

THE PIPER J-3 CUB IN SCHOOLYARD SCALE

Super simple construction, economical operation and restricted flight area capabilities make this classic training monoplane a standout.

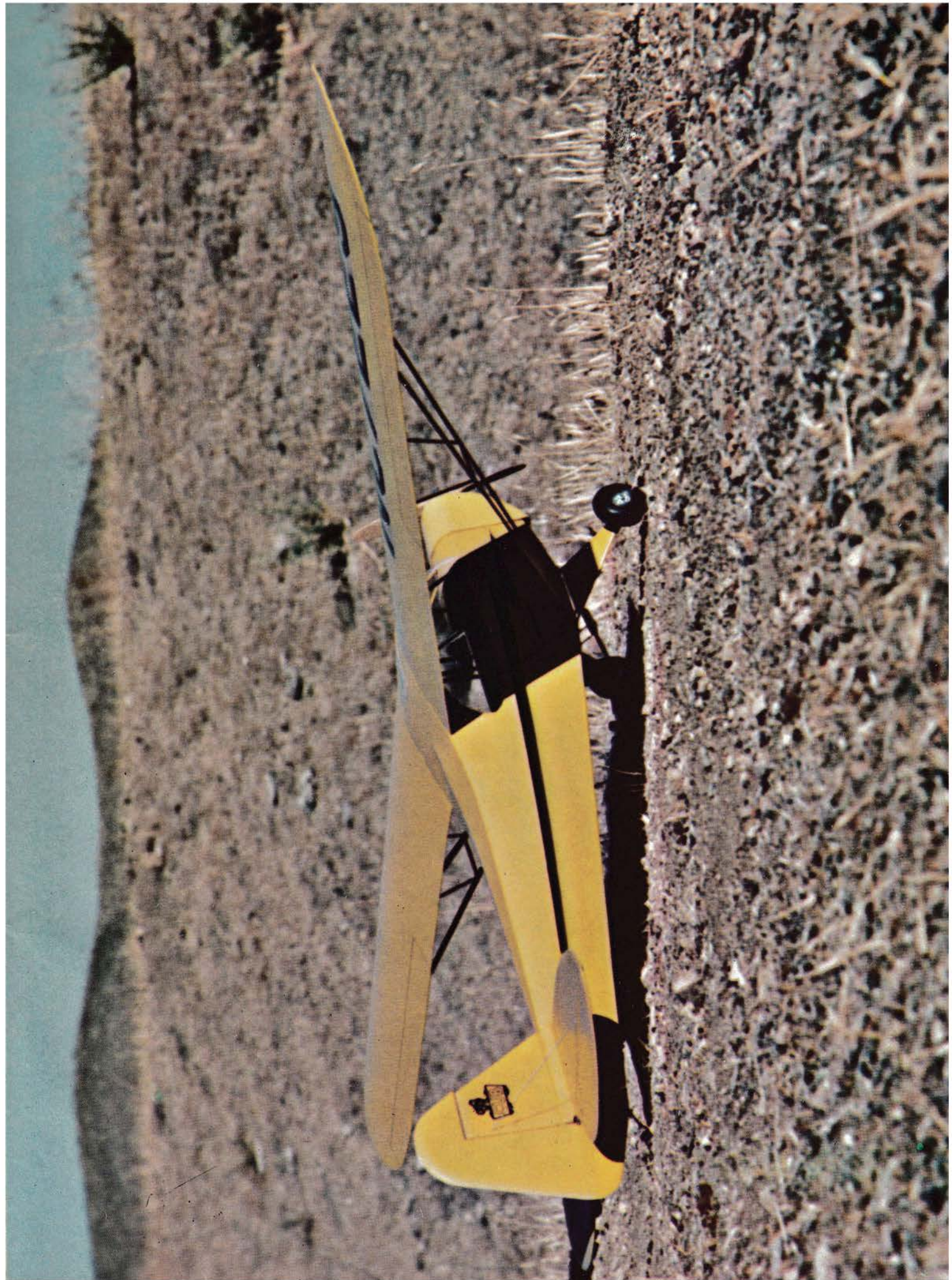
By Harold Osborne



The Piper J-3 Cub is the third subject (the first was the Bristol Scout Biplane) in our series of "Schoolyard Scale" models. This type of model has been presented with the intent of making plans available which use to the best advantage the new miniature radio gear that is now available.

There are many advantages to the smaller model; low cost of materials, ease of transportation even though the model is built "in one piece," less engine noise, less fuel consumption, smaller flying fields can be utilized, smaller workshops can be used, and
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With a custom Tee Dee from Kustom Kraftsmanship swinging a 6-3 prop, the Cub floats by at half throttle which, in this case, is about 13,000 rpm.





The Cub handles the Cannon Super-Mini series quite well. Cox Sanwa two-channel with its tiny servos would also be a good choice.

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finally, the smaller models generally do not crash with the complete destruction that a .60 engine powered model does.

Every model builder has several Cox .049 engines in his model box. Cox supplies a muffler and a throttle control for these engines. Parts are available and inexpensive.

THE PIPER J-3 CUB, A BRIEF HISTORY

The Piper J-3 Cub is possibly the most famous lightplane in America. Originally manufactured in 1931, the first E-2 Cub bears a resemblance to the J-3 trainer in size and general shape, but the old E-2 was a simple 2-place open cockpit ship with a little 37 hp engine which gave it a top speed of 62 mph. The J-2 Cub, first made in 1936, had an improved 40 hp engine and an enclosed cockpit. It was almost identical in appearance to the J-3 which was introduced in 1938 with a 65 hp engine.

The Cub has served in many capacities; cropduster, flying ambulance, business and freighter plane, trainer,

etc. During the Second World War the Cub had many designations; YO-59, O-59, L-4, L-18 and L-21 Grasshopper. 1,801 aircraft of the L-4H variety were produced and 1,070 L-4J's were completed by the end of the war. The L-4 performed its first combat mission for the Army in the early '40s, when four of these lightplanes flew off the deck of an aircraft carrier to spot for ground units going ashore in the invasion of North Africa. Thereafter, the Piper L-4s operated with the Army in every campaign and on every front.

BUILDING THE MODEL

Start by cutting out all the parts shown on the plans. If you have access to a Xerox copier, parts can be copied from the plans and the copies stuck on the wood with rubber cement. Cut the part out right through the paper and peel the paper from the wood when completed.

FUSELAGE CONSTRUCTION

Cut out the two fuselage sides from 1/16 sheet balsa. Score and bend the sides along the center lines of the two rear fuselage stringers.

Next, locate and cement in place the tapered side stringers. Then cement the 1/16 x 1/4 vertical braces, the 3/32 dia. hardwood dowel (Note: 3/32 square hardwood may be used),

the square hardwood may be used), the 1/16 dia. hardwood dowel and the various 1/16 x 1/4 and 1/16 x 1/8 doublers. Remember to make a left and a right side. Cement the 1/16 sheet nose doublers in place making sure that they are scored and bent to match the change in fuselage contour shown in the plan view.

Lay one fuselage side flat on your building table and glue the 1/16 x 1/4 cross braces properly cut to length at stations F4, F5 and F6. Check to make sure the braces are vertical with a small square. This is the straight section of the fuselage. Then place and glue the other half of the fuselage to the vertical members. Pull the two tailpost ends of the fuselage together and glue them. Then cut to proper length and glue in the cross braces for sections F7, F8, F9 and F10.

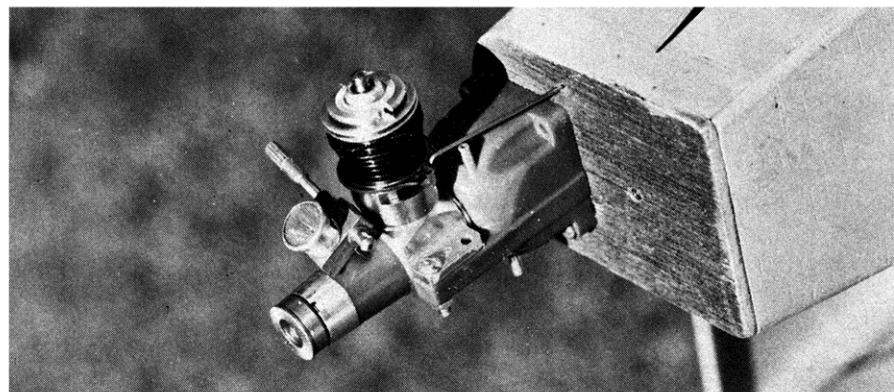
Epoxy the hardwood strips in place to form the front and rear gear channels. Use a piece of 3/32 dia. wire as a spacer for the front and a piece of 1/16 dia. wire for the rear groove.

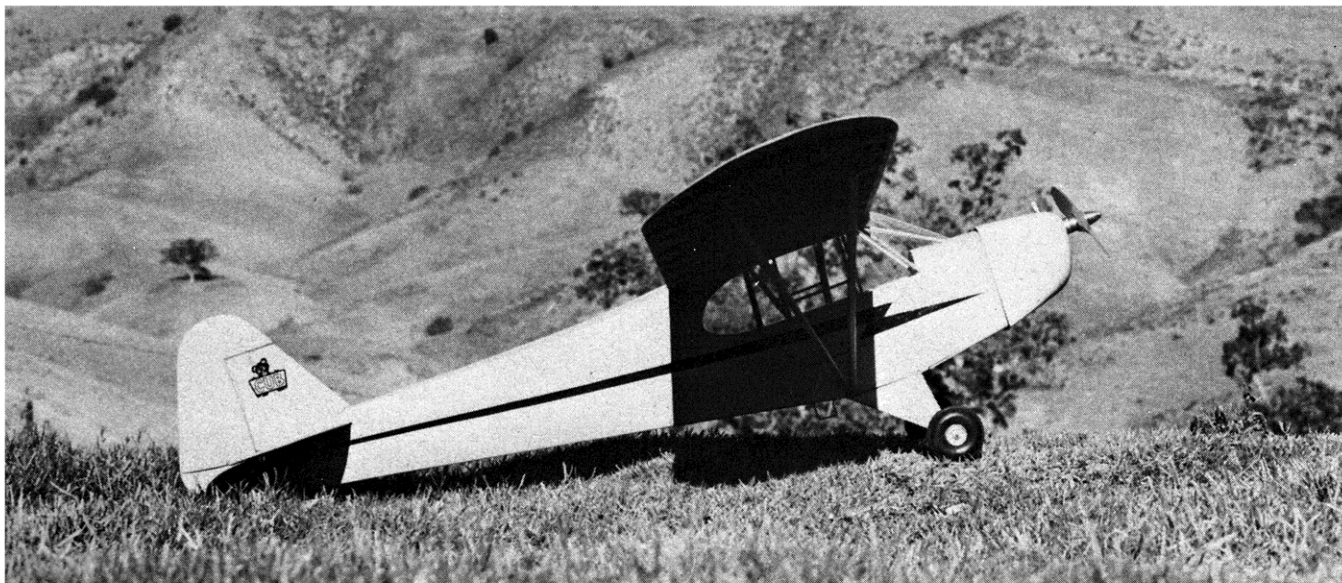
Epoxy the blind nuts for engine bolts on the back of F1. The location on the plan is for a Cox Golden Bee. Epoxy a blind nut as shown for cowl retention.

Cement formers F2 and F3 in place and epoxy in place the two hardwood servo mounting blocks. Plank the cowl between F2 and F3 with 1/16 sheet. Now make the hatch so that it is a tight fit. Epoxy F1 in place. Locate and epoxy the outer nyrod tubes for the rudder and elevator.

Next, cover the top center section with 1/16 sheet to section F7. Cement the top stringer in place and cover the top rear of the fuselage to F10 with 1/16 sheet. Cover the bottom of the

Mount the engine as you please . . . right side up, upside down, side mount, etc. We chose the side mount route which worked fine and kept the profile clean.





fuselage with 1/16 sheet with the grain running crosswise. Bend the tailwheel wire, and at this point make your decision on a fixed or steerable tailwheel. The steerable tailwheel is a little more work but is a nice feature.

Apply a coat of resin to the firewall and the inside of the fuselage back to F3. Carve two balsa filler blocks to fill the center section and cement in place the two 1/16 dia. dowel windshield braces. At this point set the fuselage aside.

WING CONSTRUCTION

Cut the two panels from light 1/16 sheet. Use 2" or 3" wide stock cemented together to get a blank wide enough for the wing chord. Cement the 1/16 x 1/8 leading edge brace in place. Cement about 1/4 inch of the leading edge of each rib to the wing panel. After the cement has set, curve the balsa wing panel around each rib and cement the rest of the rib. Add the 1/8 sheet gussets, score the aileron location with a ballpoint pen and sand the leading edge to a round shape. Set the wings aside and proceed with other parts.

EMPENNAGE CONSTRUCTION

Join the elevators with a 2" length of 1/8 dia. hardwood dowel. Install the control horns on the rudder and elevators. Cut slots for the hinges. Epoxy the hinges in place after painting.

LANDING GEAR

Bend the gear wires to the patterns shown in true size on the plan. With the front and rear struts held to the fuselage by tape, bind the joints with fine copper wire (household appli-

ance cord stripped apart) and solder the points. Epoxy the filler in place. The shock covers may be made from masking tape wrapped around the wire.

WING STRUTS

Build one right and one left directly over the true size shown on the plan. Use only hardwood and epoxy.

ENGINE COWL

A cowl is always a difficult item and no scale aircraft looks good without it. I carved two plugs and I can supply vacuum formed cowls that are trimmed and have prop and scale air inlet holes cut. You will have to trim the cowl for your cylinder head hole, either side mounted or upright and spray the cowl with Pactra's Namel lemon yellow S8. You will also have to epoxy a hardwood mounting block inside the cowl. (See plans for cowl ordering details.)

PAINTING AND FINISHING

An all balsa model must be kept as light as possible. A model railroad paint called "Floquil" is excellent for this type of model. Brush on one coat of RR31 Reefer Yellow just as it comes in the bottle. Sand lightly with 400 sandpaper to remove the fuzz. This

The Cub awaits another flight. The ABS cowling is just what the doctor ordered for this type of project and is available as an accessory item along with the plans from Harold Osborne. See the plans page.

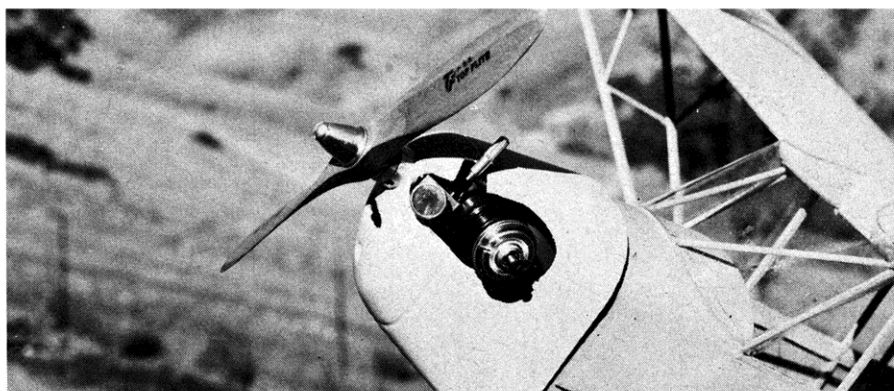
one coat gives the balsa wood a deep yellow base color. This paint is compatible with fuel proof cements and epoxy. The final coat of paint—after assembly—will be Aero Gloss Cub Yellow hot fuel proofer in a spray can.

FINAL ASSEMBLY AND DETAILS

Epoxy the windshield in place before any other assembly. This is not easy and the pattern shown on the plan may not exactly match your construction, but it will be very close. If you have trouble, make the windshield from three pieces; front and two sides. This goes on easier.

Cement the wings in place next with the fuselage upside down on a table. The 5/8 inch dihedral shown is a minimum amount. More will do no harm. Epoxy the struts in place and add the small interplane struts.

Make sure that both wings have no washin or washout. Adjust this by pinning the struts in place so the wing is true before epoxying the struts to the wing. Line up and cement the empennage in place. Epoxy the land-



You just can't beat the kind of performance we got from the modified Cox Tee Dee. And Kustom Kraftsmanship does it all for \$29.95. To our way of thinking, that ain't bad.



It's a fun little flyer with no nasty habits. But remember, it's small and has a lot of lift and is quite affected by the any wind. So when there's a stiff breeze, think about waiting until tomorrow to fly unless you are an experienced pilot with a quick trigger finger.

Gear installation is, like the rest of the airplane, ultra simple. We did have ours break loose twice, however, so we would suggest that they be tied down through the wood at the base for full time operation. We also suggest the use of Trexler inflatable rubber tires and wheels as they absorb a good deal of shock on landing, especially on rough surfaces.



dimension to our schoolyard flying. With the Golden Bee in this kind of an airplane where you are flying full throttle all the time, there just isn't much time to relax. It's no different than flying a full size airplane at full throttle . . . that just isn't the time to take it easy. Everything happens a bit faster. Now with the Tee Dee . . . you gain a little altitude, throttle back to half power and just coast around. Take a few deep breaths, hey, this really is fun!

When it comes to landings, if you have the Golden Bee mounted, you won't get anywhere near the ground as long as the engine is running. With the custom Tee Dee (see SR/CM 2/5 for October 1976 for an article on these engines) in place, just idle back all the way, set a respectable glide slope, and in you go with a little flare before touchdown. The Cub isn't too bad on nose-overs so don't worry about it. With a little practice, short approaches (like coming around that oak tree) and very short field landings are easily accomplished. By the way, we would recommend the use of Trexler inflatable tires on the Cub although we did not use them ourselves during our tests. Happy Flying! □

ing gear in the bearer slots. Mask the windshield and spray the model with Aero Gloss Cub Yellow hot fuel proofer.

Sure Flite Products of Buena Park, California has a decal sheet which I used for license, fuselage blaze and Cub emblem. This saves a lot of time and trouble. This Cub plan was optically enlarged from Jim Triggs drawings that were published in October, 1958 American Modeler, so the model is 1/10 true scale outline and is not a stand-off scale model even though it is of all balsa construction.

FLYING

Here's the fun part. Flight testing of the Cub was done in both the two channel configuration with a regular Golden Bee courtesy of Cox, and then

later with the three channel Cannon Super-Mini with that third operation running up through the firewall to one of Kustom Kraftsmanship's customized Tee Dee .049s.

The Golden Bee powered version seemed to have more than adequate power and indeed the Cub is a rather light airplane particularly if balsa selection is done wisely. Basically, the Cub flies like any self respecting Cub should—hands off. We figured in about 25° of rudder travel to move the dihedral around and this produced nice, graceful turns. But watch yourself on the elevator so as not to build in an over control potential. A little up elevator makes the Cub climb like an elevator so take it easy.

Installation of the throttleable Tee Dee added, literally, another very enjoyable