

A proven trophy winner, this .09-powered Class A Free Flight has a near vertical climb with a flawless transition.

CLASS-A GAS is the most hotly contested event in free-flight power competition today. I feel this is due to a number of factors: availability of a number of good factory engines not requiring tuning, a good manageable size model, FAI power influence and, above all, spectacular performance. One only needs to check entries in A-gas at the Nats or the U.S. Free Flight Champs at Taft, or note the contests requiring a fly-off to settle final standings, to confirm this popularity.

As with most free-flight models Dixie-Gal came about in an effort to build a better mousetrap. I had always admired "Geodetic" or "Union Jack" structures and for some time have eyed the 1/2-A Galaxie by Vic Cunningham. The Galaxie,

Clarence Haught
Photos by Tim Christie

however, with all apologies to Vic, always seemed overbuilt for a 1/2-A model so I resisted the temptation to build the design. Later, while firming up a new Class-A ship, I kept thinking of those rigid Galaxie surfaces. My new ship was to be built around a hot Cox TD.09 that I happened to have lying around and 315 sq. in. should be just about right. For some time I have been flying a Dixielander in Class A. The Dixielander by George Fuller is the English equivalent of "our" Starduster. The English have been flying small-field rules

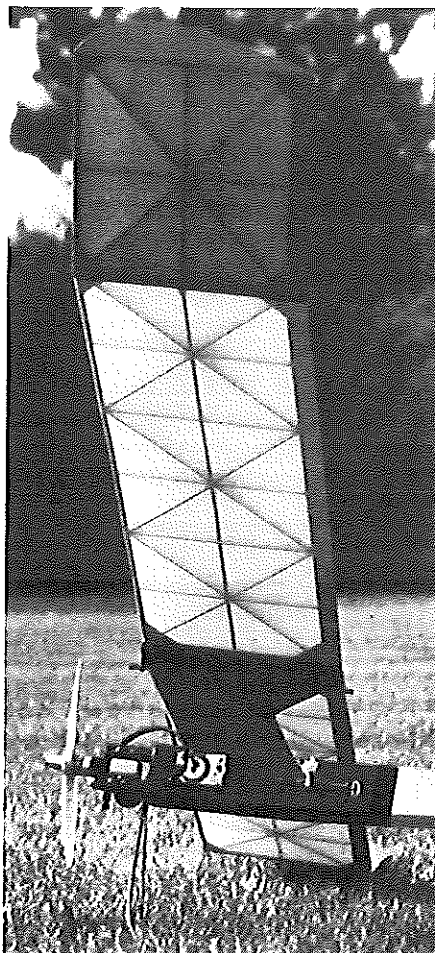
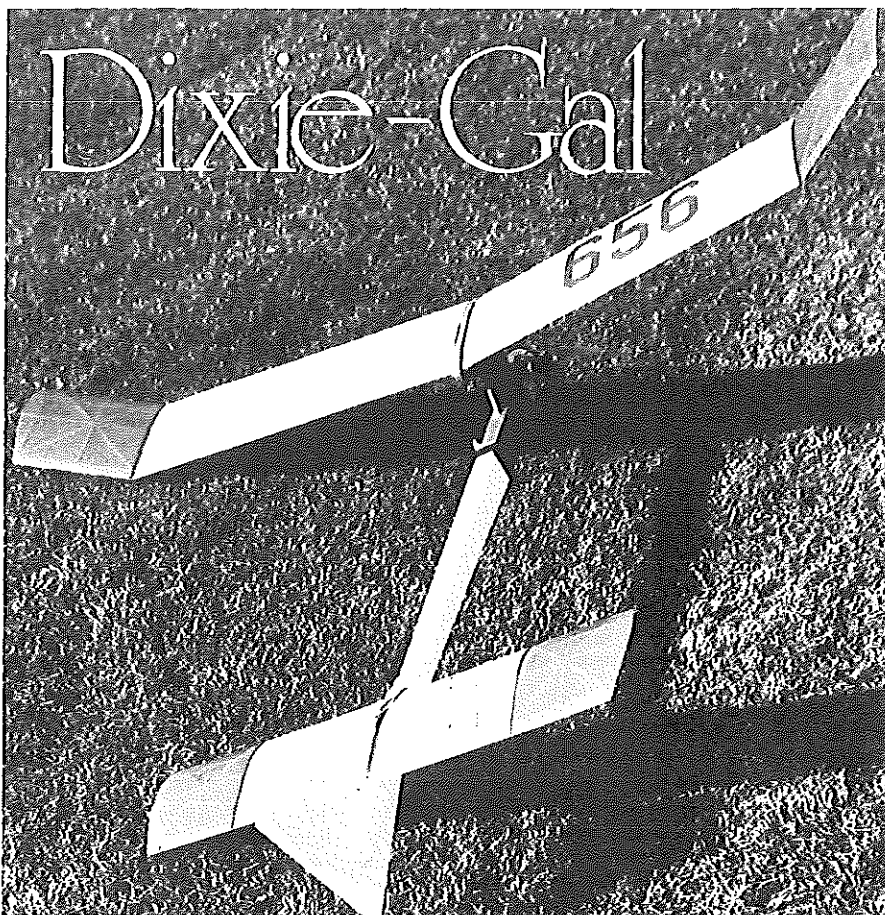
for years and have developed small high-climbing models capable of handling large powerplants. A Dixielander using a 350 sq. in.-wing powered with a Supertigre .15 is anything but boring!

So the pattern was set. Galaxie-type surfaces and a Dixielander type fuselage mated together and sized for an .09 engine and christened "Dixie-Gal." The resulting model presented here has given me a great deal of pleasure and has added extensively to my trophy shelf.

If you elect to build Dixie-Gal I know you will not be disappointed. She has a near vertical climb that gets her up where the lift lurks and transitions flawlessly for the spirited glide we all strive for. All this with that classic European look!

Right: Typical English styling. "Union Jack" construction provides rigidity for high-speed climb without flutter problems. Structure is virtually warp-proof.

Below: High pylon, long moment arm, rear fin force layout handles high power output of a Cox TD .09. No down- or side-thrust required with this configuration.



Construction

Wing and Tail: As with most free-flight models construction should begin with the flying surfaces so that they may be covered and allowed to cure out while the fuselage is being fabricated.

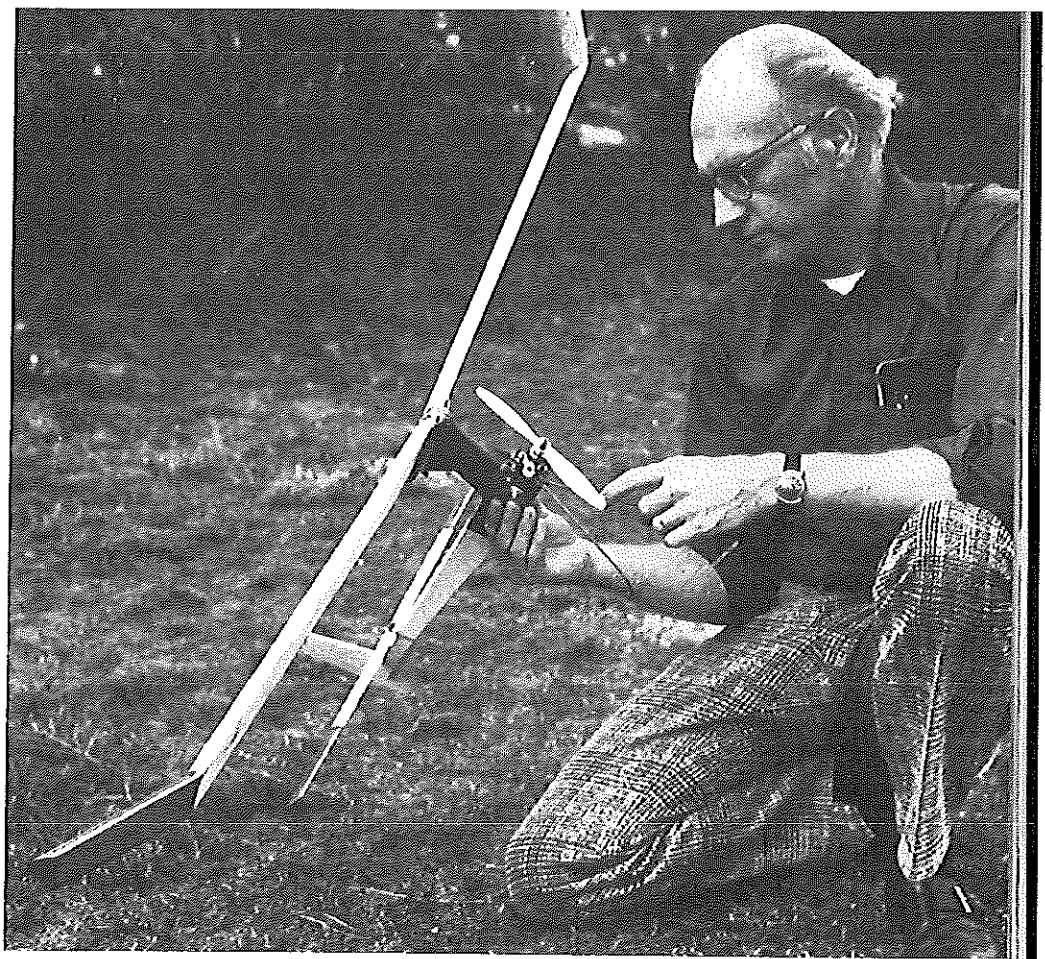
If you haven't built geodetic structures before, start with the stabilizer and work up to the wing. I like to use white glue applied with a brush for building structures such as this. You will find geodetic structures very rigid and warp-free, so be sure you are building on a flat surface as any built-in warps are permanent.

Notch the trailing edge for the ribs as indicated and pin to plan along with bottom spar and leading edge. Fit straight ribs and top center spar. Next, cut geodetic ribs at spar location and trim to exact length striving for a good tight fit at the spar to main rib intersection. When dry, notch geodetic ribs to receive the top front spar. Line up notch location with a straightedge and cut with a single-edge razor blade. A strip of masking tape along the side of the razor blade makes a good depth reference.

Add tip plates and gussets. Fit a $\frac{1}{8}$ dowel rubberband anchor at the center spar location as shown and brace well with scrap. The small plywood hole reinforcement at the trailing edge is added after covering.

Wing construction follows essentially the same procedure as the stabilizer with a few extra steps.

Stabilizer tilts 45 degrees for dethermalizing. Remote fuse location works best on rear fin force layouts. Ship combines Class A performance with handling ease of 1/2A ships.

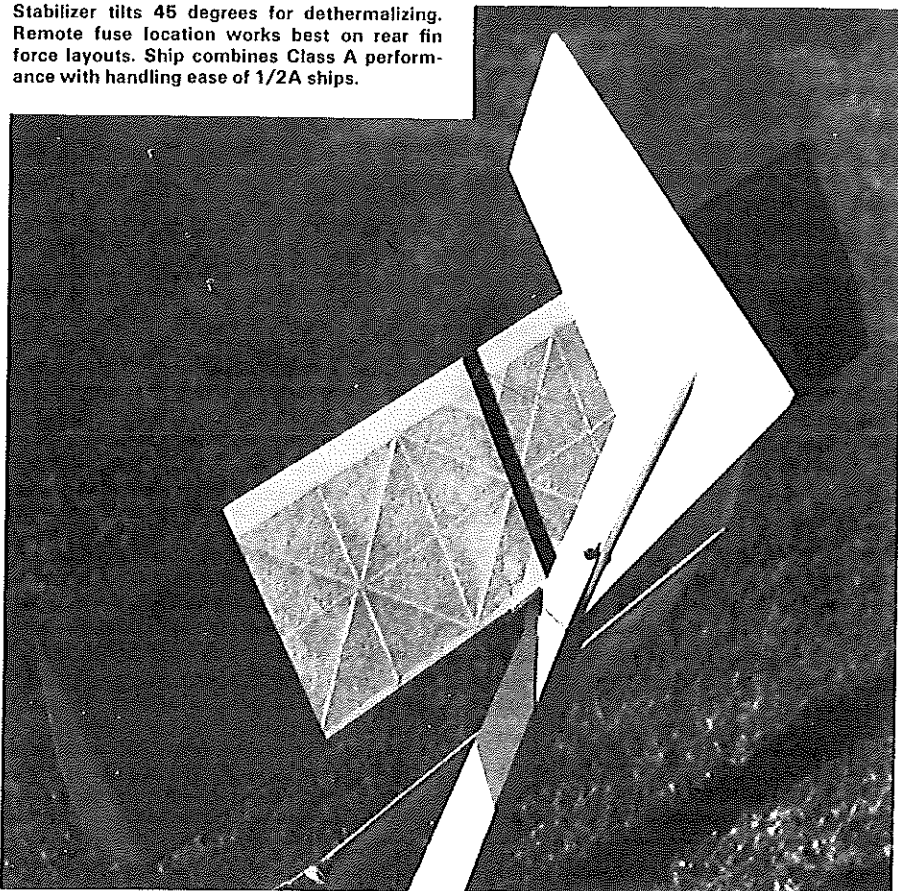


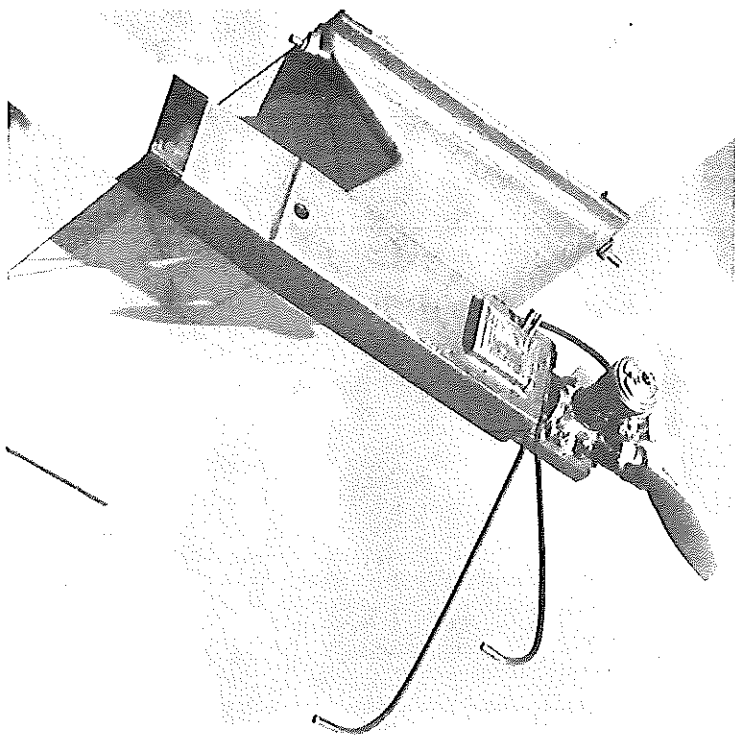
Author contemplates a prop change. The Cox TD .09 handles 7/4 prop well. Spectacular climb is tailored to new Category II rules.

I used to detest plans with only half the wing shown, until I began drawing plans for publication and became aware of space limitations. As a builder you have two options. You may build the right wing as shown, then grease the plan with cooking oil or shortening to make it more transparent, turn it over, and build a left wing, or do as I do and build both panels at once by building the right wing directly over the plan and the left wing directly above the right with the leading edges mated up in a mirror image effect. This system provides for accurate rib spacing via the notched training edge on the left panel and the mated leading edges.

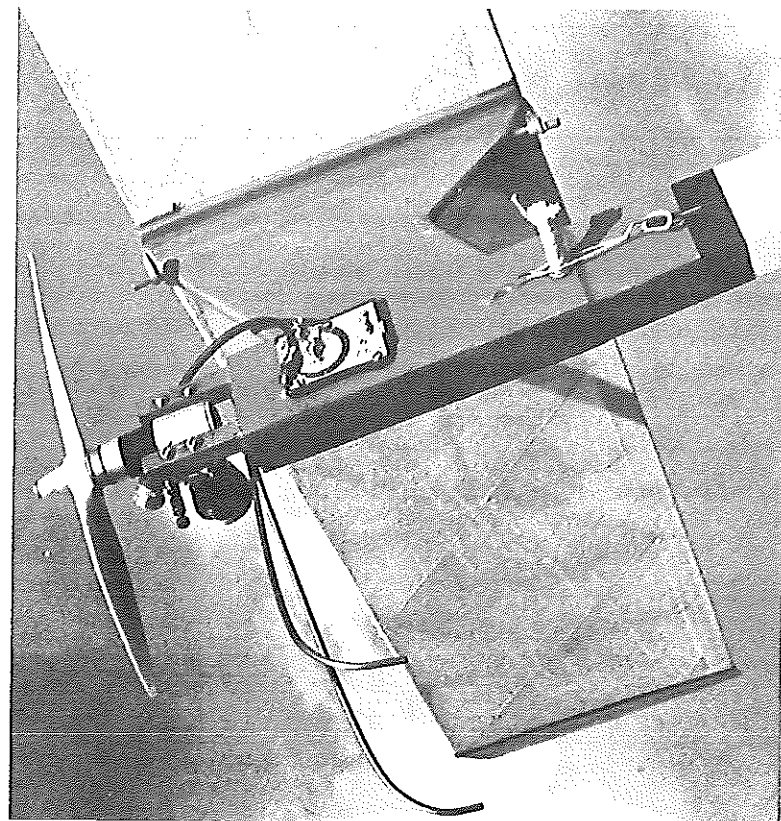
Proceed with construction as on the stabilizer through the straight rib stage omitting dihedral ribs. Prior to adding geodetic ribs all warps called for on plan must be initiated. Cut wing panels apart at dihedral joints and block up the outer end of the trailing edge of tip panels $\frac{1}{16}$ in. for washout. This is to avoid tip stall prior to complete stall of wing. Block up outer end of right wing main panel leading edge $\frac{1}{8}$ in. for washin. This is necessary to compensate for the reduced lift produced by the inboard wing during right turning flight and will help to prevent right spiral dives under power or strong thermal glide conditions. The left main panel is built flat on the building board.

Install all geodetic ribs except those adjacent to dihedral ribs. When completely dry, remove wing panels from board and sand in dihedral angles. Secure main pan-





Above: A modified Perfect #6 "Rectank" is inletted into 1/32" ply fuselage doubler. Husky skid protects model on hard DT landings.



Right: Wing keys to pylon with 1/8" dowel assuring positive alignment. Fuse snuffer goes through fuselage to allow instant fuse length adjustments. Tatone squeeze-off controls engine run.

Dixie-Gal

els to board. Block up tip panels to proper dihedral angle and glue to main panels. When thoroughly dry, join main panels at center in similar manner. Allow to dry, then add dihedral braces and ribs, center rib, geodetic dihedral ribs, center planking and gussets. Notch geodetic ribs and install front spar.

The surfaces are now ready for a thorough sanding. Shape leading edges carefully to maintain airfoil shown on plan. Employ a sanding block long enough to span three or four ribs to insure uniformity. Blend ribs into trailing edge smoothly. Work carefully, taking care not to damage the structures with corners of your sanding block. Dust thoroughly.

Determine at this point what covering material you plan to use. The structure is plenty adequate for plastic films. If you elect to use them, proceed according to the manufacturer's instructions.

I recommend medium Silkspan for wing main panels and Japanese tissue for the wing tips and the stabilizer. Prior to covering with paper, predope perimeters of structures with two coats of dope, sanding after the first coat.

Apply tissue covering, water shrink and apply two coats of clear dope. Cut trim from colored Japanese tissue and your AMA numbers should be applied with thinner at this time. Follow with three more coats of clear dope on the wing and two on the stabilizer.

Set flying surfaces aside to cure, preferably secured by some sort of jig holding fixture to insure alignment.

Fuselage: Before starting fuselage construction, study the plan carefully in order to be thoroughly familiar with the design. Prefabrication of certain parts and sub-assemblies will aid the overall progress.

Start construction with the pylon. Cut center lamination from 1/16 plywood. Add outer laminations of 3/32 sheet balsa bonded with contact cement. The left balsa lamination ends at the engine mount. Check plan for proper grain direction. You will note that the pylon is offset to the right. This allows the engine thrust line to be centered and the mounts to be bonded directly to the plywood pylon core. Secure 5/16 sq. engine mount stock to the pylon assembly with epoxy. Space to suit width of engine being used. Don't waste time trying to buy 5/16 sq. engine mount stock in a hobby shop. Have a friend with a table saw rip it for you from oak or maple.

Cut longeron and diagonal stock from medium 3/32 sheet. Notch top and bottom for rudder and top for pylon. Glue up light 1/8 stock for rudder and sub-fin assembly. When dry, cut to shape and add 1/16 by 1/8 spruce hard edging. Cut fuselage sides from medium 1/16 sheet. Glue up some medium 1/8 stock for wing rest.

Begin final fuselage assembly by pinning right side to plan. Be sure your building board is flat as any curve will be built right into the fuselage with disastrous results. Install longerons and diagonal bracing. Fill in support in pylon and tank area as shown on plan right side detail. Add pylon engine mount and rudder-sub fin sub-assemblies. Align 1/8 plywood firewall and secure.

Add fill in structural members to pylon and finally left fuselage side. Let this assembly dry thoroughly, at least overnight.

Remove fuselage from board and sand carefully. Secure 1/32 plywood doublers to front of fuselage with contact cement. Check top of pylon for proper incidence angle and install wing rest reinforcing with 1/4 in. triangle stock. Wing runners and hold-down dowels complete the pylon. Build up stabilizer rest and install on fuselage. Glide turn will be controlled by stab tilt so I recommend the stab rest be installed with built-in tilt to align the stabilizer with the right main wing panel. This will avoid a lot of unnecessary shimming later.

Purchase a Perfect number six "Rectank." Remove stock fuel outlet and seal hole. Install a new fuel feed of 1/8-in. copper tubing, picking up fuel from the bottom rear of the tank and exiting at the front left corner near the timer. Cut openings in the fuselage plywood doublers for tank and timer. Secure tank with epoxy glue building a fillet of glue around the tank. Note that the tank projects out of the fuselage approximately one half tank depth.

Bend a length of 1/2-in. aluminum tubing for the dethermalizer line guide and install at rear of fuselage as shown on plan. Add 1/4 in. aluminum snuffer tube and D.T. band hook at forward fuselage location.

Sand fuselage well, apply two coats of dope and cover from plywood doublers aft with Japanese tissue. Cover balance with lightweight fiberglass cloth or silk adhered with dope.

continued on page 82

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RC Helicopters (continued)

storage problem. I usually store the belt in notches cut in the flange on the upper part of the cooling fan housing. This won't work on the Super-Baby because it gets in the way of the collective bellcrank. A simple 1/16 music-wire clip was made for each side of the fuselage plates (see sketch). This has worked well with no problems.

M/R pitch was set at plus 2 degrees at full collective and carburetor-needle valve richened so that tail-rotor speed at lift-off was 7000 rpm's. On the Super-Baby this is 4.8 to 1 of the M/R. This is half-throttle stick to half-carburetor barrel open. All of this is as per the kit instructions. Throttle trim was set at half to start, at full to engage the clutch, and to shut off the engine at full close. Blade tracking was checked and brought to dead on by a simple turn on the ball joints at pitch arm. This is a much needed and welcome change. With everything checked out, the Super-Baby and I were both ready to fly!

First Flight: The Super-Baby flew on the very first attempt, and it took one small trim change on the tail rotor to fly hands off. I ran several tankfuls through it doing take-offs, landings, and hovering. It did all of these things very well for a novice (or someone learning to fly). However, in translational flying, it left a great deal to be desired. I will list some of the undesirable things that it did, and in case you should read any further, I will also tell you

that all of these undesirable characteristics have been eliminated, and now it is really a super Super-Baby.

Undesirable Characteristics:

1. Collective undefined on lift-off.
2. Causes helicopter to swim on lift-offs.
3. Blade speed not constant.
4. Helicopter "porpoising" in hover and in flight.
5. Very sluggish on cyclic control.
6. Hard to turn and stop.
7. Obvious need for tail-rotor mix.
8. Excessive head tilt before fuselage follows.
9. Reduction of collective causes instant reduction of blade speed.

Fortunately, I have had quite a lot of experience with the Schluter collective head on the Gazelle so these problems were quickly recognized, and solutions were not hard to come by. Next month's column will deal with these solutions, one by one.

Helicopter Holdouts: If you have been holding off getting into RC helicopters because of the price, Kavan has announced their new prices—Jet Ranger, \$320.00, and Alouette, \$160.00. I am sure that these prices will never be lower so now is the time. RC helicopters are no longer a mystery, and any part or help you may need are now readily available. Just call me and you will see!

Walt Schoonard, 2080 Sharon Rd., Winter Park, FL 32789. Phone (305) 422-1531, days; (305) 647-1335, nights.

Dixie-Gal/Haught

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Apply two more coats of dope and add microballoon fillets around base of pylon if desired. Continue with finish and trim until desired effect is achieved.

Fabricate landing skid from 3/32 music wire and install on fuselage. Make up D.T. line from control-line cable. Rig a stop using a short piece of fuel tubing tied in D.T. line to bear against aluminum tube line guide at rear of fuselage. A 40-degree stab pop up will bring Dixie-Gal down without damage.

Check alignment of pylon and rudder with straightedge or a taut thread held against the edge of the pylon. If alignment of rudder is not perfect, correct as necessary. Band on wing and align carefully measuring from base of rudder to tips. When satisfied all is square install wing keys.

Mount engine, a 7-4 prop, timer and fuel line. Assemble complete airplane and check CG. Model should balance ¾ in. forward of wing trailing edge. Ballast as necessary. Nose weight can be added by securing sheet lead under engine mount screws or within fuselage beneath the timer. Make a final check for specified warps.

At this time it may occur to you, as you view the assembled model, that you may have created a monster. A Half-A-size model with twice the normal engine size! You may feel inclined to wear a hard hat and have a pre-dug fox hole near your launch site. Let me assure you none of this will be necessary.

Flight Testing: This may begin with a few hand glides over the legendary tall grass. However I personally have never located this phenomena. Actually, a couple of tosses to determine that the model is neither diving or stalling is sufficient. Hand gliding can't really tell you much more as too many variables exist. Glide trim is best worked out after the power pattern is established. Dixie-Gal should be tested at full power using the fuel and prop you plan to use in competition. For the first flight launch at a 60-degree angle slightly to right of wind with right wing down slightly for a three-second engine run. The model should move out smartly maintaining a 60-degree climbing angle and should turn approximately one-quarter turn to the right. Try to remember exactly what happened on each test flight. Transition may or may not be good on such a short engine run as speed will not be built up to normal. Glide at this point should only be safe. Use a 30-second D.T. fuse to avoid extensive chasing. If all is

well continue to increase engine run in two second increments until nine seconds is reached. Transition should be good by the five-second run and no later than seven seconds. Three-quarters turn in nine seconds is about right. Climb angle will increase as speed builds. More turn will improve transition. Glide should be just above stalling speed on calm days and slightly faster for rough air.

Make all adjustments one at a time and according to the following four basic rules.

Climb Turn—rudder tab

Use 1/16 × 1/2 × 1/4 balsa shaped like trailing edge stock, glue to side of rudder at trailing edge. Pylon models must turn right under power.

Climb Angle—stab incidence

Raise trailing edge to increase. Raise leading edge to decrease. Shim with matchbook cover or plywood 1/32" at a time.

Glide Turn—stab tilt

Model will turn toward high tip. Right tip high for right turn. Should be about even with right main wing panel.

Glide Angle—shift CG

Add lead to tail to slow glide, add lead to nose to increase speed.

The above trim changes will act independently of one another with the exception of the stabilizer tilt. When a shim is placed under one end of the stab rest, it will have the effect of one-half that shim thickness being placed under the stab leading edge center and will reduce climb angle. Removal of stab tilt shims will have the reverse effect and will increase climb angle.

Fly Dixie-Gal often to be thoroughly familiar with her flight characteristics. Enter competition every chance you can. Dixie-Gal has won several trophies for me and can do the same for you.

TIMER!

CL Scale/Stott

continued from page 30

After the filler has been sanded smooth, it is the time to add all or most of your surface detailing, such as panel markings, rivets and hatches, etc. With a good base of sanding sealer or primers very little finish color paint will be necessary to cover the model. I like to add a tint of my finishing color to the sanding sealer or primer to obtain still better paint covering.

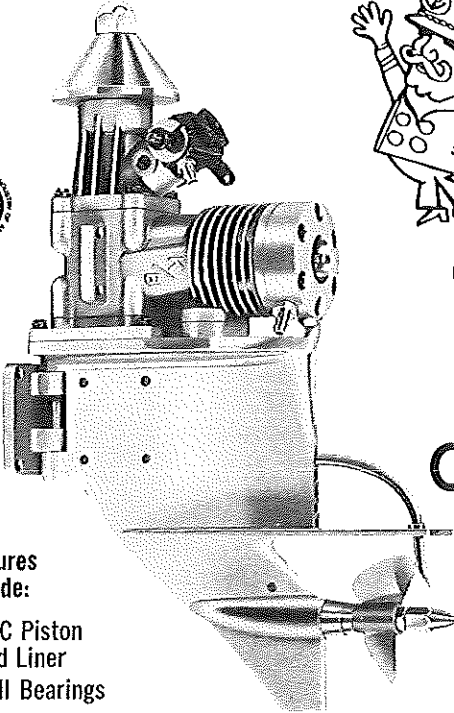
You may think this is an awful amount of work involved in building your model. But it will definitely pay off when you receive your 1st place trophy.


Some time ago I received a letter from Bob Jones of Long Beach, Calif. He sent some pictures of his Me-109K. Bob informed me that his model is all fiberglass, even the wings and control surfaces. He said he really enjoys working with fiberglass. Working with fiberglass requires a

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different style of building, since a wooden plug is made first, then a female mold, and then the first positive. Bob didn't want any engine parts visible so he spent quite a bit of time and energy at a local machine shop devising a right-angle gear drive for his engine. The engine is a McCoy 60, rigged to run backwards so that, through the two gears, the prop will turn in the correct direction. It also has retracts and shock absorbing and retractable tail wheel. All hatches are spring loaded and hinged. Bob estimates it should weigh 7 to 8 lbs. when finished. He has been working on his Me-109K for two years. A true test of patience!

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