

# CASSUTT - BONZO

YOU CAN BUILD EITHER OF THESE FAMOUS GOODYEAR  
RACERS FOR THE NEW RCM HALF-A MIDGET RACING EVENT.

By Roman Bukolt

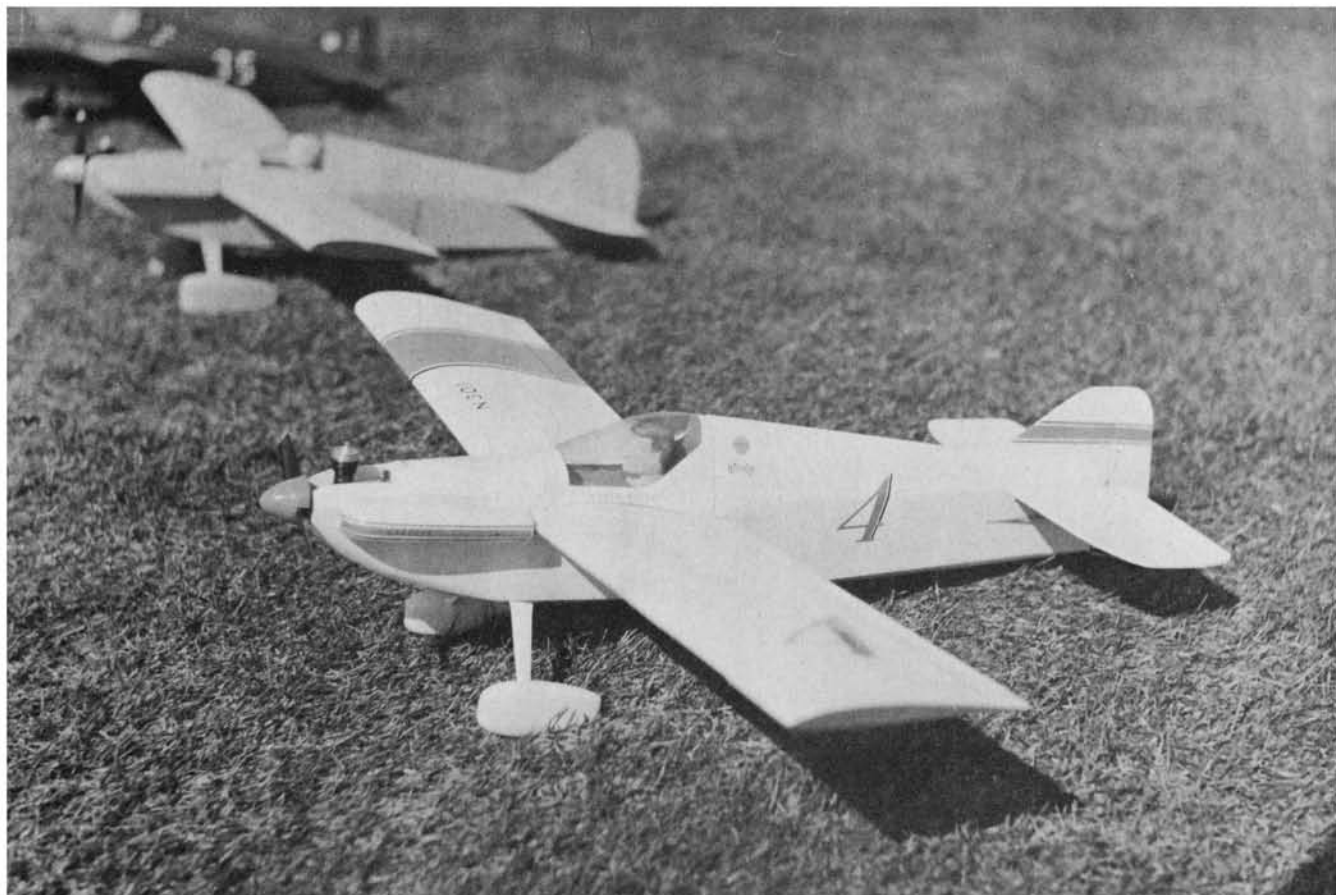
Midget Pylon Racing with .049 Goodyear type R/C pylon racers, is, at the moment, beginning a "wildfire" spread in popularity across the country. This 2 channel .049 Midget Racing event is designed to make racing a fun event, and encourage participation by the casual "Sunday" flier. The planes are small, simple, easy to build, easy to fly, and relatively low cost. The recent May issue of R/C Modeler Magazine saved the starting flag, following a very successful preview by ACE R/C at the Toledo Show, with Don Dewey's proposed rules governing 1/2 A Midget Goodyear racing, and Owen Kampen's construction article on the "Upstart" racer designed for this event. This was followed by ACE R/C's introduction of the "Upstart" kit, a top drawer pro-

duct at a real bargain price.

Now that a couple of thousand "Upstarts" are flying the closed course around the country, it's about time they have a little competition. The Cassutt is a direct outgrowth of the Upstart design. Last January I dropped in on Owen Kampen to do a little "hangar flying" since not much else outside of building can be done during a Wisconsin winter. I was surprised and delighted to see his newly completed prototype of the "Upstart." He and I both had been spending our winter months developing new design ideas around the ACE mini foam wing and this one really snagged my interest. He handed me a copy of a list of racing proposals he compiled for an .049 Goodyear type Pylon Racing event. By the time I finished reading it my

subconscious urge to compete was beginning to swell out in the form of "goose pimple" enthusiasm. I greedily accepted a print of the "Upstart" plans. In our conversation that day, Owen made two comments that made a lot of sense and started me thinking of the Cassutt; that the flying skill of the pilot, more than the design of the aircraft would win the event; and that the model should maintain a Goodyear racer appearance. So, after studying the plans for a little while I decided, rather than build the Upstart, I'd see just how scale-like I could make my racer. I saw a little full-sized Cassutt doing aerobatics over a small airfield one day a year ago and ever since then, I thought it would make a great R/C design whether used for racing, aerobatics, or just fun flying. The Cassutt

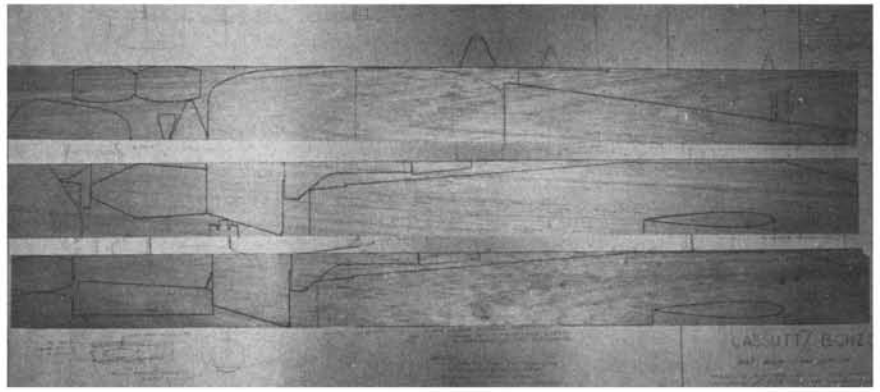
**Orange trimmed white Cassutt waits on the ready line with the Bonzo version in the background.**



design is well suited as a stable, easy-to-fly model because of the shoulder wing. My data came from published 3-views in the Experimental Aircraft Association publication, Sport Aviation, May, 1962.

Designing a model such as this Cassutt is easy. I simply lay a piece of tracing paper over the "Upstart" plan, trace out the vital statistics including the engine thrustline, firewall, wing airfoil and tail assembly. After removing the tracing from the Upstart plan I simply draw in the new design (in this case, the Cassutt and Bonzo) around the existing parameters, following the Cassutt tail group profile but sticking pretty close to the Upstart tail surface areas. Incidentally, these models turn out to be approximately 2" scale. Note, too, how the Bonzo's distinguishing characteristics are superimposed over the Cassutt plan. It just so happens that the full size Bonzo is very similar in appearance to the Cassutt. For that matter, using the same basic design technique and applying similar construction methods you just might try your hand at designing your own version of a Goodyear racer. The plane will fly alright, as long as you stick to the nose and tail locations in relation to the wing, and to the center of gravity units shown on the plans.

Before getting involved with construction notes I'd like to discuss the flying performance of the aircraft. By now you may have told yourself, "If I build a racer, I'm going to use ailerons instead of rudder, for good pylon turns, and power it with a T.D. .049 or .051 rather than the tame Golden Bee." So go ahead, but chances are you might be out run by a Golden Bee powered, rudder controlled plane. "Hah!" you say, as you start thinking of ways to cut down weight to a bare minimum. OK, I'll even help you. Use 1/16" balsa where 3/32" is specified, even on the tail surfaces. Omit the cheek cowls, spinner and wheel pants. Use wheels made of 3/32" plywood sandwiched between two 3/32" balsa sheets. Cut down on doubler thickness and use a thinner firewall. Oh yes, a built-up wing weighs a whole 2½ oz. less than a foam wing. Two coats of clear dope sprayed on followed by one or two coats of colored dope sprayed on should yield a respectable looking aircraft with an all up flying weight of 20 oz. Now go out there and compete. I'll put my money on the guy with the heavy servos, 600 mah battery pack, thick doublers and an all up weight of



Most of the parts can fit on three sheets of 3/32" balsa. A ball point pen works well for tracing around the templates.

28 oz.

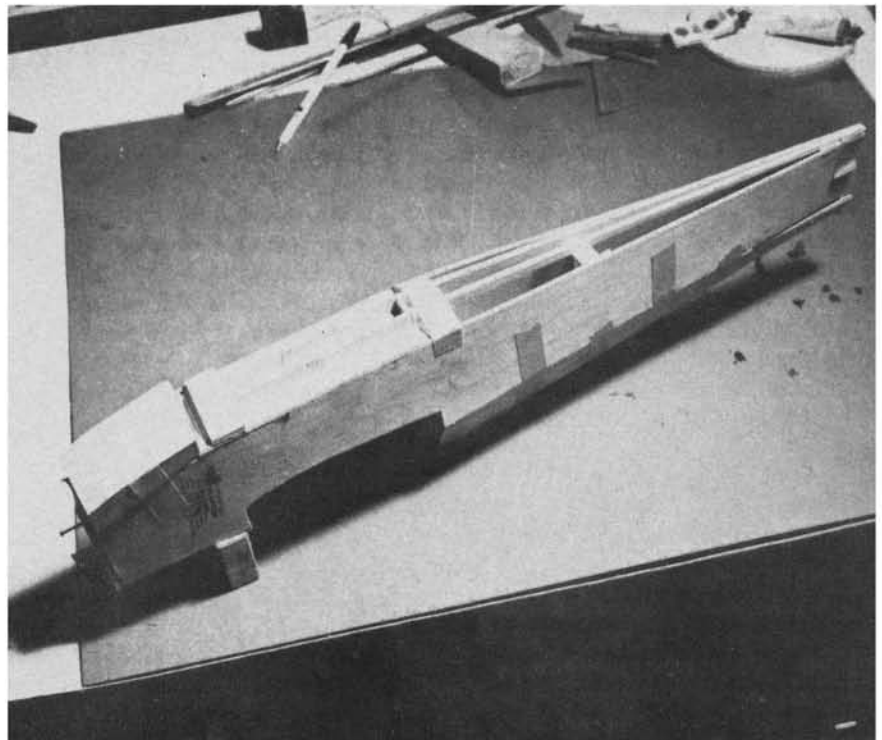
No, I'm not out of my gourd! The Golden Bee engine will fly a Cassutt or Upstart weighing in at 28 oz. at 50 plus mph and if you don't think this is fast, wait until you see two, three or four planes flying around two pylons about 100 yards apart. The heavier plane will have better wind penetration than a lighter one. The lighter plane will have a tendency to balloon coming out of the turns, and be more difficult to hold on course. Yet when the engine stops, this 28 oz. plane turns into a slow, graceful, beautifully docile performer providing the pilot with ample time to make a reasonably accurate spot landing, something he wouldn't do with aileron control. One word of warning, however, a heavier plane has a higher stalling speed so

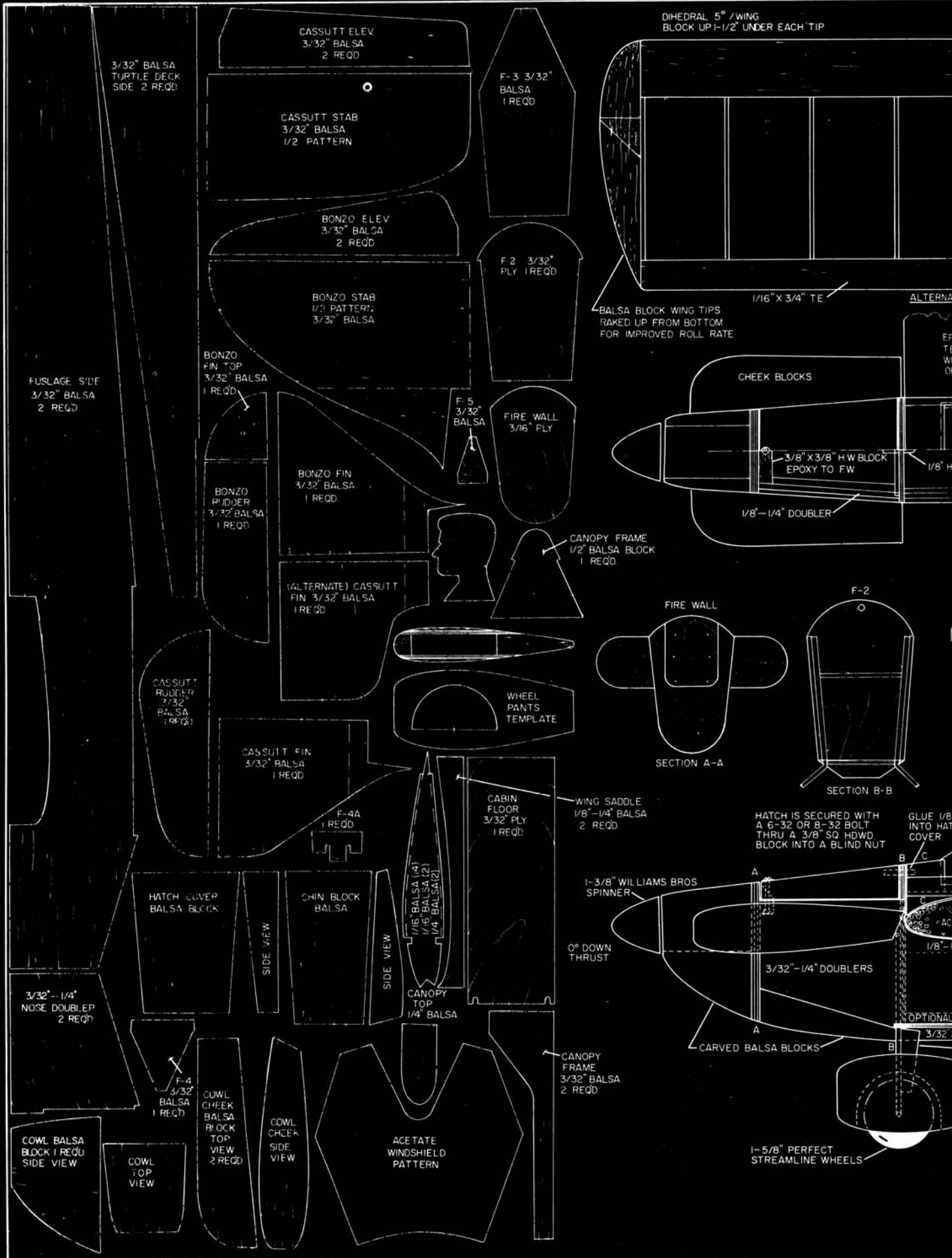
keep the nose down in the turns and don't fly if your engine isn't peaking out. As far as speed and power are concerned, Don Dewey flew numerous flights with his Upstart switching from a Golden Bee to a T.D. .051 with very little change in speed. One or two wide pylon turns can more than eat up whatever speed advantage the T.D. powered plane has over the Golden Bee model. This is where piloting skill will determine the outcome of the race.

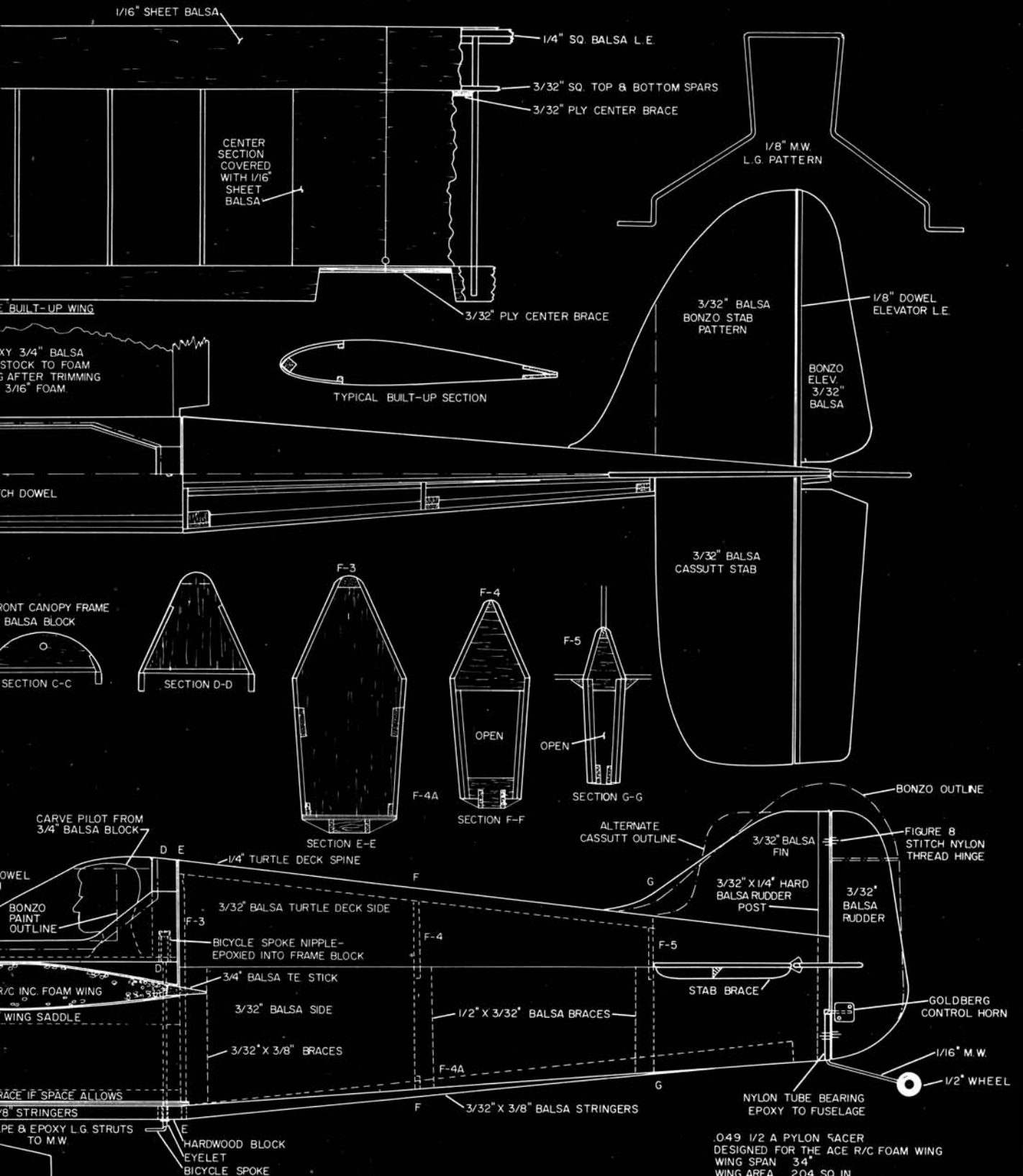
The ability of the plane to fly well weighing 28 oz. with a 0° - 0° thrust and 0 incidence wing configuration, may be attributed to the efficient ACE mini foam wing airfoil. With the CG located 25-30% back from the leading edge you'll be able to make slow

*(continued on page 67)*

Bottom view of fuselage showing installation of stringers and use of masking tape to hold parts together while the glue dries.







**WING NOTES FOR ACE FOAM WING**  
 CUT WING T.E. BACK 3/16", THEN ADD 3/4" Balsa T.E. STOCK. RECOMMEND 5° DIHEDRAL. SLASH TIPS UP 45°-60° FOR INCREASED ROLL RATE. APPLY 1/2" SCOTCH FILAMENT TAPE FROM TIP TO TIP ACROSS BOTTOM OF WING 2" BACK FROM L.E. TO IMPROVE STRENGTH. FINISH WING WITH 2 COATS POLYURETHANE VARNISH OR COVER WITH QUICK-N-EASY PRODUCTS "TOPCOTE".

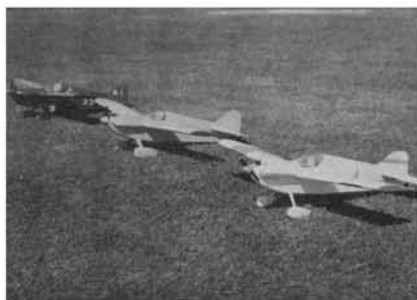
DESIGNED FOR THE ACE R/C FOAM WING  
 WING SPAN 34"  
 WING AREA 204 SQ. IN.  
 FUSELAGE X-SECTION 11-1/2" SQ. IN.  
 WEIGHT 20-27 OZ.



**CASSUTT and  
 or BONZO**

DESIGNED BY ROMAN B. BUKOLT DRAWN BY ROMAN B. BUKOLT





gentle landings by feeding in some up-elevator to increase the angle of attack. However, if you should choose to locate the CG up around 20% back from the leading edge, you'll get real groovy penetration but the landings are going to be rather abusive. I'd say build the plane strong to take a lot of punishment and don't give weight another thought. Use epoxy, at least in the nose area. Use thick doublers, braces, firewall. You might as well add ballast in the form of structural materials because you'll probably end up adding nose weight anyway. One other advantage to the planes non-critical weight is that it can stand a lot of epoxy field repairs with no apparent loss of performance.

Concerning performance of the Golden Bee engine, several people racing these planes agree that the Cox 5½ x 4 prop seems to provide the best performance. Of course Cox Red Label racing fuel is used, and one modeler here in Madison compared engine performance between the Golden Bee glow head and the T.D. head and noted an increase of 800 rpm's using the T.D. glow head. That's one of the beauties of this event; novices and experts start out on an even footing. No super hopped up engines or razor thin airfoils.

Building materials for this model, including a 1-3/8" dia. Williams spinner and a pair of 1-5/8" "Perfect" streamline wheels shouldn't cost any more than \$5.00 though I strongly suggest the investment in some Quick-N-Easy Products "TopCote" plastic covering or Solarfilm and I'll explain why later in the article. If you buy your materials on Monday, you'll be flying by Saturday. Four evenings should be more than adequate time to finish a model.

Construction of the Cassutt or Bonzo is very typical and straightforward. The plan is self explanatory and templates are included to further simplify the transfer of information to the wood without having to back up the plan itself. Besides, I suspect you may want to build more than one. So, instead of telling you what you can see

from the plans I'll discuss a few "whys" of the design of this model, such as why a removable hatch instead of a battery access hole in the F-2 former? Easier to make repairs to the nose area, add or subtract ballast, shift or check batteries, install or remove the engine or even add a tank if you decide to try a T.D. .049. Why the involved screw, dowel and bicycle spoke method of holding the hatch, wing and canopy down instead of a couple of dowels and rubber bands? Dowels and rubber bands cause drag, especially at the root of the wing; they're unsightly and very unscale-like; and they detract from the clean flow lines of the model. The canopy is not glued to the wing so that an easy and quick substitution of wings can be made should the wing break during a rough landing. The canopy is not in a particularly vulnerable spot as far as getting damaged is concerned so by making it a part separate from the wing you might avoid some time consuming repairs. Incidentally, ease of repair, is probably the foremost advantage to using a foam winged aircraft in a multiple plane closed course race.

The balsa trailing edge serves at least three useful purposes; it increases the wing area to 200 plus square inches as per the proposed racing rules; it increases wing strength especially since wing fractures frequently begin with a tear at the trailing edge; and it improves the aircraft speed, lift, and performance by reducing turbulence and drag. Turbulence exists at the trailing edge of a stock foam wing because of the blunt 1/8" thick radius-ed edge. For normal sport flying, the performance is entirely adequate but where speed is concerned, drag is your greatest enemy and turbulence causes drag. As a matter of fact, avoid any blunt or abrupt trailing surfaces anywhere on the aircraft such as an open cockpit, round dowels, blocky air-scoops, etc. Always maintain a smooth surfaced, airfoil-like or "tear drop" shape throughout the design.

I've covered all my racers as well as all other planes I've built in the past year, with Quick-N-Easy Products, "TopCote". This is an iron-on sticky-back mylar that is available in clear or chrome and I mean chrome, not "silver" finish. It has at least three advantages over the better known, higher priced "spread." It can be applied "cold" to raw foam. Just sand the surface smooth with a 200 grit paper to remove the parting line flash and vent nibs, then after epoxing the trailing edge to the wing lay on the

"TopCote." I use a single 17" x 13" piece to cover each wing half. Starting at the top trailing edge carefully wrap it around to the bottom trailing edge, pressing it down with your fingers as you progress. If you get a wrinkle, pull it up and try again. Then iron it on at the trailing edge for additional adhesion and, with the iron at a low setting, shrink the covering over the surface by holding the iron just off the surface. The foam will not be affected. I know of no other quicker, easier way of adding strength and a beautiful smooth finish to raw foam. Secondly, the TopCote can be painted with dope. Usually two spray or brushed coats will yield good coverage with a high gloss "painted-look" finish. Thirdly, TopCote seems to have great impact strength. I have a 37" span "Ugly Stik" that I battered around all last summer, covered with this material. It has taken a heck of a beating and still is in one piece or shall I say one bag. The fuselage has numerous cracks and splits in it. The wing has several cracked ribs, but the plane still flies. I cannot honestly say that I've had as much luck with the 'other brand'. (Solarfilm, available in all popular colors, can also be ironed on the foam wing.) With a little careful planning the entire plane, including fuselage and tail surfaces can be covered with a 26" wide x 43" long piece of TopCote. Save the stiff plastic coated backing sheets from the TopCote. They make handy patterns for cutting the covering material on the second model or when making repairs. Also the backing paper is excellent for mixing small amounts of 5-Minute Epoxy. If you choose to trim your model using "Scotch" brand colored vinyl tape, apply a strip of tape to the backing paper, cut out the numbers, letters, designs, or thin line stripping such as I use to illustrate fake aileron outlines. The tape peels away from the backing paper easily, with no loss of stickiness.

Trimming a plane with TopCote is easy. Just paint a piece of TopCote with your trim colors, cut out the strips or design and apply the "decals" to the painted surface "tape on" fashion. The "Bonzo" name on my model was made by painting a scrap of TopCote the same color as the fuselage. Thus the name was written on the piece with thinned cope in a draftsman's ruling pen, then I cut the logo out just outside the outline of the word, peeled it off the backing paper and stuck it on the fuselage.

The canopies on my models were drape-formed acetate. I carved a pine block using the front and rear canopy template and the fuselage canopy profile to develop the shape. The wood was sanded smooth and sealed with a coat of urethane varnish. A piece of .015 acetate cut from a sheet purchased at a local Book and Stationery Store, was stapled to a piece of 5" x 9" x 1/2" plywood with the center cut out a 1/2" larger than the canopy mold block. Then, with the block firmly mounted on a post clamped in a bench-vice, I set the plywood frame, with the acetate side up, on an upside-down household iron turned all the way up. In about three minutes the acetate gets soft and flexible about like a thin rubber membrane. Then, grasping the ply frame by both ends, I quickly plunge it down over the mold, acetate side down. I ruined about three pieces getting the hang of it but then in about thirty minutes I stockpiled a half dozen canopies, enough for the entire summer. It's an easy and cheap way of getting canopies, custom made to your particular aircraft.

Gluing an acetate canopy to a fuselage always has been a sloppy job with me. The glue either attacks and melts the plastic or doesn't stick at all. Here again, is a real handy use for TopCote. Just cut a strip 1/4" wide, pre-painted to match the fuselage, and tape the canopy on. I trim the canopy to overlap the wood frame 1/8" and then cover that 1/8" with the tape. It makes a real clean, neat job and it is very easy to replace a damaged canopy since all you do is peel away the tape and tape on a new one. However, for those who are less ambitious you will note that I've included on the plan, a template for a wrap-around windshield.

Because there isn't much space in the fuselage, the simplest way I know of to mount the servos would be to tape them to the ply floor using 1/8" foam double stick tape. I've been mounting my servos this way exclusively, both in large models and in small ones. As a matter of fact, I cut the mounting lugs off the servo cases



**Dowel extending from the rear of the hatch, goes through the hole in the F-2 Forner and into the front of the cockpit section.**



since I never use them. Besides, without the lugs I can fit the servos into smaller spaces such as my 2 channel T.D. .02 powered "Dick's Dream." I would suggest, however, that rather than applying the two sided tape directly to the cabin floor, give the floor one coat of dope to seal it, then cover it with a piece of vinyl tape. Apply the servo tape to the vinyl covered floor. Then when you wish to transfer your servos instead of the tedious time consuming job of picking off the remains of foam tape, you can easily peel away the whole vinyl tape with the foam tape still on it.

I'd just like to add a couple of final comments concerning flight time. This model, as well as the "Upstart" is a high performance aircraft. It is designed and built to fly fast. I'd recommend not flying it unless your engine is turning up high rpm's. If you do fly it with a slow engine be careful on your turns. Fly a large turning radius and minimize the banking. The plane does not derive much lift standing on its wing tip unless you've got a lot of speed.

Minimize rudder throw, at least on initial flights. These planes have a very responsive roll rate. Set up a lot of elevator throw. When you come in on a dead stick landing you're going to need it if you want a soft, slow, gentle landing.

Because turning is the prime maneuver conducted with a pylon racer, you may want to adjust your roll rate for optimum response. This can be done four ways. To increase roll rate; increase rudder throw; increase rudder area; increase dihedral; or decrease the angle between the raked up wing tip surface and the horizontal. Needless to say, doing the opposite of any or all of the above will decrease roll rate. Believe me, once you fly one of these bombs or see one fly you'll quickly see why there is no need for the more complicated aileron control.

One more suggestion, buy enough material and stock cut parts for two or three aircraft because one race is all you'll need to see or experience to motivate you into building a couple of back-up aircraft for some real "mean" competition "next week." □

IF YOU WANT TO

# Build Bukolt's Cassutt or Bonzo



## TOP-COTE

Top-CotE by Quick-N-Easy Products is a polyester film covering material that is applied with heat--or in case of foam wings will adhere with its own tackiness. Weighs less than 1/4 oz. per square foot and will accept dope, lacquer or epoxy paints by brush or spray. Will not wrinkle on planked or foam surfaces. Crystal Clear or Silver Chrome.

## SOLAR FILM

Comes in opaques, transparents and metallics in 72 x 26 inch sheet. \$6.00, \$6.60, \$7.80. 17 colors!

## DIXON SMALL TOOLS

You have to feel these to believe them. Quality like you haven't seen before. Needle nose, wire cutters, screwdrivers, tweezers, drill sets, pin vise--you name it and Dixon's got it.

## OTHER ACCESSORIES

Full line Cox engines, props, wheels, hardware and other accessories are listed in our 1971 Handbook-Catalog.

Ace R/C also has the SIMPLE system--Pulse Rudder Only Control. Easy to install, ideal for small planes (RC gear 2.5 to 4.5 oz.) Packages start at \$59.00. Get catalog for more info.

WE'VE GOT THE WINGS!



## ACE MINI FOAM WINGS

Ace Mini Foam Wings feature a special 17% semi-symmetrical airfoil with a 5 1/2" width.

The constant chord measures 35" span, width 5 1/2", area 192.5. Weight 3 oz.

The taper chord is 35" span, center 5 1/2", tapers to 4". Area 166.24. Weight 2 oz.

Either wing comes in two 17 1/2" pieces, which may be easily epoxied for desired dihedral. May be finished with polyurethane varnish, or covered with Top-CotE, and then doped or finished to your choice. Solar Film also works well.

Designed for the small planes of the Half-A Race type--or for rudder-only type airplanes which are ideal for smaller engines and pulse systems.

No. 13L192--Ace Foam Constant Wing \$2.95  
No. 13L166--Ace Foam Taper Wing 2.95

# Owen Kampen's UPSTART Custom Kit

The Upstart by Owen Kampen is the first in a series of 1/2 A Midget Race-for Fun Airplanes! Featured in RCM, this event is catching on like wild fire.

Upstart has 34" span, 6" chord, 200+ sq. in., an overall weight of 20 to 26 oz.

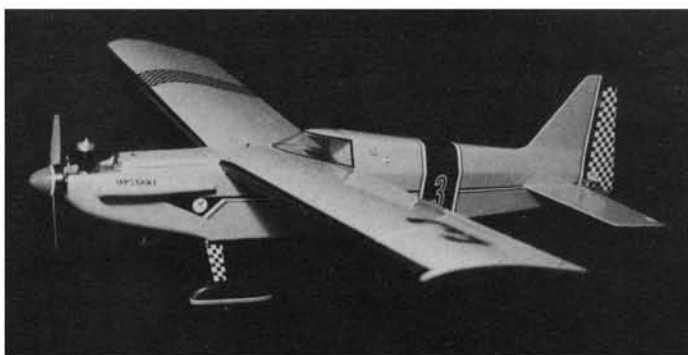
Designed for the new two channel R/C systems, or two servos of any digital. Rudder and elevator only. Motor control is not used. Rudder response so effective ailerons are not necessary.

The Ace kit contains our constant chord foam wing, and is a deluxe Custom Kit with all of the balsa and ply-wood parts band-sawed and precision-sanded from prime wood.

This means that this is the highest quality possible and assures you of a kit that will go together accurately and quickly.

Does not contain wheels, linkage, covering material, optional spinner, or other accessories.

No. 13L102--Kampen'sUpstartCustomKit 10.95



QUALIFIES FOR RCM HALF-A MIDGET RACING RULES

THIS KIT IS RECOMMENDED FOR THE EXPERIENCED MODEL BUILDER--NOT FOR BEGINNERS.

## BEST SELLER

We're on the THIRD Printing of our 1971 Handbook Catalog! The demand exceeded expectations. One of the reasons is that it contains the most comprehensive information and data for Pulse Rudder Only published anywhere. Send coupon and \$1.00 today. Refundable on your first order.

Don Dewey says: "This should be in the library of every modeller!" Walt Schroder says: "An exceptionally well done job."

## NEW HANDBOOK-CATALOG (Completely Revised)

Our NEW Handbook-Catalog has been completely revised to make it easier to locate items you are looking for. More items on less pages, to save you time.

Also contains complete info on what makes Pulse Rudder Only work--and why it is your best bet.

Price is just \$1.00 via THIRD CLASS MAIL. Refundable on your first order of over \$5.00.

ACE RADIO CONTROL, INC \*

\* HIGGINSVILLE, MO. 64037

NAME \_\_\_\_\_

ADDRESS \_\_\_\_\_

CITY \_\_\_\_\_ STATE \_\_\_\_\_ ZIP \_\_\_\_\_

QUANTITY	STOCK #	NAME OF ITEM	PRICE	TOTAL

My BankAmericard #

Guaranteed delivery anywhere. Orders over \$5.00 sent prepaid. Orders under \$5.00 please add 50¢ for postage and packing.