KORLA PLANKTON

By BOB STALICK . . . The next Mark after the 1975 World Champion F1C, "Uncle Remus", this ship put up nine maxes in a row to place Second in Class A Gas at the 1976 U.S. Nationals.

• I first met Lars Olofsson at the 1976 Nats as we were waiting in line with MB Editor, Bill Northrop, to attend the 1976 version of the SAM Dinner. I felt this tapping on my shoulder and it was Bill saying, "I'd like to introduce you to Lars Olofsson." When I turned around and looked, there he was . . . looking not so much like a world champion, but more like a hungry modeler. During Nats week, Lars and I did many things together, including getting lost several times on the various roads and highways in and around Springfield, Ohio. We also roomed together, and it was during those rooming-together sessions that I learned more about the man and his models.

The "Korla Plankton" is a further development of the "Uncle Remus" design which Lars used to win the F1C event at the 1975 World Championships in Bulgaria. The airfoils are the same, but there have been several changes which have improved both the climb and the glide. As FAI Power models go, this one is quite simple and very straightforward. There are no really exotic features that cannot be duplicated by most fliers who have built some of the larger AMA gas class ships. The engines are stock Rossi mills, which Lars has disassembled and cleaned, then with some fine jeweler's rouge, has hand lapped the piston into the cylinder. The engine is then cleaned again and bolted to the front end of the model, where it is broken in by flying it.

The timer used on this model is the Monks timer, made by Ray Monks of England (See F/F column). It is a very accurate and well engineered device, but lacking in the various arms and switches that we in the U.S. are used to. Lars has also used the Seelig Multi-Function timer in other models.

For the construction phase of this article, I have chosen to list all dimensions in millimeters or centimeters . . . just as supplied by Lars. I have taken the liberty of substituting equivalent (or similar) English measure when it seemed appropriate, in order to alleviate any confusion among our readers who have not yet been metricated (myself included).

CONSTRUCTION

WING: Select some high grade A grain light weight balsa (6 lb. stock or lighter) sheet. Also get some hard 1/16 by 3/8 spruce strip. For the main wing panels, laminate the balsa to the spruce strip . . . which has been tapered according to the plan. Use epoxy cement to laminate. When cured, lay one sheet flat on a building board and glue the pre-shaped balsa trailing edge to one side. Attempt to get the joint as flush as possible. Glue the 3/8 sq. leading edge strip on top of the sheet at the leading edge. You now have most of one main wing panel. Cut all ribs as indicated on the plan. Drill an oversize hole where indicated into those ribs which will to be used to accept the 3/16 O.D. brass wing wire joiner tube. Mark the inside of the sheet wing skin to indicate rib locations and glue all ribs in place (except the plywood root rib). Taper the leading edge strip on the top to approximate the airfoil. Add 1/8 balsa spar webs (vertical grain) between each rib so they run full depth of the airfoil right at the front edge of the spruce spar, then . . . glue on the top wing skin, using slow drying epoxy and rubber banding the entire affair to the building board. If you are building the right main wing panel, be certain you have included the 3 degree washin.

The wing tip panels are made similarly to the main panels, except there is no spruce spar . . . the webs act as a spar section. Be certain to wash out wing tips 1/8 inch. When all 4 wing panels are completed, bevel the 1/8 inch polyhedral break ribs with a mitrebox or sanding block and epoxy the tips to the respective main panels.

Slip the brass wing joiner tube into the root area of each main panel and line up the two wing halves. After fitting these parts, epoxy the tube in place in each wing half. Now, carefully sand or mitre in the correct amount of dihedral in each wing half, bend the 5/32 music wire wing joiner to the correct angle, and slip into the brass joiner tubes. When satisfied that each main wing panel has exactly 35 mm. (1-3/8 inch) dihedral, remove the wire and epoxy the plywood root ribs in place. Hold all parts together with the wing wire joiner and masking tape until the epoxy has cured. When cured, take the two wing halves apart and carefully sand each one. Carve and sand in the airfoil as indicated on the full size plan. Cut lightweight fiberglas cloth (K&B cloth is recommended) to fit the top and bottom of each wing main panel. Thin out some slow drying epoxy (such as the 12 hour Hobbypoxy in tubes) with methanol and apply the cloth to the main panel with the thinned epoxy . . . brushed on. Cover all parts of the cloth with epoxy and be careful not to spread it too thickly.

When the first coat has cured, add the wing tip blocks as shown in the plan, carve and sand to shape. Apply two coats of nitrate dope to the wing tips and the tip blocks sanding lightly between coats. Apply Japanese tissue. Dope over the tissue and apply any trim desired, including AMA numbers, etc. When cured, brush or spray on two thin coats of Hobbypoxy Clear or K&B Super Poxy Clear.

The wing is finished, except for keying, so set it aside until later.

STABILIZER: The stab is built nearly the same as the wing. The bottom sheet is constructed and cut to shape, just as the wing. Notice that there is no wing spar, but there is a spar web, just as on the wing tip. If you are unable to get lightweight 1/20 sheet, use 1/32 sheet of 8 lb. stock or so. After the stab is completed, cut out the tip fins and sand to shape. Glue the fins in place very carefully, to be sure they are aligned with the center line of the stab. Carefully cut the stab indexing mount out of birch plywood. After covering the stab and fins with tissue, carefully epoxy the indexing mount to the underside of the stab leading edge, directly on the centerline, with absolutely no offset either direction. Apply the plywood stab hook to the top of the stab center section as indicated on the plans. Give one coat of nitrate dope and spray or brush on one thin coat of clear epoxy.

FUSELAGE: The fuselage can be best built by making a "kit" of the parts. Although the following order can be varied, all parts should be made before assembly begins.

FIREWALL: Determine what engine pan you wish to use. Lars used the Collins pan on the original. Either an Oliver round backplate pan from NFFS can be used or the Collins. Once the pan is chosen, cut a piece of 3/8 inch plywood (birch) to the shape of the pan backplate. Since the engine is rotated to the right (looking from the rear) in order to get the exhaust residue off the timer area, drill your engine mount holes accordingly. Mount the pan to the firewall with blind nuts . . . 3 mm nuts were used on the original, but 6/32 bolts and nuts will suffice. Set the pan/firewall assembly aside when completed.

PYLON: The pylon is constructed of a 3mm plywood core with 3mm medium balsa laminated to either side. The plywood center core extends out on the front and back of the pylon to act as rubber band hold-downs. Laminate

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with epoxy.

Find the hardest 3/16 you can get and construct the wing platform. Both the leading and trailing edges should be faced with a 3/16 spruce strip. Epoxy the 3mm (1/8 inch) spruce runners on the wing platform as indicated. The pylon only extends into the fuselage 3mm (1/8 inch). Notch the front bottom part of the pylon so that it mates into the top rear of the firewall. After sanding the pylon assembly to a streamlined shape, set it aside for later.

FUEL TANK ASSEMBLY: The fuel tank is a Perfect No. 6 type. You will need to rearrange the fuel pick up and delivery tubes. The original model had fuel feed, floodoff, and pressure lines coming out of the front of the tank and mounted through a hole in the firewall so that they exited directly through the pan backplate. In addition, there are two tubes which extend from the right side of the tank through the side of the fuselage for filling the tank.

After all tubes are in place, check for leakage. When satisfied there are no leaks, plug all tube ends, smear the tank with 1/2-hour epoxy, and cover the complete tank . . . epoxy and all . . . with 1/8 inch sheet balsa. Be certain that the tank and balsa sandwich is completely loaded with epoxy glue. Give a second coat if necessary. When cured, set aside for later.

VIT ARMS: The VIT arms are constructed from either nylon or aluminum. They are hacksawed or otherwise cut from 3/16 inch stock. Use the plans to determine shape and size. Tap the end of each arm to accept a 6/32 nylon screw (or larger). Drill three holes in each arm where indicated. One is the arm pivot and another is for the return spring attachment. The third is for the threaded steel control line. Find two springs with moderate tension. Strong ballpoint pen springs will work here. You may, as Lars does, wind your own.

FIN: The fin is uncomplicated. Use a good quality medium weight C grain balsa for the fin and rudder. Install the hinges as shown on the plans. Make the auto-rudder mechanism as indicated and install. Sand assembly to shape. The fin does not inset into the fuselage.

STAB PLATFORM: The stab platform is critical to accurate alignment of stabilizer and glide fin assembly. Make it out of plywood as indicated on the plans. The little "wings" that project to the side from the top of the platform help index the stab to the fuselage without the use of any other jig or assembly, and always maintains alignment. When perfectly epoxy-cured, set it aside.

FUSELAGE STRUCTURE: The fuselage is cut from good quality straight grained medium weight 1/8 inch sheet balsa. Cut the sides to shape as indicated by the plans. Note that the top of the fuselage is a straight line. Bottom taper begins just behind the pylon trailing edge. Cut the top and bottom sheets to shape, but a 1/4 inch narrower than indicated. After cutting to shape, glue 1/8 inch spruce longerons on either side of the top and bottom sheets.

After all glue has dried, line the fuselage parts up and begin sanding down the top and bottom and both sides so that you have a constant taper from 1/8 thick just behind the pylon location to 1/16 thick at the stab trailing edge.

Pin the fuselage top in place on the building board, glue the fuselage sides in place over the spruce longerons. Use epoxy. Be sure the fuselage sides are perfectly upright and perpendicular to the building surface. Epoxy the tank in place. Glue a bulkhead behind the tank to isolate it from the timer compartment.

Fit the firewall into place . . . you will need to drill holes in the firewall and pan to fit the tank outlet tubes. When satisfied with the fit, epoxy the firewall to the front of the fuselage . . . be sure you have canted the firewall for engine offset. Epoxy securely in place. There is no thrust line offset in any direction. Epoxy the bottom of the fuselage in place.

When cured, remove the fuselage assembly from the building board. Notch the fuselage top and epoxy the pylon in place directly on the fuselage centerline. Install the rudder/fin assembly on the centerline of the fuselage by epoxying onto the fuselage top. Install balsa cheeks on either side of the fuselage behind the firewall. Sand to shape. When completely installed, using a file, notch both the firewall and the cheek blocks 3/32 to accept the spruce reinforcing strips on either side. These are faired into the blocks by sanding. Install the stab indexing mount on top of the fuselage as indicated in the plans. Do not give any stab tilt to the mount, but be certain the mount is perfectly aligned so that the stab assembly is at a perfect 90 degrees to the fuselage centerline.

Cut the 1/16 plywood VIT mounts to size and epoxy to the fuselage sides at the tail end as indicated on the plans. Drill to accept the pivot wire. Install the VIT arms, using steel washers between each arm and between the plywood and each arm. The arms should extend above the trailing edge of the stab no less than 1/8 inch on the power arm and 1/4 inch on the glide arm. The set screws should also be mounted so that they overlap the stab trailing edge by no less than 1/8 inch (more is desireable). When satisfied with the arm location, epoxy the pivot wire in place (or you may solder washers on the ends of the pivot wire). The return springs can be attached later.

Mounting the timer: The original model used the Monks timer, but the Seelig is a very excellent timer and will substitute with no trouble. Cut the timer hole in the spot indicated on the plans. Reinforce the fuselage sides inside the timer area with plywood. Mount the timer in place with 2-56 blind nuts and bolts.

Drill a hole through the balsa cheek block on the left side of the fuselage . . . continue the hole through the firewall and engine pan. This is for the flood-off and engine brake line. Line the hole through the cheek block with a 1/16 diameter aluminum tube. Plug all holes with clay or similar material. Sand the fuselage and prepare to coat it with epoxy resin and cloth. Using medium weight cloth and thinned epoxy, cover the entire fuselage with one layer. The area from the firewall to just behind the pylon is covered with three more layers of cloth and thinned epoxy. Spray any color epoxy on at this time. The original had no color but was left in natural finish.

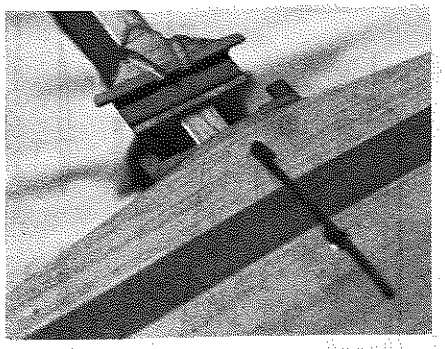
Cover the fin and rudder with tissue and give one coat of nitrate dope. Spray a coat of clear epoxy over the entire fuselage assembly, including the fin, just as you did for the wing.

All metal parts should be reinstalled, including the pan, timer, VIT arms, etc. Unplug all holes. All VIT lines, auto-rudder lines, etc., are stranded steel wire. String them through the fuselage and attach to the appropriate place. Install any necessary springs. Check the operation to see that all are functioning correctly.

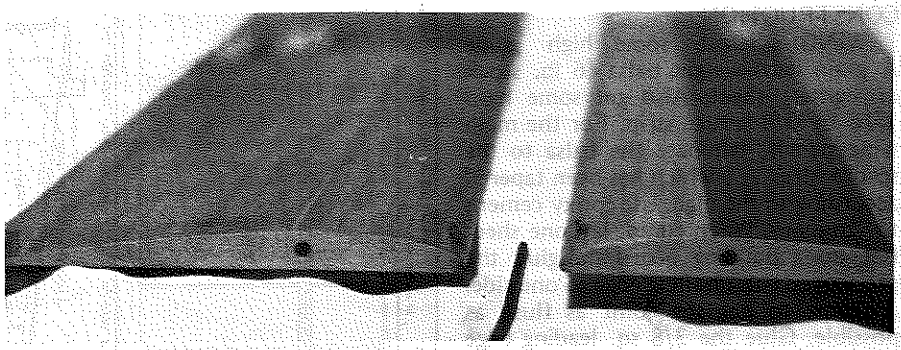
Install the engine and prop brake. The original used the Kerr brake and it is recommended. A "Brokenspar" brake can also be used, and is shown in some of the pictures. The original model had a floodoff mechanism bent from music wire and installed onto the left engine mounting lugs. In turn, the music wire floodoff had a stranded wire which was connected to the prop brake, so that when the engine floodoff was actuated, the prop brake followed at the same time. A Parsons flood-off assembly, available from Jim Crockett Replicas, would suffice. But an additional line from the timer would be needed to actuate the prop brake.

Check total weight. The model should weigh 26.53 oz. or 752 grams, completely assembled with propeller. It will probably need to have weight added. Check the balance point. Add weight in the timer compartment area in order to obtain the 68% center of gravity.

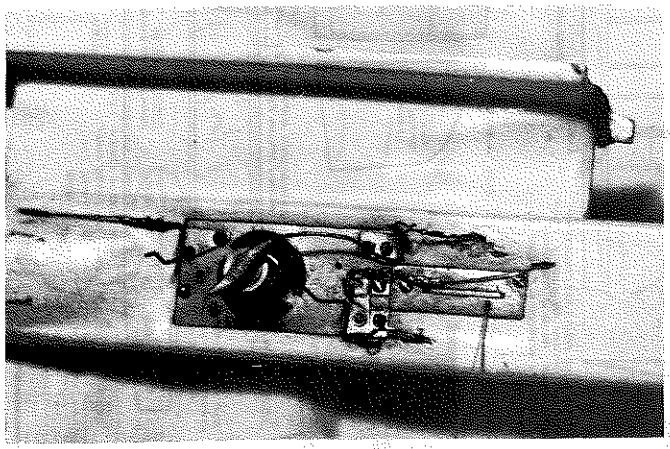
Check to see that all gadgets function correctly. Start up the engine and check the floodoff and brake mechanism. When completely satisfied, try to find that elusive place where the grass is long and the ground is soft. Set the VIT and auto-rudder for glide position. Hand glide a couple of times to insure no



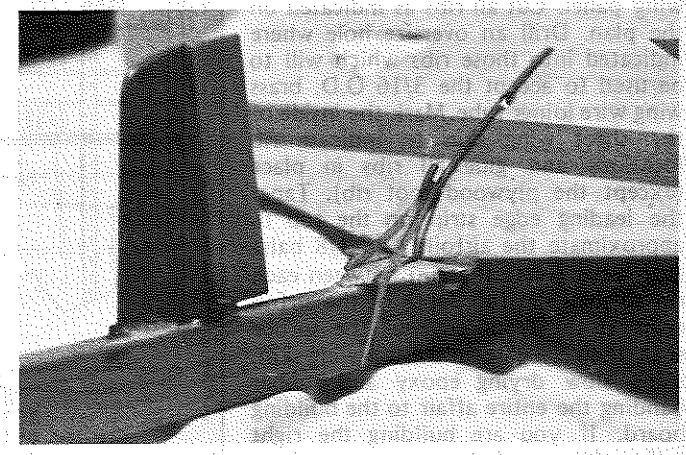
Stab mounting system. Accurate indexing system provides consistent alignment.



Wings are joined at center by sturdy steel rod in brass tubing. Wing hold-down rubber bands are routed so as to hold panels together, as well as keeping them on the airplane!



Monks timer. Lars has added spring-loaded switch that timer starts at moment of release. Watch for construction info on this switch.



Stab in DT mode. Note position of indexing mount. DT limiter is fishing line permenantly attached to stab that loops under fuselage.

violent tendencies. Try some full power short (2 to 3 second) engine runs with short D.T. The model should climb to the right. Adjust the auto-rudder to obtain a 1/2 to 3/4 turn right climb in 7 second engine run. Glide turn is determined by auto-rudder and glide rudders. The glide rudders may be gently bent to the right. Glide is approximately 200 feet in diameter.

The model is launched just slightly to the right of the wind. Lars' launches are indeed a sight to behold, as he literally javelins the model into the air at about a 60 to 70 degree angle. The model climbs as though on rails throughout the power run, ending up facing the wind when the VIT sets up for the glide. Adjusting the VIT arm screws and the auto-rudder will give you the optimum climb, transition, and glide for this ship. Don't be afraid to do some careful adjustment. Test between each change to guarantee to yourself that you haven't done something stupid.

Once completely satisfied with the climb, transition and glide, you can experiment with different propellers. Lars uses a relatively large prop (compared to most of us) with very thin blades. He makes his own. The closest prop to his that is commercially available in the U.S.A. is the Rev-Up 7 x 3-3/4. His testing method to determine prop effectiveness is to use different props until the model begins to power to the left. The prop that draws the model to the left is the most effective one to use with the engine-model combination. Keep trying until you find that prop . . . then adjust your model to use that combination.

In Closing: There are a couple of unusual but simple features to the model which should be explained. One is the wing mount system. The wing is assembled with the wire joiner and the entire wing is rubber banded to the pylon with bands going over and around the indicated hooks on the wing leading edge and the plywood trailing edge brackets. The hold down rubber bands act to hold the wing halves together as well as to hold the wing to the fuselage. The wing halves are then keyed with split dowels to insure proper alignment to the pylon platform each time. Plenty of rubber bands are used.

In addition, Lars uses a thin brass engine muff, which can be seen in the pictures. This allows the engine to be run at a high temperature, which is necessary for proper ignition using the cool methanol and oil mix. This muff is kept in place at all times except when the weather is very warm. This allows Lars to use the same No. 2 Rossi plug with no fiddling with compression spacers all the time. The muff covers only the cylinder fins, and is simply held in place by a small machine screw and nut soldered to a flange on the muff itself.

The Korla Plankton is an outstanding model developed from the FAI F.F. World Champion Uncle Remus. If you build it well and fly as well as Lars, you can be competitive in the FAI Power battles, too.

Where to Get Items Mentioned In This Article:

Seelig Multi-Function Timers: Doug Galbreath, 707 Second St., Davis, CA 95616.

Oliver Engine Pans: Doug Galbreath, 707 Second St., Davis, CA 95616.

Landing Skids: NFFS Supply, c/o Barbara Parsons, 202 Linda Ave., Piedmont, CA 94611.

Rossi Engines: Bill McGraw, 1325 Carol Drive., Memphis, Tenn. 38116. R.L. Anderson, 4804 Janet, Sylvania, Ohio. 43560.

Props and Engine Brakes: K&W Enterprises, P.O. Box 18895, Philadelphia, PA 19119.

Flood-Off Assembly: Jim Crocket Replicas, 1442 North Fruit Ave., Fresno, CA 93728.

Ray Monks Timer: Ray Monks, 232 Westwood Road., Sutton Coldfield, Warwickshire, England, or Colony Enterprises, P.O. Box 26084 Los Angeles, CA 90026.

Brokenspar Brake: Hardy Brodersen, P.O. Box 1104, Birmingham, MI 48012.