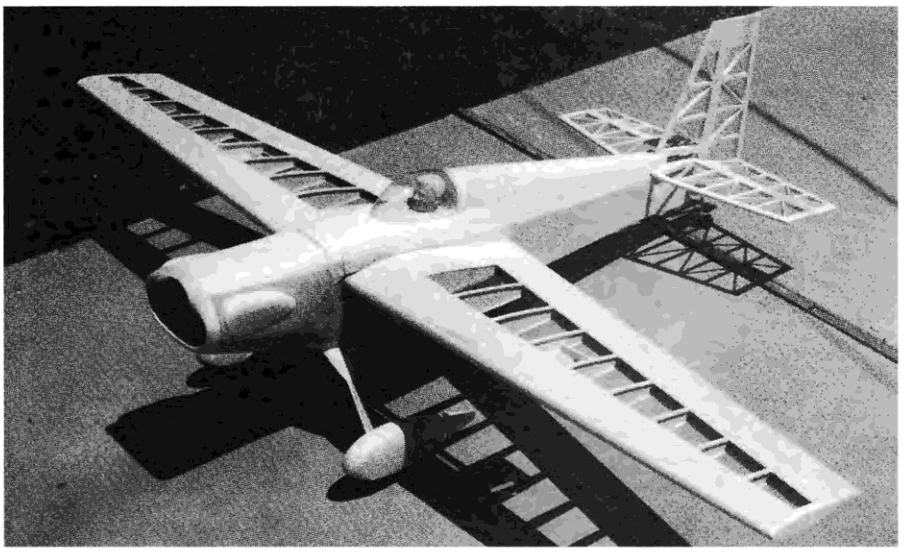
Brush slow dry epoxy inside of the 1/64-inch cowl skins and on the fuselage sides under the cowl and on the formers. Then pin the cowl in place, and repeat for the other side. Glue the wing hold down blocks in place.

Place the wing in the saddle and drill the holes for the mounting bolts. Glue the ⅛ × ½ × ¾-inch lite ply hatch ties in place fore and aft. Place poly sheet over the wing in the fuselage, cut two cockpit doublers from ⅛-



Full Size Plans Available Through Carstens Flying Plans Order Plan CD070

Brad Shepherd's *Laser 200*



This color scheme was the original paint that was applied in 1975 to the just finished *Laser.* Linck Models has a vinyl graphics package for this specific model, and also has a custom hardware package that takes care of the hard-to-do items like the bubble canopy, the landing gear, plus other assorted convenience hardware items. Check the text for Linck's address.

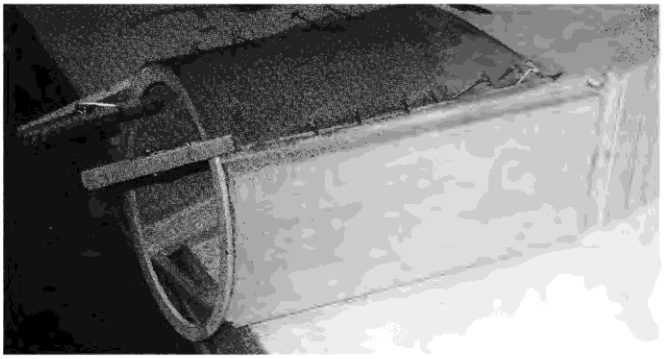
***Laser* in the bones** details major points of construction and the finished shape of the balsa cowl bumps. Sig 16-inch canopy is cut down to fit. Balsa and ply fairings cover the 3/16-inch music wire landing gear struts.

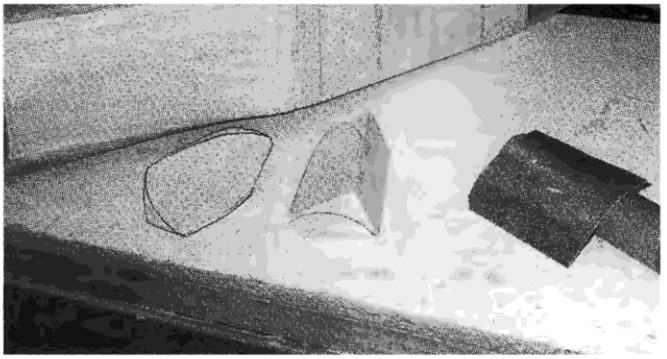
inch medium balsa and glue in place along the inside of each fuselage side. Check fit them in place, and sand where needed for a good fit between the formers and wing curvature. Check fit the formers for the cockpit section, trim where needed, then glue the cockpit sides on.

Glue the ½-inch top blocks in place and drill holes for the hold down screws; remove the cockpit section and install blind nuts on the hatch ties. Bolt the cockpit section in place and shape its top blocks with a small plane and 60-grit paper. Make a tracing of the side shape of the cowl at F1 and transfer it to the face of the cowl bump block. Use a gouge, or knife, to first rough shape the inside of the bump to the curve of the cowl. Take 60-grit paper and place it over a round object with a diameter of roughly 1¼ × 1½ inches and sand to fit over the location on the cowl side; this will take a little patience.

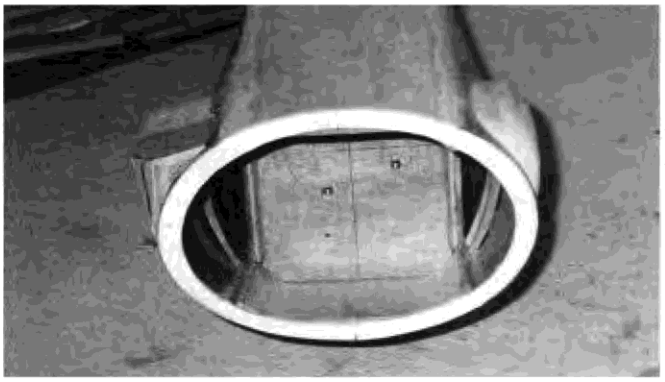
The tail surfaces are built directly over the plans as shown. If the desire is there to build the model for Sport Scale competition it will be good to inlay the ¼-inch dowels at the location in the horizontal and vertical stabs. These will make solid anchors when installing the tail section wires. If the model is to be flown as a Sunday flyer, or in IMAC competition, the tail surfaces are strong enough to eliminate the wires and make it a little easier to clean the surfaces.

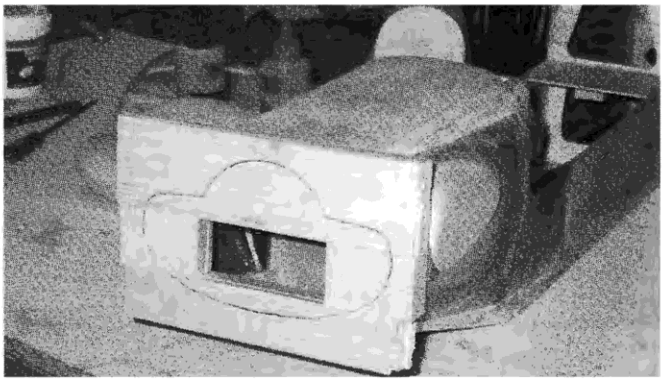
The canopy is cut from the front section of a Sig 16-inch canopy, the number is CS-016. Shape the fuselage top just aft of the canopy as shown on the plans to fit the canopy cir-





The all-wood cowl is simpler to build than it may appear. Once the cowl ring is installed, two layers of 1/64-inch ply is attached to ¼-inch tri-stock and ⅛-inch ply sub formers **(above left)**. Then the ½-inch balsa, top and bottom, fuse planking is blended into them. Referencing the plans, cowl bumps **(above right)** are shaped, and sanded out of balsa blocks. The trial and error technique is strongly needed here. Once the curve of the cheek is matched, both bumps can be rounded and smoothed to equal shape **(below left)**. The ¾-inch nose block is then glued to the nose ring **(below right)**. Inner cowl shape is distinctive to the *Laser 200.*





cumference fairing the cut into the sides. Finish shaping all the top blocks referring to the pictures for final shape. Install the landing gear blocks and drill the holes to accept the gear. The gear is bent to fit the shape on the plans. Sheet the bottom of the fuselage, then shape the bottom.

Install the front cowl blocks onto the F1 former and carefully shape the blocks to conform to the pictures. Using a razor saw, cut away the removable portion of the cowl for engine access. A Williams ¼-inch scale Sportsman pilot head is glued in place followed by gluing the canopy on. The prototype model shown is covered in Metallic Blue MonoKote and the graphics are from Kirby's Kustom Vinyl Graphics (available through Linck Models).

The model was flown with a Magnum .75 two-stroke engine which gives good performance. Some of the medium size four-strokers would be suitable for work in IMAC competition, so decide which engine is to be used before cutting the doublers from lite ply. A good .65 engine is satisfactory for all-around sport flying.

Linck Models (141 Moulton Hill Road, Monson, MA 01057) has the graphics package and a kit of hardware parts for sale to prospective builders, so give Steve a call at 413-267-9545 or drop him a note requesting the "goodies" (email: MrLinck@aol.com).

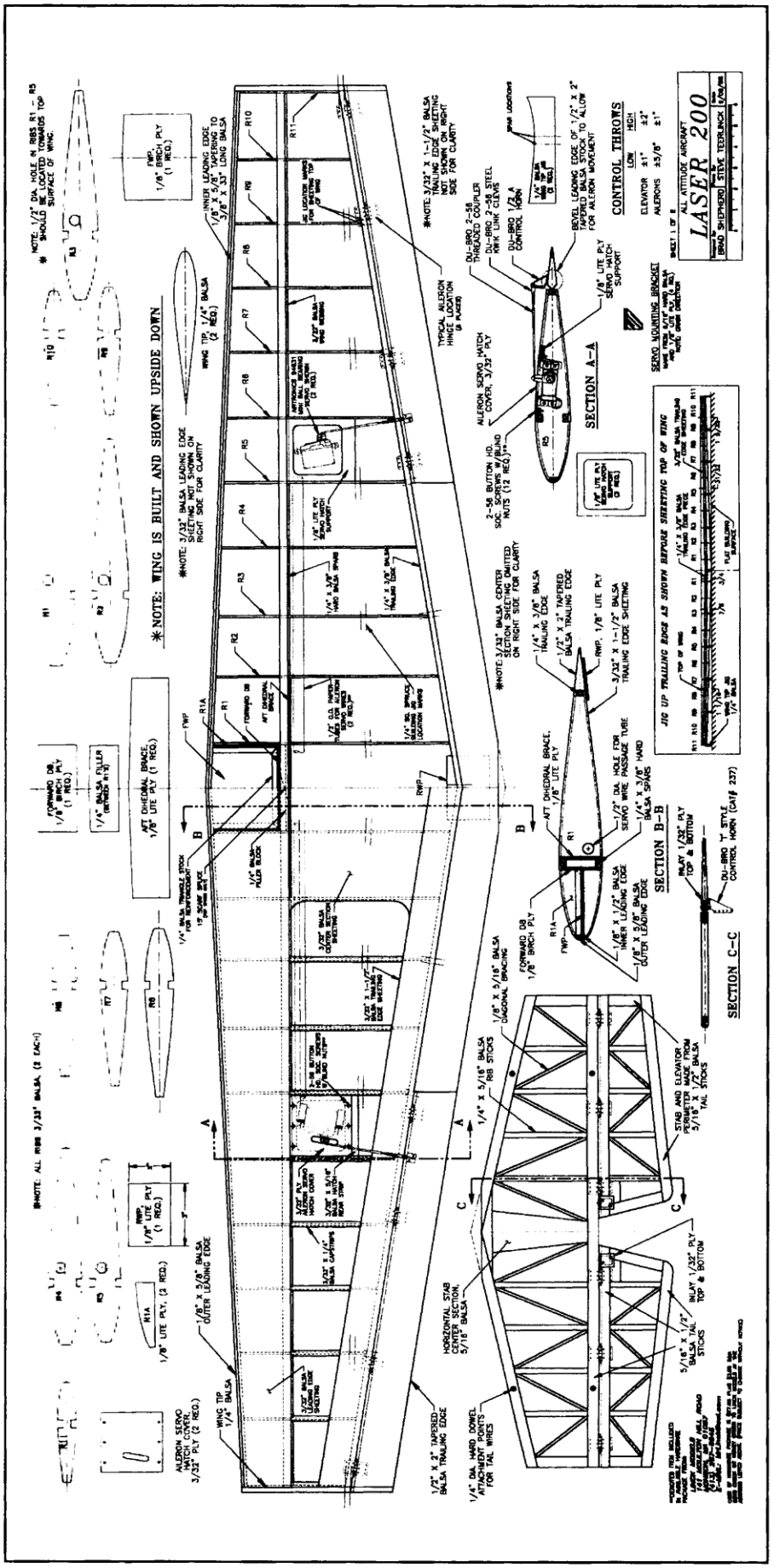
Flying

After a wait of a few weeks for the weather to moderate from the above century mark that had been the norm for our part of the country (Texas), I arrived at the field at daybreak. I unloaded all the gear, fired up the Magnum .75 and did some taxi testing while waiting for good buddy, Gerald Merks, to show up for some flight shots. The model handled well on the grass, straight runs were solid, and the turns were easily made. So, I taxied back and shut down.

When Gerald arrived and the camera was checked out, the engine was fired up again. Trying to get the wad of cotton out of my mouth and the butterflies in my belly settled down, I headed into the slight breeze and advanced the throttle. The model acted like it was on rails, and so far all was okay. It tracked about 100 feet and up it went. I continued the climb, and made a turn back. The controls were very responsive, but I had to trim a little down into the elevator. I checked low speed with the throttle backed off, then made several passes doing some rolls, checked the loops and the snap on top.

The model is extremely responsive in all attitudes just like the plane that Leo flew and will be a good candidate for IMAC flying for fellers that don't fly giants. I made several passes for Gerald to get some flight shots and then put it in the downwind leg for a landing. The engine flamed out on base leg, and the model kept right on flying as I turned for final. The glide slope was gentle and positive, and the model touched down about 25 feet past us with a nice three-point. It was decided my old nerves had enough for one day, not wanting to push my luck any further.

I would not advise setting the throws up for test flying the same as you would for unlimited aerobatics. Be conservative until a few flights have been accomplished. This is a model for those with experience flying advanced aerobatics as it will fly just as Leo flew the big one to everyone's delight. Have fun!



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