TMTT

If you want a taildragger that appears to have flown right out of the Thirties, try this one on for size.

Photos & Text By
Tom Mountjoy

There is hardly an R/C Modeler around these days who does not have a few thoughts now and then on the subject of what airplane would make an acceptable construction article. In other words, what does this country need besides a good 5¢ cigar? It is not an easy answer to come up with when you consider the large number of plans for all kinds of planes just waiting for an eager builder like yourself.

Tom Mountjoy, if you don't already know, is a serious contender for the taildragger of the year award. Tom has noticed that 9 out of 10 Scale or Sport Scale winners, whether it be a flying or static contest, are taildraggers. Not only the winners but also the entries.

There are many different reasons for the popularity of the taildragger type, but when it is all said and done, I suppose the real attraction can be summed up in a few well chosen words. For example: classic lines, visible details, colorful paint schemes and, for the old timer, just plain "nostalgia" (means homesickness).

During one of the last big R/C shows, I had the pleasure of talking with several of the super builders who entered some of the most beautiful models I have ever seen. I was surprised to learn that many of these experts were not too interested in flying their creations. A situation that seems logical when you consider the hours spent on this type of project.

With the above in mind, it occurred to me that what the scale modeler needed was a "taildragger trainer". Something that could be built in a reasonable length of time, that is relatively easy to fly, and rugged enough to take abuse. A sort of basic trainer, to fill the gap between the high wing tricycle job you learned to fly on, and the beautiful scale job you may have just about finished. Since a scale modeler has a need, as well as talent for showmanship, I decided the taildragger trainer must be colorful in appearance and still maintain the vintage look of the 1930's. With the above in mind, I went to work.

Constructing The Fuselage

The first step is to read the plans carefully and make certain you understand the method of construction. You will note that the 1/2" square balsa rod running from behind the firewall to the tail post acts as an assembly jig for moutning each of the bulkheads. Make sure the rod is straight and made from hard balsa. After cutting out the bulkheads, they can be glued in their proper position along the rod. Make certain the 1/8" x 1/4" hard balsa stringers fit properly in each of the slots in the bulkheads while the bulkheads are still in the flat. Use the stringers (minus glue) as an alignment tool for truing the bulkheads to the master rod.

Before applying the stringers, glue the 1/2" square balsa tail post to the aft end of the master rod. When gluing the stringers, do the top and bottom first, then the sides, alternating from side to side in order to hold the proper alignment. The top stringers just under the wing position are made in three separate pieces on each side, as shown on the fuselage plan.

The next step is to line the inside of the fuselage from the firewall F1 to the forward cockpit bulkhead F5 with 1/16" plywood. The floor of 1/16" plywood is added last in the same area. This forms a strong box-type construction to protect your radio gear in case you zig when you should have zagged.

After framing up your fuselage, you are now ready to cover it with a good grade of 1/16" balsa sheet (I used Balsa U.S.A. throughout and found it very satisfactory). Use as large a sheet as your skill can accommodate, going from side to side to insure alignment. Be sure to leave the balsa covering out of the landing gear area until the gear is securely in place. You will also want to leave the balsa covering from the top between bulkheads F1 and F2 until your fuel tank is fitted into position. An 8 ounce Sullivan slant tank works nicely in the space provided. Should you wish a different or larger tank, some modification will be required.

You will find that the plywood firewall F1 is backed up with a 1/4" hard balsa bulkhead F1A. Also, that F1A is undercut 1/16" to allows for the flush application of the sheet balsa covering.

The final step in the assembly of the fuselage is to add the "V" shaped 1/8" hard balsa spacer T1 between the two stringers at the aft end directly under the stabilizer location.

Wing Construction

An effort was made to design the wing as simple, yet as strong as possible. A straight wing with no struts for support must contain sufficient internal structure or it may fold up under excessive stress. It is better to have the wing a little on the heavy side than to worry about its ability to remain in one piece.

The two lower wing spars are 1/4" x 3/8" spruce or pine. the two upper spars are hard balsa. You will want to angle the rear top spar as shown in cross section before installing the ribs. This will allow for a proper seating of the rear top balsa sheeting and capstrips.

The ribs are cut from 3/32" medium grade balsa with the exception of the center section ribs which are made from 1/16" plywood. Using a level flat surface, assemble the ribs to the lower spars first before adding the upper spars. The right and left outer panels are assembled separately before joining them to the center section. The leading edge is made from 1/4" square hard balsa. Use a medium grade balsa for the trailing edge, which is cut from sheet stock, or buy pre-tapered as shown on the plans.

For added strength, the center section is made from 1/16" ply. Make certain the aileron servo box is adequate in size for your servo before final assembly. The upper and lower front spars are tied together and reinforced with a 1/8" plywood doubler plate J-1 which also establishes the 2" dihedral at each wing tip. At the rear of the wing, each upper and lower spar has separate 1/8" ply doublers (J-1 and J-2), allowing the wing ribs to extend through to the trailing edge. Note that the outer center section ribs (1/16" ply) glue directly to the inner wing panel ribs at time of assembly to the center section. Make certain these opposing ribs are in the proper plane for butt joining. The small leading edge ribs are located after the wing panels are secured to the center section.

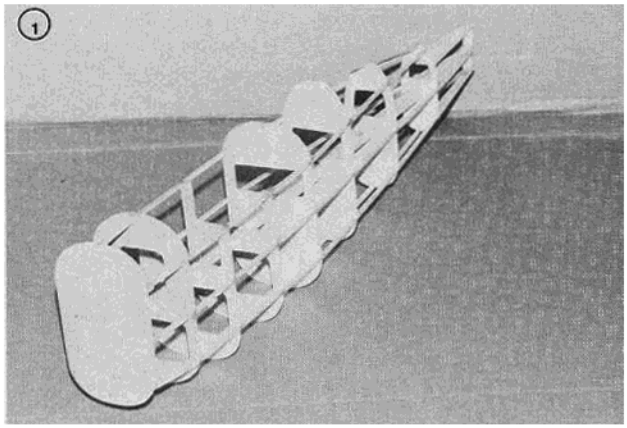
Upon completion of the basic wing

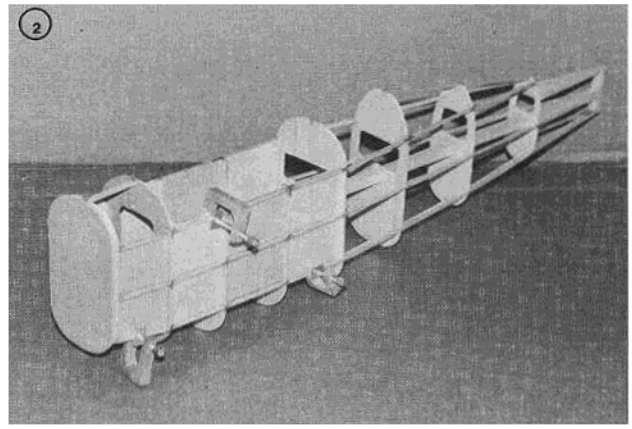
TAILDRAGGER TRAINER

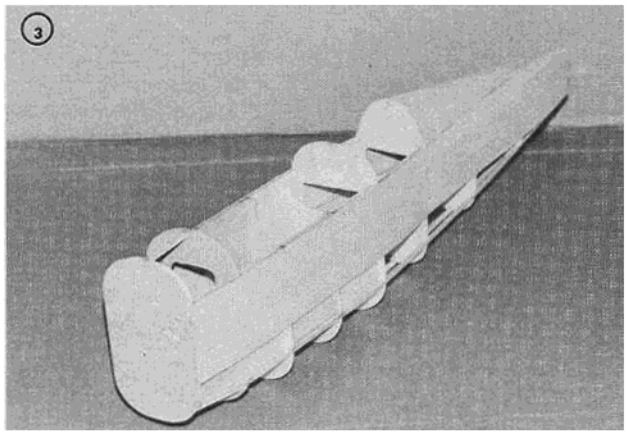
Designed By: Tom Mountjoy

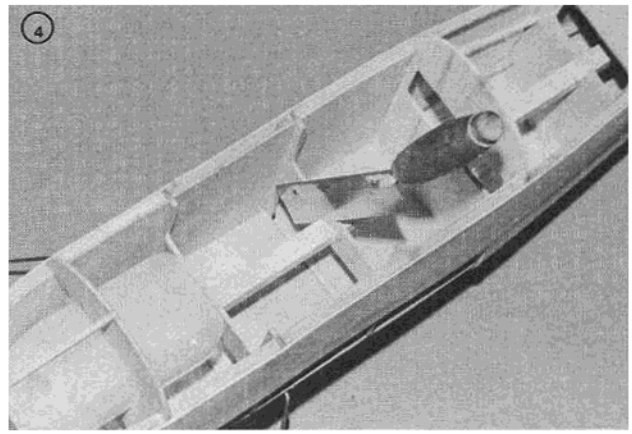
TYPE AIRCRAFT
Trainer
WINGSPAN
63¼ Inches
WING CHORD
9¼ Inches
TOTAL WING AREA
571 Square Inches
WING LOCATION
Shoulder Wing
AIRFOIL
Flat Bottom
WING PLANFORM
Constant Chord
DIHEDRAL, EACH TIP
2 Inches
O.A. FUSELAGE LENGTH
40½ Inches
RADIO COMPARTMENT AREA
(L) 9" X (W) 3½" X (H) 4"
STABILIZER SPAN
17¼ Inches
STABILIZER CHORD (incl. elev.)
6¼" (Avg.)
STABILIZER AREA
97.6 Square Inches
STAB AIRFOIL SECTION
Flat
STABILIZER LOCATION
Top of Fuselage
VERTICAL FIN HEIGHT
6 Inches
VERTICAL FIN WIDTH (incl. rudder)
6¼" (Avg.)
REC. ENGINE SIZE
.35-.45 Cu. In.
FUEL TANK SIZE
8 Ounces
LANDING GEAR
Conventional
REC. NO. OF CHANNELS
4
CONTROL FUNCTIONS
Rud., Elev., Ail. & Throt.
BASIC MATERIALS USED IN CONSTRUCTION

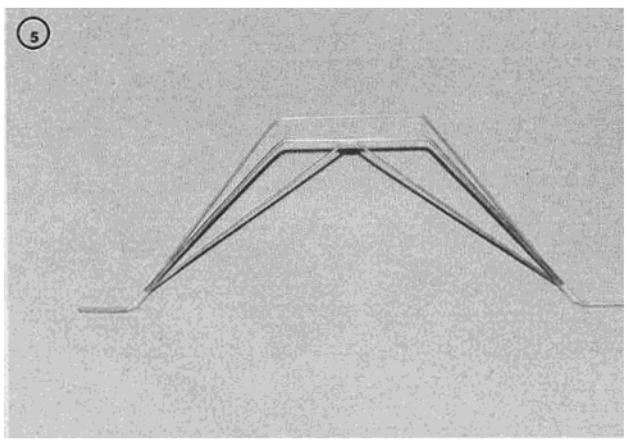
Fuselage	Balsa, & Ply
Wing	Balsa & Ply
Empennage	Balsa & Basswood
Wt. Ready-To-Fly	96 Oz.
Wing Loading	24.2 Oz/Sq. Ft.

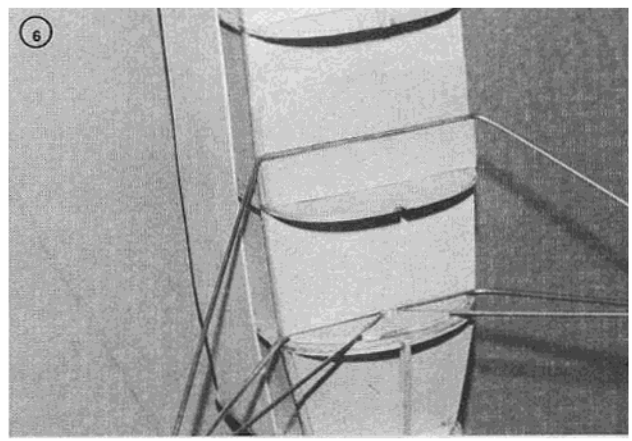


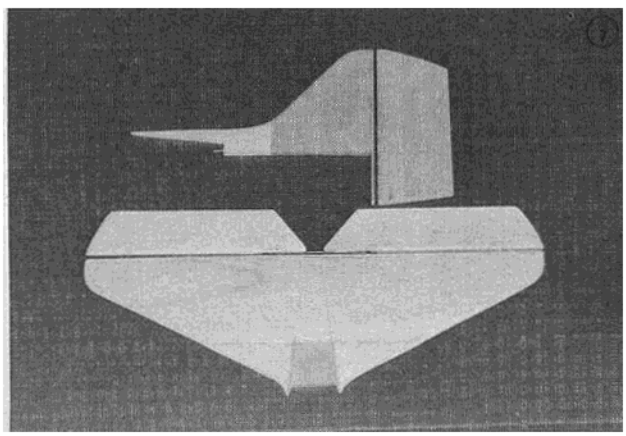


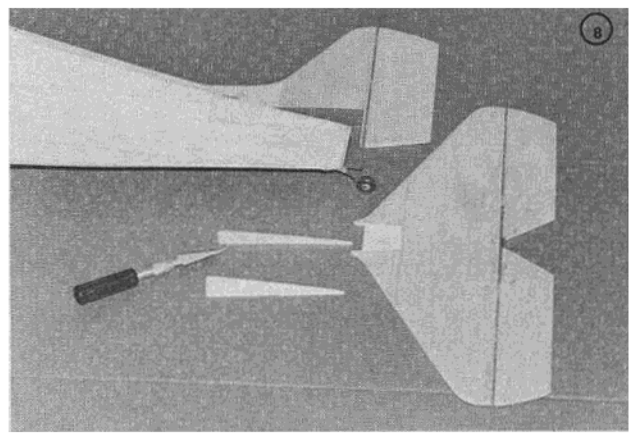




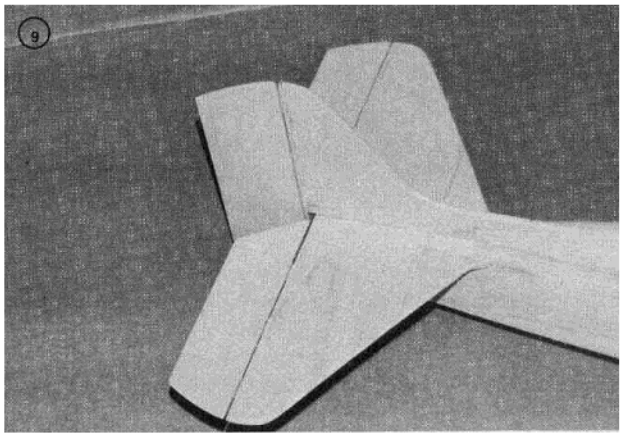


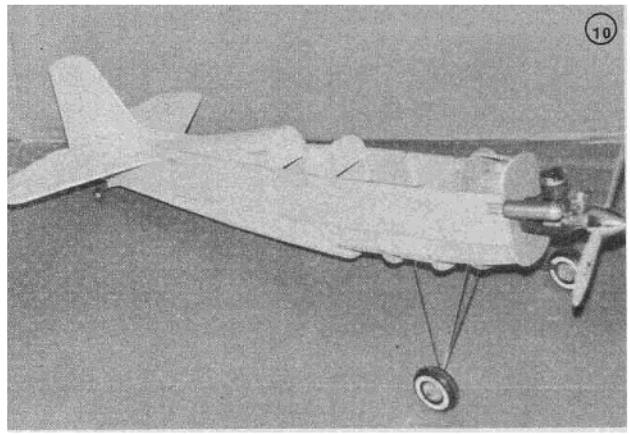


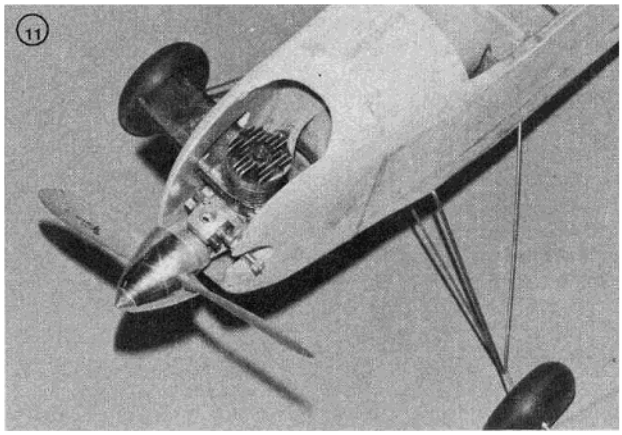


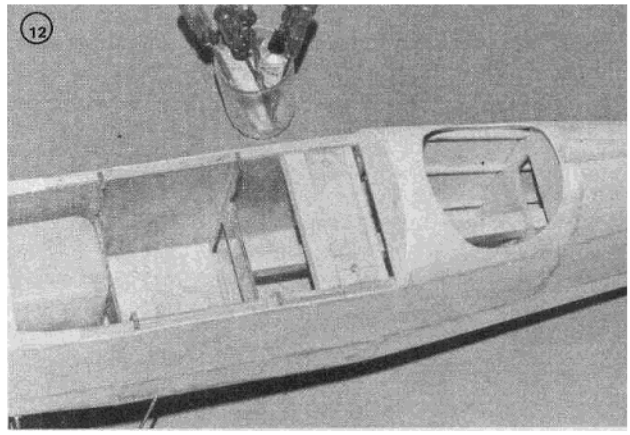


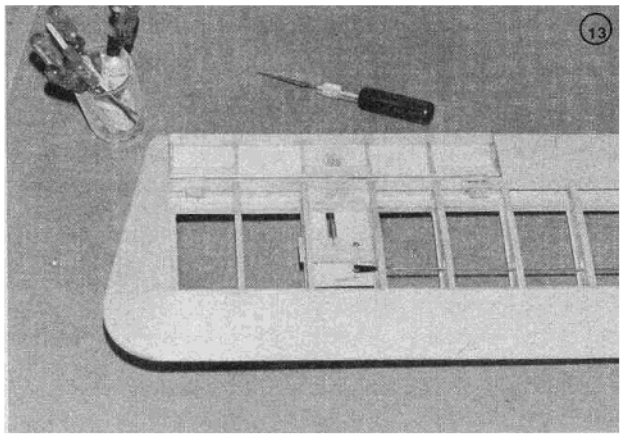
(1) Basic fuselage structure built on 1/2" sq. balsa crutch. (2) C-clamps used to glue 1/16" ply doublers inside fuselage. (3) Start of the outside sheeting. (4) Crutch is cut out at servo location. (5) Landing gear bent & soldered ready for installation. (6) Landing gear installed. (7) Tail feathers ready to attach. (8) Filler blocks trimmed to shape prior to assembly.

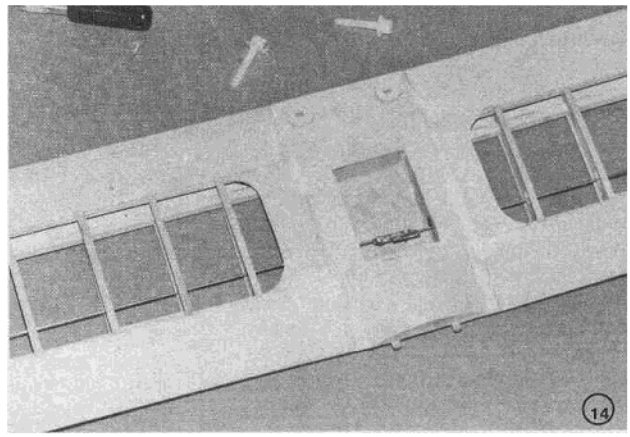


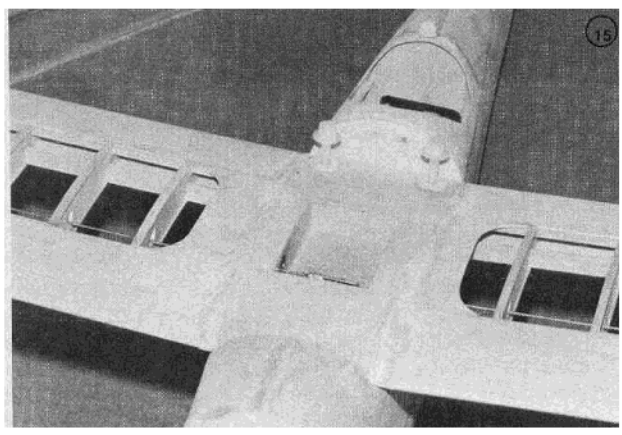


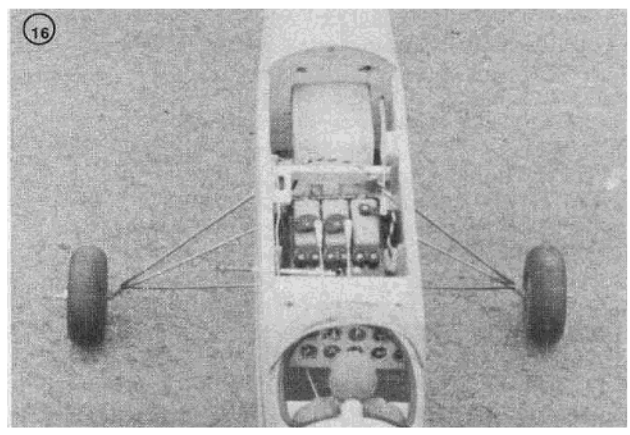












(9) Tail glued in place. (10) Engine mounted and ready for cowl blocks. (11) Cowl shaped and sanded. (12) Wing hold-down block epoxied in place. (13) View of aileron bellcrank and linkage. (14) Aileron servo compartment showing wing dowels and nylon hold-down screws. (15) Wing in place. Hatch cover not shown. (16) Wing removed showing very neat radio installation. Pilot has a full instrument panel.

structure, apply the 1/16" balsa sheet to the top and bottom of the leading and trailing edge. Next add 1/16" x 1/4" balsa capstrips to each of the ribs as noted on the plans. Be sure you fill in the area where you will drill for the 1/4" nylon wing bolts with hard balsa block before applying the rear top center section plywood.

The wing tips are cut from 1/2" light grade balsa sheet. Taper as shown before applying. I lightened my tips by drilling out some of the wood with my X-Acto hole cutter. The tips are covered top and bottom with 1/16" balsa sheet.

Wing Fairing

Using a good grade of carving balsa, shape the front and rear fairings that blend the top of the center section to the fuselage. The front fairing is glued to the wing leading edge area as shown on the fuselage plan. The rear fairing is made removable in order to gain access to the aileron servo and the nylon mounting bolts.

Tail Surface Construction

The complete tail assembly is made from 1/4" x 4" balsa sheet. This is one place where you will want to select the very best grade of lightweight balsa available — something that will hold its shape after you have formed it to the cross section shown on the plans. The trailing edge of the fin and stabilizer has a 1/8" basswood or pine strip for added strength. I found that the Goldberg Hinge Slot Cutter works very well with the basswood.

Be sure all of the tail surfaces work free and easy before assembly to the fuselage. Place the wing securely in position and line up tail assembly before gluing. The final step is to add the small soft balsa fairings in the area where the fin meets the stabilizer.

Landing Gear

The landing gear is a practical design for taking the abuse inherent in a training plane application. The two main legs are bent from 5/32" piano wire and the center support is made from 1/8" wire. Use the full size layout on the plans for accurate bending as required. Fine brass wire wrap all joints prior to soldering.

In order to mount the completely assembled gear on the fuselage, it is necessary to cut out the lower stringer in that area. As the final step, replace the stringer and complete the 1/16" balsa covering on the lower fuselage.

Engine and Cowling

I suppose one of the main reasons this trainer appears to be early vintage is because of the engine cowling. Most of the free flight gas models in the 1930's had a similar layout. Keep it simple but protect the engine which, by the way, was the major investment in those days.

As shown on the plans, the engine is mounted upright on the center line of the fuselage. I used a Kraft rear rotor type mount in order to get the engine as far forward as possible. Engine selection ranges from .35 to .45 with an OS .40 shown on the plans. My trainer has an Enya .45 which is enough power to maintain altitude on half throttle. A good feature to have on a trainer.

The cowl is formed from four pieces of medium hard balsa block. Rough shape each part before assembly to the firewall. Make a cardboard template of each cowl side and use it to superimpose the cutout for your particular needle valve and muffler. I installed a Semco exhaust extension, although most any muffler will work. A small extension adaptor will usually be required so that the muffler will clear the right side of the cowling.

After assembly of the cowl to the firewall, do your final sanding so that it blends in nicely with the fuselage. The last step prior to admiring your new cowl is to apply a coat of Hobbypoxy Formula 2 throughout the inside area of the cowling. While you have the glue mixed, coat the entire inside of the fuselage, back to bulkhead F5, and also the aileron servo box in the wing center section.

Covering and Finishing

Following my usual procedure for taildraggers, I decided on Permagloss Coverite for the "fabric look". Two rolls will do the job, although there is no room for careless cutting.

I thought long and hard on selecting a color scheme until a good friend informed me that most early trainers were painted blue (fuselage) and yellow (wings). The numbers on the wing and tail, as well as the fuselage striping, were cut from 6" wide Goldberg DJ multistripe. I found the overall color combination to be very striking in appearance and easy to see in the air.

Flight Controls

The servo installation and flight controls in this trainer are pretty standard. Careful thought has been given to easy access for adjustment or removability when required. The aileron servo can be adjusted without removing the wing, which I found handy during the initial flight tests.

The control travel is normal and not overly sensitive on rudder and elevator. The ailerons need full travel in both directions which seems to be inherent with this sort of design. Actually the trainer would probably be a good three control airplane although I have not experimented with it as such. In the good old days, we flew them like this with the only control being a hard toss and a quick prayer.

The Center of Gravity should be a little forward of one third of the way back from the leading edge of the wing. It is better to have this airplane a little nose heavy than tail heavy. My completed model weighed in at exactly 6 pounds.

Good luck with your "Taildragger Trainer." If you build this plane and master its flight, the day will come when you take your place at the head of the class and they will call you "Ace". □

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