TARMAN

DESIGNED FOR FLYING IN TEXAS WINDS, THE TARMAN IS A .60 POWERED BLEND OF SPORT AND COMPETITION AIRCRAFT.

By MAX BLOSE

The Tarman, like most present day aircraft, is a composite of the attractive and desirable features of other models. It has evolved, during the past year and a half, to its present configuration which, to the author, seems to be the ideal blend for a sport and competition model. Not being a competition flier, the Tarman has never been entered in a contest, so I cannot present an impressive list of accumulated hardware to accompany this article. Due to the amount of traveling required by my job, I'm usually in the wrong place at the wrong time for a contest! This is not to say that the Tarman would not give a good accounting of itself in competition circles - it flies the pattern quite well, and has excellent slow speed characteristics due to the modified NACA 2419 airfoil. Quite simply stated, it goes where you aim it, and does everything you ask of it. It will do all of the AMA and FAI maneuvers, including easy knife edge flight and inverted spins. The latter is quite easy to accomplish since the plane will come right out of the spin upon relaxing your death grip on the sticks! I might mention that it will do these maneuvers in the high Texas winds that have grounded many of the popular pattern aircraft.

The Tarman is very easy to build, and has the appearance of a late model cropduster.

WING

The choice of foam core wings offer many advantages, and have been used on all of the planes that I have built since Ed Izzo's first articles appeared on this method of construction. In my 24 years of modeling I find them to be real time savers. I have also found that my wife is very proficient on the other end of the bow! I will not go into the details of the actual cutting of foam cores since this has been covered in infinite detail in the RCM Annual (1966) and the summer 1968 edition of RC Limited.

After the wing cores have been cut, and before sheeting or covering, I draw the outline of the ailerons. I prefer the conventional "barn door" ailerons since they require very little extra effort, add to the appearance of the plane, and improve the overall efficiency of the aircraft. It is recommended that the aileron horn be epoxied in position right in the foam itself. Then, align the bellcrank position, cut out the well for the bellcrank clearance as well as for the pushrod. Instead of attempting to cut a channel for the pushrod from the servo to the bellcrank, try using a gun cleaning rod heated with a propane torch. This makes a clean, simple tunnel and is quite simple to accomplish. Mark the foam for the proper location, and use blocks of wood to hold the heated rod to the right height, then push it to the bellcrank area. This "tunneling" process eliminates the tendency of foam cores to warp, as they are prone to do when channels are cut into either the top or bottom surfaces. And, after all, one of the main reasons for foam cores is to produce a true, warp-free wing.

The bellcrank and pushrods are mounted before the sheeting is applied to the wing. Also, install a 1½" dowel landing gear support located above the main gear trunion. This gives additional support to the landing gear for those occasional less-than-perfect landings! The wing is then sheeted, making sure to provide the necessary holes for the aileron horn and for the pushrod as the sheeting progresses to that area of each panel. Block up each wing panel 1", and sand the root section to provide the proper dihedral bevel. Join the wing halves with HobbyPoxy No. 2 glue. When dry, wrap the center section of the wing with a 6" wide piece of fibreglass cloth. Use HobbyPoxy glue instead of resin in this area. The former is much easier to sand then polyester resin, feathering nicely into the sheeting. In addition, you are using the same type of glue with which you joined the wing panels, thus avoiding an adverse reaction that occurs between polyester and epoxy resins.

The wing tips are cut from soft balsa blocks, hollowed, and glued in place. In order to provide a proper surface for the wing hold-down bolts, add another thickness of fibreglass cloth and more epoxy glue. This method works quite well, and eliminates the inlaid hardwood box in the trailing edge section of the wing.

FUSELAGE

The two fuselage sides are cut from 3/16" sheet balsa and sanded so that they are identical. Line both sides up over the top view of the fuselage, support in place, and glue the ends together at the tail, using

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Titebond glue. Install bulkheads F4, F5, and F6. Be sure you install these bulkheads directly over the plans, checking with a right angle to make sure you have both the sides and bulkheads in proper alignment. When the glue has dried, pull the front together and epoxy firewall F1 and bulkhead F2 into position. Hold the nose section together with rubber bands, maintaining accurate alignment of the basic fuselage assembly until it has dried thoroughly.

Add 3/16" sheeting and trailing edge stock to the tank and battery compartment for additional strength in these areas. As an added safety measure, use narrow strips of lightweight fibreglass cloth and Hobby Poxy No. 2 glue applied to the joint of the firewall and bulkhead F2 when they join the balsa sides. This provides added strength to these areas and prevents any cracking at the joints. The nose gear bearing blocks may now be added and the Tatone mount installed in place. With regard to the latter, you will have to drill a new hole in order to miss the nose gear mounts. If you so desire, you can use the new Tatone combination nosegear-bulkhead mount.

Now sheet the top of the fuselage with 1/8" balsa and then proceed to the bottom sheeting. The top of the fuselage, forward of the cockpit area, can be carved from a solid block and hollowed out, or F3A can be used, and this area built up with formers and sheeting. The nose section can be built from bits of scrap balsa, or from a solid block. Whatever method you use, build it around the engine of your choice, then remove the engine and carve the front section to shape, using a razor plane and sandpaper to fair the area smoothly into a 2¼" spinner.

Build the fin and stabilizer, then glue them to the fuselage. Be sure that they are true to the fuselage and aligned to the wing. Form fillets around the fin and stabilizer where they join the fuselage using Epoxy-Bond. This material can easily be faired into the balsa wood using either thinner or water on your finger. These fillets add considerably to the overall appearance of the Tarman as well as increasing the strength of the areas to which they are applied.

Now cut a piece of 1/2" x 3/4" hard maple and install it across the fuselage at the wing mount. Again, I use HobbyPoxy No. 2 and light fibreglass cloth at this joint since this is a high stress area. Place the wing in position and drill the holes for the wing bolts through both the wings and the hardwood mount. Then remove

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the wing and tap the holes for the wing hold-down bolts you intend to use. Reinstall, and make sure the wing is properly aligned.

Don't be afraid of tackling the wing fillets; these are actually much easier to make than they are to describe. The proper procedure is to use a sheet of Saran Wrap or wax paper between the wing and fuselage, forming your fillets with Epoxy Lite. Use a small rubber ball, or a cardboard center ring from a roll of plastic tape to rough form the fillets. Then, using thinner or water, and your finger, smooth down and finish forming your fillets. This step is not just for the sake of appearance, since they do play an important part in the overall flight characteristics of the model.

You will notice, on the plans, that I use copper tubing extensions for the two fuel lines from the tank where they come through the firewall. This makes the fuel and battery compartment less susceptible to the residue from the engine exhaust. The tubing is epoxied in place, and then No. 732 RTV Silastic is put around the sides of the hatch. Wax paper is placed over the Silastic and the hatch is placed in position. Pull the hatch down lightly with the bicycle spoke hatch cover and allow to dry. Later, the wax paper is removed and the excess Silastic is trimmed away. This will seal the entire compartment from the exhaust residue.

The windshield is glued in place and Epoxy Lite is used to fair it into the fuselage. Use thin strips of masking tape around the canopy, and on the fuselage, removing the masking tape before the Epoxy Lite dries.

FINISH

The Tarman is covered completely with lightweight silk and three coats of clear dope. I then use thinned out HobbyPoxy "Stuff" which is brushed on as a sealer. Use enough coats to completely fill the pores and grain of the silk, sanding with 220 garnet paper. Then, apply two or three more coats of the mixture, sanding with 400 wet-or-dry, used dry. This will give you an excellent base for your paint. I spray on one coat of white HobbyPoxy, allowing it to dry thoroughly. If you trim with HobbyPoxy, let it dry for a week before masking and trimming in order to avoid any lifting of the base coat of color. Don Dewey informed me that MonoKote, or Solarfilm, is excellent for the trim colors, having picked up the idea from Dick Riggs. On my most recent Tarman prototype, I tried this method, and it works quite well, requiring far less work than the conventional masking and painting method. In addition, using this method, you need not let the base coat cure for more than 24 hours. After the trim is applied, the entire plane is sprayed with one or two coats of HobbyPoxy clear. This not only protects and seals the trim but gives you an excellent finish with very little work. I use acrylic lacquer thinner for all of the HobbyPoxy materials. This seems to speed up the drying time of the paint and prevents a gathering of dust on your new finish. Martin Senour Twin Thin Acrylic Lacquer Thinner has proved to be excellent for this purpose. It is also unsurpassed for butyrate dope and is much less expensive than dope thinner. I have had excellent results with the finishing methods decribed above, however, what works for some doesn't work for others, so use your own favorite method for finishing your Tarman.

FLYING

I have built and flown 4 Tarmans, and have another almost finished. I have yet to discover any bad characteristics of the aircraft, each prototype flying straight out with very little trimming necessary. There is no problem of torque on take-off, and when you are flying straight out at full throttle and idle back, it will not fall out of the sky like a boulder. Conversely, when you are flying at reduced throttle and accelerate to full RPM, it won't try to loop on you! In other words, it stays level at both settings. All that is necessary for a perfect take-off is to simply ease the stick back a little for a beautiful climb out with no tendency to jump off the ground. The landings are slow and graceful, unlike some pattern ships which approach the strip like an SST!

I hope you will enjoy your Tarman as much as those of us who have built the prototypes prior to the publishing of this article. Each one has flown with the exact same characteristics as those that preceeded it. If you should happen to take it with you on the competition circuit, I would be most interested in hearing of the results of your efforts. Drop me a line care of R/C Modeler Magazine. ●