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RCM MODELER



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This Month's Cover
Features two beautiful R/C boats displayed by Miss Wendy Bowen at Lake Eola in downtown Orlando, Florida. The mono hull is a 1978 model Ward Craft with a K & B 7.5 and the outboard is a stock Dumas Hot Shot. Both boats were shot with automotive lacquer and sealed with clear Imron. Kodachrome transparency by Gary Yeomans.

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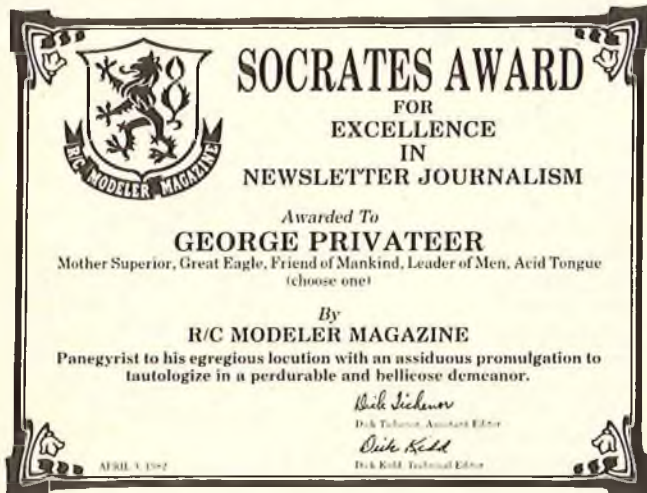
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FROM THE SHOP

Don Dewey



They did it again! All I have to do is to turn my back on those two elderly bearded wonders who we call Technical and Assistant Editors, and right away they get into some sort of mischief. I'm referring to Kidd and Tichenor, who else?

It seems that our good friend George Privateer, Editor of Stars Dust, newsletter of Southern Tier Aero Radio Society, Inc., Olean, New York, had a miserable winter with people from all over the country getting on his case. Those who are privileged to receive the newsletter are familiar with George's unparalleled command of the English language, his style of writing, and his sardonic sense of humor. For others, all we can say is that we thoroughly enjoy George's effort tremendously even if it is a bit weird.

Somehow our guys sympathize with George's dilemma and I suspect that their contact with him is probably in the same vein as his Stars Dust. Regardless of whatever details might be involved our two Dicks (Kidd and Tichenor, that is) worked up an award certificate and presented it to George at the Toledo R/C Exposition this year.

Let it be clearly known to one and all, this certificate is a sincere token of affection for our chubby little friend, George Privateer, may he model forever.

★

A Classic Returns

The Hawk is back!

Bob Martin RC Models Inc., has just announced the purchase of the tooling to produce this high technology sailplane. Anyone who has ever seen the elliptical polyhedral of this sailplane wing knows it is one of the few unique sights in R/C. The Hawk was designed by Hobie Alder, a pioneer R/C modeler who was also famous for his design of the Hobie Cat, a catamaran racing sailboat. First sold in the early '70's, the Hawk was way ahead of its time, but because it was marketed as a "ready to fly" beginner's sailplane, it earned an undeserved bad reputation. The speed envelope of the Hawk was so wide, due to its thin section, under cambered airfoil, making this craft a bit too much for the beginners of that time. There are enough dedicated glider guiders around now that this super sophisticated kit should be in high demand. The kit consists of ply sheeted foam wings with the built-in elliptical dihedral, pre-sheathed foam empennage and polyethylene / fiberglass fuselage. The whole kit is packed in a carrying case of expanded bead foam. All you do is a little sanding, MonoKoting, put your radio in and fly.

Bob Martin expects to produce kits later this year, and to market a whole spectrum of spare parts for the Hawk from
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Cliff Werrick is back in the R/C business! Cliff, shown here with the 1/2 Scale Corsair that he built with his little hot hands, has joined Airtronics. Lee Renaud, President of Airtronics announced that Cliff will fill the position of General Manager.

Cliff's fantastic background in R/C modeling includes: Past President of Academy of Model Aeronautics, several times National Pattern Champion and Formula 1 Champion, member of U.S. World Championship Aerobatic Team (twice), and other honors too numerous to mention.

In the R/C industry, Cliff has been President of Proportional Control Systems, Executive Vice President at Kraft Systems, and a member of Cox Hobbies Management Team that introduced the Sanwa radio to the United States market.

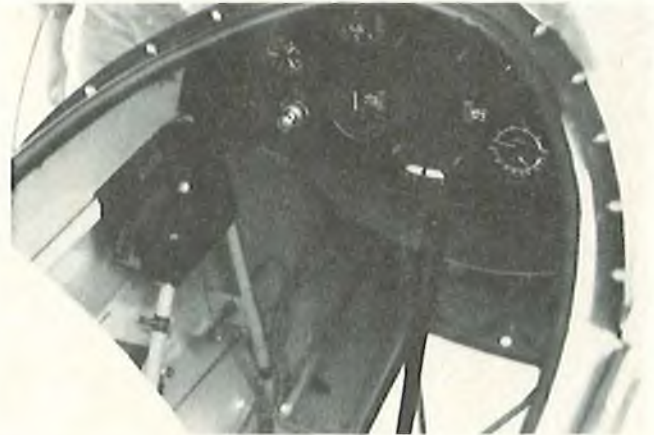
We are happy to welcome Cliff Werrick back to R/C; not only is he a treasured friend but he is also a gentleman who enjoys world wide respect and popularity.

CUNNINGHAM ON R/C

Chuck Cunningham



Chuck admiring Dal Downer's Pitts Special.



Pitts cockpit — notice the view port in the floor.

Probably no other aircraft in modern times has had as much coverage as has the Pitts Special. Untold numbers of kit models and magazine plans have been presented about the Pitts. But have you ever seen one? Up close that is? I hadn't until one nice warm Sunday afternoon last fall when Helmer and I went out to visit with Dal Downer at Oak Grove airport just south of Forth Worth. Dal and his son Paul treated us to an aerobatic display with their beautiful home-built Pitts. They had just finished it that spring, and, in fact, finished the doping in the den of their home 'cause the humidity was too high in the garage. When you see an aircraft such as the Pitts doing aerobatics, you realize why you get the feeling that the jumbo type models really fly more like airplanes. After years of pushing high powered models through the air at supersonic speeds,

it comes as a bit of a shock to see an aircraft actually fly through the maneuver. When the Pitts came back down after its final flight, we walked over to give it a close look. The first thought --- "Boy, is it small!" Take a look at the picture of me standing next to the Pitts. When the top wing is just about hair height, it's small. Looking at the cockpit I realized that if I were to try and squeeze into it, I'd probably break out the sides. I know that I need to lose some weight, but it sure is small. Note the hole in the bottom of the cockpit. This is a clear plexiglass covered view port to enable the pilot to pick up reference points on the ground when doing aerobatics, plus give him a view of the ground when coming in for a landing. His head is so low in the cockpit that he just can't see very much ahead and down. Dal is very proud of his bird, and well he should be. The story of another modeler who

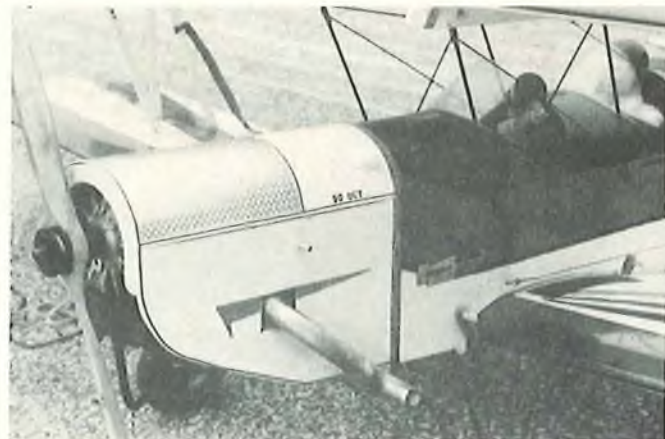
just kept building bigger and bigger and bigger --- even if the darn thing really is small.

This month we're going to cover a variety of subjects, and try to get to some items that I've been going to mention for some time. But first, let me pass along some chainsaw engine tips that I gleaned from Bob Hutton at the last meeting of the North Texas Miniature Aircraft Association, Chapter 21 of the IMAA. By the way, we think that we have a pretty good format for a group dedicated to jumbo models. Since we draw our members from all over the Dallas/Fort Worth area, we hold a meeting every other month, some place in the middle of the area early on a Saturday morning; then adjourn to the nearest model field to spend the time flying big birds together for the rest of the day. It's a good way to get together and to get

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Archie Klassen's hot dog Lazy Ace. Evra 190 power.



Archie Klassen's Evra 190 powered Lazy Ace.



Young tennis star Tom Bartzan and his Cunningham design "The Coach" 72" span for .60 engines.



40 Turbulent. Second in Turbulent series and an upcoming construction article.

some flying and flight line BS in all at the same time. But, back to Bob. Since I know very little about the inner workings of the chainsaw type engines, their special care and feeding, it seemed like this would be a good program — and it was. I can't remember all that Bob touched on, but the important items to me were on fuel and carburetion.

The gas consuming engines are built to run. They are built for long life under very trying conditions and, in normal model use, should last a heck of a long time. Much longer than any of us realize. Unless of course you stick it straight down into the ground at 90 mph — not really built for this. If you take reasonable care of your engine, it will certainly care for you. At one time Bob had a test engine that had run for over 800 hours and was still running great, better than when it was new. Not too much maintenance is required, but you should remove and clean the plug after every couple of hours of running.

The main thing that fouls the plug is the oil in the gasoline. The engines can run on an oil mixture of less than the 16:1, or 20:1 that is generally specified, but the type of oil is important. If you only have access to normal chainsaw oil, then stick to the 20:1 ratio. Bob recommends McCulloch chainsaw oil above the other chainsaw engine oils. But, and this is important, never mix oil blends in the same container. In other words, do not mix up a mixture of gas and oil of one brand, use part of this, then mix up another mixture with a different brand of oil and dump it into the same container. Some oils will not be compatible with each other and may react causing a sticky mess that can gum up your engine's carburetor. If you're going to change oils, then flush out the container with clean gasoline before mixing the new batch.

Next, only mix up the amount of fuel that you will use in a week's flying session. If you have any left over,

dump it out. Always use fresh gasoline. Mix up only a quart of fuel at a time, or perhaps a half gallon, but never mix up a gallon of fuel and then let it sit around. If it's in a metal container, then it will become diluted with moisture from the air that gets into the container each time that it is opened. Got all of that?

Okay, next item, always filter the fuel going from the gas can to the tank in your aircraft. The best way to do this is to use a filter on the pickup line in the gasoline container. Don't use a filter in the aircraft fuel tank, or in the fuel line to the engine; filter the fuel before it ever gets to the tank. You will be surprised just how much trash can accumulate in gasoline.

Now, for carburetors. Don't mess with them. Keep your tinkering hands out of the Welbro carburetor. Don't take it apart. If you do, chances are that you're not going to get it back together correctly. Not that you can't get all of the pieces back in the right place, but some of them are set with a very fine instrument at the factory and it is impossible for you to duplicate this setting.

The Welbro carburetor is a pump type carburetor. You will need to get into one area of the carb to do periodic maintenance. The section of the carb that has one screw head holding it in place can be removed, exposing the rubber pump diaphragm. Remove this diaphragm very carefully. It must go back exactly as it was removed as there is one small hole in it to allow air to pass along the correct passage. The thing that we are looking for in this area is the small fuel filter. It is very fine mesh screen pressed into a hole about 1/4" in diameter. You can pop this filter out of the hole with a needle. Pick it up with a pair of needle nose pliers. Look at it. If you see any trash on the filter, you've been running some dirty gas. Even if you don't see anything on it, it's probably dirty. Blowing on it won't help, it just leaves film of moisture on the screen. The

correct way to clean it is to light a match, hold the filter in the flame for an instant, and burn the trash off. It will flare up due to the residue of gasoline left on it. Push the filter back in the hole, replace the rubber diaphragm, replace the cover and you have completed all of the maintenance that you need to do on the carb.

I had been having a lot of trouble getting my Quadra to start. I had removed this cover several times, and had blown on the filter, but it was still hard to start. After doing the above type of cleaning job, the darned engine started on the second flip. It made a believer out of me about clean fuel.

While on the subject of carburetors and Quadra engines, I ordered a part from US Quadra, 1032 E. Manitowoc Ave., Oak Creek, Wisconsin 53154, that should be standard equipment on every Quadra. If yours doesn't have it, get one. It is Part #160596 Carb Adapter and currently sells for \$6.95 plus \$1.90 shipping. This is the adapter that allows the carburetor to be rotated so that the needle valves are pointing away from the prop, and allows you to adjust your needles while the engine is running. Sure is nice to adjust the idle and top end while you can hear and see what is happening rather than having to stop the engine, twist a bit on the needle, then start it up again to see if the adjustment is better or worse.

While on the subject of big engines and aircraft I wanted to pass along to you some pictures and a bit of information from Archie Klassen who lives in Kingsville, Texas. Archie built a Lazy Ace but stuck an Evra 190 in the nose rather than the customary .61 or .90 engine. Part of Archie's letter reads:

Hello Chuck,

As you can see by the pictures, my hot Lazy Ace is Evra powered. The craft has over forty hours flight time. It is capable of 50 mph level flight, climbs at

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SUNDAY FLIER

Ken Willard

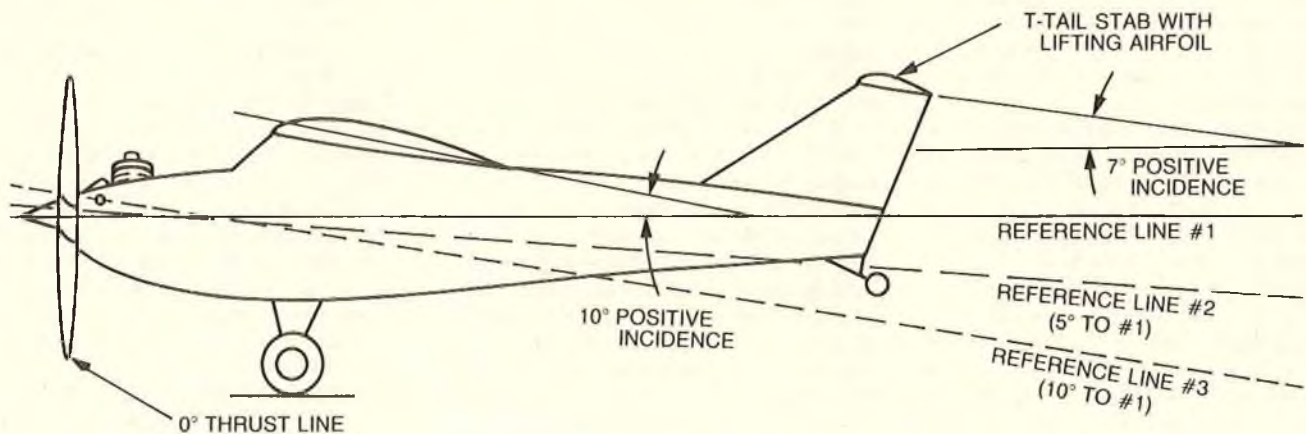


"All right, boys and girls, let's all take our seats and begin the lesson."

Many years ago --- and I do mean many --- that's about the way the grammar school teacher would start the class session. Dutifully, we did what we were told, sat down, and listened. Question the teacher? Absolute heresy!

Well, that ain't the way it is any more --- or, at least, that's what I'm told. Nowadays, it's, "Let's begin the discussion with some different viewpoints, and see if we can reach an agreement." Then all hell breaks loose.

Some time ago, just for the hell of it, and knowing full well what would happen, I published a "learned" treatise on the loss of altitude which supposedly occurs when an airplane makes a downwind turn. The response gave me enough material for about six columns --- and I could still be writing about it. However, knowing that the issue will never be settled to the full satisfaction of everyone involved, I went on to other subjects. Of course, I knew all along that the theory was erroneous. (Now stand back and wait for the blasts!).



- REFERENCE LINE #1 YIELDS: 0° THRUST LINE
+ 10° WING INCIDENCE
+ 7° STAB INCIDENCE
- REFERENCE LINE #2 YIELDS: 5° DOWNTHRUST
+ 5° WING INCIDENCE
+ 2° STAB INCIDENCE
- REFERENCE LINE #3 YIELDS: 10° DOWNTHRUST
0° WING INCIDENCE
- 3° STAB INCIDENCE

AND NOTHING IS CHANGED!

FIGURE 1

So, once again it's time to present some theoretical observations. Then we'll let the chips fly as the pot shots hit --- or miss --- the target.

Sooner or later, as you progress in the art and science of radio controlled aircraft flying, you'll get the urge to design your own dream ships. You sit down to the drawing board, draw a line, and say, "Lessee, I want this job to be easy to fly, but still capable of doing good maneuvers. That means it should be stable, but also controllable. Think I'll make my first design a sort of trainer type. Should be able to fly slow, so I'll put the wing at a fairly high angle of incidence. Then, to keep it from 'ballooning' at full power, I'll put a little positive incidence in the stab. While I'm at it, I'll make it a little different, and put the stab on top of the fin so it'll be a T-tail design."

Using the original reference line, you put the wing at 10 degrees incidence, the stab a 7 degrees positive to the reference line, and the thrust line at zero degrees. (These angles have purposely been a bit exaggerated so the drawing will show up better). The plane should fly slowly with that much incidence, yet when power is applied, the positive incidence on the stab should keep the nose from coming up too high at full power. Not too bad for starters.

But what do those angles really mean? Take a look at Fig. 1. Using the original reference line No. 1, the angular settings described above are obtained. However, by drawing a second reference line --- or a third one, as shown in the drawing, it seems you have a whole new set of angles. Yet nothing has changed!

Which reference line is the right one --- the one that really will be in a horizontal position when the airplane is flying straight and level? The odds are that reference line number two will come closest in most cases. Why? Because, with reference line number two, the angle of the wing to the oncoming air is five degrees --- just about what it would have to be at cruising speed to keep the trainer flying straight and level. Remember, the angle of attack and the angle of incidence are the same only when the lift of the wing is equal to the weight of the plane in steady, horizontal flight. (For another discussion of angle of incidence and angle of attack, see the November 1980 issue of RCM.)

What this all leads up to is that the reference line you choose when designing a model is not necessarily the line which will be horizontal when your plane is in level flight. To assure that your reference line will be horizontal, you have to do some calculations. What speed do you want your plane to fly at? Remember, the

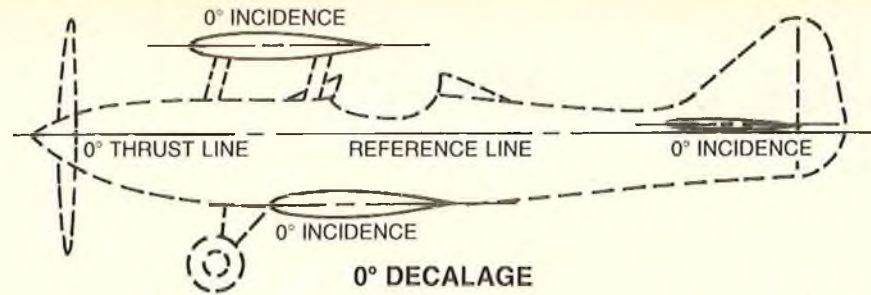


FIGURE 2

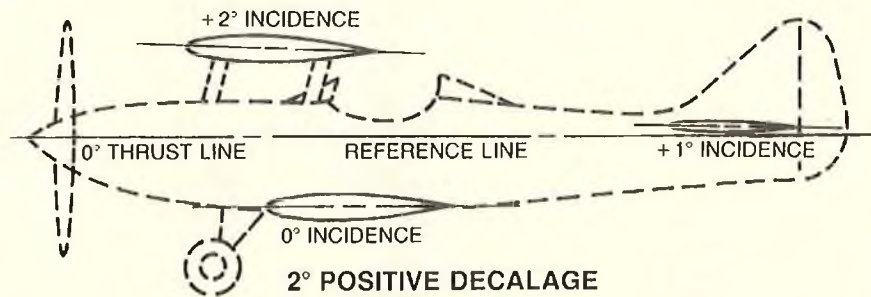


FIGURE 3

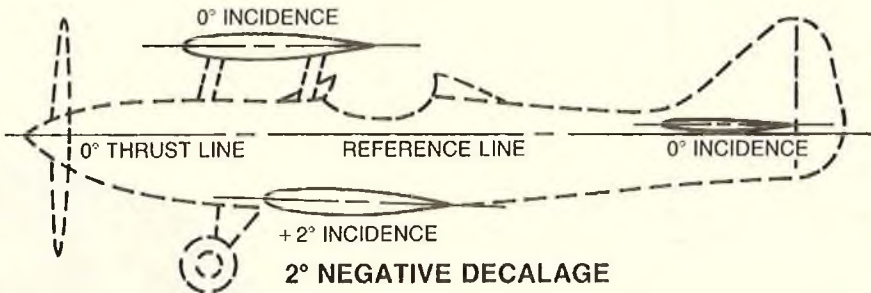


FIGURE 4

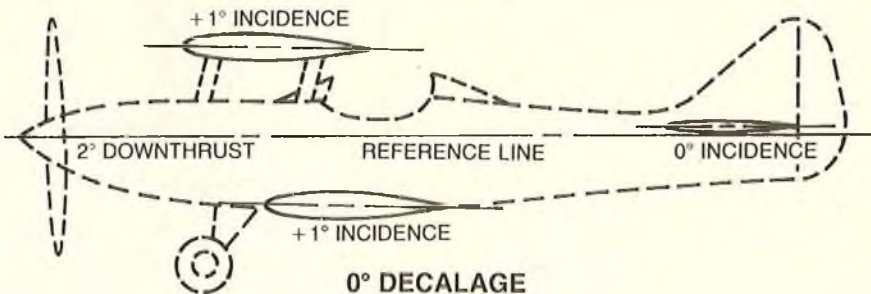


FIGURE 5

lift of the wing varies as the square of the speed; if your plane goes twice as fast, the wing will have four times as much lift if you stay at the same angle of attack. That's because your wing is hitting twice as many air particles at twice the speed, and two times two

comes out four. And if you don't want that much lift, you have to lower the angle of attack of the wing by nosing the airplane down. The opposite is true if you want the plane to fly slower.

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GIVE IT A WHIRL

John Gorham



A Star Is Born

Those of us who have been modeling for any length of time will be well aware of the popularity and excitement of the 'Toledo,' 'WRAMS,' 'MACS,' and 'Dallas' trade shows. At these shows you can see, all in one place, the best efforts of your fellow modelers together with all the latest products from the manufacturers. For 1982 a brand new show was announced by the Mount Rainier R/C Society who live way up in the state of Washington. When they first heard of this show very few of the manufacturers believed that it would be other than relatively small and locally attended. Consequently the attendance by the model manufacturers was not the greatest this year. The show was held on February 6th and 7th when the 'locals' expected the weather would be reasonably warm and possibly "not even raining." Well, we decided to attend the show and since the driving distance was just over 1,200 miles we dispatched a van load of helicopters two days ahead of show time. Yours truly flew up the day before. On arrival I met the first and only problem of the visit which was my utter failure to pronounce the name of the town in which the show was held: Puyallup. Believe me, when the locals say it, it sounds easy but it is very hard to remember how they say it. Well, the first indication that I had that the show would be something different from just a relatively small local show was when I arrived, the night before the show opened, at the Western Washington Fairgrounds.

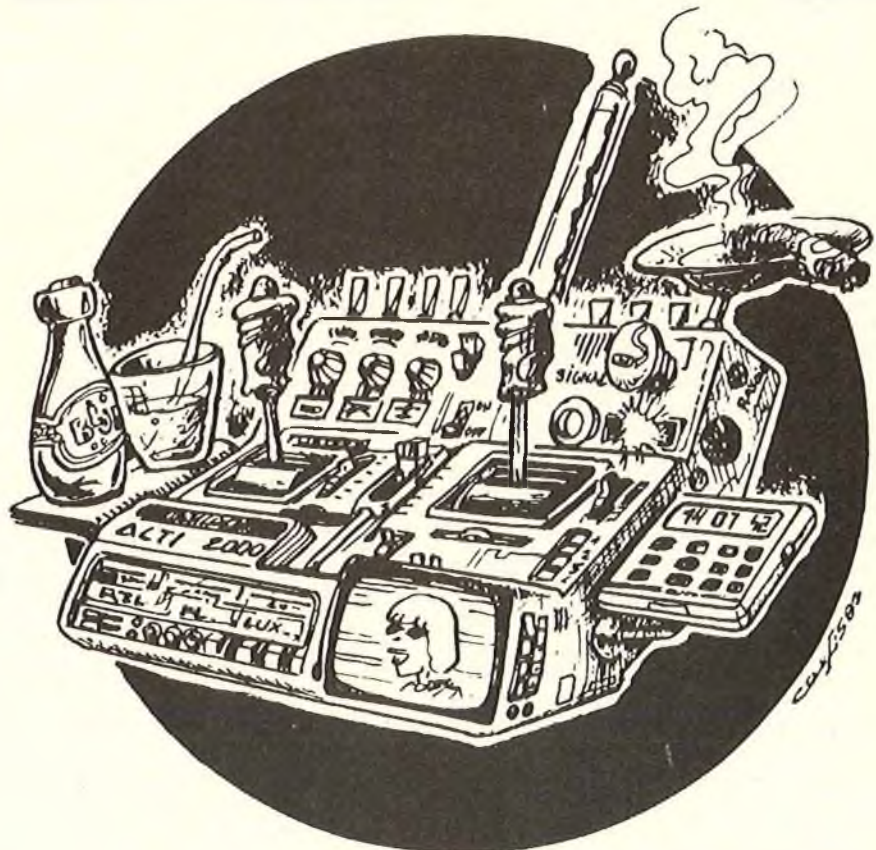
It was quite obvious that parking would be no problem at all and that walking distance from the parking to the show would be very short even if thousands of cars turned up. This in itself is a big improvement over many of the other shows. The fairgrounds extend over many, many acres and the display hall chosen for the models and the manufacturers totaled 24,000 square feet. There was also another hall of 20,000 square feet where there was always something active going on such as 1/12 Scale electric R/C car demonstration and racing. Also, in line with the 'Toledo' show, a large swap meet was held throughout the two days where you could wander down the tables and pick up an



"Ohlson .23" or an old "Brown Jr." together with many of the more modern planes and boats, built and unbuilt. There were more than 250 registered models in the static exhibition of this show, most of them

beautifully built, all types — large and small — bi-planes, pattern ships, yes even helicopters.

Thirty six manufacturers had booths at the show, including several
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Reprinted from 'Modelle' Magazine.

NEW RELEASE!

Dynamic New Flying Machine

We at Orange Coast Hobbies have had hands-on experience with almost every brand of model helicopter on the market. We have been providing technical assistance to helicopter modelers in southern California for the last five years and have built a reputation of giving sound advice and offering technical know-how on every major model brand that has come onto the U.S. market.

Over the last four years we have seen the state of the art of model helicopter engineering advance to the point that the average modeler can now buy a model helicopter off the shelf and know that it will fly once properly set up. This is as it should be, and advances are still being made to further improve the performance of these rotary winged aircraft.

Orange Coast Hobbies has exciting news. We have found in Japan a helicopter manufacturer that has something new to offer the helicopter modeler. We have done extensive testing of this new product and have decided to import it to the U.S. This decision was not hard to make after flying a model that looks like a real helicopter in the air, flies as smooth as anything we have ever flown, comes assembled from the factory (with engine if you want it) and is the easiest model to set up and fly that we have seen to date. This model comes to us in the form of a HUGHES 300, with features that

have been offered in the past only on high performance, contest type models which carry a heavy price tag and require hours of building and hours of maintenance with expensive replacement parts.

The HUGHES 300 retails for only \$295.00 and requires only that you assemble the tail boom to the main frames and install the main and tail rotor blades and flybar. All of the linkage on the collective Bell/Hiller head is done for you at the factory and our easy to follow instructions will help you install your engine and radio and be ready to fly in one evening. There are no wood parts to cut out and paint, the canopy is molded in colored plastic and requires only a little pinstripping. New rotor blade design and a revolutionary new blade covering eliminate the need for glassing the blade hub which is required on all other collective pitch models — a messy and tedious task.

The features and advantages of this new HUGHES 300 go on and on. If you have been looking for something new in a model helicopter, if you want a model that looks and flies like the real thing, if you want to be able to get good technical assistance when you need it, if you want replacement parts at a reasonable price, if you want "sudden service," then you want the new HUGHES 300 from Orange Coast Hobbies.



\$295⁰⁰

\$425⁰⁰ with OS50
FSR engine installed

HUGHES 300

SPECIFICATIONS

Rotor Span:	54"
Length:	45"
Tail Rotor Span:	12"
Height:	21"
Weight:	9 lbs. 4 oz.
Engine:	45/50 FSR or equivalent

Trainer/Sport Scale

FEATURES:

- Semi Knock Down Kit
 - Collective-Bell/Hiller Head (assembled)
 - No Wood Parts
 - Canopy & Fins Molded in Color
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- *Auto rotation clutch assembly available separately. Full line of replacement parts available.

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DEALER INQUIRIES INVITED

GIVE IT A WHIRL

from page 14

of the major ones but, as we said earlier, this was a relatively small attendance because of the then unknown potential of the show. I understand that, already, 55 manufacturers have registered for next year. During the two days of the show more than 9,000 people attended and, believe me, the interest shown by the public was outstanding. Also outstanding was the organization, friendliness and industry of the Mount Rainier R/C Society modelers. Bob Pfeiffer, who is the president of the local club and chairman of the exhibition committee, did a fantastic job of organizing and all of the large team of men and ladies that ran the show did an outstanding job, too. The other unusual feature of this show was that we had a safe and sensible flying site in which to provide demonstration flying. But even better, a grandstand for the public to sit and watch the flying. The weather was, I'm told, "very unusual" and the temperature varied from 20 degrees in the morning to 30 degrees during the middle of the day. For us thin blooded Southern Californians it was "quite hard" to hold our transmitters and to fly using shivering blue fingers and thumbs.

One of the most dramatic highlights of the show, for me at least, was my first visit to inspect the flying site. I walked from the show through the grandstand center tunnel to the flying field like a Roman gladiator entering the arena about 20 minutes before we were due to fly. When I turned around to view the grandstand I saw that there were more than 1,000 people already sitting down, quite prepared to wait for the next 20 minutes to see the R/C helicopters fly. We did two shows a day for two days and an average of 1,000 to 2,000 people were watching each time. So, all in all, this was an unexpectedly fascinating new show and one which I believe will be very well-attended next year. I have included this report of this show in the column so those of you within driving (or flying) distance will know that there will be good helicopter flying at this show next year plus considerable increase in the number of

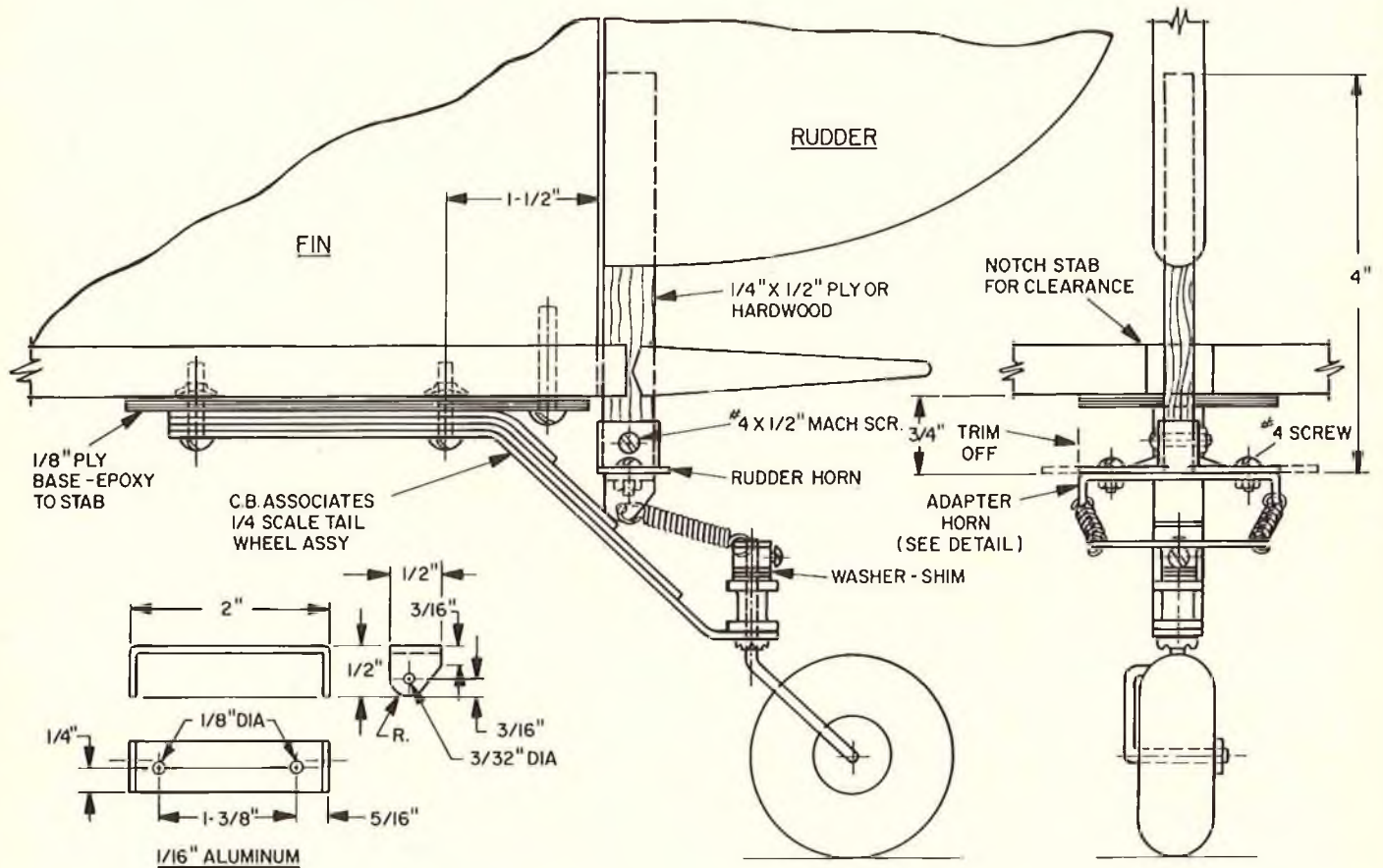
to page 176

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For

BYRON ORIGINALS

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I'm a tail-dragger fan and have been for years. I can't remember when I last installed a nose gear. It's been that long ago. Somehow, the challenge of keeping the nose straight down the runway during takeoff and the taxi back ground handling provide an extra thrill for me. It's simply a matter of keeping your thumb on the rudder stick with that extra touch.

While studying the plans of a Bud Nosen Big Stik, it occurred to me that maybe others might want to build this aircraft as a tail-dragger. Not a bad idea. It would simplify things a great deal to eliminate the nose gear. No servo linkage to hook up, no gear to straighten out every time it came in hard, and much easier on the rudder servo gears are a few things that come to mind. So, I took my big black magic marker and crossed it off the plans. Just like that!

To begin with, making a tail-dragger from a trike gear aircraft requires moving the main gear forward. The rule of thumb is that the wheel axle should be in line with the leading edge of the wing. On the Big Stik, the landing gear placement was such that the front edge of the aluminum gear provided was in line with the leading edge of the wing. This puts the wheels slightly aft, however, the aircraft still tracks and ground handles well with the main gear in this position. Very little modification to the fuselage is required for this change.

The tail skid shown on the plans is totally inadequate for a tail-dragger. It requires a steerable tail wheel suitable for the size of the aircraft. I highly recommend the C.B. Associates 1/4 Scale tail wheel for this purpose. It's strong, easy to mount, and is certainly realistic in appearance. The springs take up the shock loads from the wheel making it a whole lot easier on the rudder servo gears.

Once the tail wheel is mounted to the underside of the stab, a simple matter, it is necessary to mount the rudder control horn. Because the rudder does not extend below the elevators, a piece of 1/4" x 1/2" ply or hardwood is set into the rudder, allowing the mounting of the control horn in a better position with respect to the tail wheel tiller horn. A simple aluminum adapter horn is screwed to the control horn giving it additional reinforcement. The ends of the adapter horn are bent down to further enhance the spring location in a more horizontal position.

Although this idea is shown specifically for the Nosen Big Stik, the application is most suitable for any aircraft with the same rudder/elevator relationship. If you haven't tried a tail-dragger yet, you'll be in for a pleasant surprise when you do. They're simply great!

WICKED WANDA



The best laid plans of mice and men . . .

We wanted a small aerobatic airplane that would also be gentle and easy to fly. It must also be strong, quick and easy to build, and have a fair degree of eye appeal. It would be powered with a .10 size engine and use a standard size 4 channel radio.

The above criteria seemed reasonable and should fill our desires for a small machine to make believe that we are a Don Lowe, or a Dave Brown, or a Tony Bonetti, on an economical scale. Well, it was no big thing to draw lines on paper, nor was it much of a project to build this number. Then came time to fly — wow! It was aerobatic, oh boy, was it aerobatic! Gentle and easy to fly, no way, it was fast, sudden, even vicious.

After a few flights by several talented fliers who had their hands full, this little bird was christened Wicked Wanda. It didn't take too much smarts to figure out what was happening, the wing was the culprit. The quick build approach had prompted a symmetrical airfoil, no leading edge sheeting, and a small radius leading edge. Back to the drawing board!

This time we did it correctly. A Clark Y type airfoil, a bit fat, with sheeted leading edges and a more reasonable LE radius. With a re-shaped wing saddle in the fuselage, we were ready to have another go at it. This time it performed the way we

A .10-.15 sport plane with aerobatic capabilities. Or, how we made a lady out of Wicked Wanda.

wanted it to in the first place. So we have to feed in a bit of down elevator for inverted flight, big deal, now it's gentle and predictable.

After passing Wicked Wanda around to several friends, we couldn't resist the urge to replace the Hobby Shack Fuji .099 engine with a Fox Schnuerle .15 BB. The engine change made the take-off and climb a bit quicker and made it pull through maneuvers faster while retaining its low speed characteristics. Some of the guys preferred the .15 and some of us were happy with the .10, it is sort of a personal taste thing as it flies beautifully with either size engine.

By Dick Tichenor

Then there was the time that Randy called and asked if he could put his engine in WW. He installed his Cox .15 Conquest and the results weren't exactly what we had in mind for WW.

For those who aren't familiar with the Conquest, it is a high performance engine developed by Cox a couple of years ago with Quarter Midget racing in mind. Now WW had a sky rocket climb and streaked around like greased lightning. Forget it, that isn't what we wanted but it did prove that WW would hold together under all the G's imposed upon her with that hot engine.

A Circus Hobbies JR Spectra Series 4 channel radio was used in this project. This was the lowest priced radio system in the Circus Hobbies line (when we started the project) with their standard size servos, receiver, and battery pack. We selected this radio to make sure that WW would perform properly with a sport model radio most often flown in larger aircraft. The radio has rendered excellent service over the months of use in WW and everyone involved in this project has been happy with the smooth gimbals and nice handling balance of the transmitter.

So much for the taming of the shrew, let's build one.

General:

We suggest that a complete set of parts be cut out for each major component before starting assembly as this makes the project go together much faster. We have become addicted

WICKED WANDA

Designed By: Dick Tichenor

TYPE AIRCRAFT

.09-.15 Sport

WINGSPAN

44 Inches

WING CHORD

7 $\frac{1}{2}$ Inches

TOTAL WING AREA

335 Sq. In.

WING LOCATION

Low Wing

AIRFOIL

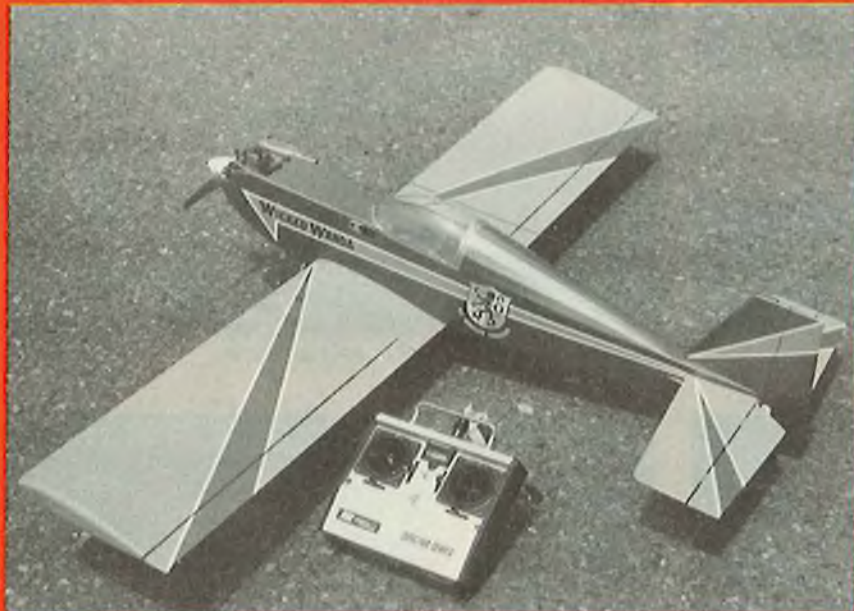
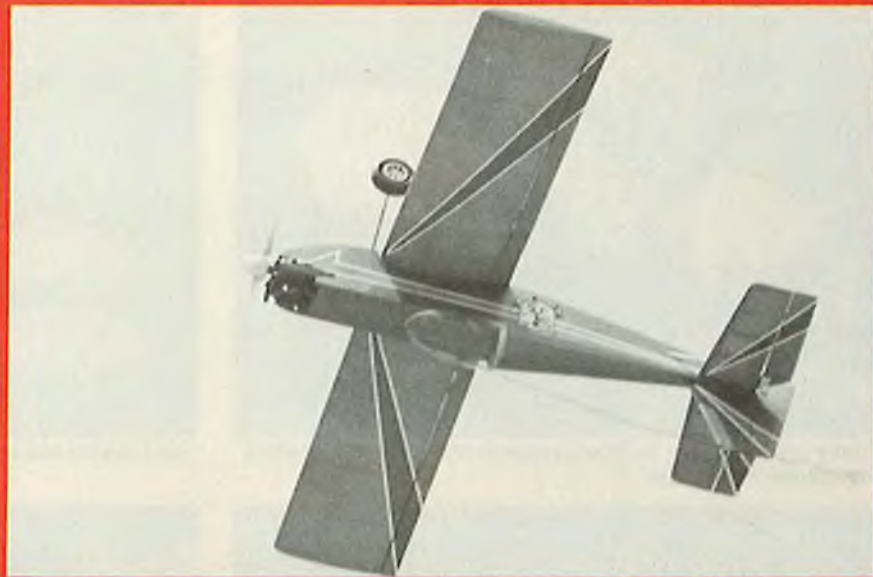
Clark Y Type

WING PLANFORM

Constant Chord

DIHEDRAL, EACH TIP

1 $\frac{1}{2}$ Inches



REC. ENGINE SIZE

.09-.15

FUEL TANK SIZE

2-4 Oz.

LANDING GEAR

Conventional

REC. NO. OF CHANNELS

4

CONTROL FUNCTIONS

Rud., Elev., Throt., Ail.

BASIC MATERIALS USED IN CONSTRUCTION

Fuselage Balsa & Ply

Wing Balsa & Ply

Empennage Balsa

Wt. Ready To Fly 46.5 Oz.

w/Cox Conquest eng. Installed

Wing Loading 20 Oz./Sq. Ft.

O.A. FUSELAGE LENGTH

31 $\frac{1}{4}$ Inches

RADIO COMPARTMENT SIZE

(L)10 $\frac{1}{2}$ " x (W)2 $\frac{1}{4}$ " x (H)3"

STABILIZER SPAN

16 Inches

STABILIZER CHORD (incl. elev.)

4 $\frac{1}{2}$ " (Avg.)

STABILIZER AREA

72 Sq. In.

STAB AIRFOIL SECTION

Flat

STABILIZER LOCATION

Mid-Fuselage

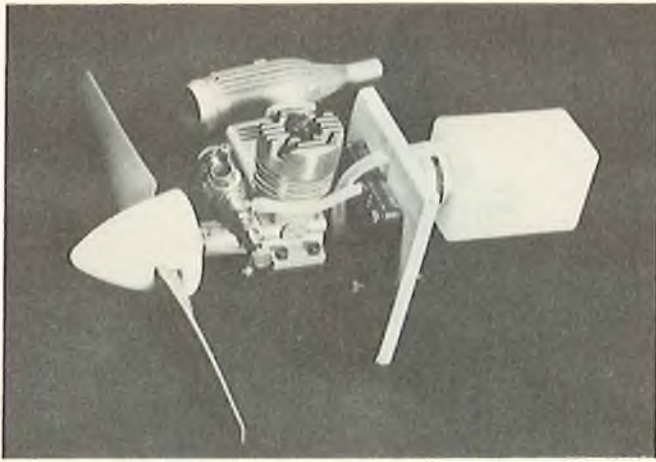
VERTICAL FIN HEIGHT

5 Inches

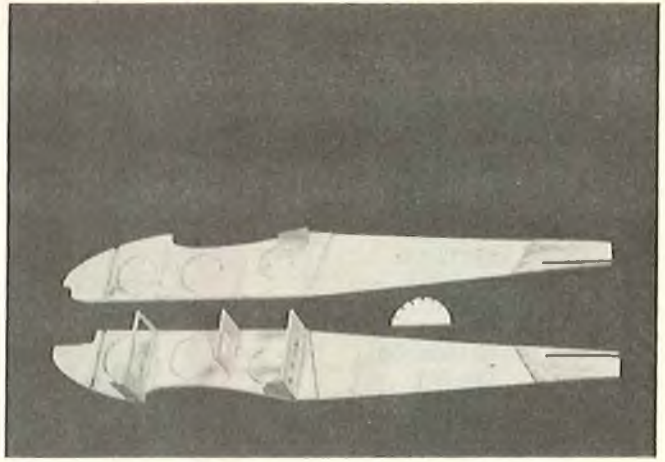
VERTICAL FIN WIDTH (incl. rudder)

4 $\frac{1}{2}$ " (Avg.)

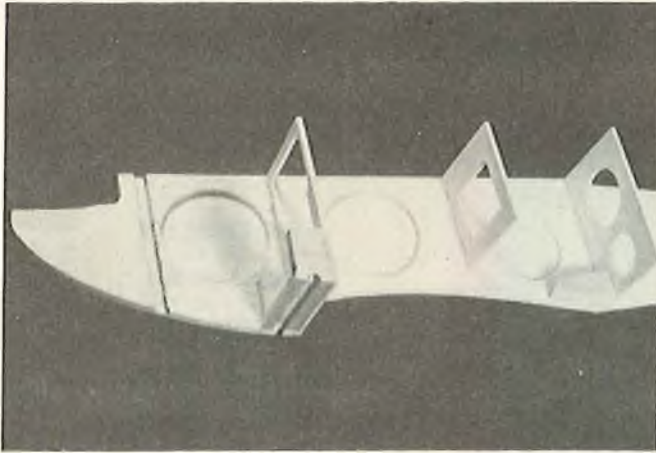




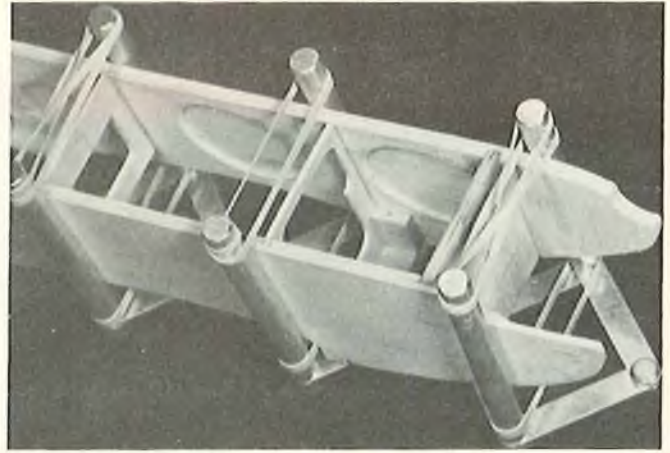
Fitting engine, mount, and fuel system to firewall is easier before installation in fuselage.



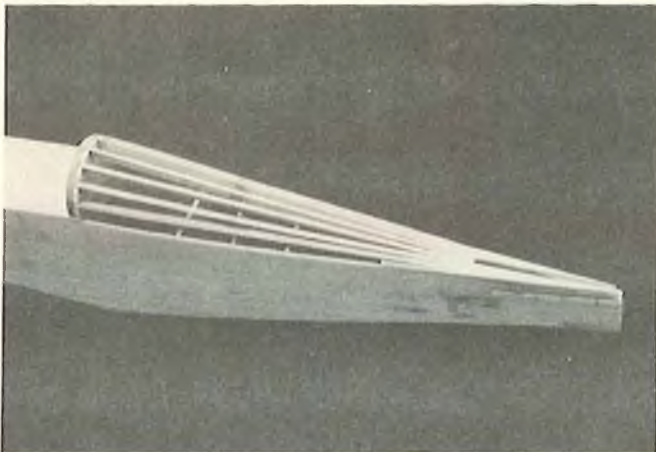
First step in fuselage assembly.



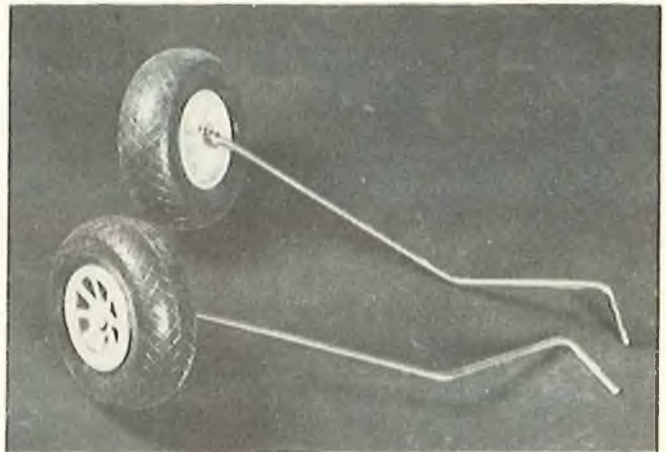
Close-up view of side panel assembly.



Fuselage was assembled in a Fourmost jig.



Turtledeck details.



The landing gear is about as simple as we can get it.

to cyanoacrylate instant glues, in fact this project was almost entirely built with the CA's and we used all the brands, Hot Stuff, Jet, Loctite, and Zap, both thick and thin. Our reference in this article will simply be CA. There is nothing unusual or tricky about the construction of WW, we tried to keep it as simple and easy as possible. Consequently, these instructions will only highlight the unique or more important steps.

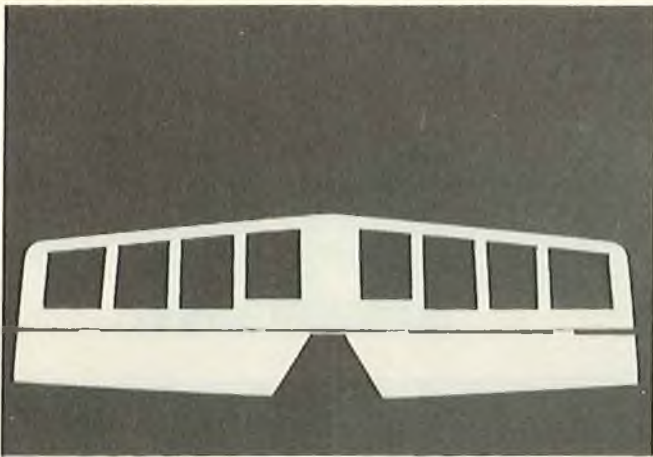
Fuselage:

Our first step after cutting out the detail parts was to make a sub assembly of the 1/4 ply firewall (F-1), engine mount with engine, blind nuts, and fuel line provisions to tank. The Hayes engine mount adds a surprising amount of rigidity to the engine installation.

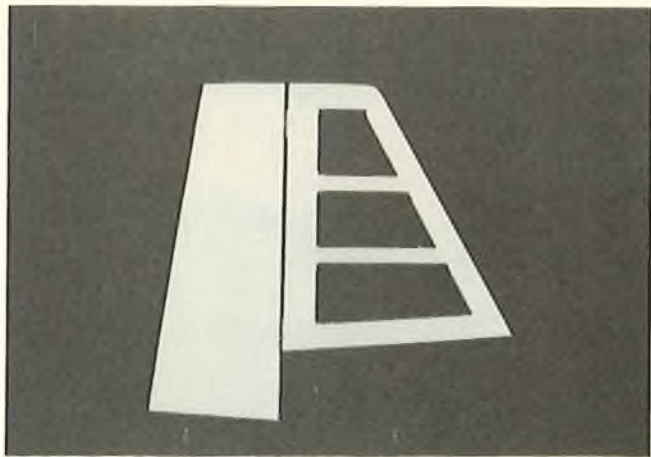
Assemble a right and a left hand side fuselage panel as shown in the photos. Then the two side panels are

assembled. We used the Fourmost fuselage jig but since the sides of the forward half of the fuselage are parallel, it is easy enough to assemble on your bench top.

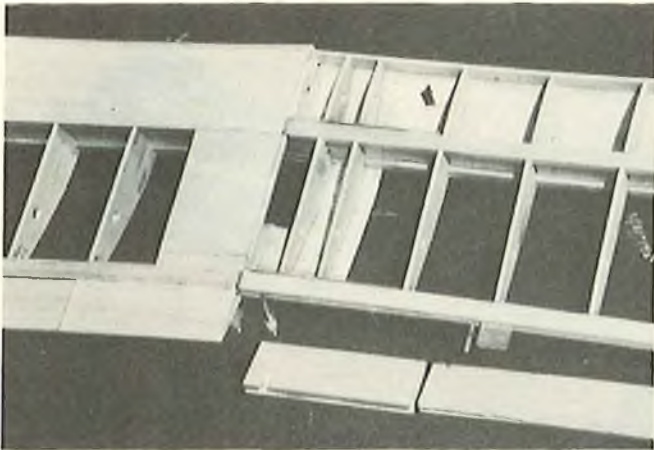
The rear fuselage has no unusual feature as can be noted in the photo. Some of us prefer to make our preliminary radio installation at this point, however, it is a builder's choice. The landing gear struts can be bent with a couple of heavy pliers, or in a



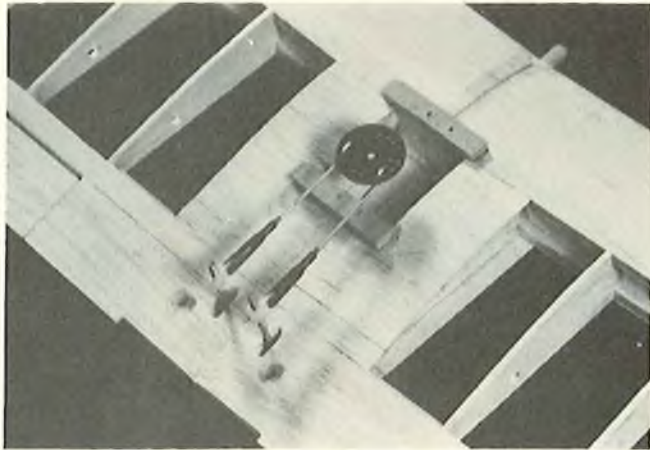
Conventional structure of horizontal stab.



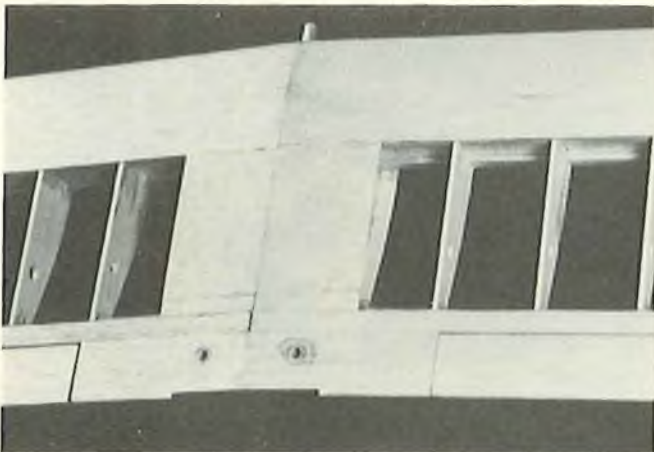
Fin and rudder are quick to build.



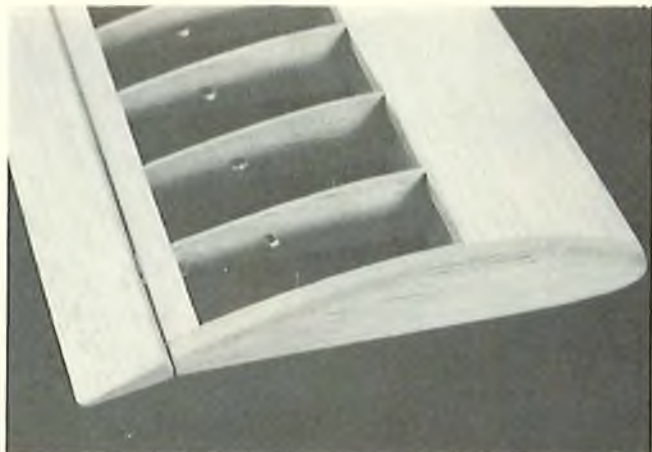
This photo shows several steps of wing assembly.



Construction details of wing center section.



Bottom view of wing center section.



Wing tip details.

vise, or with a wire bender if you have one. Any of the lightweight wheels will be fine, we used Robart's just because we liked the spoked hub covers.

Tail Surfaces:

There is nothing unusual with the tail surfaces, just keep them flat and straight.

Wing:

There are only a couple of precautions to be taken in building the

wing. The wing panels are assembled flat on the plans using 1/16 scrap to block up the lower spars to provide for the LE sheeting. The center section ribs are glued in place in the initial assembly and then the clearance is cut for the dihedral splice plates after the top sheeting is installed.

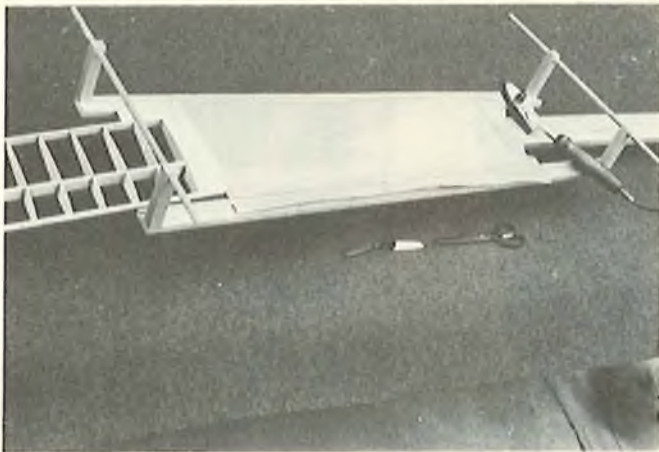
A strip of Goldberg 3" wide fiberglass was wrapped around the center section joint and adhered with CA. We spread the CA with a

forefinger and managed not to stick said finger to wing. We won't mention sticking fingers together.

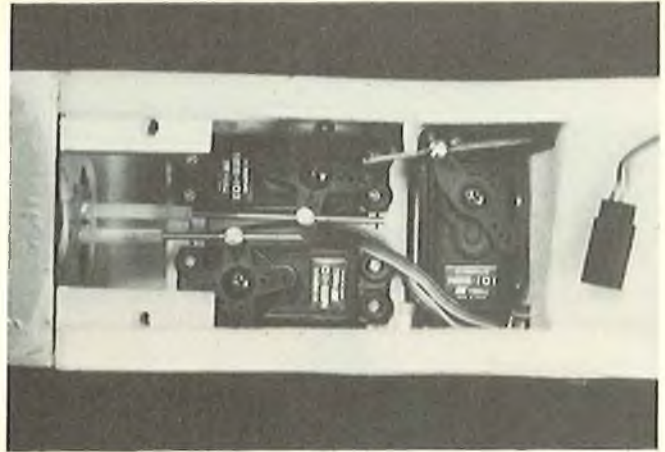
Covering:

Sig's iron-on Polykote was used for covering WW. Polykote is a medium weight, adhesive coated, heat shrinkable plastic film and is applied with fairly low heat. We were quite pleased with its application for both covering and trim.

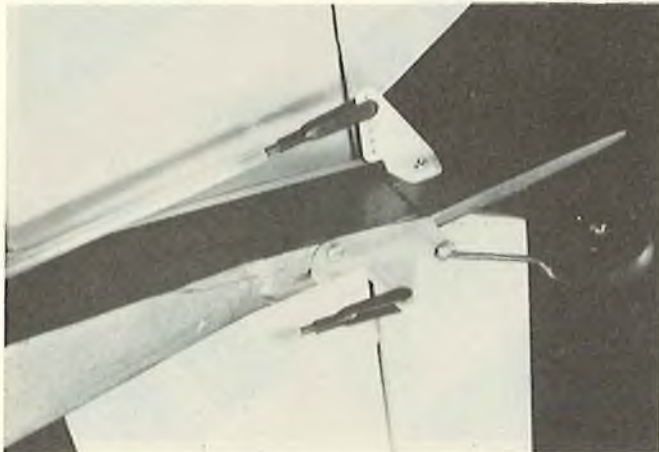
As an assist in covering we used the



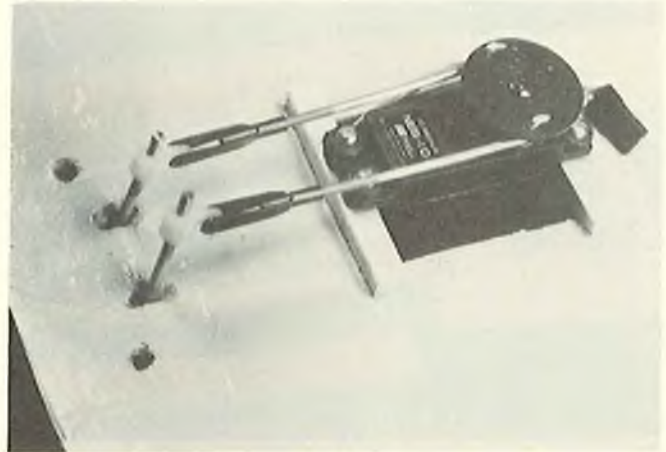
The Eldon J. Lind's Extra Hands covering tool was most helpful with the covering chores.



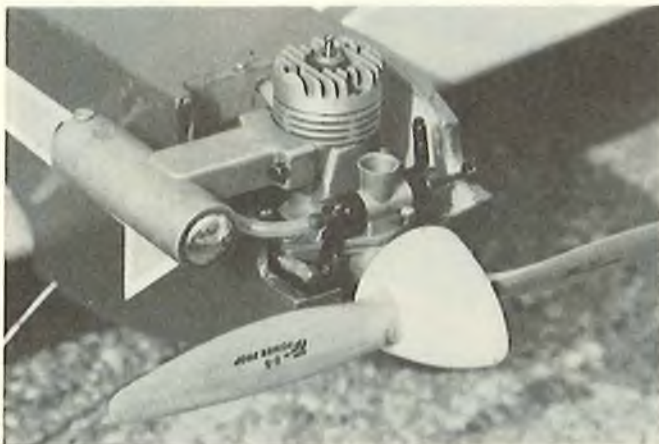
The JR servos make a nice installation. Pushrod connectors are great for small models.



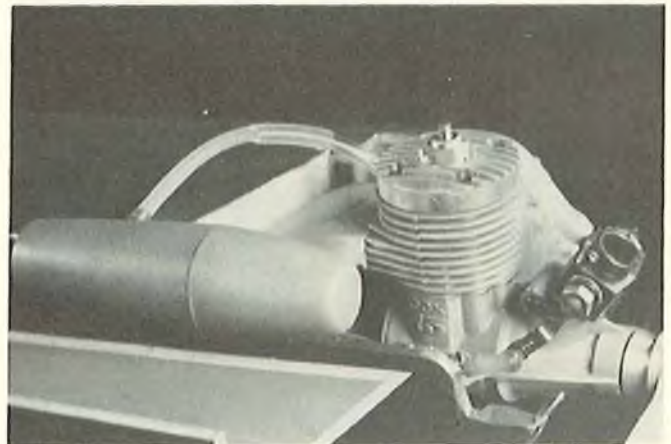
Tail control arrangement.



Aileron control linkage. Note off-center holes used for differential throw.



Fox .15 Schnuerle makes Wicked Wanda a lively lass.



Cox Conquest .15 provided more than ample power.

Eldon J. Lind Company Extra Hands covering tool which gave us a surprise. Teaching an old dog new tricks ain't easy and we have our old techniques so the reaction was mainly, who needs another gadget. This tool does an excellent job of holding the film snugly in place so that the edges can be tacked down without accumulating a bunch of wrinkles and it also eliminates a lot of fumbling.

The canopy was cut from a Sig

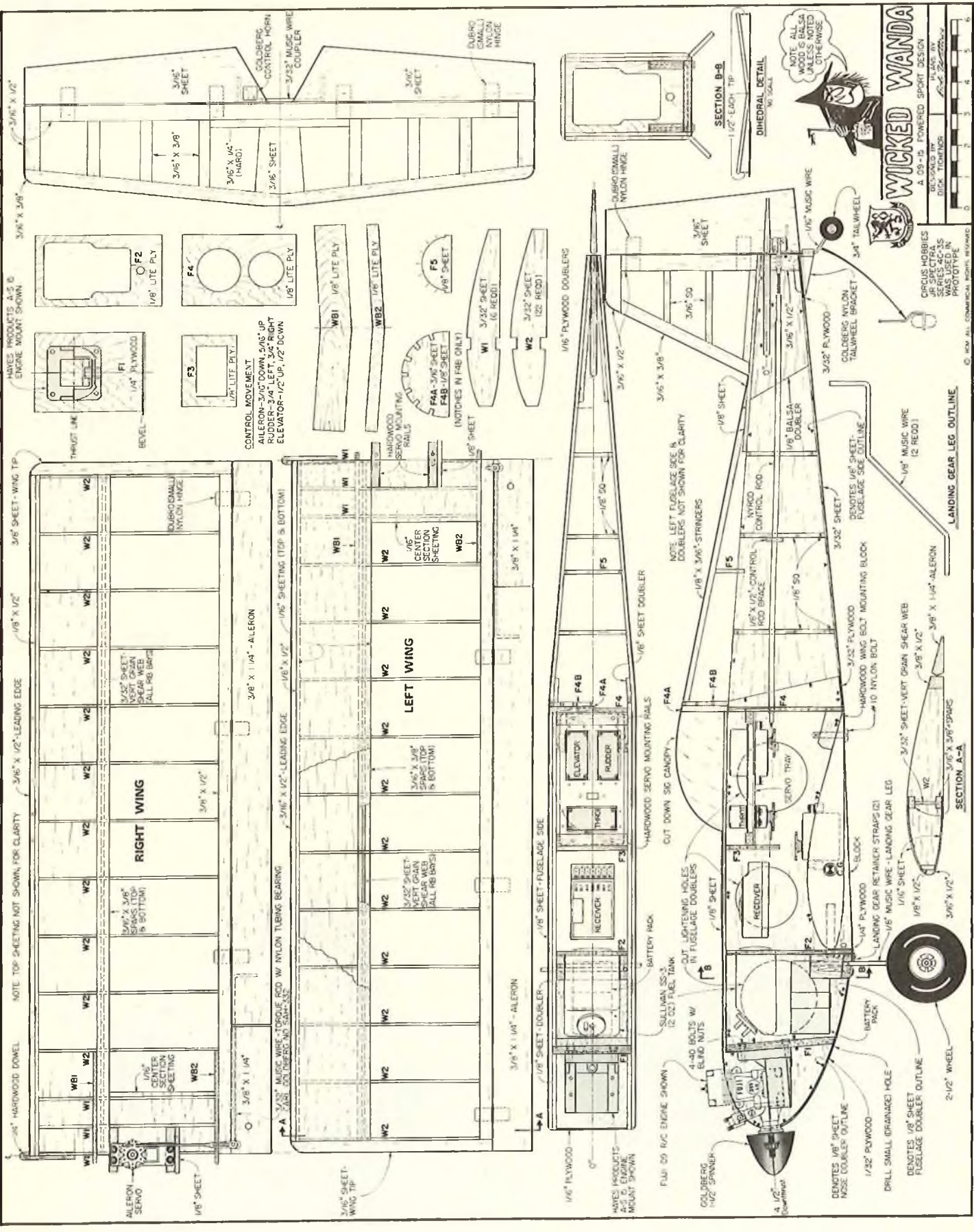
CS-012 12" butyrate canopy. There is nothing sacred about the canopy shape, use whatever strikes your fancy. Someone might even elect to omit the turtle deck and stick on a bubble canopy or maybe just go with a plain flat top, your choice.

Finis:

After many hours of flying and many control throw adjustments (none of which were critical), the final set-up when WW was returned by

friend Randy Wisley, with his Cox Conquest installed, is: ailerons 5/16" up and 3/16" down, elevators 1/2" up and 1/2" down, and rudder 3/4" left and right. This works fine for us but some others might like to reduce the travel a bit, do what feels the best for you.

Wicked Wanda has been a real joy for both us and our friends. Don't let the name scare you, she's as gentle as a lamb. □



WICKED WANDA
 A 09-15 POWERED SPORT DESIGN
 DESIGNED BY
 DICK TOMPINS
 PLAN NO. 867

NOTE ALL WOOD IS BALSA UNLESS NOTED OTHERWISE

PLAN NO. 867

CIRCUS HOBBIES
 JR SPECTRA
 SERIES RC JS
 PROTOTYPE

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POWER BOATING

Howard Power



Last month I discussed an adjustable trim plate system that has worked well on our deep vees. Bill Prigley of Fremont, California, has sent in his refinement of last month's design. His design is neat because it involves no silver soldering. It does require, however, access to a metal brake to bend the aluminum stock from which the plates are constructed.

The photographs below show the finished trim plate. The main component is bent from .030" to .060" thick soft aluminum stock. Figure 1 shows the layout for this part. The layout shows where to drill three passage holes each for the 4-40 and 6-32 bolts that restrain the ends of the adjustable support rods. Four passage holes for 6-32 bolts are used to mount the completed trim plate to the transom of the hull. These are offset so that they can be tightened after the trim plate is assembled.

The trim plate support rods are made from 1/4" diameter aluminum round or hex stock 1 1/4" long. One end is slotted 1/2" deep and a hole is drilled and tapped for the 4-40 restraining bolts. The other end has to be drilled and tapped for a 6-32 bolt approximately 3/4" deep. A self locking jam nut is used to hold the trim plate adjustment.

The bent aluminum plate, trim plate supports, and their hardware are now assembled. After assembly, an aluminum plate (2" x 4") is glued to the trim plate. You can use JB Weld

(available at most auto parts stores) or Hysol epoxy glue to accomplish this. The plate is glued so that when the assembly is mounted on the transom, the plate butts up against the hull with very little gap. Don't leave this plate off or water will roll up the back of the trim plate assembly and cause unnecessary drag. The pattern shown is usable for 40 to 90 sized deep vee hulls. Smaller sized plates for 20 boats may be similarly assembled using this same design scaled down.

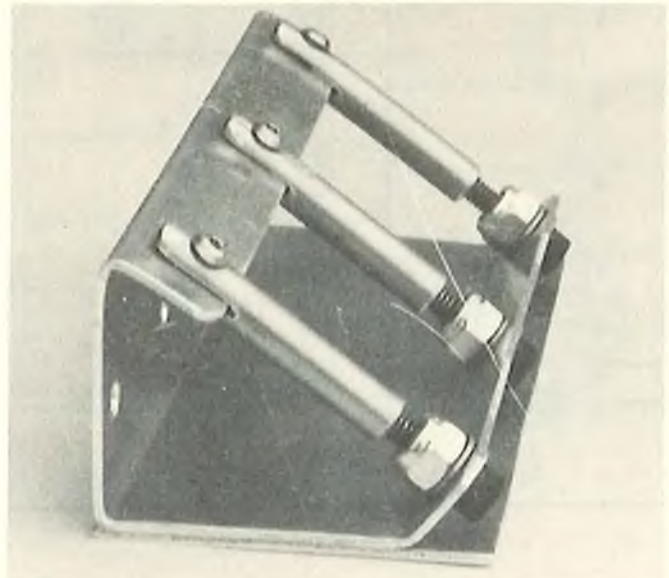
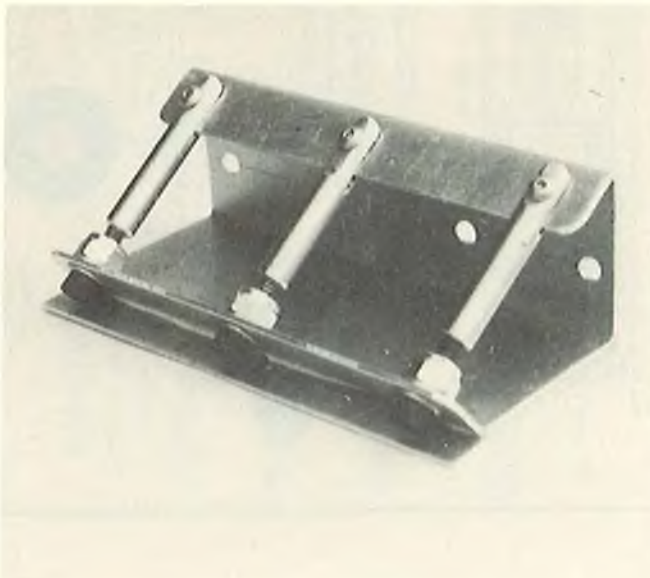
While we are on the subject of useful things you can make; have you ever had the flywheel nut loosen while starting your motor? The flywheel spins and of course the motor is mounted so close to the hull bottom that you can't re-tighten the nut without taking the motor out of the boat. Do you use water pump pliers to hold the flywheel when tightening the nut? Does your flywheel look like the Monster of Loch Ness has been chewing on it? Well, you need the handy flywheel spanner wrench shown in the second figure.

My particular wrench was given to me by Bill Prigley many years ago but, if I'm not mistaken, the original design was worked out by Charlie Pottol (the father of the K & B Marine Specialties line of boat hardware). Using the full size pattern you can cut the outline from 3/8" thick aluminum stock using a bandsaw. The left side has a larger diameter radius and a 3/16" flywheel engaging pin. The right side has a 1/8" pin and is useful on

smaller flywheels. The pins are held in place by 8-32 set screws. If the hole in your flywheel is on a tapered surface you will have to rotate the spanner and insert it flush with the tapered surface. With this spanner you can loosen and tighten your flywheels the right way.

Many of you are probably aware of the efforts of the AMA to acquire new frequencies that modelers can use exclusively without interference from industrial and commercial radio users. The job is very close to being accomplished but since the wheels of bureaucracy turn slowly we have yet to be informed of the effective date for the acquisition of these new R/C-only radio channels. I received a draft for a plan that outlines what will happen when the FCC gives us these new frequencies. This plan is effective upon the implementation (1) date to be established by the FCC. I will only discuss the parts of the plan that affect boaters. During the five year period after "1" date boaters will be able to use the following frequencies:

Channel No.	Frequency
Blue/White	72.160 (shared)
Violet/White	72.320 (shared)
Yellow/White	72.960 (shared)
Green/White	75.640 (shared)
101	75.430
103	75.470
105	75.510



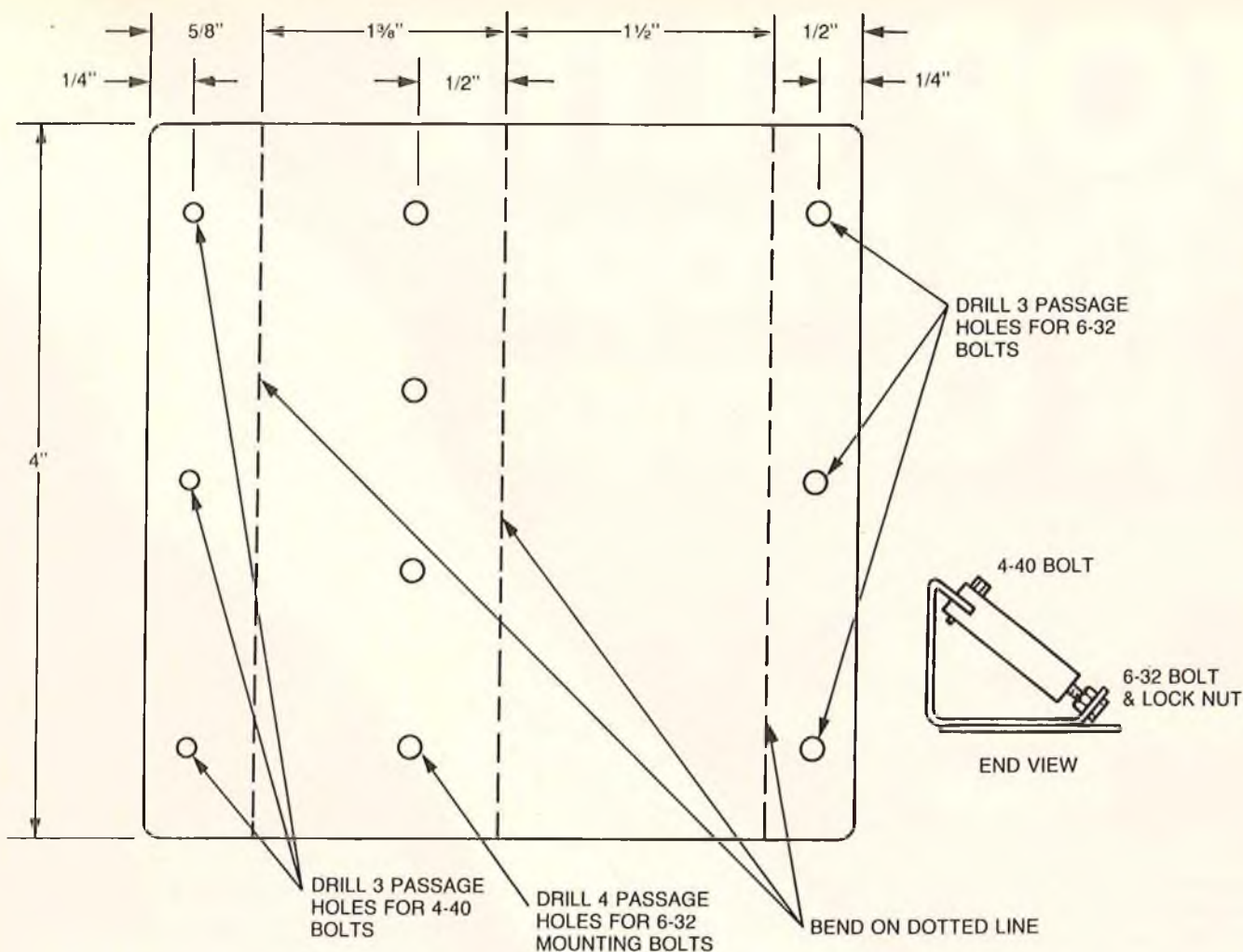


FIGURE 1
LAYOUT FOR BILL PRIGLEY'S TRIM PLATES

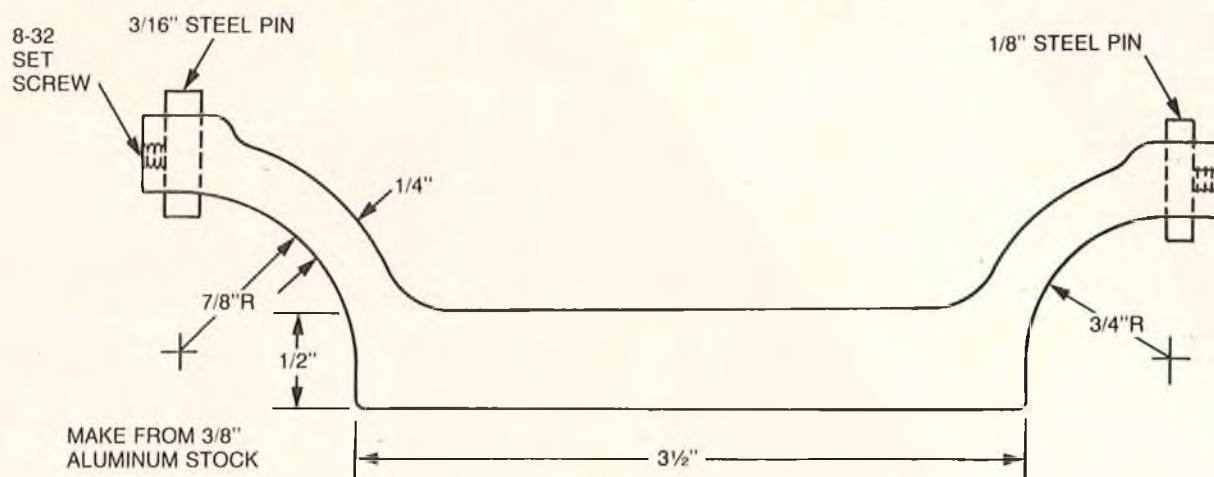


FIGURE 2
FLYWHEEL SPANNER
(FULL SIZE)

Channel No.	Frequency
107	75.550
109	75.590
114	75.690
116	75.730
118	75.770
120	75.810
122	75.850

This is a total of 14 usable frequencies. The frequencies with

channel numbers are for non-aircraft use only. The old frequencies will remain on a shared basis. Due to the number of new channels that will become available it will be inappropriate to use the old color code system for frequency identification

after "I" date (except for the old 72 MHz frequencies). The 75 MHz non-aircraft band transmitters will fly a black flag with white channel numbers. Existing 27 MHz and 53 MHz colored flags will remain as is.

At "I" + 5 years the shared frequencies (our old ones on 72 MHz) will be eliminated completely and we

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RCM PRODUCT REVIEW

Speed Glass Prod.
SUPER LR-1A

SPECIFICATIONS

Name	SUPER LR-1A
Aircraft Type	Formula I
Manufactured By	Speed Glass Products 5364 Via Alcazar San Diego, California 92111
Mfg. Suggested Retail Price	\$65.00
Available From	Direct from Mfg.
Wingspan	49½ Inches
Wing Chord	9¼ Inches
Total Wing Area	460 Square Inches
Fuselage Length	41 Inches
Stabilizer Span	15 Inches
Total Stab Area	80 Square Inches
Mfg. Rec. Engine Range40
Recommended Fuel Tank Size	11 Oz.
Recommended No. of Channels	4
Rec. Control Functions	Rud., Elev., Throt., All.
Basic Materials Used In Construction:	
Fuselage	Epoxy/Fiberglass
Wing	Balsa
Tail Surfaces	Balsa
Building Instructions on Plan Sheets	No
Instruction Manual	No
Construction Photos	No

RCM PROTOTYPE

Radio Used	Kraft — 4 Channel
Engine Make & Displacement	Super Tiger X-40
Tank Size Used	11 Oz.
Weight, Ready to Fly	80 Oz.
Wing Loading	25 Oz./Sq. Ft.

SUMMARY

WE LIKED THE:

Ease of assembly, cowl cheek and canopy installation. Excellent flight performance.

WE DIDN'T LIKE THE:

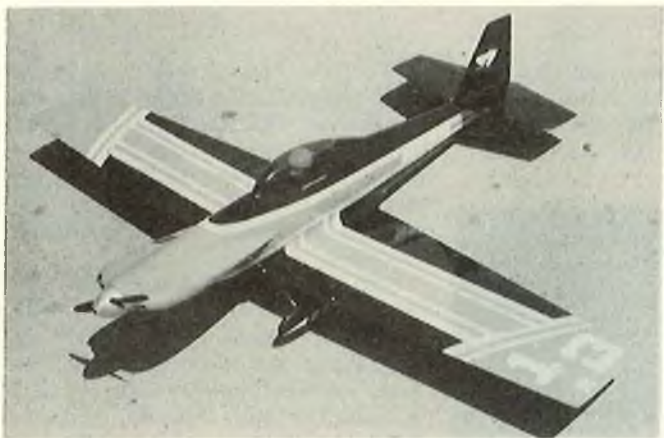
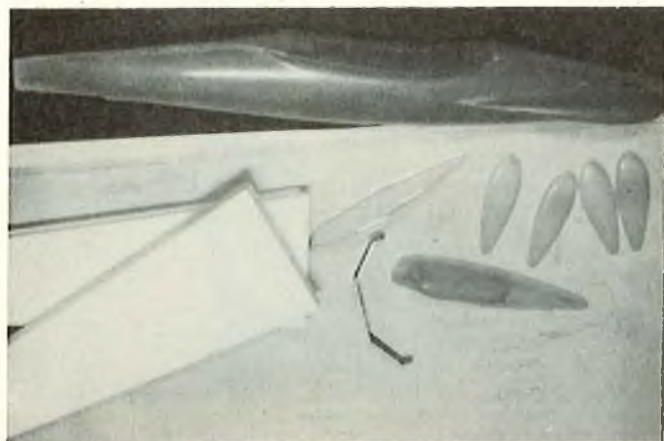
Provided 3-views.



canopy. Trim the canopy on the trim line, glue it to the fuselage and that's it! There are two alignment marks on the fuselage where the front of the canopy goes, making canopy installation a breeze. This has to be the easiest and simplest cockpit/canopy installation of all the Formula I kits on the market today.

The wing was built using 3/32" balsa, then 3/4 oz. fiberglass cloth and 6 oz. fiberglass cloth reinforcing the center section. The optional spar was not used in the prototype. The Super LR-1A wing is very thin and we recommend the use of this optional spar.

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For the last few years there has been only one or two new Formula I kits. The static judging line is a look alike; airplanes differing only in paint schemes. Speed Glass Products, 5364 Via Alcazar, San Diego, California 92111, is now producing a Super LR-1A Formula I kit. The new Super LR-1A is the design of Ed Allen and Harly Condra and is a welcome sight in the static judging line.

The kit comes in a 6" x 13" x 41" box and includes wing cores, canopy, fuselage, cheek cowl, wheel pants, dural formed landing gear and one sheet of full size plans. This kit is for the builder who selects his own wood and has his own building techniques.

Construction:

The 45" x 36" plan sheet contains the full size templates of the rudder, tail, firewall, landing gear plate and wing hold-down supports. The long firewall is used with a Super Tigre X-40 and the short firewall is for the K & B 6.5.

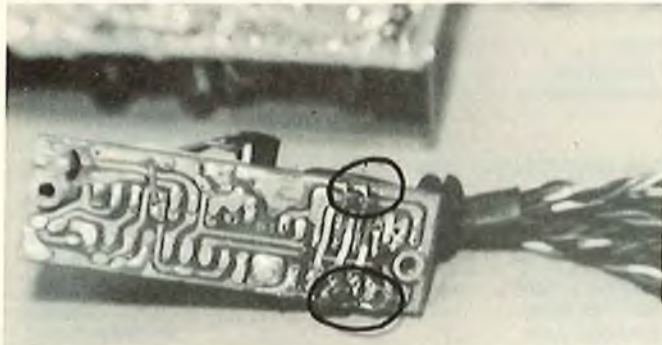
One of the outstanding features of the kit is that the cheek cowl alignment pins are installed in the fuselage. This makes cheek cowl fitting a lot simpler. With a little bit of heat and a fillet of epoxy / micro-balloons, the cheek fits up nicely. The cheek cowl is designed for the rear exhaust engines. A Dzus fastener with the 1/16" wire attached to the outer motor mount screws secures the cheek to the fuselage.

The cockpit floor and instrument panel are molded into the epoxy/fiberglass fuselage. This fuselage is very thin and light.

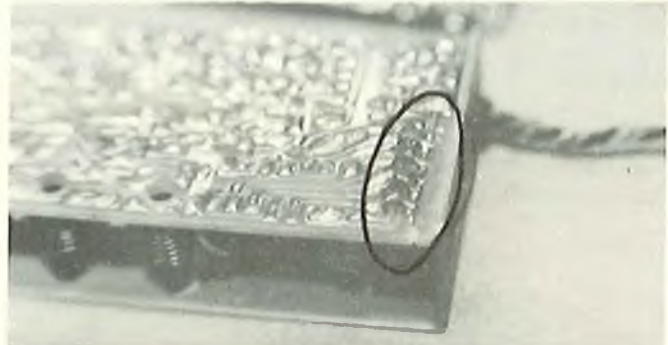
Another outstanding feature is the ease of fitting the

FLYING LOWE

Don Lowe



.001 mfd bypass capacitors installed between servo signal lead and ground on four channels of a Pro-Line receiver decoder.



Bypass capacitors on Kraft decoder.

Giant Models: One of Their Problems:

An important phase of our hobby at present is giant models of all kinds. Most of us have been bitten by the bug in one way or another. My activity has involved large semi-scale aerobatic types for the Circus Circus Tournament of Champions.

I wrote some time ago about the developmental problems associated with that activity. One of the problems bears more discussion since everyone who builds a huge model will face the issue. Whenever you extend the servo wiring for remote placement of servos for wings, tail, etc., you risk a weird radio operational problem. We discovered the phenomena back in 1972 with our first large remotely piloted vehicle test bed which used Proline radio equipment. Loss of range and glitching occurred which could not be cured by tuning. Essentially, the extended servo leads were screwing things up.

We tried lots of things, including chokes in the wiring; they helped but did not eliminate the problem. We finally resorted to using small bypass capacitors right in the receiver on the decoder board. This idea was arrived at after much cut and try, and, it is very effective. Essentially, all you do is add a very small .001 to .002 mfd. capacitor to each channel with extended leads between the servo signal lead and ground. It is most effective when soldered directly to the decoder printed circuit board. Any physical size capacitor will work, however, the space limitations usually requires something very

small. The smallest capacitor that we found is made by Erie (P/N 8101-050-651-100M; .001 mfd. capacitor). This little "red cap" fits on any board.

1982 TOURNAMENT OF CHAMPIONS

Plans for the Seventh Tournament of Champions in Las Vegas, Nevada, on November 4-7, 1982 have been announced. Sponsored by Circus Circus Hotel/Casinos in Las Vegas and Reno, the \$100,000 cash prize list is the richest purse in the history of competitive aeromodeling.

Leading contender will be Hanno Prettner of Austria, current World Champion, who will attempt to beat the odds against his seventh consecutive Tournament of Champions victory. Striving to break Prettner's unparalleled record in this invitational contest will be the top ten aerobatic competition modelers from the United States and nine additional modelers from various nations around the world.

The 1982 Tournament of Champions is patterned after a full-size aircraft aerobatic contest and the maneuvers duplicate those flown by the full-size aircraft. The models flown in this contest are scale replicas of full-size aerobatic aircraft and are radio controlled.

For further information or reservations, write to Circus Circus Hotel/Casino, P.O. Box 14967, Las Vegas, Nevada 89114.

We have found every make of equipment afflicted with this disease, i.e., Proline, Futaba, Kraft, J.R., etc. I know that every modeler in our military RPV project who built a giant model (there were many) had this problem and resolved it in the fashion described.

I recently modified a Futaba "J" Series receiver for friend, Bob Godfrey. His radio is now in his big "Super Fly" and works perfectly. The AGC problem was evident until I installed the caps. (.002 mfd.). It really did the trick.

Usually the symptom that appears, after wiring extension, is a reduction of range --- checked with the antenna collapsed. You should check range with normal wiring and then compare it with extended wiring. Bob's problem was different in that strange servo action --- trimming and jittering occurred when the transmitter signal strength was varied by moving it toward and away from the receiver antenna with collapsed transmitter antenna.

My own experience has been that my big Lasers are unflyable without this modification. I only wish that radio manufacturers would pre-install this modification for us. The snapshots illustrate where the small capacitors are mounted on a Proline and a Kraft dual conversion receiver.

Trimming the Stab:

I recently received a manuscript submitted by friend, Bud Weber. The piece was written by Dan and Terry Squier concerning the need to adjust the stab incidence for improved rolling maneuvers. These gentlemen presented a neat method for adjusting the stabs.

In my own experience (I have

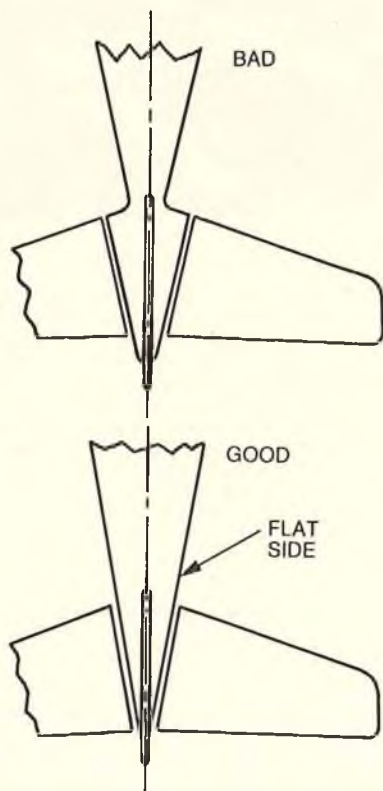


Camarillo Flying Circus (Calif.) first pattern contest — note the variety of aircraft. Front row (left to right), kneeling: Novice Class, 1st Dolph McCranie; 2nd Nick Nicholson, 3rd Ralph Frisbie. Back row (left to right), standing: Pre-Novice Class, 1st Larry Thweatt; 2nd David Wilkins; 3rd Bob Anderson. January 23, 1982, 70°. Notice the only snow is on the mountain tops in background. Photo by Edward Hotelling.

previously written concerning design, trimming and other adjustments to help rolling maneuvers), I certainly support the contention that proper stab incidence is an influencing factor. As suggested in the article, setting up the proper stab incidence is difficult, and it only needs to be off a degree or two to really mess things up. Some time ago we changed the stab incidence in a "Brushfire" and made an excellent flying ship from a dog.

The difficulty with fixing the stab is that it might be set into the fuselage properly, but the wing and engine trim anomalies could make it wrong for that particular ship. What we really need is an adjustable tail, wing and engine. An adjustable tail is not a cure-all, however, because we have seen the influence of vertical wing/tail placement relationship, wing incidence, wing warps, C.G. location, warped stabs, etc.

Personally, I feel that all pattern ships should have incidence adjustment capability. I have one Phoenix 8 with plug-in stab halves which can be changed in incidence and, of course, are removable for shipment. The proponents of flying



FLYING STAB ARRANGEMENTS

stabs will say that the stab will be automatically adjusted and --- they are right --- flying stabs don't work well on some ships, however. I had one on a P-8 and I didn't like the non-linear control feel. I believe that was due to the tail fairing arrangement which allows the stab to "unport" as it rotates, abruptly changing its effectiveness. A flying stab works best where the stab root contacts the flat side of the fuselage; this prevents "unporting." A good arrangement would seal the gap at the stab root with some kind of low drag lap seals to prevent airflow through that area and loss in effectiveness.

The need for trimming the stab incidence is very mysterious to me. One would think that the slight elevator trim adjustment required to accommodate would be insignificant, but it isn't!

Long Noses:

I received a letter from Dave Burwell of San Jose, California, concerning a desire to lengthen the nose of the Sig "Kougar" for installation of a retractable nose gear. He feels that he needs to lengthen it

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Q.A.C. QUICKIE

Introduction

Once in a while an aircraft comes along which just cries out to be modeled and for me such an aircraft was the Quickie. I chanced upon the design in *Flight International Magazine* during 1979 and couldn't resist the challenge it presented. One year and two models later I finally got what I wanted — a practical flying scale model of this remarkable aircraft.

I would say that this is one of the best flying models, of any type, that I have built and these qualities must be a tribute to the designer of the real thing, Mr. Burt Rutan. Rutan was commissioned by Tom Jewett and Gene Sheehan to design a high performance, economical, single seat sport aircraft around an 18 hp Onan industrial four stroke engine. With his previous design background of the Vari-Viggen, Vari-Eze and Long-Eze, it was obvious his answer would draw little on conventional design practice and, sure enough, the Quickie (as his brainchild was christened) turned out to be a remarkable piece of original thinking both in appearance and structure.

How about the following specifications — maximum speed 127 mph, stall speed 49 mph, take-off distance 660 ft., 104 mpg at 120 mph and a load capacity of 280 lbs. Remember all this on an 18 hp engine. The structure is cut from blocks of extruded polystyrene foam and covered with fibreglass cloth and epoxy resin. This produces a very



ABOUT THE AUTHOR

Ray Jennings is 30 years old, married with no children and lives near Belfast, Northern Ireland. He is employed as an Air Traffic Engineer at Belfast Airport and is a member of the Ulster Model Aircraft Club, the largest model club in Ireland. His main interests are competition pattern and scale aircraft, most being built from his own designs. Ray started R/C modeling some 12 years ago with single channel and reed radio equipment and has been continuously involved in the hobby ever since. Quickie is his first construction article to be published.

strong airframe with a smooth surface finish which cannot rust or warp.

Having proved this concept, Jewett and Sheehan set up a company to market kits for the airplane. Thus, Quickie Aircraft Corporation came about and to date some 500 kits have

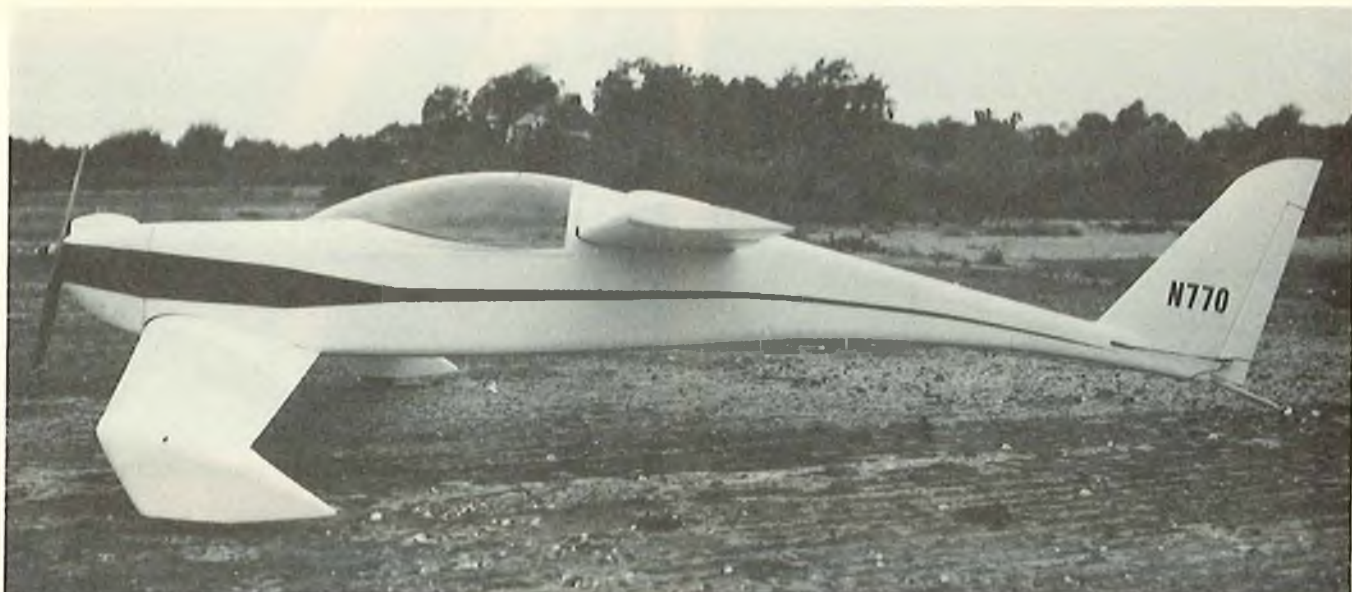
been sold and over 50 examples have been completed and flown by homebuilders throughout the world. Perhaps the best description of the Quickie was by Wayne Thoms, writing in *Mechanix Illustrated*, when he called it "the ultimate adult toy."

So much for the real thing; what about the model. Well, as I said, it took two goes to get my act together due mainly to a complete lack of any information on such an unconventional layout. Realizing this, my first attempt was built quickly and looked it. It's hard to put a great deal of time and effort into a model you are convinced won't fly. I made guesses at wing sections, incidence angles and balance point and, of course, I guessed wrong on everything.

The result of the first flight with this test model was thirty seconds of uncontrollable high speed aerobatics and a pile of pieces. Whilst repairing the mess I came across a drawing showing the C.G. of the full size aircraft and with the model balanced at this position reasonable flights were achieved.

After a few more changes and a lot more flying I was confident enough to start a new model and this is the one presented here. I incorporated the lessons learned from my first effort plus other changes based on additional information I had managed to gather on the real thing. This time everything turned out exactly right and the flight performance was outstanding. It was fast and smooth, capable of basic aerobatics and had

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Ray Jennings's exciting sport scale .40 powered Quickie is a real eye grabber wherever it appears at a flying field.

Q.A.C. QUICKIE

Designed By: Ray Jennings

TYPE AIRCRAFT

Sport Scale

WINGSPAN

55 Inches

WING CHORD

6" Avg.

TOTAL WING AREA

330 Sq. In.

WING LOCATION

Shoulder Wing

AIRFOIL

Semi-Symmetrical

WING PLANFORM

Tapered L.E.

DIHEDRAL EACH TIP

1 1/2 Inches

O.A. FUSELAGE LENGTH

56 Inches

RADIO COMPARTMENT SIZE

Fwd. (L)2 3/4" x (W)4 1/4" x (H)3 1/2"

Rear (L)9" x (W)4 1/4" x (H)4"

CANARD SPAN

46 Inches

CANARD CHORD

6 1/2" (Avg.)

CANARD AREA

300 Sq. In.

CANARD AIRFOIL SECTION

Semi-Symmetrical

CANARD LOCATION

Forward Fuselage Bottom

VERTICAL FIN HEIGHT

9 1/2 Inches

VERTICAL FIN WIDTH (Incl. rudder)

5" (Avg.)

REC. ENGINE SIZE

.40 Cu. In.

FUEL TANK SIZE

8 Oz.

LANDING GEAR

Canard Tip Wheels

REC. NO. OF CHANNELS

4

CONTROL FUNCTIONS

Rud., Elev., Throt., Ail.

BASIC MATERIALS USED IN CONSTRUCTION

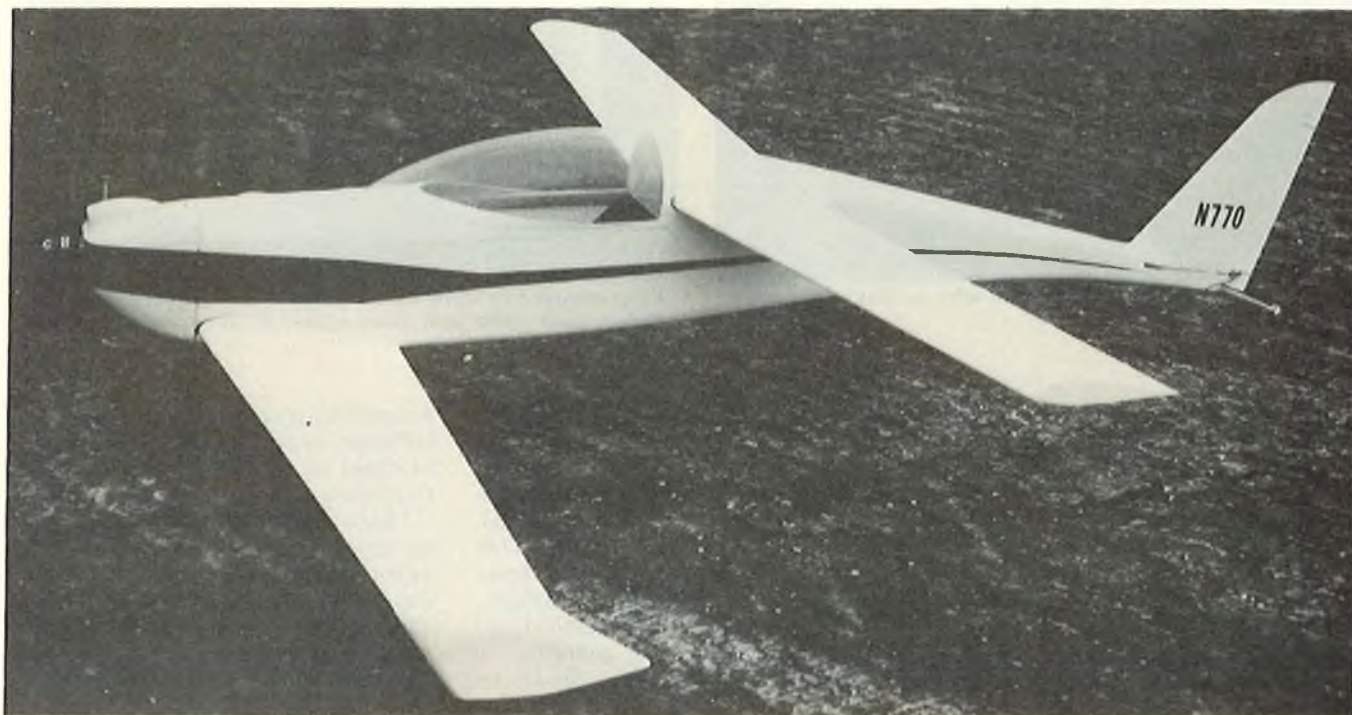
Fuselage Balsa, Ply & Hardwood

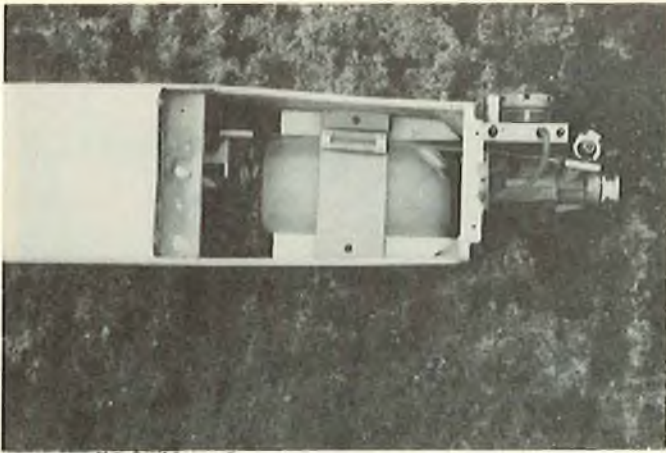
Wing Foam, Balsa & Ply

Vert. Fin & Rudder Foam & Balsa

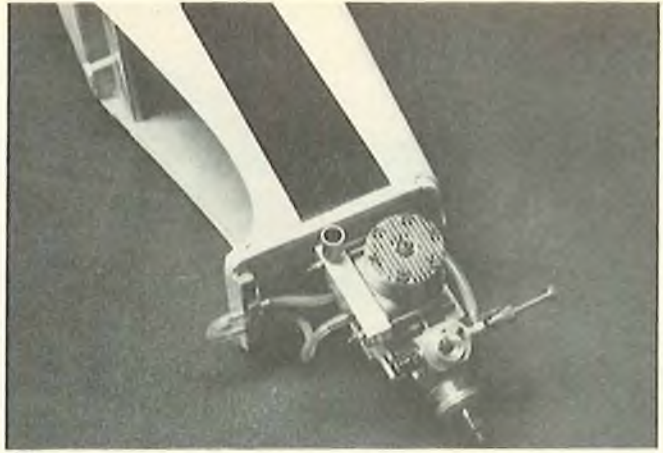
Wt. Ready To Fly 88 Oz.

Wing Loading 20 Oz./Sq. Ft.

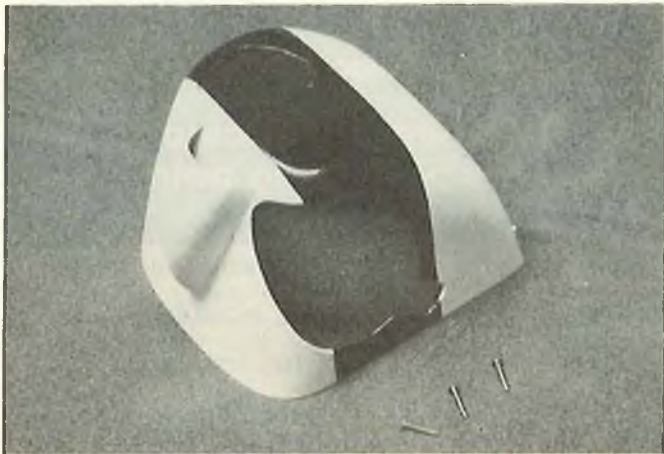




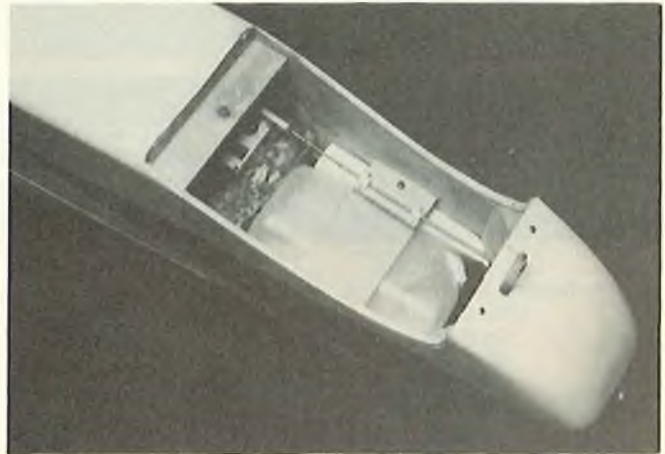
Fuel tank, throttle servo access is available through bottom when canard is removed.



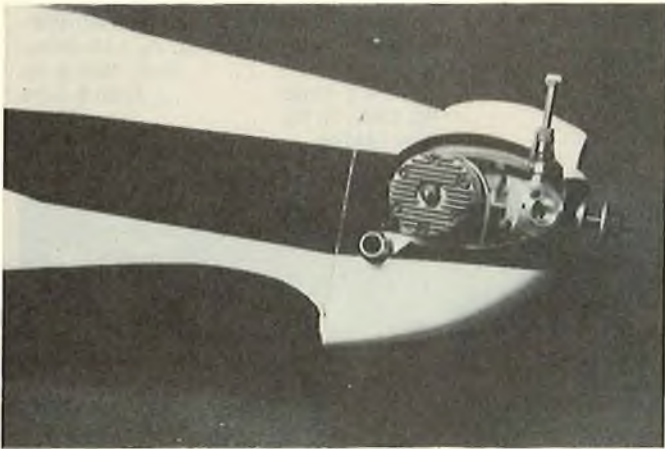
Cowling removed to show very neat engine installation and plumbing arrangement.



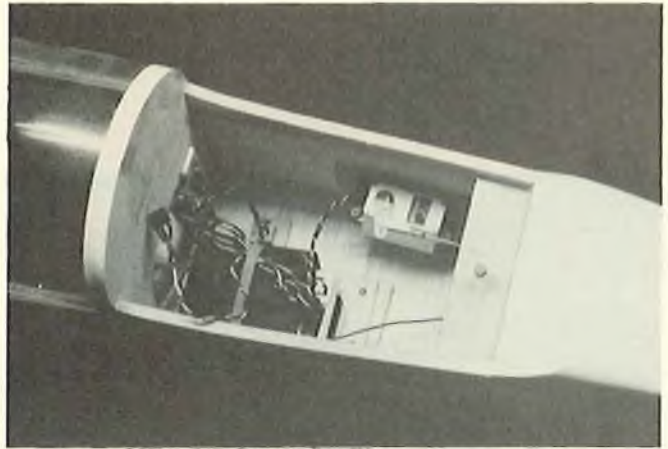
Fiberglass cowl is the best way to do it, however, balsa cowl can be carved and glassed over.



Canard removed with cowl in place. Note fueling tube on bottom of cowl.



Side mounted forty works very well with minimum of engine showing.



Wing removed to show rudder servo and receiver installation. Battery pack under seat. Easy access to all equipment.

ultra safe low speed handling characteristics. Quickie has exceeded all my expectations and I can certainly recommend it to those looking for something different.

CONSTRUCTION

Before beginning to build any scale model it is always a good idea to gather together as much information on the subject as possible. To help with

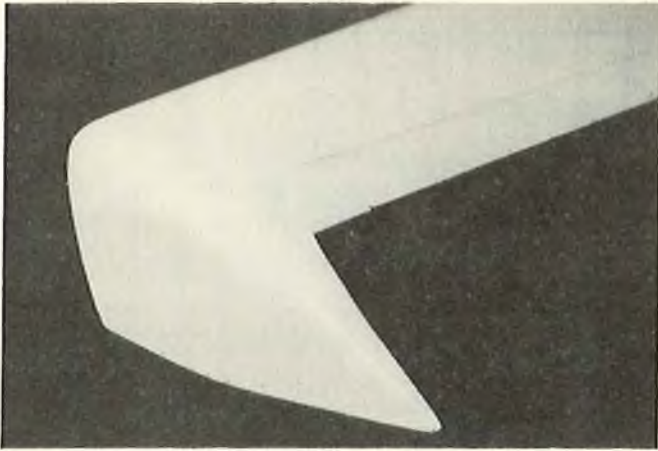
this I have listed below some sources of documentation for the Quickie:

Flight International, week ending 4/14/79, photos and 3-view; Aeroplane Monthly, July 1978, photos; Model Aviation, May 1978, photos and 3-view; Mechanix Illustrated, January 1979, photos; Sport Aviation, October 1978, photos; Aeromodeller, March 1981, photos and 3-views.

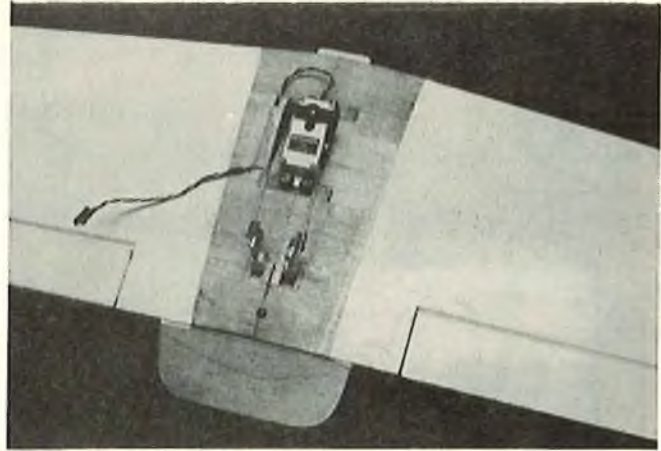
The manufacturers, Quickie

Aircraft Corporation, will supply an information package for \$8.00. Write to them at P.O. Box 786, Mojave, California 92501.

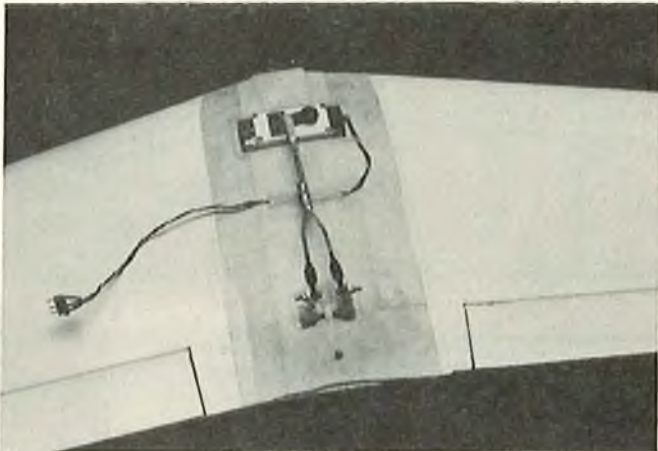
I have tried to keep the construction as straightforward as possible and anyone with a little previous building experience should have no trouble. The original model took about six weeks of spare time work and I am not the world's fastest builder.



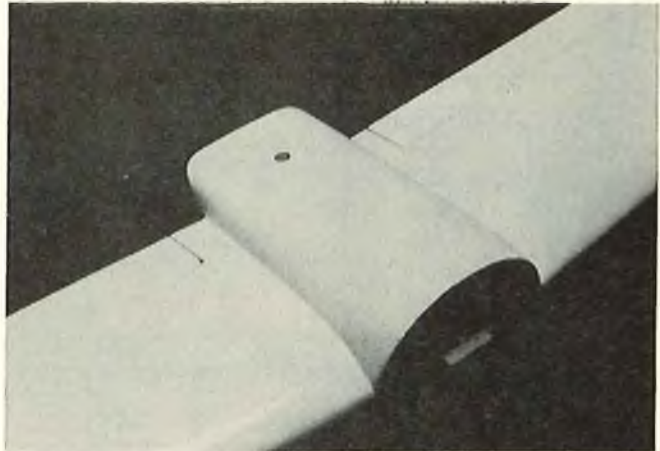
Wheel fairings at the tips of the canard add much class to the Quickle!



Aileron servo installation on bottom side of wing. Short and simple connection.



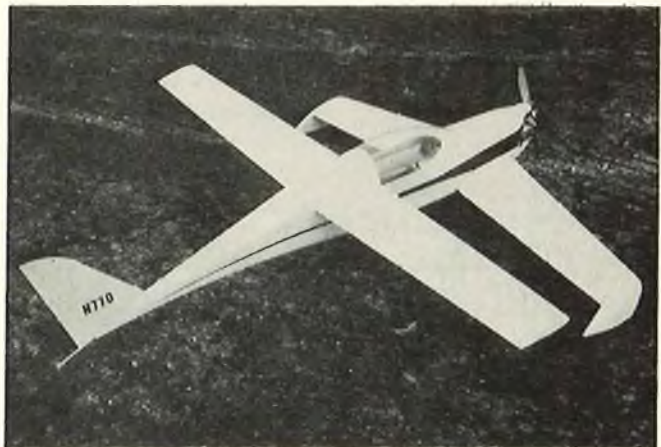
Elevator servo installation in top side of canard. Note yoke made up which gives individual adjustment to either elevator.



Wing fairing block showing plywood tongue for front hold-down. Rear attaches with single nylon bolt.



Photo shows rudder linkage and tail wheel detail. Note ball link is used on rudder horn for angled rudder.



Quickle, ready to take to the skies.

Wing and Canard:

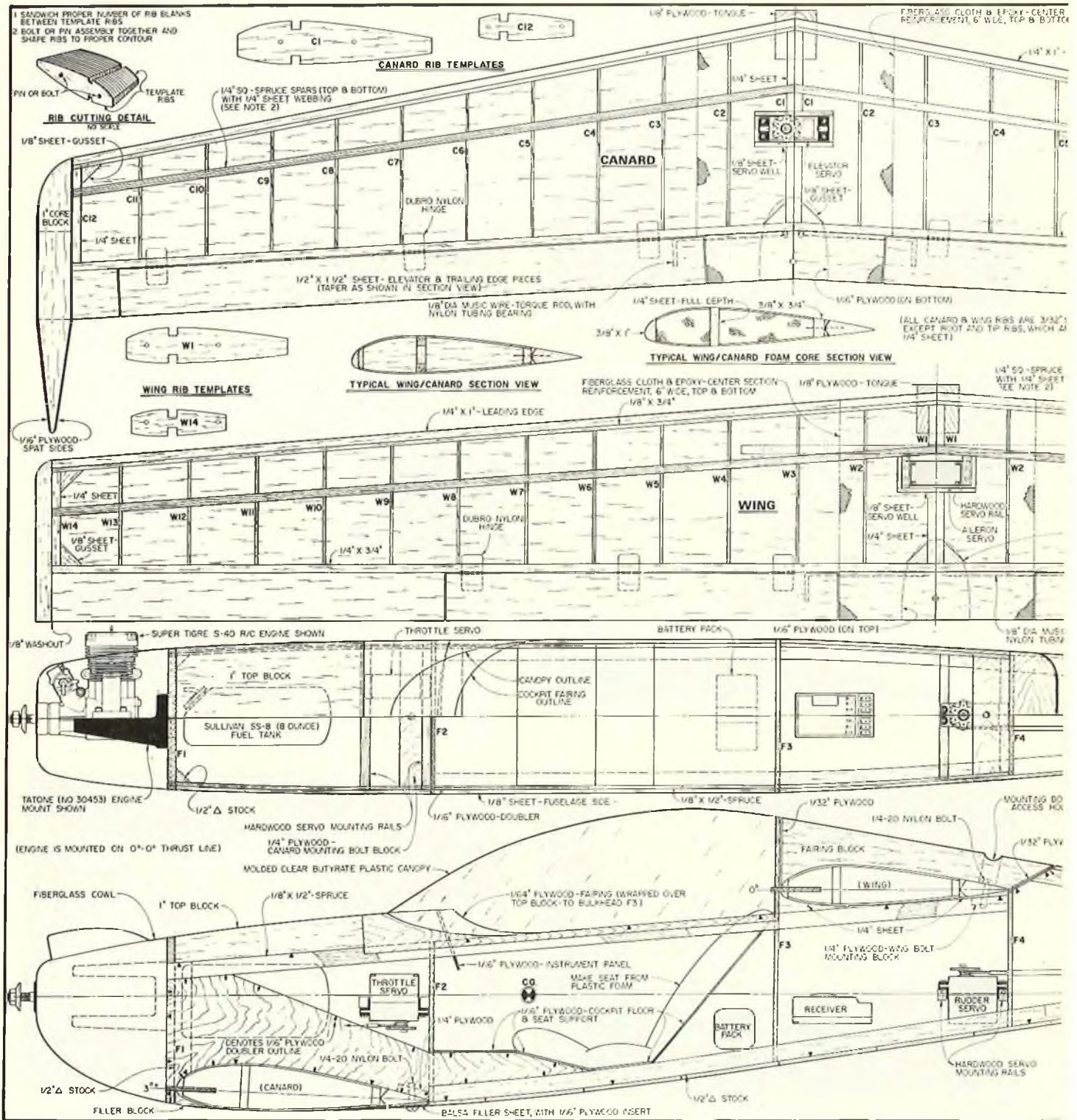
Begin by hot wire cutting the foam cores for canard, wing and fin, not forgetting the 1/8" washout at each wing tip. Glue on the 1/16" balsa sheeting, 1/4" leading and trailing edges and sand to correct airfoil sections. Sand the centre sections of the wing and canard to achieve correct dihedral and anhedral respectively. Cut a 6" long slot in each wing half for

the full depth 1/4" balsa spar and glue in this one piece spar as the two wing halves are epoxied together. Install ailerons, trailing edges, tips, servo box, wing tongue and centre section bandage. This completes the wing construction.

The canard must have a 1/4" strip removed from each half and this is best done by sliding them through a bandsaw with the panels supported in

the foam sleeves from which they were cut. Again, using these sleeves for support, glue in the 1/4" spar and sand flush with top and bottom surfaces. This spar adds great strength to the canard and should not be omitted.

The rest of the canard construction is similar to the wing apart from the wheels and wheel fairings. To construct these, sand the canard tips vertical, bend the two undercarriage



legs from 10 swg wire and bind and epoxy these to the small ply plates. Cut into the underside of each tip and remove sheeting and foam until the plates are a snug fit, then epoxy them in place filling between the plates and bottom with soft balsa. Note there is a 1/16" gap between the tip and the vertical portion of the undercarriage leg to allow later fitting of inner wheel fairing sides. Now permanently fit the wheels and check that they run true

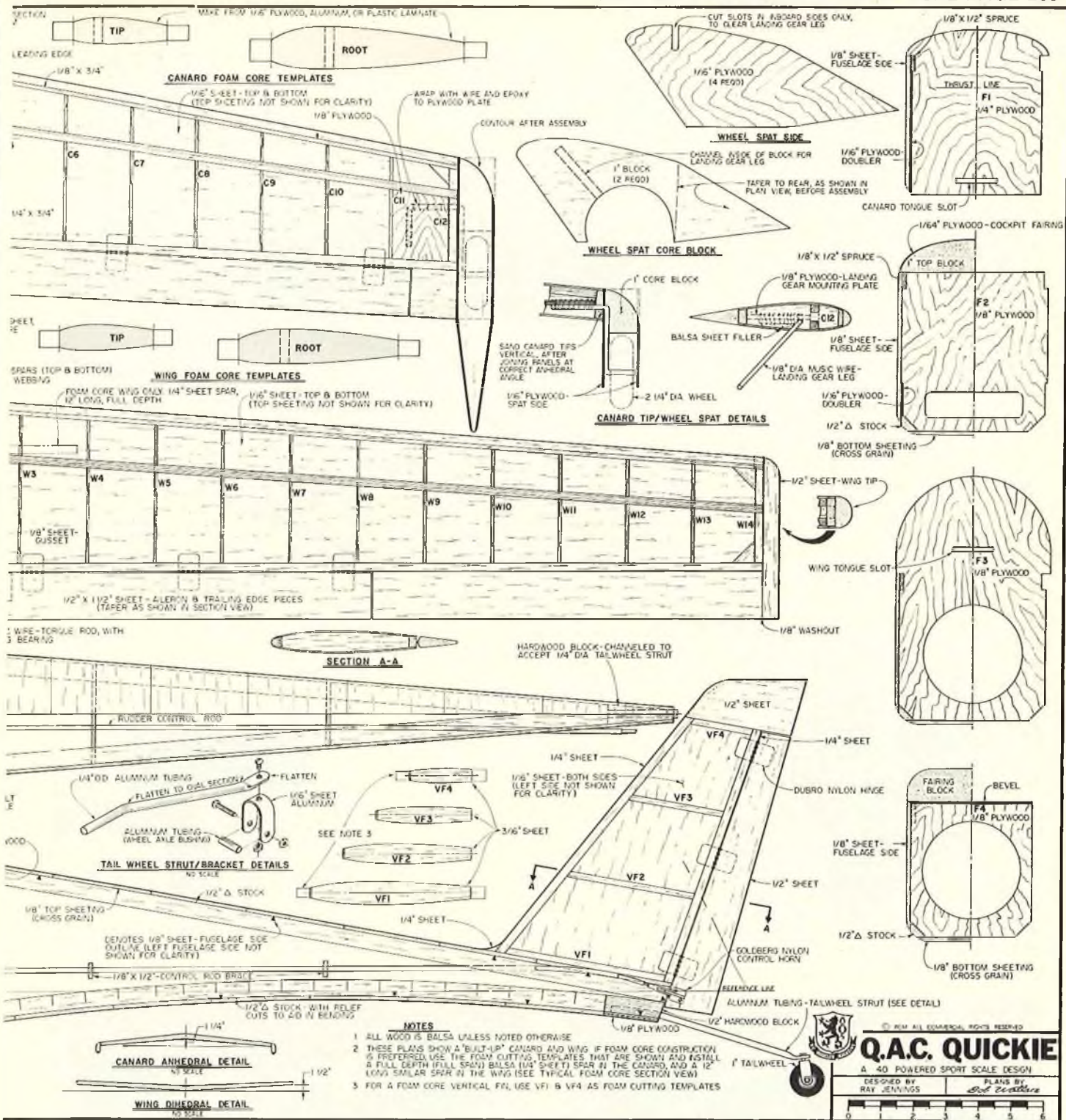
with no toe-out, toe-in or camber. Cut and glue the inner wheel fairing sides to the tips followed by the tapered 1" balsa core and, finally, the outer wheel fairing sides. Glue and clamp the sides to follow the core taper and when all is dry, carve and sand to shape. That completes construction of the canard.

Fuselage:

The fuselage has an unusual shape but is of conventional construction.

Splice together 1/8" balsa to obtain large enough sheets and cut to outline being especially careful to achieve correct wing and canard incidence angles. Attach the ply doublers, spruce longerons and triangular corners. Observe the age-old advice — you guessed it — make one right and one left side.

The two sides are then joined by F2 and F3, the rear fuselage pulled together and glued, followed by fitting



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Q.A.C. QUICKIE

A 40 POWERED SPORT SCALE DESIGN

DESIGNED BY RAY JENNINGS

PLANS BY Bob Weather

0 1 2 3 4 5 6

PLAN NO. 868

F4. Take care when attaching F1 to maintain the correct thrust line which is 0-0 (no down or side thrust). The top and bottom cross grain sheeting and front top decking complete the basic fuselage which can now be carved and sanded to a nice rounded shape. The piece of 1/64" ply around the cockpit gives a realistic scale thickness to this area. Wing and canard hold-down plates and fairings plus attachment of fin and rudder complete the structure.

A single nylon bolt is sufficient to attach each flying surface, yet will shear cleanly in the event of a crash without ripping the fuselage to pieces.

Canopy and Cowl:

Since there are no suitable commercial items available for these parts they will have to be custom made. The method for each is quite straightforward and has been detailed in this and other publications. A

fibreglass cowl is well-worth the additional work and gives lots of internal space and smooth cooling airflow in the engine compartment.

I made the small intake on top of the cowl from ABS plastic because I wanted to have a try at moulding this material. It could of course be made from fibreglass and attached to the cowl with small strips of resin and cloth. Canopy moulding is a

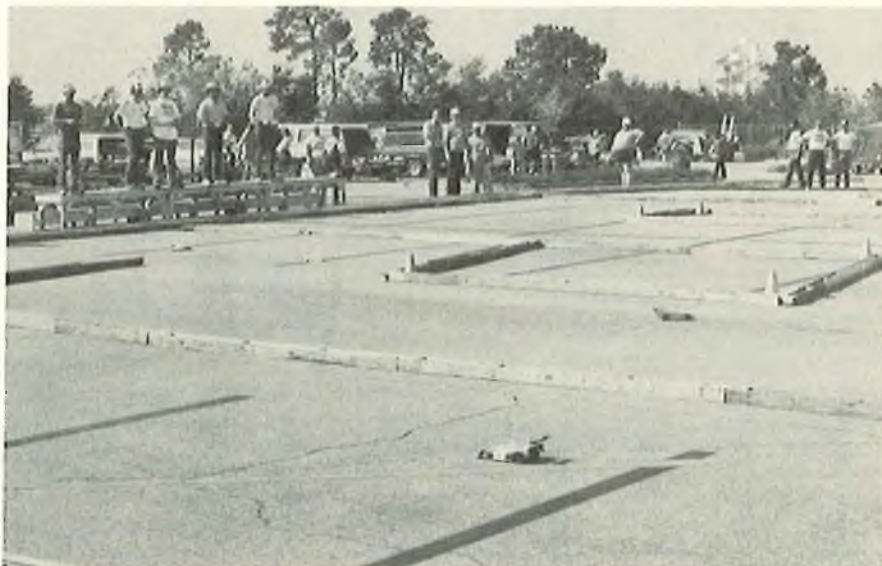
PIT STOP

Gene Husting



1/12 & 1/8 1982 FLORIDA WINTERNATIONALS

The Florida Winternationals started a few years ago, as a big weekend 1/8 gas race. It is now as long as the ROAR Nationals, but the Florida Winternationals now has more racers than the Nationals! Each year the popularity has grown, so that in 1982 there were 205 1/12 entries for two classes and 136 1/8 entries. Incredible! But the incredible part is the sponsoring club, the Central Florida R/C Auto Racers, whose members gave up vacation time to run this two week long event. The following people deserve a great deal of thanks from all the racers for staging one of the best races ever: Kim Davis, Angel Diaz, Milt McKinney, Bill Mikolaitis, Tim and Tim Jr.



The 1982 Florida Winternationals were held on the parking lot of Wet & Wild amusement center in Orlando. There were 205 — 1/12 entries and 136 — 1/8 entries.



Mike Lavacot added another big win to his long list, by winning the tough 1/12 electric Stock class.

O'Sullivan, Dana Roun, Rod Bauer, Doc Donhoff, Sylvia O'Sullivan, Linda Valyou and Patty Champion.

1/12 Stock Class

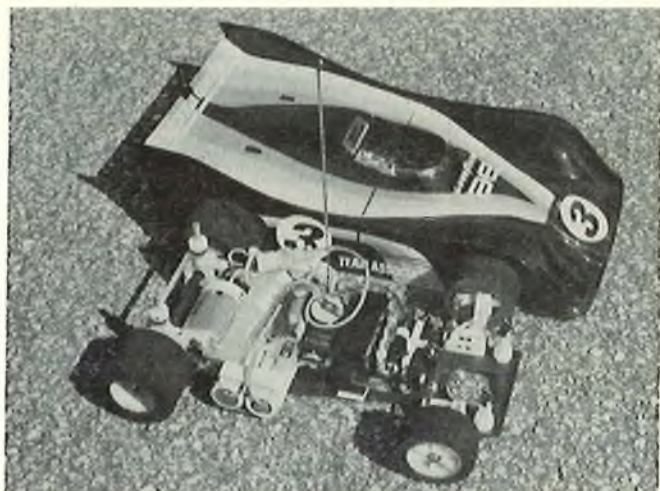
The track this year was moved to Wet & Wild in Orlando, Florida. Wet & Wild is an amusement center in Orlando featuring many different water slides and with the weather about 85° many days, Wet & Wild was packed with customers.

One of the reasons for the large number of entries was that this was the last qualifying for the 1/12 World's Championships in August, so everyone was really trying their best.

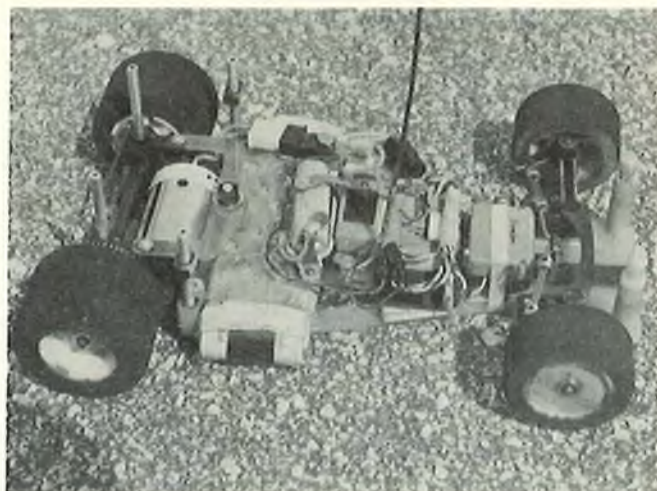
The track was on an overflow parking lot. The surface was asphalt



The best overall performance belonged to Jim Aguirre from San Francisco. Jim was Top Qualifier in the Stock Class and won the Modified Class.



Lavacot's car is based on the Associated RC12E chassis using Futaba receiver and servos. Mike used the Ligier Maserati body in Stock Class and this TOJ in Modified Class.



Aguirre's car is the new Associated RC12L car featuring Novak receiver and servos, Sanyo batteries and Reedy motor.

which was a few years old and was beginning to crack. The cracks didn't appear to have any bad effects on either the 1/12 or 1/8 cars. Doubled 2" x 4" wooden barriers were used for all inside and outside corners, so no corner cutting was possible.

The Stock Class cars, per ROAR rules, are allowed to have modified chassis, including ball bearings, but the motors must be absolutely stock. No modifications are allowed. The motors were marked, sealed, numbered and assigned to each racer by the race officials. The officials also checked the motors and weighed the cars before each heat.

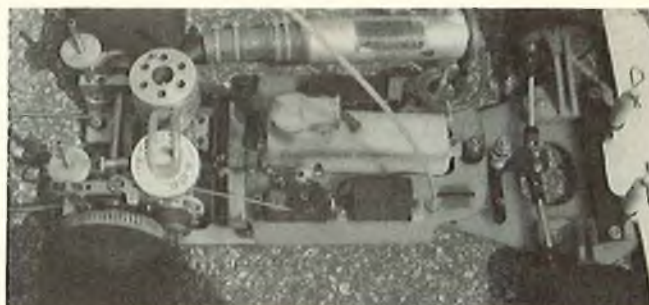
The first couple days were set up for open practice, then another day with controlled practice. No matter how hard we appeared to be trying to move



Bill Mikolaitis flags off the start of a race. Bill flagged all the races and helped to count laps.



One of the most enthusiastic group of racers were these racers from Venezuela. We also had participants from Canada and Germany.



Ralphie's Associated RC300BD car is built and tuned by his father, Ralph. The car features a K & B 3.5 engine built by Rich Lee with an OPS carb, and McCoy muffler. Associated's new plastic tank sits in the middle of the chassis with the Altronics radio on either side. A ball differential with dual disc brakes is also used.

those boards around with our cars, we couldn't do it. The boards always won. Sooner or later most of us realized this and started to drive better. Actually, the track was quite good and fast, but it was, as usual, drivers trying to go faster than their abilities.

Ten car qualifying heats were used, which made getting through the first corner rather difficult. Also, it seemed like no matter how many cars you passed, there was always another 1, 2 or 3 cars directly ahead to pass again. All qualifying and main events were eight minutes long exactly. A horn sounded at eight minutes, the cars stopped and their total laps and sections were recorded.

Three cars were racing it out for Top Qualifying honors. Actually everyone was trying, but these three were ahead of everyone else. Jimmy Welch, with his MRP car, was the early leader with 32 laps and 22 sections, closely followed by Re-Pete Fusco with 32.14. But in the final round, Jim Aguirre set the qualifying record with 32.23 for Top Qualifying honors.

The Stock Class "B" Main was dominated by Mike Toland. I was also in the "B" Main. I thought my stock motor was a little slow in qualifying, but I didn't know how slow it was until Mike jetted on by, lapping me at about six minutes, and I finished 3rd in the race. Mike easily won with Rich

Douglas about 1/2 a lap back in 2nd.

The Stock Class "A" Main was next, with the ten best drivers lined up and ready to go. The green flag was raised and Mike Lavacot made it through the first turn in 1st with Jimmy Welch, right behind in 2nd. The Top Qualifier, Jim Aguirre, made it as far as the first corner, where his motor lead wire came off. Most of the other eight cars got bumped around in the first corner, as Lavacot and Welch opened up a small lead over the rest of the pack. Farther back in the pack Kent Clausen was passing cars, and slowly closing in on the leaders. Lavacot opened up about a 30' lead over Welch and it just stayed that way.



Fastest of the fast, Kent Clausen was an easy Top Qualifier in the Modified Class.



In 1981 Ralphie Burch, Jr. qualified for the "A" Main in his 5th 1/8 race ever. In 1982 he dominated the event by taking Top Qualifying honors and winning the main event by three laps.



Arturo Carbonnel drove a super race, as usual, to take 2nd place with his prototype Delta Eagle independent suspension car. Delta's car does not require chain drive. A Picco motor is used with a Kraft radio.



Dana Smeltzer took a well-deserved 3rd place with his RC300BD, powered by a McCoy-K & B engine and Airtronics radio.



Chuck Phelps was the only one to come close to Ralphie in qualifying. Chuck's RC300BD used a K & B 3.5 engine by Rich Lee with a Kraft radio.



Rick Davis had his prototype Associated RC500 Independent suspension car running great in qualifying, but a homemade shock mount broke in the Main.

STOCK CLASS "A" MAIN				MODIFIED CLASS "A" MAIN			
Place	Name	Qual.	Car	Place	Name	Qual.	Car
1.	Mike Lavacot	32.4	Associated	1.	Jim Aguirre	33.10	Associated
2.	Jimmy Welch	32.22	MRP	2.	Rick Davis	32.68	Associated
3.	Kent Clausen	31.48	Associated	3.	Ron Schuur	32.60	Jo-Mac
4.	Arturo Carbonnel	32.6	Delta	4.	Kent Clausen	33.67	Associated
5.	Tim Morton	32.2	Bo-Link	5.	Arturo Carbonnel	33.02	Delta
6.	Allen Andrews	31.47	Jo-Mac	6.	Mike Queller	33.23	MRP
7.	Rick Davis	31.43	Associated	7.	Steve Koepp	33.19	Jo-Mac
8.	Bruce Hickman	32.1	Associated	8.	Mike Lavacot	33.29	Associated
9.	Jim Aguirre	TQ 32.23	Associated	9.	Gene Husting	33.02	Associated
10.	Re-Pete Fusco	32.14	Associated	10.	Rich Douglas	32.54	Associated

STOCK CLASS "B" MAIN			MODIFIED CLASS "B" MAIN			SUPER STOCK "A" MAIN		
Place	Name		Place	Name		Place	Name	
1.	Mike Toland		1.	Craig Kelly		1.	Bob Yelle	
2.	Rich Douglas		2.	Pete Fusco		2.	Butch Barry	
3.	Gene Husting		3.	Bruce Hickman		3.	Jim Baugh	
4.	Steve Koepp		4.	Tim Morton		4.	Dave Hechler	
5.	Pete Fusco		5.	Mike Toland		5.	Frank Vance	
6.	Jerry Brower		6.	Mike Hickman		6.	Phil Gring Jr.	
7.	Mike Queller		7.	Allen Andrews		7.	Arlynn Simon	
8.	Patrick Miller		8.	Mike Fromer		8.	Roby Keller	
9.	Mike Hickman		9.	Re-Pete Fusco				
10.	Mike Reedy		10.	Scott Ferguson				

CAN AM "A" MAIN					CAN AM OPEN "B" MAIN				
Place	Name	Main	Qual.	Car	Place	Name			
1.	Ralphie Burch Jr.	106.62	17.54	Associated	1.	Joe Sullivan			
2.	Arturo Carbonnel	103.63	16.87	Delta	2.	Earl Nestor			
3.	Dana Smeltzer	98.87	16.62	Associated	3.	Ray Hepner			
4.	Rich Lee	98.85	16.53	Associated	4.	Bill Gardner			
5.	Burnado Mauricio	97.05	16.54	Delta	5.	Rich Potempa			
6.	Curtis Husting	95.34	17.01	Associated	6.	Dan Dowdy			
7.	Re-Pete Fusco	85.58	16.34	Associated	7.	Tom Lause			
8.	Chuck Phelps	85.43	17.42	Associated	8.	Jerry Brower			
9.	Rick Davis	81.29	16.93	Associated	9.	Joe Tassillio III			
10.	Kim Davis	63.92	16.30	Associated	10.	Gene Husting			

If Lavacot made one mistake, Welch would take the lead. Or if Welch made one mistake, he would get passed by two or three other cars. But neither

driver was making any mistakes. The fastest car on the track was Kent Clausen as he moved from 8th spot to 3rd. Just when it looked like he

was ready to try for 2nd he'd hit a board and drop back. He did this three times, and finally ran out of time. to page 143



Joe Sullivan keeps getting better. He almost made the "A" Main and did win the "B" Main.



Bob Yelle, a top notch Super Stock driver from the Mid-West, totally dominated Super Stock Class, taking Top Qualifying honors and winning the Main event.



Concours honors went to Mike Saputo, from St. Louis, with this beautiful Ferrari coupe.

BIG IS BEAUTIFUL

Dick Phillips



I am not sure that they are really discoveries, but I have been using a couple of ideas lately that I thought I'd pass along in case they might be of use to you. One is the use of Hot Stuff and sanding dust (sawdust, I guess) as a filler. It works very well in filling little gaps and especially narrow gaps between the edges of sheeting. (I know, you shouldn't leave any, but some of us do!) Filling the gap with sanding waste and then sort of tamping it in with a knife blade works wonders in both filling the gap and in adding strength to where the gap used to be. Once the gap is filled, just add a few drops of one of the cyanoacrylates and — wow, instant wood. Be careful you don't go overboard by adding too much sanding dust since the resultant filler is very hard and takes a while to sand back down to the proper level again. It is very strong, however, and takes a really smooth finish, once sanded. Works great.

The other little stunt involves pinning spruce (and the other softwoods we are using) down on a plan. If you have tried driving pins through spruce, you'll know what I mean. It takes a half dozen pins to get one driven all the way through a piece of quarter inch stock and into the building board. The first five or so bend at the tap of even the light hammer I use and they have to be discarded. I decided there had to be a better way and it works like this. You take a short piece of the smallest brass tubing you have into which a pin will fit. Then cut the tubing off so that it is shorter than the pin by a little more



than the thickness of the spruce you have to pin down. Put the pin through the tubing and drive it into the spruce. You'll find it will go right through the spruce and just into the building board without bending. Then remove the pin, take off the tubing and re-set the pin in the same hole. It's a bit time consuming, but so is trying to drive five or six pins through the same hole and throwing them away until you

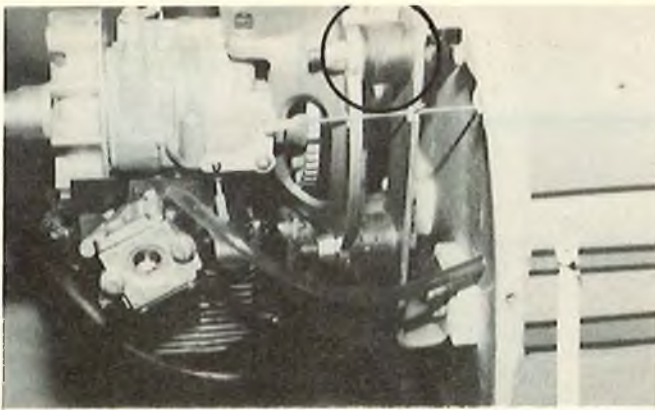
eventually get one to go all the way through. I have a light riveting hammer I use for driving these pins and, although it is pretty light, it still gets the pins where I want them. Much easier than trying to drive the pins through the spruce while holding them in your bare fingers. That can lead to very sore fingers and the brass tube, used as above, does prevent some of the potential damage to the pinkies.



Interesting treatment of unusual subject. Breezy was built by Charlie Simmons of Birmingham, Alabama. Breezy has been used to raise money for a number of local charities, including Muscular Dystrophy and a deaf and blind school. Pretty lady is builder's daughter, Pam Simmons.



Breezy airborne. Power is 1.6 Homelite engine, construction is spruce, bass and plywood with some sheet aluminum as well. Weight is 27.2 pounds. Pilot and passenger are hand carved Popeye and Olive Oyl.



Lord Mount (circled) aids in insulating vibration from airframe and radio. Engine thus mounted is isolated from fuselage except through rubber of Lord Mount.



Big P-51 is the work of Michael De Muth of Ellicott City, Maryland. Mustang was begun in 1980, and the builder says he got carried away and has been adding features almost ever since. Mustang has functionally sprung gear, working trim tabs, 28/15 flying prop and all gear doors are operated from separate system to retract gear. Hopes to fly this year. Some task for a beginner!

We have a couple of items to cover in our dissertation on converting a large kit or plan to properly use the gasoline engines currently available. One of these is the engines and their mounting, and the other, control hook-ups.

Among the engines available to us, the Kioritz and the Kawasaki are both of very high quality. It has been said, and with some justification, a modeler would be hard put to wear one of these engines out in normal modeling use. They are well-built of excellent design and should last a veritable lifetime, operated properly. The Kawasaki comes in a couple of sizes (as this is written) and one or the other of the two would power any reasonably built model you might care to build. The larger of the two produces startling power and you would be hard put to exceed its capabilities in a model.

Kioritz has a wide range of sizes available, right up to nine horsepower and, again, you'd have to try very hard to exceed the capacity of the largest of them. The smaller Kioritz, marketed under the name Mag-Aero, is about 1.25 c.i. and is as well-made as its larger brothers. It has a couple of disadvantages which could be a problem in some installations but, in the proper place, it has the ability to bridge the gap between the large glow engines of .80 and .90 size and the 2 c.i. gas engines. It's a bit heavy for its size, is fairly long at 7" from mounting plate to prop hub, although Roush Manufacturing now make a mount for it that shortens it up by an inch. (Be careful, by the way, of buying small industrial engines to convert for your own use. There is a leaf blower that uses the same engine as the Mag-Aero, but it runs in the wrong direction and is difficult to change to our use.)

The Large Roper engine of 3.7 c.i. displacement, has been a bit of a problem to some who have them in that it is difficult to get it to run at its

rated power. Dario Brisighella published a couple of fixes here in the March '81 RCM some time back which will make the engine run better, and I understand Gene Horner of Horner Sales will do the fix for a modest sum. Dario's opinion of the engine is that it has more potential than any other on the market at this time. Whether that potential will be realized or not is up in the air at this time.

Roush Manufacturing's New Titan engine (German made) is a real brute. It puts out 6 h.p. according to the supplier and, in operation, it certainly looks like 6 h.p. and more. The one we have here has been tied down to a concrete base at our field and looked as if it were going to try to fly the concrete! The engine is an easy hand starter (unusual in one so large) and runs like the proverbial Swiss watch. At a price which is crowding \$300, it is a bit expensive, but it certainly seems to have the potential to drive a large model of a WW II fighter as is claimed by the supplier. The one we have has not yet been flown, only bench run, and I'll have more to say on it after it has been in the air for awhile.

Last, but by no means least, is the Quadra. Having been the first large engine available, the Quadra engine has probably powered more large models than all the others put together with close to 20,000 engines having been sold in the model configuration. Quadra has recently replaced the wrist pin/con-rod bushing with a roller bearing and has upped the rpm's by 150 to 200, and more importantly, gotten around the seizing up of that critical connection. (It is well to note that much of this seizing was caused by running the engine with exotic oils or running it with too thin an oil mix. This was especially dangerous if done early in the engine's life. As I've suggested before, stick with the manufacturer's recommendations on gas/oil mix and you won't go wrong.)

The Quadra is still about the best buy around. Its original price of around \$100 is as good as you'll find and it will fly almost anything up to 20 to 24 pounds. Bob Nelitz's 1/3 Scale J-3 Cub weighs 30 pounds and it flies extremely realistically on a Quadra and that type of airplane could weigh significantly more than 24 pounds and still fly well. Don't, however, expect a 30 pound P-51 to do the same on the engine!

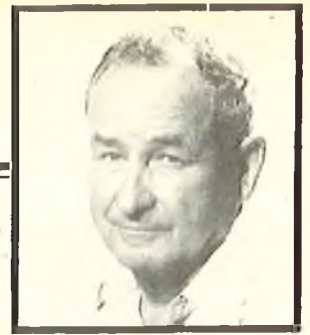
Quadra's new engine, to be on the market in the spring of 1982 will be 50 cc in displacement as compared to the old Quadra 35 cc. It has been designed from the ground up as a model engine and from what little I have seen to date, will likely be a much better quality engine than its predecessor. Another plus designed into the engine is its ability to replace the existing Quadra with little or no alteration to the mounting being required. Good news for those who have Quadra powered airframes which have proven to be marginal in the air. The new engine will provide over 40% more displacement than the older engine and the performance should be quite spectacular. No price has been announced as this is written, but you can count on it being more costly than the old engine. (These days, what isn't?) I have placed an order for one of the new engines but have heard no word on it in the past couple of months, which doesn't say much for TML's response to inquiries. I'd suggest just keeping your eyes and ears open for news of the engine when it is announced and go from there.

Quadra has announced that they have appointed Klaus Nowak of Cosmocon Ltd., as their export manager, but that won't affect Canada and the U.S. Domestic sales in Canada and export sales to the United States will still be handled directly by TML and Dario Brisighella's US Quadra respectively.

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SOARING

Al Doig



This month I'm going to tippy-toe into the never-never land of electronic powered sailplanes. My interest is restricted to the use of electric power to launch a sailplane into a thermal soaring mode. I'll leave the rest of the electric power airplanes to Jim Zarembski and his "Silent Power" column.

I've been flying an electric powered Olympic 650 for some time. This ship is featured in the "RCM Sailplane and Soaring Manual." The ship is now kitted by Airtronics and is a fine vehicle for electric power. The 650 is fitted with a standard Astro Flight 05 motor. There are now a number of more powerful 05's available from Astro Flight, Leisure Electronics, and others. My motor, however, has been quite satisfactory for the sport flying I do with this ship. It doesn't go up like a rocket, but it gets higher than winch launch, and even at 10 oz./sq. ft, it thermals very well, even with the prop windmilling on the front. I can now run down to the local park in the evening and get in a flight or two, or fly out of a local parking lot. It is handy at the club flying field when nobody shows up with a winch — or the line at the winch is long. Or --- if you are mixed in with power fliers, you are somewhat more popular if you don't have to lay out a hi-start — but not much. Anyway — this kind of sport flying is a kind of fun thing. One of the fellows in our club has a Gentle

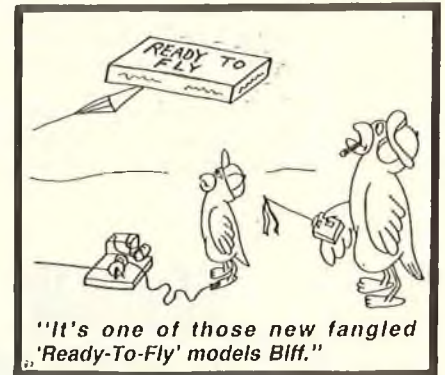
Lady with an electric pod strapped to the wing and removable batteries. He can thus convert from electric to pure glider in a matter of minutes.

However, there's a whole other world out there. I discovered that other world when I traveled to Leisure Electronics' 1st Annual "Grand Championship." The thing that drew my attention to this contest was the first prize of \$1000. Other awards were \$100 each for Best Direct Drive Plane, Best Geared Prop Plane, and Best Old Timer Design. I decided that a kilobuck would bring them out of the woodwork, and I'd see the pick of the litter.

The contest was a near standard thermal event; except for the electric power launch. Two rounds of 7 minutes precision, with a 1½ minute motor run, were flown to eliminate all but 24 contestants. The third round narrowed the field to 6 who flew the last round for unlimited duration. The last man down won the thou. All flights were flown man-on-man. I'm not going to concentrate on the contest aspects of the meet, others will no doubt give you the "blow by blow." I'd like to share some thoughts on the implications of this developing technology.

First, the contest was held near Disneyland, in Anaheim, California. Although there are probably more glider fliers per square foot in the Greater Los Angeles Area than anywhere else, only 46 contestants

OZZIE & BIFF by Gene Stottrup



punched the clock. With all that bait, I thought more would appear. I guess that's all the electric glider pilots in the area — except those who, like me, thought their equipment was not competitive.

Aside from the Old Timers, the planes were configurations you would see at any thermal contest. Many were standard designs, fitted with electric motors. Almost all props were mounted in the nose. One had a retractable pod. Most fliers I talked to had gone for the lowest wing loading they could get. However, the highest performance was achieved with a 10 oz. wing loading. The motors were required to be either a Leisure, or Astro Flight stock 05 with Leisure or Astro Flight batteries.

Performance ranged from worse than my Oly 650 to spectacular. The



Northwest Soaring Society Season Champion Guy Russo, Coeur D'Alene, Idaho, flying a Camano. Roy Anderson Photo.



Northwest Soaring Society (NWSS) 1981 Tournament Winners. 1. Guy Russo, Coeur D'Alene, Idaho. 2. Bob Nelson, Aloha, Oregon. 3. Tom Neilson, Gladstone, Oregon. 4. Bob Dodgson, Camano Island, Washington. 5. Jack Pitcher, Portland, Oregon. Roy Anderson Photo.

first day's flying was dominated by Ken Banks from Ridgecrest, California. Ken was flying a 2-Meter thermal ship the "Ocotillo 2000," with a Leisure 05 motor. The key to his success was a 5:1 gear box and a 14" folding propeller. The Ocotillo went up as on rails at about a thousand feet a minute. At the end of the motor run, it was just a speck in the sky. It would have taken 7 minutes to fall from that height. At the end of the day's flying, there was a rush to a particular hobby shop for 5:1 gear boxes and folding props. They quickly sold out. Did Ken win, with all that performance? No, he was aced out on landing points. So, as we all know, there's more to winning than pure aircraft performance.

So, what's going to happen? I'll go out and get a Leisure motor and a 5:1 gear box and a folding prop. The next contest I'll go nearly out of sight. But Ken, or somebody who is really into electric will have found a super hot 05 motor made in Havana; researched the perfect prop; found that a 7.2:1 gear box provides the most efficient ratio (as calculated on his TRS 80 computer); and he goes so high it takes him 30 minutes to fall. Then they will have to change the rules, limiting the motor run to 30 seconds. Now the guy



Grand Electric Sailplane Contest simultaneous man-on-man launch.

with an old Astro Flight motor and a plastic prop gets about 22' altitude on launch so he drops out because he can't stand the tariff to keep up. It's like Formula 1; you get into a horsepower race and it takes affluence to keep competitive, especially in a developing technology like electric power. Development of stable rules and tasks will be a real problem for some time. Once you start making

rules, however, it's hard to stop. I don't know how the FAI rules for Electroflight Models (F3E) are working in Europe, but they certainly are simple: The maximum surface is 2325 sq. in., the maximum weight is 11 pounds, wing loading must be between 3.93 and 24.59 oz. per sq. ft. The propulsion is effected by fixed or foldable propeller(s), driven by an electric motor which can be regulated



Highest performer at Grand Meet — Ken Banks, Ridgecrest, California and his Ocotillo. Look at that prop!



1980 NATS winner John Brown with his Electrolite, Midnight Models Design. Grand Electric Contest.



Steve Neu, San Diego with his Ohming Pigeon, a Ken Banks design. Grand Electric Meet.



U.S. 1980 FAI team member Don Edberg with his Buteo. Grand Contest.



Mike Reagan, San Fernando Valley Flyers with super light entry — 100" Mirage Wing, designed for hand launch.



Mike Reagan ready to launch Alex Bower's low wing sailplane at Grand Electric Meet. Both belong to San Fernando Valley Flyers club.

in flight. Full Stop! Once you start describing the electric motor, or batteries, or, or, . . . you're in trouble.

Anyway, electric sailplanes are like non-powered sailplanes — sort of. But there are differences which, I think, will demand an entirely different type of task, perhaps like F3E. However, electric sailplanes are fun, albeit more expensive. In their simplest form they offer at least a change of pace and a chance to fly without setting up a winch, or hi-start. Try an electric in your Gentle Lady, or Oly 650, or whatever; you might get hooked.

★ ★ ★

Just got a flyer from another source of Hi-Starts and winch line. RLF Products, R 3 Box 178, Paoli, Indiana, 47454, will send their price list, on request. Their heavy duty replacement Hi-Start tubing seems fairly priced. They also have a range of braided nylon winch line in 2000 ft. rolls in strengths from 93 to 180 pound test.

★ ★ ★



Dave Katagiri, Seattle, Washington, and his entry, Grand Electric Contest.

Also received a news release from the League of Silent Flight which I am happy to share with you.

What is the League of Silent Flight? Many of us have a tendency to take it for granted that everybody knows — when, in fact, a large number of glider guiders, (or missile minders, if you are into F3B, FAI) as well as almost all beginners know nothing of the LSF. Many times a new club member at the flying field will ask, "What does that pretty insignia on your wing stand for?" It stands for having achieved membership in the largest model soaring organization in the world with over 4500 members. Membership in the LSF must be earned, it cannot be purchased with a check. There are no dues. To become a member, certain basic tasks must be performed and witnessed. Upon completion of the basic tasks the new member is given a number which is his/hers forever. As the pilot becomes more proficient, higher levels of accomplishment are attained until the zenith of Level V is

reached.

Of the over 4500 who have achieved Level I, there are but 21 who have reached Level V. The LSF is not just for the contest buff but for all R/C soaring enthusiasts who enjoy that warm feeling that comes with accomplishment.

Interested in learning more about the LSF? Then send \$1.00 with your request for an aspirant form to the following address: League of Silent Flight, P.O. Box 39068, Chicago, Illinois 60639.

To which I say Amen. The LSF is a most worthwhile organization and it is a real challenge to progress up through the various levels. Personally, I'm stuck on Level IV. I have everything complete except the cross country and can't seem to get an adequate chase vehicle, thermals, and myself all together at the same time and place.

For those who are already members, the league has decals available for
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Col. Thacker inspects Larry Jolly's Charging Station at Grand Electric Contest. Note: Gas driven generator, battery, and two digital chargers — a system for the complete modeler.



Dennis Brandt with 85" Electrolite, Grand Contest.

RCM PRODUCT REVIEW

Jet Hangar Hobbies
F9F-8 COUGAR

SPECIFICATIONS

Name	GRUMMAN F9F-8 COUGAR
Aircraft Type	Stand-Off or Sport Scale
Manufactured By	Jet Hangar Hobbies, Inc. 12554 Centralia Rd. Lakewood, California 90715
Mfg. Suggested Retail Price	\$169.95
Available From	Both Mfg. & Retail
Wingspan	47 Inches
Wing Chord	13" Avg.
Total Wing Area	755 Square Inches
Fuselage Length	56 Inches
Stabilizer Span	18½ Inches
Total Stab Area	109 Square Inches
Mfg. Rec. Engine Range	K & B 7.5 Ducted Fan #9100
Recommended Fuel Tank Size	(2) 8 Oz.
Recommended No. of Channels	5-8 (can be flown w/5)
Rec. Control Functions	Rud., Elev., Throt., Ail. Flaps, Retract Gear, (opt. dive brakes, cycling gear doors)
Basic Materials Used In Construction:	
Fuselage	Fiberglass & Ply
Wing	Balsa
Tail Surfaces	Balsa
Building Instructions on Plan Sheets	Yes
Instruction Manual	Yes (63 pages)
Construction Photos	Yes

RCM PROTOTYPE

Radio Used	Ace R/C 7 ch.
Engine Make & Displacement	K & B 7.5
Tank Size Used	(2) 8 Oz. Sullivan
Weight, Ready to Fly	152 Oz. w/fuel
Wing Loading	29 Oz./Sq. Ft.

SUMMARY

WE LIKED THE:

Detailed plans, instructions, and quality of decals.

WE DIDN'T LIKE THE:

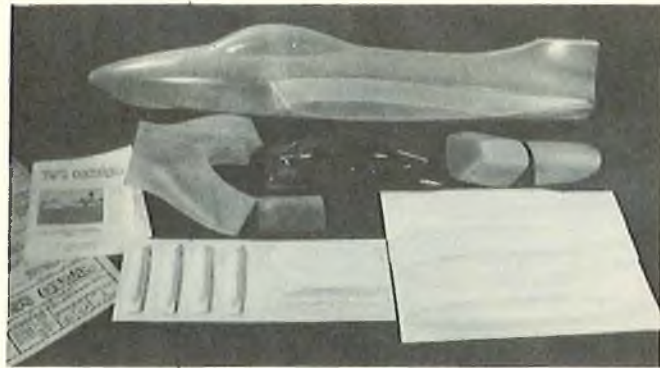
While not a fault of the kit, an understanding of the present ducted fan technology is beneficial.

Both wing panels were constructed at the same time. The wings were, as were the stabilizer and dorsal, built-up by conventional methods. After the wing tips are glued in place the panels are sanded smooth. The wing panels are constructed such that the ailerons and flaps are all one part with the main wing. Once the wing is totally sanded, the ailerons and flaps are cut away, leaving a perfect matched set for each panel.

After separating the ailerons/flap sections, their leading edges are rounded and fitted into a unique trailing edge on each panel. This trailing edge gives the Cougar hidden hinge lines which greatly adds to the overall scale fidelity of the F9F-8. This hidden hinge line technique can be used, at the builders option, on the elevators and the rudder.

With the completion of the wing and dorsal sections we were ready to begin the assembly of the fuselage. We first cut out the hatch that runs along the top of the molded fuselage. Molded in the fuselage are ten raised etches that outline this area. Masking tape is run in straight lines

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We began to realize that we had something special from the moment we opened the box that contains the F9F-8 Cougar from Jet Hangar Hobbies. The 50" x 13" x 15" box opens to reveal a well-protected epoxy glass fuselage, molded air intake ducting, clear plastic canopy, rolled full size plans and an illustrated construction manual. The package also contains a full set of decals as well as the necessary parts for drop tanks and rockets.

Construction:

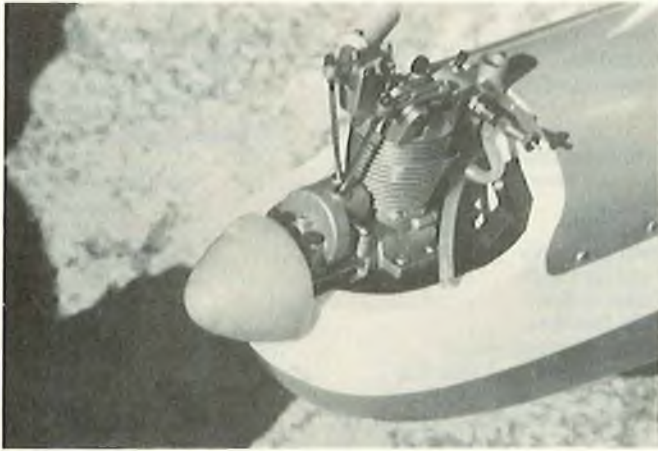
The plans consist of five rolled sheets, each 36" x 36", and a 63 page construction manual with over 120 photographs. Weight saving measures are emphasized throughout the construction manual and every area of possible weight reduction should be taken advantage of.

Before any actual construction was started, all templates were cut out and applied to the balsa and plywoods with a light coat of spray adhesive. We would suggest that all parts be cut oversize and final sanded individually for a tight fit.

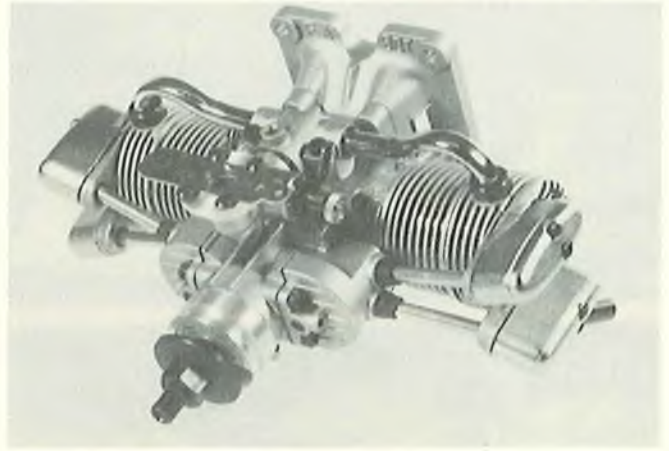
We then started construction on the stabilizer/elevator because this must be finished before the vertical fin and rudder can be attached to the dorsal assembly.

ENGINE CLINIC

Clarence Lee



Saito FA-30 four stroke.



Saito FA-80 four stroke twin.

Imagine most of you who read Engine Clinic regularly noticed the picture of the Saito FA-80 four stroke twin engine being held by a very pretty girl in the February issue. "Sneaky" Dick Tichenor — RCM's Assistant Editor and chief picture taker had just acquired the Saito twin for a building project and slipped a picture of his latest pride and joy (the motor — not the girl) into Engine Clinic. Some of you may have wondered why there was no mention of the engine in the text. I did not know about the picture being run until after turning in the column.

After Dick got through drooling over his new engine he forwarded it on to me for inspection. The Saito line of engines being imported and sold by Hobby Shack are also available in your local hobby shop for viewing, however few people really know about this fine line of engines.

A little over a year ago Paul Bender of Hobby Shack sent one of the then new Saito FA-30 single cylinder four stroke engines to RCM for product inspection. The engine was, in turn, forwarded to me. I was quite impressed with the quality of workmanship and overall design of the engine. I fired it up on the bench and found it started easily and ran quite well. The idle was very good also. About the only complaint I could find was that the needle setting was a little touchy but nothing to cause any real problem. I always intended to do a little "bit" on the engine in Engine Clinic but other priorities kept coming along and I never did get to it. Having just inspected Dick Tichenor's Saito FA-80 twin I think many of you would

be interested in knowing a little bit more about this line of Japanese imports.

My first exposure to the Saito line of engines was the FA-30. To my knowledge the Saito FA-30 is the smallest displacement four stroke engine available to the modeling public. The FA-30 was followed shortly by the slightly larger FA-40; the latest offering now being the FA-80 twin composed of two FA-40 cylinder assemblies. This new twin is unique in several ways. The FA-40 and the FA-80 twin Saito four stroke engines utilize an AAC piston / cylinder. This means that the engines use a high silicon aluminum piston running in an aluminum cylinder that has been chrome plated. A separate liner or sleeve is not used. The piston runs directly in the cylinder. Several of the Japanese engine manufacturers have gone to the aluminum piston and chrome plated aluminum sleeve or cylinder. Evidently they have solved the problem of getting chrome to adhere to aluminum cylinders without peeling or flaking. This has been a problem in the past due to expansion and contraction of the sleeve or cylinder causing the chrome (with a different expansion rate) to crack and peel off the wall.

I did considerable experimentation with different chroming methods on aluminum many years ago and finally gave up the idea. Evidently the Japanese have now solved some of the earlier problems encountered. Four stroke engines run considerably cooler and at lower rpm which helps considerably also. The use of an

aluminum liner or cylinder would more closely match the expansion rate of the aluminum piston helping to keep a good compression seal hot or cold. The weight of the engine would also be less than with a steel or brass sleeve. I, personally, would prefer a separate liner or sleeve rather than running the piston in the cylinder. When the engine shows wear, you have to replace a complete cylinder which would be more expensive than a separate drop in sleeve. However, for heat transfer and ease of manufacturing, the plain cylinder without a liner does have an advantage.

All twin cylinder engines I have seen in the past had a double throw crankshaft. This was necessary in a two stroke twin so that both pistons would be at top center or bottom center at the same time. This, in turn, was necessary to provide pumping pressure to transfer the fuel from the crankcase to the combustion chamber. This also meant off-setting the cylinders or using off-set rods. The Saito is unique in that it uses a single crank throw crankshaft the same as in a single cylinder engine. This could only be done with a four stroke engine due to no crankcase pressure being required. One cylinder uses a conventional connecting rod and the other cylinder uses a connecting rod with a "U" shape big end. The end of the opposing rod slips into the "U" of the other rod. The length of the crank pin is naturally somewhat longer so that both rods have adequate bearing area. By using a single throw crankshaft a very unusual firing order results. One cylinder fires — the

crankshaft rotates 180° and the other cylinder fires — then the engine rotates a turn and a half (540°) and the sequence starts again. So you have a bang, bang, then the engine turns a turn and a half and another double firing sequence. This gives the engine a sound different than other four stroke engines that only fire every other revolution. You actually have two firing impulses during the two revolution four stroke cycle. However, the engine still does not sound like a two stroke engine due to the firing impulses being 180° rather than 360° apart. By using a single throw crankshaft the engine is simpler to make and has less complicated parts. The disadvantage is slightly more vibration than an opposed firing engine; however, vibration level is still very low.

Another unusual feature of the FA-80 is a small vane type pump built into the back cover. This is used to lubricate the internal moving parts of the engine. Most four stroke engines have a crankcase vent to allow oil that accumulates in the crankcase to be vented to the outside. Saito instead places a vent under the front bearing and uses the small vane pump to force the oil that collects in the crankcase back through the engine and out the front vent. At least I think this is the intention, having never seen this done before. Quoting from the instruction sheet that accompanies the engine — "To maintain a positive crankcase pressure, and eliminate harmful blowby gasses, and to ensure complete and smooth lubrication throughout the engine, and protect from inside rust, a vane type air pump is employed (Patent applied for)."

The manufacturer recommends using standard glow fuel with a nitro content between 5%-15%. Normally most four stroke engines operate best on lower oil content fuel than two stroke engines. I have found 15% to work very well. More than this and excess accumulates in the crankcase and you can experience erratic operation. I imagine the Saito twin with the air pump would not have this problem. However, lower oil content fuels could still be used successfully.

The manufacturer claims the engine will turn a 14/6 Top Flite propeller at approximately 8,500. Our brief bench check confirmed this figure. In fact, with 15% nitro fuel the engine was turning 8,500 still set quite rich. I did not want to peak it out without a proper break-in which would take a couple of hours of running. When fully broken-in the engine should easily exceed the 8,500 rpm figure which power-wise puts it in the same class as a good two stroke single cylinder .60. Most of your

unpipied .60's turn a 14/6 in the 8,000-9,000 rpm range. So this engine would be ideal for a .60 size scale aircraft. Whereas your two stroke .60 is working itself to death turning a 14/6, a four stroke is just coasting along, so to speak. A four stroke engine is quite happy turning a big prop at low rpm. A two stroke, however, performs better with a smaller prop at higher rpm. It is not a good idea to load a two stroke engine down much below 10,000 with 11,000 being a safer figure. If you do, the operating temperature skyrockets. Needless to say, loading a two stroke .60 down with a 14/6 prop and enclosing it in a scale type cowling — usually without adequate cooling — makes for a very short lived engine and, more often than not, quite a few dead stick landings right after takeoff. A lot of grown men have been known to shed a tear when the effort of many months or years is reduced to kit form when the engine freezes up on takeoff. Your four stroke engines have a big advantage in this department — providing, of course, the design calls for a slow moving aircraft swinging a

Both the Saito FA-30 and FA-80 are beautifully made.

large prop at lower rpm. A four stroke engine would not exactly be the way to go with a high performance type aircraft such as a P-51 where higher air speed is required.

The engine idles down very well and recovers after a prolonged idle with a minimum of hesitation. At one time I had the engine idling smoothly at 1,800 but did have to keep the batteries on the glow plugs to keep it from dying on acceleration. Safe idle speed without battery assist was 2,500-2,600 rpm — this with the 14/6 prop.

Both the Saito FA-30 and FA-80 are beautifully made. I have not had a FA-40 for examination but would assume the FA-40 shares the same quality of workmanship.

I believe that about covers the Saitos. If any of you are considering purchasing a four stroke engine you might consider one of the Saito line. The quality and workmanship is far above average and the prices lower than many competing four stroke engines.

Dear Mr. Lee,

I have an O.S. .61 FSR with a Mac pipe and a Perry pump on it. I use K & B 500 fuel and Fox long plugs. The engine has the original O.S. 7D carburetor with the larger I.D. venturi insert installed.

With a Zinger 11/7.5 prop, the engine runs good at full throttle (approx. 13,000 rpm) but when the throttle is brought back to half power, the engine runs very erratically and seems to be too lean. Idle is good. If I try to increase the pump pressure to correct the mid range problem, then the engine stumbles when the throttle is moved rapidly from idle to full. The idle adjustment on the carb is set to a neutral setting between rich and lean. This adjustment doesn't affect the mid range problem.

One problem that I do detect is that air bubbles are present in the fuel line during throttle changes and they originate at the pump. Is this my main problem? Is the pump defective?

Any answers you may give will be helpful.

Thank you,
Pat Hall

Miami Beach, Florida

A few air bubbles in the line between the pump and carburetor are perfectly normal. These come from air trapped in the pump diaphragm chamber. If every time you started the engine you picked your aircraft up and held it nose down the trapped air would be bled from the pump. Normally, this will occur after a few minutes of running in the air and is no cause for concern. If a steady stream of bubbles persist then there is a leak somewhere in the pump, the fuel line leading to the tank, or your fuel is foaming from vibration. You can check the pump for leaks by plugging the outlet side and blowing through the inlet side with the pump submerged in water. If there is a leak in the diaphragm or where the threaded portion of the pump screws into the backplate part it will show. The Perry pump was intended to be used in conjunction with the Perry pump carburetor. The Perry pump carburetor has a fuel reservoir so that even though there are bubbles in the fuel line, these dissipate in the reservoir before entering the spray bar. The Perry pump carburetor is also calibrated to compensate for a slight richening through the mid range. If you use another make of carburetor with the Perry pump then you can expect some mid range problems.

Some hesitation on acceleration is normal with an engine using a muffler or tuned pipe. In the days prior to mufflers and tuned pipes being in common use, engines came with an exhaust baffle to keep the glow plug

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hot. This improved the idle and acceleration considerably. When the baffle was removed from the engines in order to use a muffler, the acceleration problems began. The muffler does help keep the plug warm due to back pressure but not near as much as the old exhaust baffle did. The same thing pertains to a tuned pipe. You also have the added problem with a tuned pipe of mixture change as the pipe starts to work. This usually does not occur until closer to full throttle but still has an effect in the lower rpm ranges when the pipe is starting to draw the exhaust gasses from the engine and, in turn, push them back.

A lot of fellows spend half their day trying to get perfectly linear throttle response. This is pretty hard to do with a two stroke engine — and especially when using a tuned pipe. Some times you have to settle for a little stumble or hesitation through the mid range. Some engine / carburetor / fuel combinations having more of a tendency to do this than others. In your case — I believe that if you increase the pump pressure just enough to overcome the mid range leanness and then set the idle mixture a hair leaner, you will get rid of most of your problem. Make sure, however, that there is no leak in the fuel line

causing the air bubbles you see and that your fuel is not foaming. Your engine may pass through a vibration mode at mid range causing the fuel to foam, in turn, causing the leaning. You then have to overcompensate with pump pressure resulting in too rich of a mixture.

Hi Clarence,

Thanks for all your help in the past.

I have a RCM Trainer with a H.B. .60 and a Bootlegger with a Webra .61 rear exhaust.

What plug would you stick in the head in the summer? In winter? Should it have an idle bar or not? What is the difference between long reach plug and short reach? Pretty stupid ain't it. Actually, I got 2 dozen plugs last Christmas and never really thought about those little guys.

Thanks,

*Paul Maharis
Kew Gardens, New York*

There is no need whatsoever to change glow plugs for summer or winter flying. This would be carrying things to extreme. Humidity plays more of a factor than temperature. Use the same glow plug in the summer that you do in the winter. There are any number of good glow plugs on the market — and unfortunately some pretty bad ones. I like either the Fox

or K & B idle bar plug myself. You definitely want to use an idle bar plug in any engine you intend to idle.

Whether you use a long or short reach is determined by the thickness of the head. Most smaller displacement engines use short reach plugs and the larger displacement engines use long reach plugs. However, there are exceptions. It would not hurt to use a short reach plug in an engine intended for long reach but you would never want to use a long reach plug in an engine intended for short reach. The plug idle bar could hit the piston. If ever in doubt, remove the head and check to see how far the plug extends into the combustion chamber. The end of the glow plug threads should be flush with the combustion chamber. If any threads protrude you should use a short reach plug. Or if you have a lot of long reach plugs and the head indicates a short reach should be used, put an extra washer under the plug.

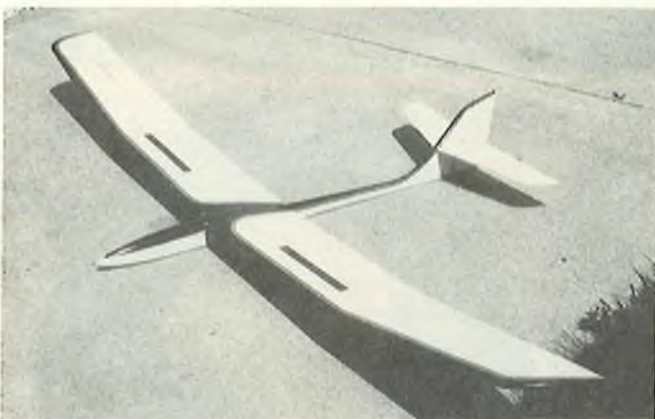
Dear Sir;

I own a HB .40 PDP engine that has about 100 hours on it. I have broken it in and ran it very conservatively, but the last few times out the first flight was great, but on the next few flights the engine would lose power and

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RCM PRODUCT REVIEW

Airtronics
SAGITTA 900



Airtronics kits are, in this writer's opinion, one of the finest kits offered. The rolled plans are full size and all parts are expertly machined and placed in separate plastic bags which makes finding a part very easy. The instruction booklet does an excellent job of communicating. The balsa and hardwood stock is clean cut, sanded, and **straight**. The balsa sheeting must be hand selected! In reviewing this kit, two were built at the same time.

Construction:

This is a "builders" plane and for that reason it should **not** be suggested as a first or second kit. It is a lot of work to build correctly — and please do! So get your sanding block ready . . . but remember to **plan ahead**. Build around your equipment — there is very little room for changes because the front 12" is crowded.

Wing:

Don't let that short wing rod fool you; it's 5/16" x 6" and the wing can handle the FAI type launches and turns. Sanding is very important, especially the sharp tapered trailing edges (balsa/spruce laminated). The T.E. sanding is best done before joining the wing panels, or maybe before gluing it to the wing. No washout was used — or needed. On the first set of wings the entire top of the wing was sheeted — no big deal — or advantage as we can see it. We know some are thinking about adding ailerons and removing the polyhedral . . . and so it goes.

Fuselage:

As you put in the 1/4" triangle to locate the formers, put in your battery pack, servos, and receiver, because of the small space. Two E.K. "SM" servos side by side were used with some room to spare sideways. The spoiler/tow release servo rails should be mounted before the fuselage sides are

SPECIFICATIONS

Name	SAGITTA 900
Aircraft Type	FAI Sailplane
Manufactured By	Airtronics 12160 Woodruff Ave. Downey, California 90241
Mfg. Suggested Retail Price	\$89.95
Available From	Retail Outlets
Wingspan	99 Inches
Wing Chord	10 Inches
Total Wing Area	900 Square Inches
Fuselage Length	47 Inches
Stabilizer Span	26 Inches
Total Stab Area	56 Square Inches
Mfg. Rec. Engine Range	NA
Recommended Fuel Tank Size	NA
Recommended No. of Channels	3
Rec. Control Functions	Rud., Elev., Land. Spoil.
Basic Materials Used In Construction:	
Fuselage	Lite Ply & Balsa
Wing	Balsa & Spruce
Tail Surfaces	Balsa & Spruce
Building Instructions on Plan Sheets	No
Instruction Manual	Yes (10 pages)
Construction Photos	Yes

RCM PROTOTYPE

Radio Used	E.K. Super Pro 7 Ch.
Engine Make & Displacement	NA
Tank Size Used	NA
Weight, Ready to Fly	53 Oz.
Wing Loading	8 Oz./Sq. Ft.

SUMMARY

WE LIKED THE:

Sleek appearance. Good parts fit. Quality of wood.

WE DIDN'T LIKE THE:

Nothing to fault.

glued together to get the spoiler cables lined up with the servo output arm. Watch the direction of all servos. Check and double check. A word of caution about gluing the fuselage sides together. It's a flimsy situation until the top and bottom is glued in place and you can end up with a "banana" very easy if you are not careful. The two ballast compartments are easily accessible and spacious with enough room for two large chunks of lead.

Tail Surfaces:

Ugh! The stabilator is a bear to sand — but beautiful to see finished. When the second set was built, the diagonal ribs were left out until after it had been sanded to shape. The stab has an outline of spruce/balsa lamination and is tapered spanwise with a symmetrical airfoil. We also used only one wheel collar to hold on the stab — and Hot Stuffed the two wire joiners into the other half. That way you are sure to bring the wire joiners with you when you go flying and you also saved some weight.

Finishing:

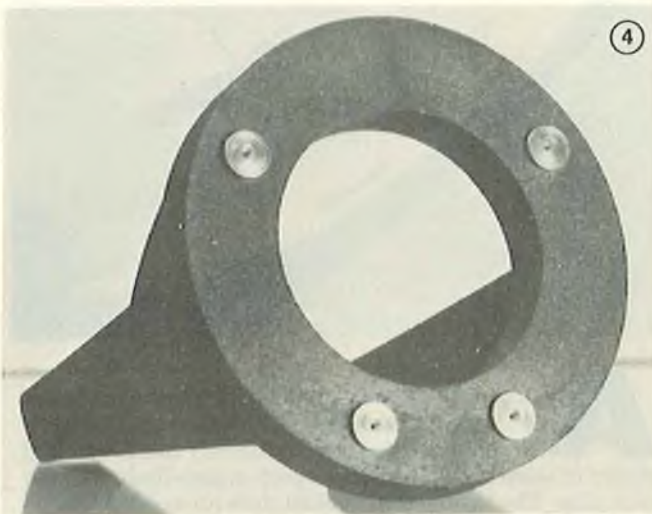
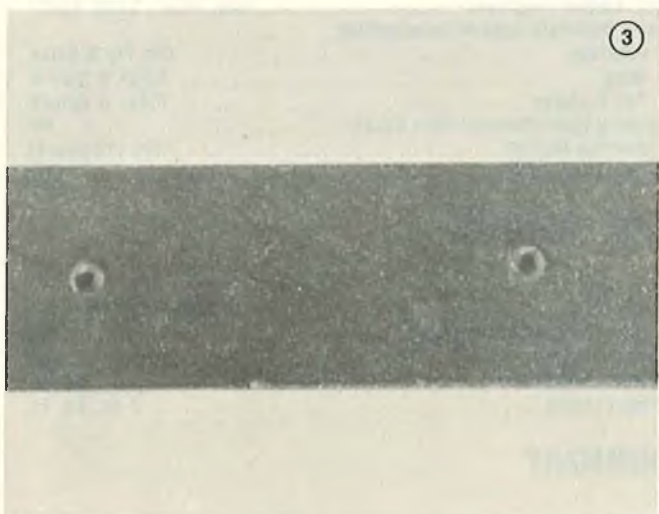
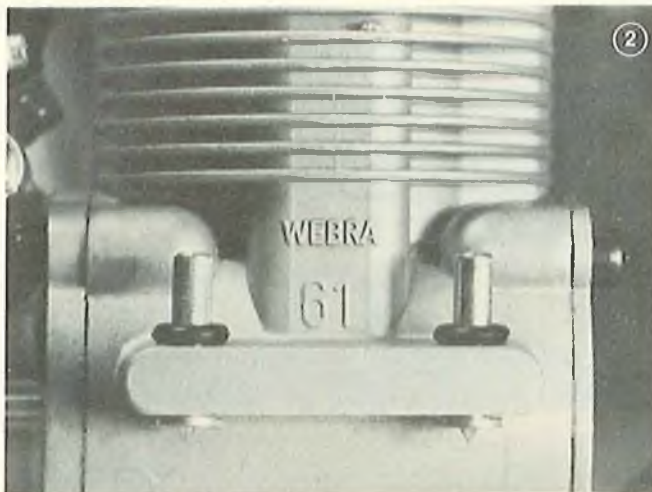
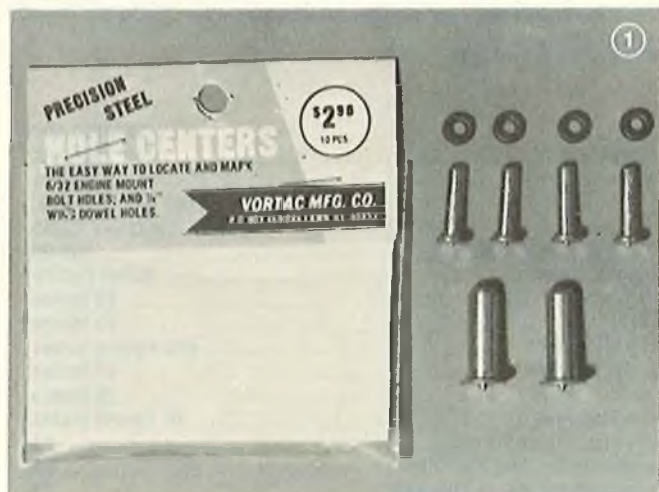
A Rocket City releasable tow hook was used and activated by the spoiler servo. A "no load" push was used to

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VORTAC MANUFACTURING

Has The Answer

By Greg Poppel



PHOTOS BY CHARLES F. DANIEL

The long asked question is, "How do you mark the holes for your engine? I can't get a pencil in there." Vortac Mfg. has developed a product to take care of that. A 6/32 steel pin with a large steel washer at the end and a very sharp point at the end of the pin. (See Photo #1.) There are four in a set with rubber retainers. Simple to use, you just insert hole centers in mounting holes on engine. (See Photo #2) and insert roll rubber retainer over pin. Position engine at desired spot on engine mount, then tap on top of steel pin and this will make a clear indentation on the mount. (See Photo #3.) To make a positive mark on your aluminum and nylon, just paint a light coat of white dope over mounting surface, let dry and then mark your mount.

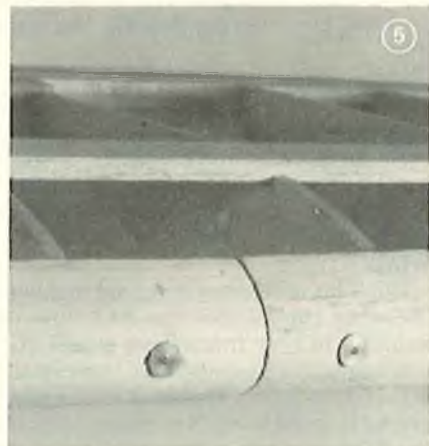
Centers will self align in any engine that mounts with 6/32 bolts. Engines with smaller bolt holes can be drilled out with a #27, .144" drill bit.

These hole centers also work perfectly for marking the holes in the firewall for the engine mount itself. (See Photo #4.)

Yet, another use for 6/32 hole center is to insert one in the outer tube of a set of Gold'N-Rods and mark bulkheads and firewalls. Also, for hard to mark spots, throttle hook-ups and steerable nose wheels.

Included in the same package is an answered prayer, hole centers for 1/4" dowel rods in the leading edge of the wings. Do you remember the last time you had to mark your hole in the fuselage for wing dowels? It was next to impossible to get a perfect alignment. Well, it's a breeze with these 1/4" hole centers from Vortac. (See Photo #5.)

Drill two 1/4" holes in leading edge of your wing or in the fuselage bulkhead where dowels are desired, then install centers in holes. Square wing to fuselage and press together. If centers will not reach bulkhead, slip



1/4" washer over the shaft to close the gap. For use with larger dowels, just slip a larger washer over the shaft and wrap with tape to desired diameter.

They will also assist in locating correct centers for wind hold-down bolts.

Available from your local hobby shop at a price of \$2.98. □

USING SILICONE SEAL

I've always found the "100 Uses For . . ." type articles very helpful. Lots of good ideas; some familiar, some new. One such article that comes to mind is one that appeared in RCM several months ago. It detailed lots and lots of uses for Hot Stuff. Ideas that you read about and file away somewhere in the grey matter until you need them. The only problem I've had since reading it is that I now go through my favorite cyanocrylate like water!

While this article doesn't deal with 100 uses for silicone seal, we have tried to capture some of the more familiar uses of this handy material. Sold in hobby shops, hardware stores, auto parts stores, markets, and such, it comes in 2.8 fl. oz. tubes that sell for about \$3.00. One tube will last for months of projects. While silicone seal is available in white, black, or clear, we have always used the clear product because it's less noticeable.

Before you use any of the silicone seals available, be sure to read the cautions on the back of the tube, especially those for contact lense wearers. We want to add though, that aside from the strong smelling vapor (use it in a well-ventilated room), neither we, nor anyone we know, have ever experienced any health related problems as a result of using it.

Silicone seal sticks to just about any clean surface, except waxed paper or plastic kitchen wrap. While it is both a sealer and adhesive, generally speaking, we have not used it as an adhesive because of its rubbery quality — unless that won't cause problems. We know of modelers, for example, who use silicone seal to glue nylon hinges in place. When we experimented with it though, we found that the hinging was spongy. That is, the control surface felt as though the hinges were about to come loose — even though we couldn't pull them free without breaking something. Back to epoxy or a cyanoacrylate for solidly mounted hinges.

We use silicone seal mainly as a sealer and for vibration dampening. For a good bond, the surface(s) to which you apply the silicone must be clean. Where it is being used as a



By Ben Strasser

sealer and applied to only one surface, such as for a **Hatch Seal**, apply the silicone seal to the front, back, and sides of the bottom of the hatch. Don't use too much of the stuff. If it squeezes onto the hatch hold-down tongue, getting the hatch off may present some challenging moments. Lay a piece of plastic kitchen wrap on the hatch saddle (with appropriate holes cut for the hatch hold-down screws and tongue) and put the hatch in place. Wipe off the excess that squeezes out of the joint and smooth it off for a clean edge. A medium size screwdriver blade works well for that. If you find that you didn't put enough of the seal on bottom of the hatch so it squeezes out to make a nicely filled joint all around the sides of the hatch, some silicone seal may be squeezed into the joint from outside. Let the stuff set up over night.

On the next day, remove the hatch and peel off the plastic kitchen wrap. Trim the excess with a sharp razor blade or small scissor.

With that general technique for use as a sealer in mind, we'll review some other uses of this handy material.

Wing Saddle Seal:

Instead of using foam wing seating tape, silicone seal offers a neat wing saddle seal, especially for models with wing fillets. Use the same procedure outlined for the hatch except that the seal is applied to the wing saddle and the plastic kitchen wrap is taped in place onto the wing. After the stuff sets up overnight, remove the tape from the plastic kitchen wrap and remove the wing. Slowly peel the kitchen wrap off of the wing saddle and trim the excess seal for a neat, clean, oil-proof wing saddle seal.

Sealing Foam Wing Seating Tape:

On models for which foam wing seating tape is preferred, you've no doubt found that the tape loses its

hold as the foam soaks up engine oil over time. Prolong the life of the foam tape by sealing the sides and top with a thin coat of silicone seal.

Sealing Stick-On Weights:

Held in place with double stick foam tape, stick-on weights (especially when they are installed inside the engine compartment) come loose as the foam tape absorbs engine oil. To make a relatively permanent job of it, coat the foam mounting tape and weight with silicone seal. It will stay where you put it. The silicone seal may be cut away with an X-Acto knife or razor blade if you want to remove the weight at a later time.

Muffler Gasket Material:

Because silicone seal is not affected by the heat of R/C engines, it makes a great muffler gasket material — and helps hold the muffler in place as well. Clean the muffler port and engine exhaust port with acetone or alcohol. Apply a thin coat of the seal to the mating edge of the muffler and bolt it in place. When you want to remove the muffler, unscrew the mounting bolts and tap the muffler body smartly with the handle of a screwdriver.

Vibration Dampening Engine Mount Bolts, Engine Mounting Bolts, and Muffler Mounting Bolts:

Clean the bolts with acetone or alcohol and wipe a thin coat of the seal onto the threads. Use the blade of a screwdriver to press some seal into the blind nuts in the firewall or threaded engine mount. Install and snug down the bolts. They'll stay that way — but may easily be removed later.

Fuel Proof Fuel Line, Throttle or Nosegear Linkage in Firewall:

Simple. Wipe some silicone seal onto the bulkhead around the fuel lines or around the outer NyRod tubing. Unlike epoxy, the silicone seal

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USING SILICONE SEAL

from page 61

may be easily cut away at a later time if you want to remove and replace the fuel line or re-do the linkage.

Carburetor Seal:

Sometimes we find it impossible to get a good seal between the sides of the bottom of the carburetor body and engine housing. Clean the carb body, wipe on a thin coat of silicone seal, and slide the carburetor body in place and tighten the carb mounting screws. Note that the seal is applied only to the bottom of the carburetor, not to the engine housing. In this way, excess squeezes out of the top of the carburetor/engine housing joint rather than being pushed down the inside of the housing. To remove the carburetor at a later time, use a twisting motion.

Sealing Aluminum Main Landing Gear:

The mating surface between the fuselage and landing gear becomes a sump for engine goop. Using the plastic kitchen wrap approach, apply the seal around the front, back, and sides of the center of the aluminum landing gear. Put the kitchen wrap onto the fuselage and install the landing gear. Let it set up over night. Remove the gear and kitchen wrap.

Sealing Main Landing Gear On Low Wing Models:

Usually the piano wire main gear on low wing models are installed in grooved hardwood blocks and held in place with a couple of metal or plastic screw-mounted straps. These grooves become a nesting place for engine oil, dirt, etc. Keep them clean and neat by wiping some silicone seal into the grooves to seal them. To remove the landing gear at a later time, use a sharp X-Acto blade to cut the silicone seal down both sides of the piano wire and work the landing gear strut free.

Wing Saddle Shims:

On occasion we find it necessary to shim a wing saddle to change the wing incidence or to align the wing in front view. "Glue" the shim in place with silicone seal. If you want to remove it at a later date, a sharp, double-edged razor blade will do the job easily.

Field Box Fuselage

Cradle Seat:

Wood fuselage cradles on flight boxes usually have a foam tape seat that comes loose after awhile. A bead of silicone seal will make an ideal seal cushion. However, because of the back and forth and down pressures applied to the cushion when starting an engine, the bead of silicone seal should be "anchored" if it is to stay in place permanently. To do so, drill a series of

1/8" (or larger) anchor holes into the inside of the cradle at about 1" intervals. Press some silicone seal into each of the holes first. Then, before the silicone sets up, apply the bead of silicone seal down the thoroughly cleaned cradle and let it set up over night.

Attaching NyRod or Cable Guide Tubes to Bulkheads or Fuselage Sides:

To prevent sloppy operation of the control surfaces, the outer tubing should be attached to bulkheads and the fuselage sides (or braces inside the fuselage) at several points throughout its length. Temporarily tape the outer tubing in place and apply a blob of silicone seal.

Dampening Control Surface Flutter:

Suggested to us several years ago by John Gerlach, we hesitated to include this very useful handy hint because using the seal is easier than finding the possible source of the flutter in the first place. If you do experience flutter on your model, make sure that you have eliminated pushrod slop and loose hinges first! Useful on a fluttering control surface with a rounded leading edge, the trailing

edge of the flying surface at the tip is first thoroughly cleaned and temporarily covered with a piece of plastic kitchen wrap to keep it clean. Wipe some vaseline or other mold release to the leading edge of the control surface in the area to which you are to apply the silicone seal. Remove the plastic kitchen wrap from the flying surface and apply the seal to the hinge gap such that it adheres to the trailing edge of the flying surface, both on the top and bottom. Shape the seal to the airfoil contour. With the control surface set at zero deflection, let the adhesive set up over night. On the next day disconnect the pushrods and check the operation of the control surface to assure it works okay, though dampened somewhat. In many cases, dampening the tip of the control surface in this manner will stop flutter problems.

Those are some of the more familiar uses of silicone seal we have learned about over the course of our years in R/C. If you have any other ideas send them into the magazine for publication in the For What It's Worth feature. If your idea is used you'll receive your choice of one of RCM's neat Anthology books.



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SILENT POWER

Jim Zarembski



If you are an electric powered R/C enthusiast in California, 1982 started out with a bang. On successive weekends both Astro Flight and Leisure Electronics sponsored major contests for silently powered model aircraft. Both Bob Boucher of Astro Flight and his twin brother and chief rival, Roland Boucher of Leisure Electronics, did a fantastic job in planning these events to start off the 1982 flying year. Let's look at both in detail.

1st Annual Grand Championship Jan. 9 & 10, 1982

The flier announcing the Grand Championship sponsored by Leisure Electronics certainly caught the eye of a large number of electronic powered sailplane enthusiasts. Fifty contestants vied for a \$1,000 grand prize. Over 150 onlookers attended, including Carl Goldberg of Carl Goldberg Models and John Worth, Executive Director of the AMA.

The site of the contest was the Magnolia High School in Orange County, California. The weather was not the sunny, thermal popping day all had hoped for. In fact, the wind gusts were severe enough to damage some of the models.

Leisure sponsored a static event for best direct drive sailplane, best geared sailplane, and best old-timer, with a \$100 prize in each category.

Gary Ittner placed first in direct drive sailplane with an original design powered by a Leisure Racing System. This bird utilized a fiberglass fuselage and a semi-symmetrical airfoil with an RTF weight of 50 oz.

Larry Jolly won the geared sailplane prize with his Olympian, powered by a Leisure system with a home brew gear drive. This ship used an Eppler 205 airfoil and a folding prop.

Ross Thomas' Leisure powered Playboy used an Astro gear drive and a 11/7 Rev-Up prop, and was judged best in old-timer. The model, to be kitted by Leisure, has a span of 67" and an RTF weight of 33 oz.

All in all, there were 22 direct drive, 24 geared sailplanes, and 4 old-timers. The rules of the contest were simple. The model had to be powered by either a stock Leisure or Astro 05 System with qualification rounds the first day consisting of Precision Duration with a 1½ minute motor run. The top 24 contestants from the first day were



Roland Boucher presents a check for \$1000.00 to the Grand Champion, Mike Charles.

grouped into six flights of four contestants each for the final battle of \$1,000.

After two rounds, the final six contestants were sorted out and the Championship flight was all that remained. Mike Charles, Frank Chasteler, Frank Heacox, Steve Neu, Mike Reagan, and Jeff Rebholz had made it to the finals.

All launched simultaneously into a bleak overcast sky, and immediately Steve Neu had radio trouble. His ship performed endless loops with the controls locked in up-elevator without any rudder control. All ended well since the radio function returned to normal after the motor battery was drained and the flight system's rpm tapered to a stop.

The winner was Mike Charles with a duration of 8 minutes and 19 seconds, which just edged out Jeff Rebholz, who finished second at 8 minutes.

The final six, in order of finish were:

1982 LEISURE GRAND CHAMPIONSHIP

Name	Aircraft	Flight System	Batteries
1. Mike Charles	Ultra	Pattern Leisure	6 1.2 AH Sanyo
2. Jeff Rebholz	Olympian	Racing Leisure with Gearbox	6 1.2 AH Sanyo
3. Mike Reagan	Mirage	Pattern Leisure with 8/4 Direct Drive Prop	6 1.2 AH Sanyo
4. Frank Heacox	Original Design	Racing Leisure Home Brew Gear Drive with Home-made Folding Prop	6 1.2 AH Sanyo
5. Frank Chasteler	Original Design	Racing Leisure Direct Drive 8/4 Prop	6 1.2 AH Sanyo
6. Steve Neu	Original Design	Racing Leisure with Graupner 3 to 1 Gear Drive	6 1.2 AH Sanyo

R/C Powered Sailplane: A 2-minute motor run and 6-minute max, with spot landing bonus points.

- | | | |
|-----------------|----------------------|-----------------------|
| *1. Larry Jolly | Olympian | Geist with Geist Prop |
| 2. Dave Shadel | Hot River | Geist with Geist Prop |
| 3. Mike Charles | Ultra | Leisure Racing |
| 4. Frank Heacox | 2 Meter Orig. Design | Astro 05 |
| 5. Steve Neu | 110" Orig. Design | Astro Cobalt 25 |
- *5-way tie for first place — final standing determined in fly off.

Sport Scale: Stand-off scale, Mooney judging system, extra bonus points for multi-engined aircraft.

- | | | |
|---------------------|--------------------|-----------------|
| 1. Bob Sliff | Rearwind Speedster | Astro 10 Geared |
| 2. Steve Mangenelli | Norman Islander | Twin 020 |
| 3. Bob Boucher | Porterfield | Astro 15 Geared |
| 4. Tony Naccaratto | Farman Moustique | 035 Geared |
| 5. John Szary | P-68 | Twin 075 |

Electric Old Timers: A 2 minute motor run and 5 minute max, with spot landing bonus points.

- | | | |
|----------------------|---------------|-----------------|
| *1. Ross Thomas | Small Playboy | Leisure 05 |
| 2. Larry Jolly | Interceptor | Not Given |
| 3. Bob Sliff | 80" Playboy | Astro 15 Geared |
| *4. Ross Thomas | 80" Playboy | Astro 15 Geared |
| 5. Ray Vander Walker | 80" Playboy | Astro 15 Geared |
- *Flew two entries

Sport Pattern: Novice Pattern with special handicap bonus points for planes with less than 4 channels.

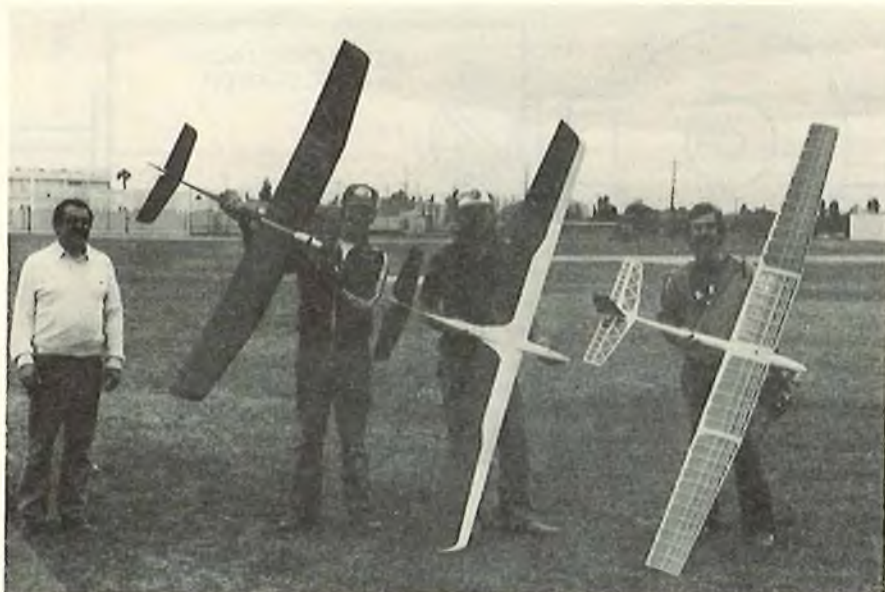
- | | | |
|---------------------|-----------------|-----------|
| 1. Steve Nue | Tri Star | Sagami |
| 2. Steve Mangenelli | Devil | Not Given |
| 3. Tony Naccaratto | Original Design | Astro |
| 4. Bob Sliff | Air Chief | Astro 10 |
| 5. Scott Manning | Original Design | Astro 05 |

400 onlookers watched 67 contestants fly a spectrum of free flight and R/C aircraft from a fine 4,000' runway. The contestant who traveled the farthest to fly at Mile Square was Charley Binder, a Lufthansa pilot from Germany. There were spectators from several states and two from Switzerland. Electric power is generating worldwide interest.

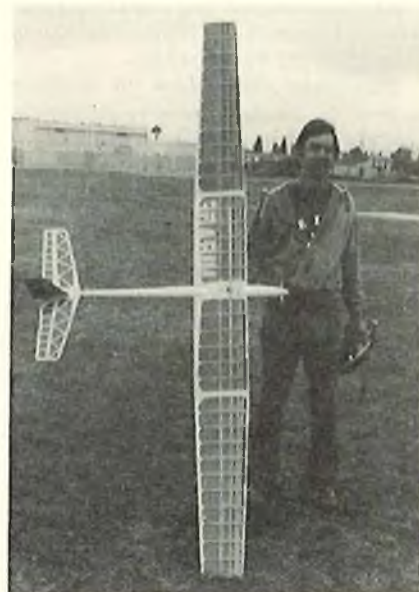
Electric Powered Model Fliers To Organize

Electric power for model aircraft has been proven to be efficient and practical. With this in mind, a group of electric power enthusiasts have decided to form the Society of Electric Aircraft Modelers (SEAM), as a national organization dedicated to the advancement of all forms of electric powered model aircraft.

SEAM is to be chartered by the Academy of Model Aeronautics (AMA) and will serve in an advisory capacity to the AMA in all matters relating to electric powered model aircraft.



The top three — Left to Right Roland Boucher, Mike Charles, Jeff Rebholz and Mike Reagan.



Mike Reagan with Mirage.



Larry Jolly with Leisure 05 powered Olympian. This model uses a new gear drive and fiberglass prop to be marketed by Midnite Models.



Ross Thomas with Best Old Timer. 67" Playboy with Leisure 05 and Astro 05 gear box.



Gary Ittner First Place Static Display direct drive sailplane.



Part of the staggering crowd of 400 at the 1982 Astro Flight Electric Championship.



On the flight line an unidentified Porterfield.

The ultimate goal of SEAM will be to form an organization which will provide the following services to all members.

Information Exchange — Quarterly Newsletter. Reprints of technical and experimental data sheets. Direct "member to member" information exchange. Product information brochures.

Contest Rules Forum for all types and classes of free flight and radio controlled electric powered model aircraft.

Promotion of regional electric powered aircraft activities of all kinds through local SEAM clubs.

Business directory for dealers who stock electric motors, batteries, chargers and suitable aircraft kits.

If you are interested in any form of electric powered model aircraft, send your name, address and telephone number, plus a stamped, self-addressed #10 (business size) envelope to SEAM, c/o: Frank Heacox, 11632 Flamingo Drive, Garden Grove, California 92644.

New Astro Flight Challenger 05 Samarium Cobalt Motor

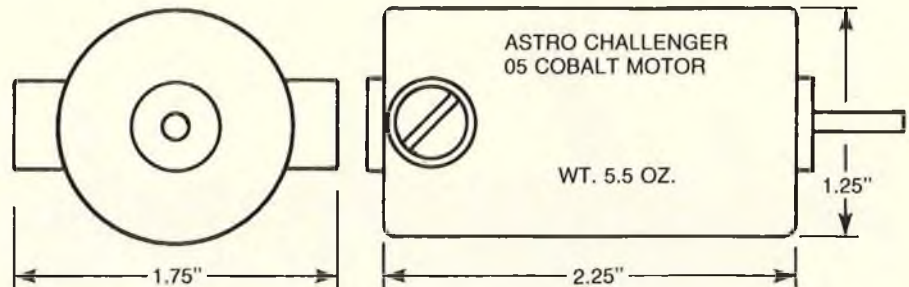
Bob Boucher of Astro Flight, 13311 Beach Avenue, Venice, California 90291, has announced a new line of Samarium Cobalt electric motors. The first to be produced is the Challenger 05, which will be available direct from Astro Flight for \$75.00. This will be followed by an Astro 15 and Astro 35, if demand warrants.



Steve Mangenell's Norman Islander. Twin Astro 020's.



Another round of R/C electric powered sailplanes at the Astro Flight contest.



Astro Flight made its first cobalt motor in 1975 for their solar-powered Sunrise aircraft built under Air Force sponsorship. The first cobalt motor was the size of the regular Astro 25, but delivered over 3/4 horsepower. However, its cost made it prohibitive except for very special applications. Last year Astro Flight designed and built the solar propulsion system for the Du Pont Solar Challenger, which made a historic crossing of the English

Channel on July 7, 1981, in a five-hour flight from an airport near Paris to Manston RAF Base near Canterbury, England. The Solar Challenger motor used a different type of design, which was more adaptable to volume production and had very high power to weight. This small motor, only 3" in diameter by 6" long, produced up to 3 horsepower. Astro Flight has used these same techniques and advanced

to page 123



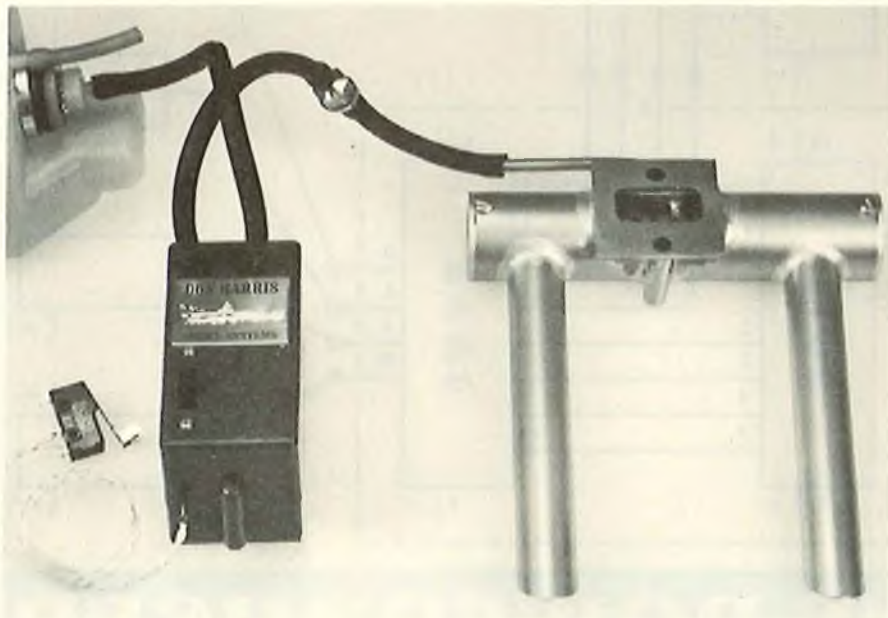
Another Barbarlan (see March RCM) by Roland Boucher — it handles like a 60 pattern ship according to Roland.



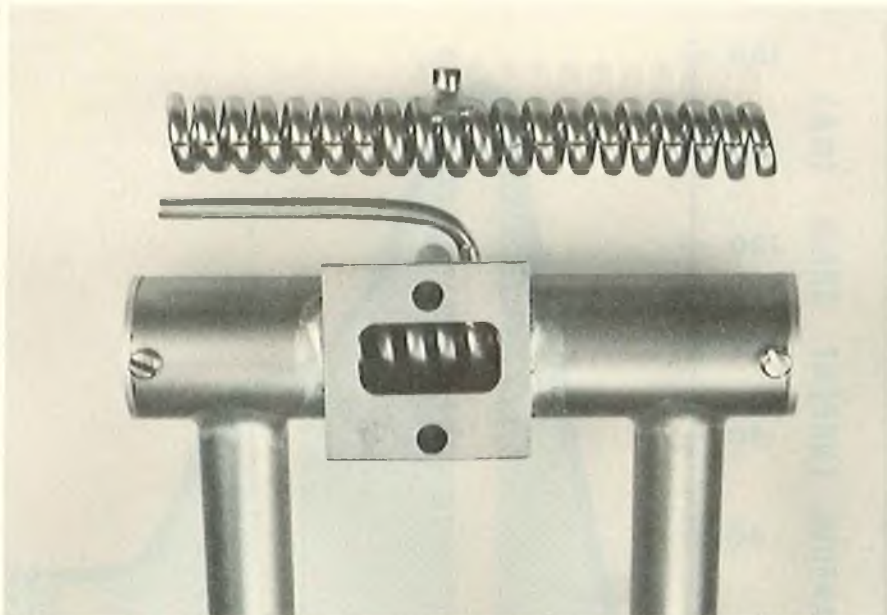
Astro Flight's Challenger 05 Samarium Cobalt motor.

A SMOKE SYSTEM — By RCM Staff

THAT REALLY SMOKES . . .



This photo shows a schematic type arrangement of the Don Harris smoke system.



The heart of the smoke system is the stainless steel tubular coil shown above the complete manifold assembly. Note the tiny slits in the coil for even fuel distribution. Unit shown is for the Quadra.

Don Harris Has The Best Smoker We Have Seen

For the past five years there has been a tremendous effort expended to develop a method of laying a smoke trail in the sky. The desire for smoke has increased with the growth in popularity of the large gasoline engine powered models. Numerous approaches to generating smoke have met with varying degrees of success and several good products have been developed to assist the modeler in his experiments. Until recently we haven't known of a method that really excited our enthusiasm.

In February of this year we had the pleasure of seeing the most effective smoke demonstration that we have ever witnessed. Don Harris really wowed the crowd at the Scale Squadron Uncontest in Southern California. Don has not only developed a smoke system, he is making the entire system available to other modelers in one complete package.

The heart of the Don Harris smoke system is a coil of stainless steel tubing installed in a tubular muffler manifold in order to preheat and vaporize diesel fuel prior to its release into the hot exhaust gases.

The Harris system consists of a high pressure self contained battery powered fuel pump with a micro switch (to be servo operated), an in-line check valve, and a muffler with exhaust stacks. The muffler units are available in four configurations to fit the Quadra, Kawasaki 3.15 and 2.22, Roper 3.7, and Kioritz 2.42 engines. Heavy gauge stainless steel is used for all the muffler components which are brazed together with a high temperature silver alloy. The assembly is head blasted which strain

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Here is the amount of smoke generated in only 7 seconds.



The bottom line, Don Harris' Half Breed doing its thing.

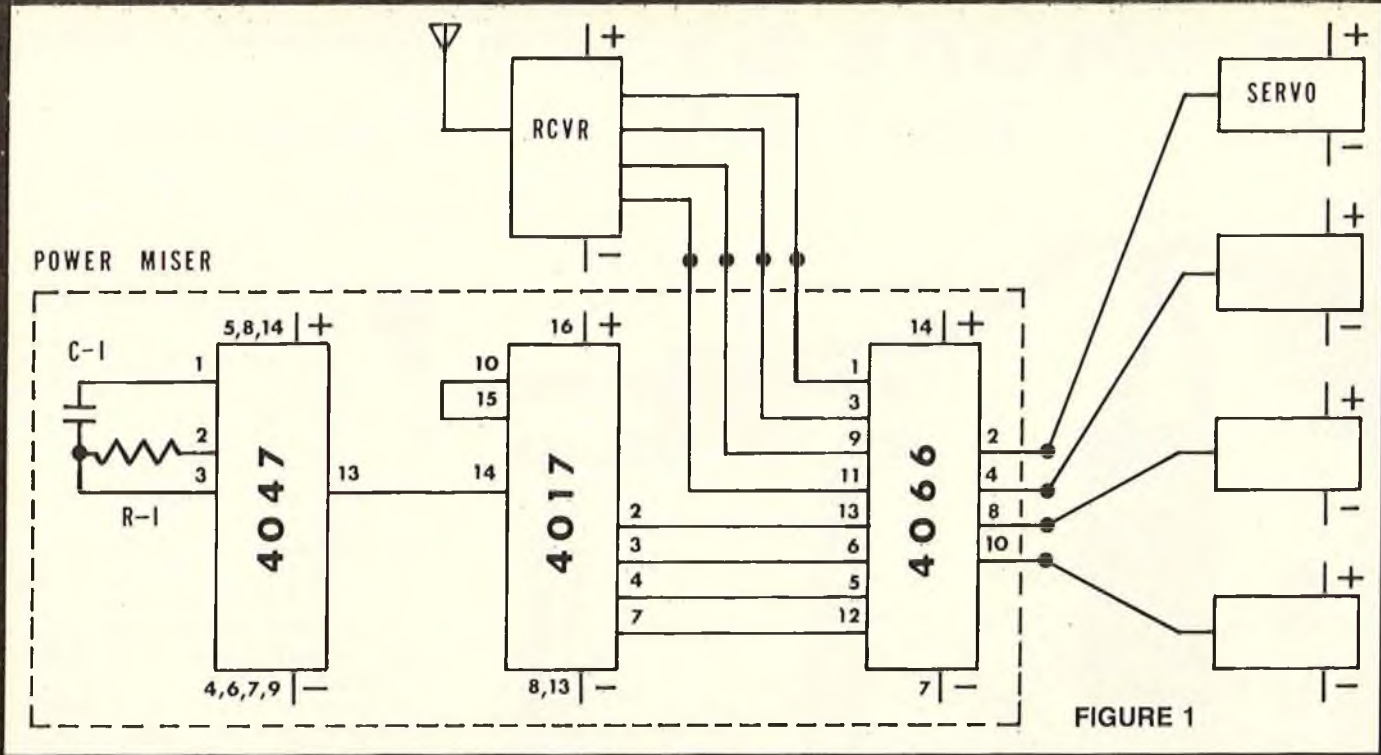


FIGURE 1

AIRBORNE POWER MISER

By Richard A. McGrath

ABOUT THE AUTHOR

The author is an instrument rated private pilot who has built, flown and sailed all sorts of models since the age of 10. His special interest is low voltage electronic/computer devices in Solar energy systems. Rich was Sr. Technical Writer at the Dalmo Victor Division of Bell Aerospace/Textron. He is now Operations Manager for Studio 7 Technical Documentation, in San Carlos, California.

Summary:

Power Miser is a (CMOS), solid state, circuit card assembly that operates like a clocked rotary switch. This device can be used for signal distribution, switching or power conservation. Four channels are provided. The switching IC (4066) dissipates 500 mW. Operating frequency, from less than 1 Hz to several KHz, is determined by the value of a single resistor. The circuit operates from 3V to 15V and draws less than 1.0 ma at 4.8V. Parts count is limited to 6 components, including the printed circuit (PC) board. The completed device measures 1½" x 2" x 3/8" (3.8 x 5.1 x 1.0 cm) and weighs 0.4 oz (11 g). An application to the receiver-servo system in radio controlled (RC) gliders is described. In this application, Power

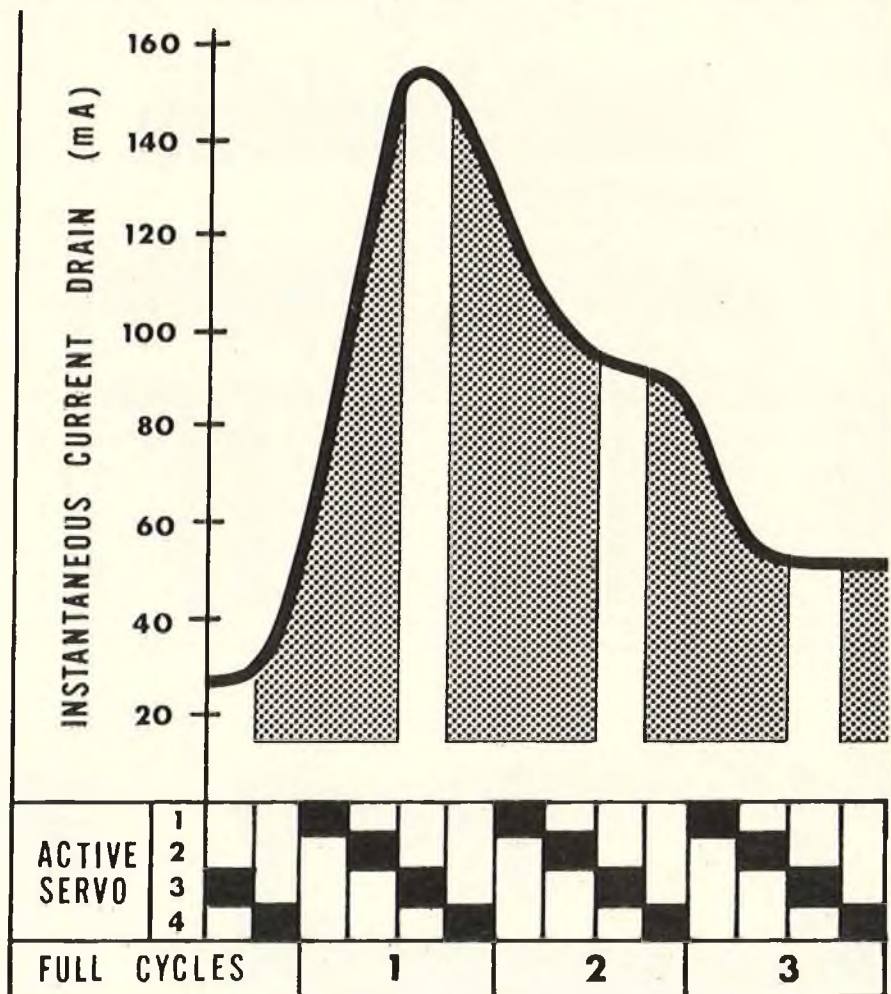


FIGURE 2

Miser switches a signal window from servo to servo, at a frequency of about 10 Hz, to provide reduced current drain from on-board batteries. Operating time is extended by 38%. Construction is straightforward. Simple tools and novice electronics experience are required. Preparation of the PC board, fabrication of circuit card assembly and testing are described in detail.

Introduction:

Flight of radio controlled (RC) gliders is limited by the available on-board power source. This article describes construction and testing of Power Miser, a solid state device that operates like a clocked rotary switch installed between the radio frequency (RF) receiver and servos (See Figure 1 and photographs). Parts count is limited to 6 components, including the printed circuit (PC) board. Power Miser switches a signal window from 1 servo to another in rapid succession, at a frequency of about 10 Hertz (Hz). Full power is available to one servo at a time and other servos continue to operate under no-load conditions (see Figure 2). The advantages of retaining full maneuverability and reducing battery drain occur at the expense of servo response speed. A 225 milliampere hour (mAh) battery pack weighs 1.6 oz (45 g); 450 mAh battery packs weigh 2.8 oz (79 g) and Power Miser weighs only 0.4 oz (11 g). This device, with either battery pack, represents a small increase in power package weight in return for 38% increase in operating time for a particular installation.

Kraft Systems provided KP-3AS (3 channel) and KP-7CS (7 channel) RF systems with KPS-18 servos, on loan, for test evaluation. These systems have high reliability, low power consumption, excellent torque and a no-nonsense service policy. Other 3 wire servo systems should work as well but these have not been tested. Both 225 mAh and 450 mAh battery packs were used with either 3 channel or 7 channel equipment and Power Miser. Receiver/servo operation time with either system is increased. Use of an airborne Solar battery charger (Ref. 1) can provide even longer flights on sunny days. Both devices are compatible.

Construction:

Required components are indicated on the parts list. Collect the components and necessary tools/equipment before starting construction. Refer to circuit diagram (Fig. 1) and component layout (Fig. 3). Read entire instruction set before starting work. A photostat transparency is used to generate the required trace image on a

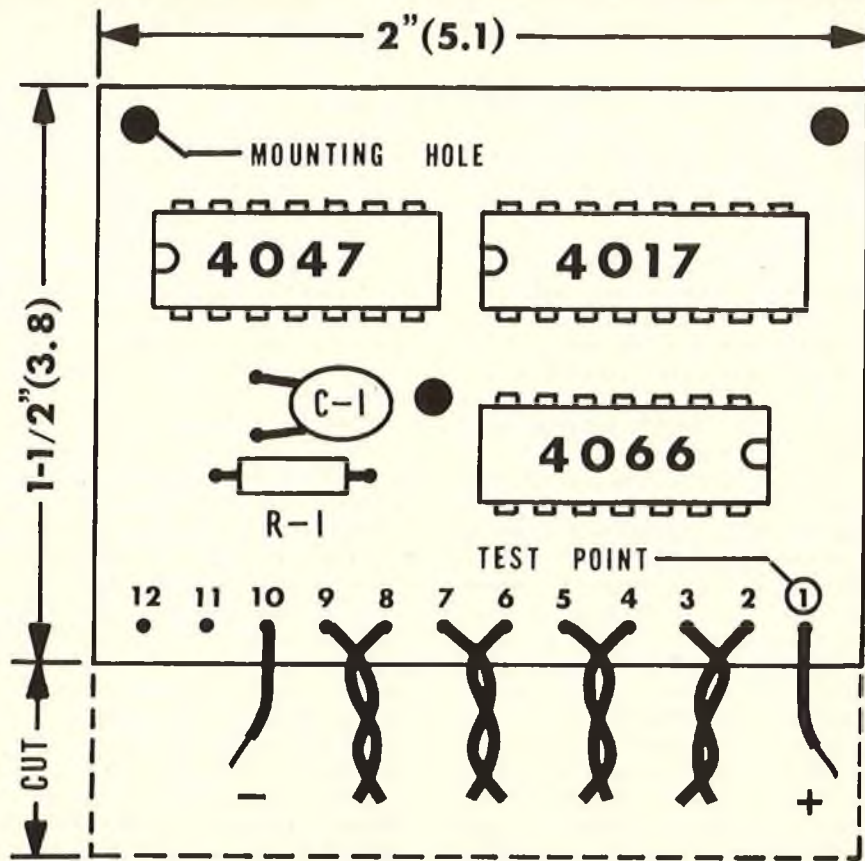


FIGURE 3

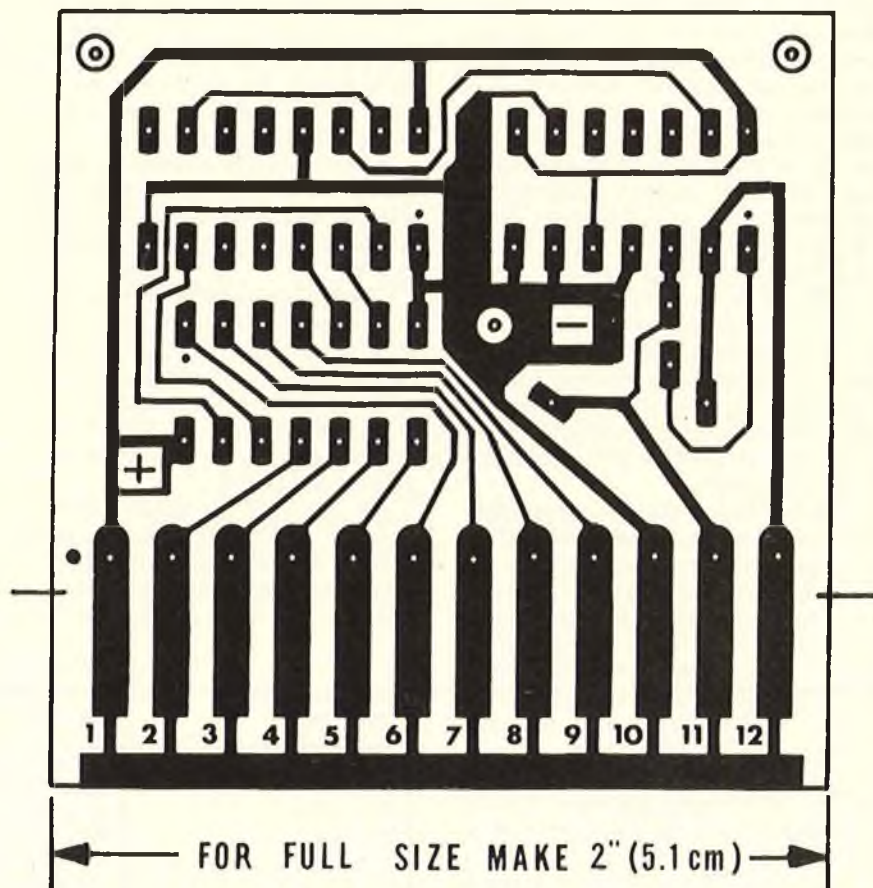


FIGURE 4

piece of presensitized circuit board material. This image is then developed and etched. A drafting supply house or telephone directory will provide a source for photostats. The required size is indicated on trace pattern (Fig. 4). Obtain a black line on clear transparency. Use the magazine page as original artwork. The majority task of construction is soldering. A low-wattage soldering iron with a 1/16" (0.2 cm) tip diameter is required. Use rosin core or Ersin solder. Do not use acid core solder. The soldering accessories indicated on parts list are highly recommended. Begin with preparation of PC board:

1. Read instructions packed with presensitized circuit board. Work in subdued light. Avoid fingerprints or scratches on photosensitive surface. Use hacksaw to cut circuit board into two pieces, 2" x 2" (5.1 x 5.1 cm) each. Store one piece in black envelope provided. This board is a spare to cover "unforeseen events." Clean surface of other board with soft brush.

2. Prepare an exposure sandwich as follows: (a) clean, dry sheet glass, (b) transparency, (c) circuit board with presensitized surface against transparency, (d) styrofoam padding, (e) sheet glass. Handle transparency by edges to avoid fingerprints. Check to determine that the image, when viewed through the top sheet glass, looks like trace pattern (Fig. 4), not the reversal image. Be certain image on transparency is aligned with board edges; connector strip will overhang one end of the board. Press sandwich together and secure ends with masking tape. Clean dust and fingerprints from glass over transparency (see Fig. 5).

3. Expose sandwich to direct sunlight for 12 minutes with transparency side directly facing the sun. On hazy or overcast days, expose twice as long (24 min). In subdued light, disassemble sandwich. Trace image will be seen in photoemulsion on circuit board.

Caution: Chemicals used in steps 4, 5 and 6 are toxic. Handle carefully.

4. Read instructions packed with PC Board Developer. Develop image as directed; be certain development is complete (4 to 8 min). Rinse circuit board in running water. Inspect image with magnifying glass to guarantee a perfect image and proper development.

5. Read instructions packed with PC Board Etching Solution (Ferric chloride). Etch circuit board from 35 to 45 minutes at room temperature. At 5 minute intervals, remove circuit board from etchant, rinse in running tap water and inspect board. When

fully etched, rinse and dry PC board (see Fig. 6).

6. Strip residual photoemulsion from copper traces with acetone. Do not use acetone near flame or fire. Do not inhale vapors. Work outdoors or near an open window. Wear rubber gloves to protect skin.

7. Use hacksaw to cut 1/2" (1.3 cm) off edge connector strip (see Fig. 3 and photographs). Use block and #100 grit sandpaper to smooth edges of PC board. Round corners. Sand component side until no shiny spots remain.

Note: Do not sand traces.

8. Drill all holes from trace side through PC board. Etched dots serve to locate centers. Tap each dot with centerpunch to provide seating for drill point. Refer to component layout (Fig. 3). Drill 1/8" (0.3 cm) mounting holes in 3 places. Use 0.043" (0.1 cm), #57 drill to perforate component pads. Lightly sand component side of board to remove drilling debris from hole edges.

9. Inspect finished PC board with magnifying glass. Look for hairline breaks or thin spots along traces. Minor repairs can be made with solder (Ref. 2). Rarely are perfect PC boards made on the first try. A spare board (see step 1) is available should it be necessary to make a new one.

10. Proceed with circuit card assembly. Install integrated circuit (IC) 4047, Monostable/Astable Multivibrator, at position indicated on component layout (Fig. 3).

Note: Double check to insure that each IC is correctly positioned with orientation notch as shown. All pins must project through PC board.

Check from component side of board for proper seating of IC. Package should be parallel to and slightly raised from board surface. Carefully solder 4 corner pins to pads. Do not smear solder on other pads or between traces. Recheck alignment of IC package on board.

11. Install IC 4017, Decade Counter, at position indicated in Fig. 3. Refer to note in step 10. Check for proper seating of package and solder 4 corner pins to pads. Recheck

alignment of IC package on board.

12. Install IC 4066, Quad Bilateral Switch, at position indicated in Fig. 3. Orientation notch faces opposite direction from other ICs. Check for proper seating of package and solder 4 corner pins to pads. Recheck alignment of IC package on board.

13. Recheck to guarantee correct placement of 3 ICs on PC board. Solder remaining pins to pads. Work carefully to avoid solder bridges across pads or traces.

14. Solder capacitor C-1 (0.47 μ f, 35V) at position indicated in Fig. 3. Bend leads so capacitor lies flat against PC board. Use one drop of instant glue (Hot Stuff) to anchor capacitor on PC board (see Fig. 7).

15. Installation of resistor R-1 shall occur after testing (see Fig. 8).

Bench Testing:

Test Power Miser before installation of off-board wiring. Use alligator clips and jumpers to access test points located at board edge. Test instructions are written for those with a minimum of equipment and trouble shooting skills. A multimeter, a 100 kilohm (k Ω) (10 or 20 turn) potentiometer, LED and some jumpers are required.

1. Set multimeter to 100k Ω scale; connect 100k Ω potentiometer to multimeter. Adjust potentiometer to 50k Ω . Disconnect multimeter.

2. Connect potentiometer, without changing setting, to test points TP-11 and TP-12. Test points are identified in Table I. Connect positive (+) red wire from 4.8V, 225 mAh battery pack to TP-1. Connect negative (-) black wire from battery pack to TP-10. Refer to component layout (Fig. 3).

3. A light emitting diode (LED) is used to check circuit operation. Connect jumper between TP-1 and TP-2. Connect another jumper from TP-3 to LED anode (+). Connect third jumper from LED cathode (-) to TP-10. LED should glow or blink. Slew potentiometer above and below 50k Ω setting. LED should blink faster or slower. If LED does not light, disconnect battery and check PC board for solder bridges between pads or traces; check for proper orientation of ICs; check for correct battery

TABLE 1: POWER MISER TEST POINTS

Test Point	Function	4066 Pinout
TP-1	V+ (Positive Battery)	14
TP-2, TP-3	Bidirectional Switch #1	11, 10
TP-4, TP-5	Bidirectional Switch #2	9, 8
TP-6, TP-7	Bidirectional Switch #3	1, 2
TP-8, TP-9	Bidirectional Switch #4	3, 4
TP-10	V- (Negative Battery)	7
TP-11, TP-12	Resistor R-1	----

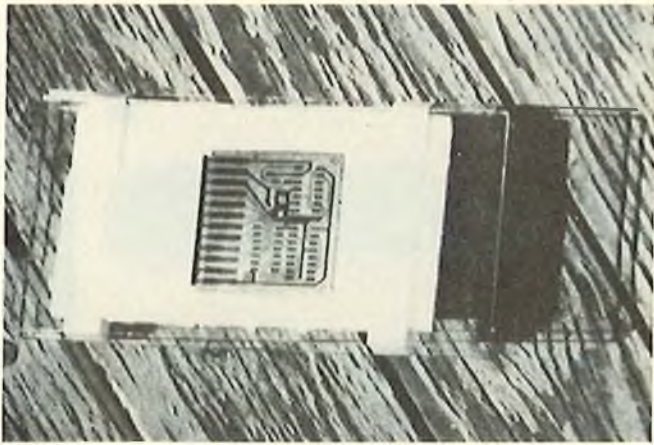


FIGURE 5

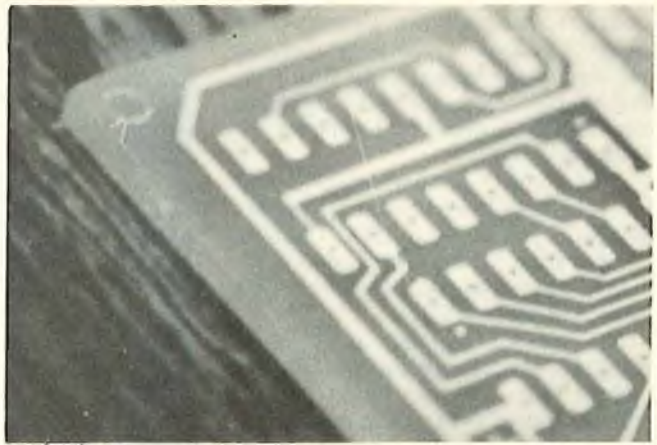


FIGURE 6

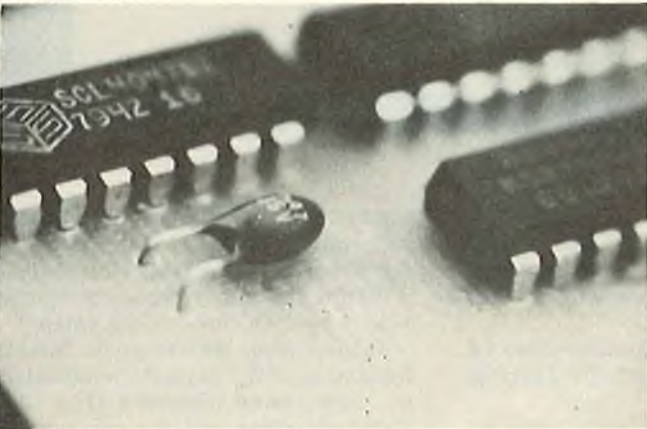


FIGURE 7

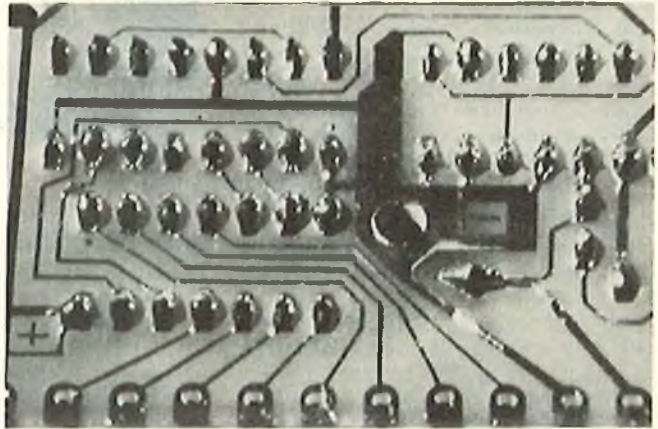


FIGURE 8

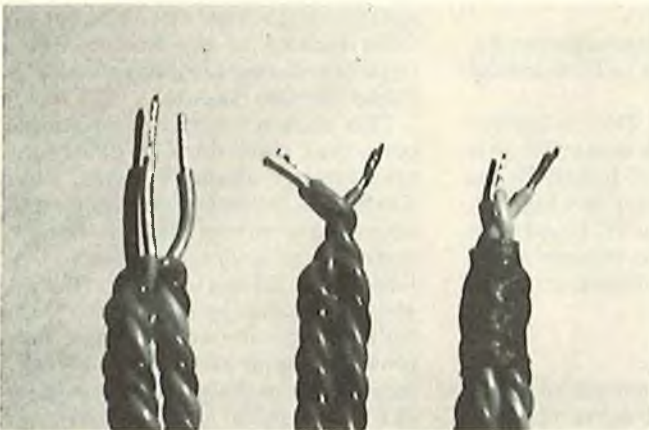


FIGURE 9

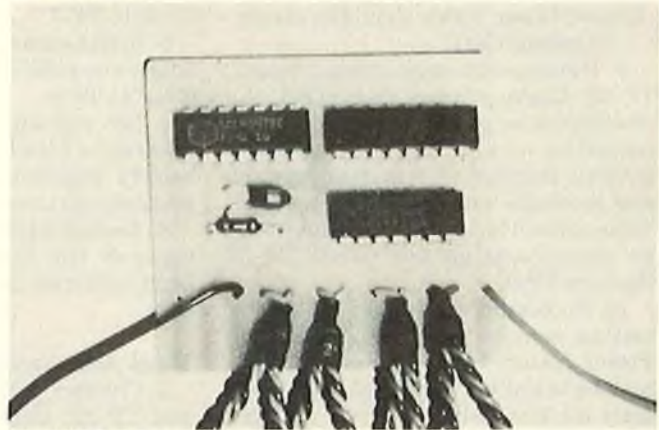


FIGURE 10

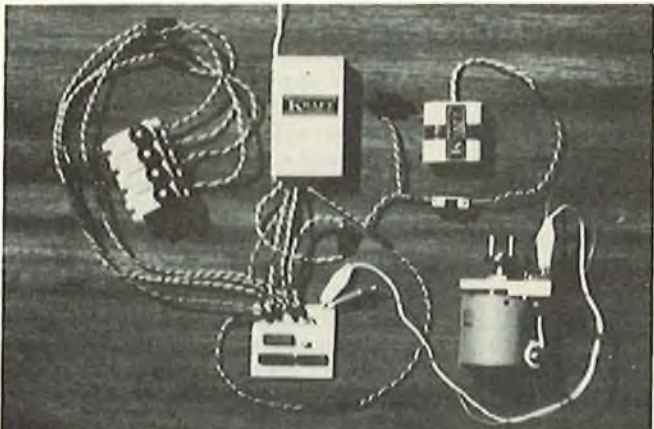


FIGURE 11

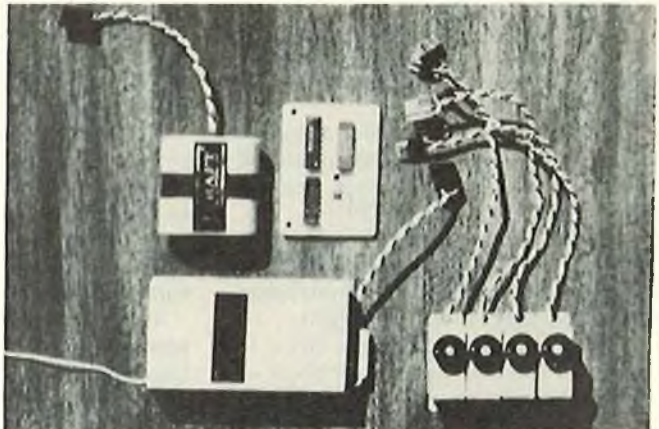


FIGURE 12

connections and for shorting at alligator clips on jumpers. Correct problem and repeat steps 2 and 3. Adjust potentiometer until blinking rate of LED is about 50 blinks per 10 seconds (5 Hz).

4. Disconnect jumpers at TP-2 and TP-3. LED will stop blinking. Connect jumper from TP-1 to TP-4. Connect jumper from TP-5 to LED anode (+). Leave other jumpers in place. LED should blink at 5 Hz.

5. Disconnect jumpers at TP-4 and TP-5. LED will stop blinking. Connect jumper from TP-1 to TP-6. Connect jumper from TP-7 to LED anode (+). Leave other jumpers in place. LED should blink at 5 Hz.

6. Disconnect jumpers at TP-6 and TP-7. LED will stop blinking. Connect jumper from TP-1 to TP-8. Connect jumper from TP-9 to LED anode (+). Leave other jumpers in place. LED should blink at 5 Hz.

7. If LED does not blink at test steps 4, 5, or 6, disconnect battery and refer to step 3. Positive results (blinking at 5 Hz) in test steps 3 through 6 indicate correct operation of circuit.

8. Disconnect jumpers from all test points except potentiometer connections to TP-11 and TP-12. Connect multimeter positive (+) terminal to TP-1 and negative (-) terminal to TP-10. Measure resistance of Power Miser. Value should be about 1.4 Megohms (M Ω).

9. Disconnect multimeter from TP-10. Leave jumper from TP-1 to multimeter in place. Connect battery negative (-) to TP-10. Connect battery positive (+) to multimeter and measure current drain in ma. Value should be less than 1.0 mA with no connections on test points TP-2 through TP-9.

10. Successful completion of bench testing ensures proper operation of Power Miser. Off-board wiring can now be installed. Disconnect jumpers from all test points. Do not change setting of potentiometer.

Off-board Wiring:

1. Strip and tin with solder, the ends of a 6" (15.2 cm) piece of insulated (AWG #24 stranded) red hookup wire. Solder one end to TP-1.

2. Strip and tin with solder, the ends of a 6" (15.2 cm) piece of insulated (AWG #24 stranded) black hookup wire. Solder one end to TP-10.

Note: Use of Deans connectors to servos depends on individual preference. Soldered connections are described to save weight.

3. Position Power Miser close to receiver. Cut the yellow (not black or red) signal wire to one servo. Strip and tin with solder both cut wire ends. Twist wires together and slip 1/2"

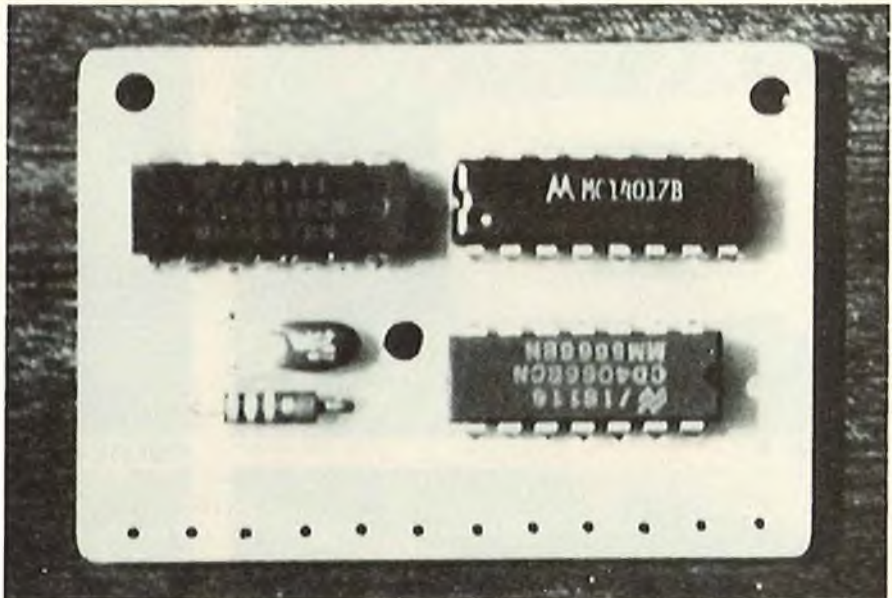


FIGURE 13

(1.3 cm) piece of heat shrink tubing over doubled back wires (see Fig. 9). Shrink tubing with tip of soldering iron. Solder one yellow wire to TP-2 and the other to TP-3.

4. In like manner, connect servo #2. Solder one yellow wire to TP-4 and the other to TP-5.

5. In like manner, connect servo #3. Solder one yellow wire to TP-6 and the other to TP-7.

6. In like manner, connect servo #4. Solder one yellow wire to TP-8 and the other to TP-9.

7. The red wire at TP-1 is battery positive (+); the black wire at TP-10 is battery negative (-). Install Deans connector pair to battery (see Fig. 10).

8. Anchor wiring to PC board with epoxy or Hot Stuff to remove strain from soldered connections at board edge.

Final Adjustment:

1. Connect potentiometer to TP-11 and TP-12. Connect servo plugs to receiver. Connect battery pack to receiver and to Power Miser. Turn transmitter on; turn receiver on. Activate control stick and observe servo movement. Some chatter or random servo motion may occur.

2. Adjust potentiometer for fastest servo response with minimum chatter. This will occur between 30k Ω and 90k Ω but must be fine-tuned for each particular system. Bench test set-up is shown in Fig. 11. Figure 12 shows basic components.

3. Disconnect battery. Disconnect potentiometer from TP-11 and TP-12. Use multimeter set on 100k Ω scale to determine setting of potentiometer. Select 1/4W, 5% fixed resistor with nearest standard value above setting

of potentiometer. Connect battery and test resistor at TP-11 and TP-12. If servo chatter is excessive, substitute a different resistor. Higher resistance values produce slower clock rates.

4. Disconnect battery pack. Install fixed resistor R-1 at position indicated on component layout (Fig. 3). Carefully solder leads to each pad and cut off excess lead material. Retest system with battery connected. Construction of the Power Miser circuit card assembly is now complete.

Experimental Tests:

This section describes operational tests that were done to determine performance characteristics. Four Kraft KPS-18 servos were mounted on a plywood servo tray that was clamped vertically in a vice. Each servo was loaded with a 4 oz. (113 g) lead fishing weight, attached by Dacron line to the hole in the actuator disc. This provided a lever arm of 3/16" (0.5 cm) from the servo shaft. The battery pack (4.8V, 225 mAh) was charged for 4 hours and then allowed to stabilize for 30 minutes before each test. Power Miser was connected between a Kraft KPT-7C receiver and the 4 servos. In control experiments, paired test points to each servo were shorted out to remove Power Miser from the circuit and still retain extra-long test wires and other conditions. For each experimental trial, transmitter and receiver were turned on and a stopwatch was started. Transmitter stick (aileron, rudder and elevator) plus throttle control were cycled simultaneously at 14 to 18 cycles per minute. Each servo lifted the quarter-pound weight about 3/8" (1.0 cm) on the average of once per cycle. Cycling was continued until one

or more servos quit working, at which time the stopwatch was stopped. These tests were repeated several times with Power Miser operating at 10 Hz or at 20 Hz, as well as under control conditions. Data were then averaged. The reason for using 2 different frequencies was to determine the effect of servo chatter on final results. At 20 Hz, some chatter remains. Even so, an increase in operating time of about 21% was observed. It should be noted that 20 Hz for the system represents 5 Hz for each servo; 10 Hz (system) is equivalent to 2.5 Hz per servo. This occurs because Power Miser circuitry divides the original clock frequency by 4. System operation at 10 Hz results in an increase in operating time of about 38%. At this frequency only an occasional servo movement occurs, that certainly cannot be called chatter. Even slower operating frequencies are possible but these tend to be unrealistic because response is too delayed.

In Table II, the preceding tests are summarized, together with measurements of battery condition that were made before and after each test.

It is worthwhile to compare experimental test results of 21 or 38 percent with the predicted 75% power savings (Fig. 2). These differences occur because of system losses (between switch 4066 input and output) to each servo, combined with the chatter effect. Chatter occurs because of mismatching between receiver pulse frequency and Power Miser clock frequency. Prevention of chatter would require use of receiver clock pulses and additional circuitry or internal circuit modifications. In separate tests, 4 lead weights, a total of 16 oz. (454 g) were attached to 1 servo actuator disc by Dacron line and the transmitter stick was cycled several times to be certain the servo still had sufficient torque with Power Miser in circuit. KPS-18 servos are remarkable for their size; they passed the test with flying colors, and torque to spare.

Discussion:

Under load, a 4-servo flight system may draw 400 to 600 mA, over and above the requirements (about 50 mA) for no-load operation. Under these conditions a 225 mAh battery pack can operate for 20 to 30 minutes. Higher capacity batteries may be used to extend flying time at the expense of increased weight; exclusion of one or more servos from the system can reduce weight/battery drain and extend flying time. The latter approach compromises control of the

TABLE II: SERVO LOAD TEST RESULTS

Test Conditions	Battery Condition Measured At Terminals				Minutes Until Servo Quits	%
	Before Test		After Test			
	V	mA	V	mA		
Control	5.48	138	4.49	125	53 ± 2	100
10 Hz	5.48	139	4.47	126	73 ± 2	138
20 Hz	5.35	135	4.45	123	64 ± 4	121

aircraft. Power Miser will work with 1, 2, 3, or 4 servos. With 7 channel receivers, three additional devices can be installed that are independent of Power Miser and these will operate normally. For certain applications, it may be necessary to bypass one or

more servos already solder connected to the circuit card assembly. A piece of wire stock can be soldered between the 2 test points for any one servo to provide normal movement. Deans connectors can be used between

to page 123

PARTS LIST

The following are listed in order of Item, Designation and Note:

CD 4047 B — Integrated Circuit, Monostable/Astable Multivibrator (CMOS) — (3)

CD 4017 B — Integrated Circuit, Decade Counter (CMOS) — (3)

CD 4066 B — Integrated Circuit, Quad Bilateral Switch (CMOS) — (3)

C-1 — Capacitor, 0.47 µf, 35V, Tantalum dipped — (3)

R-1 — Resistor, 5%, 1/4W (see text for value) — (3)

PC Board Materials:

A). Presensitized Positive Acting Printed Circuit Board, 4" x 2" x 1/16" (10.2 x 5.1 x 0.2 cm), glass epoxy base, copper one side, G.C. Electronics part number 22-330 — (4)

B). Printed Circuit Board Developer, G.C. Electronics part number 22-225 or 22-226 — (4)

C). Printed Circuit Board Etching Solution, G.C. Electronics part number 22-237 or 22-238 — (4)

D). Photostat Transparency (see text) — (5)

Miscellaneous:

Soldering Iron, 23W, Ungar part numbers 776 (handle), 537-5 (heater), PL-114 (tip) — (4)

Kleen Tip Sponge and Tray, Ungar part number 400 — (4)

Solder, rosin core or Ersin Multicore, part number 115 (thin wire solder in metal tube) — (4)

Potentiometer, 100kΩ (10 or 20) turn — (6)

Multimeter — (6)

Light Emitting Diode (LED) — (6)

Hacksaw — (6)

Drill, 1/8" (0.3 cm) — (6)

Drill, 0.043 (0.1 cm), #57 — (6)

Masking tape — (6)

Window glass, 2 sheets 3" x 6" (7.6 x 15.2 cm) each — (6)

Styrofoam sheet, 1/4" (0.6 cm) cut to 3" (7.6 cm) square from scrap

Acetone — (6)

Insulated AWG #24 stranded hookup wire, 6" (15.2 cm) each (red and black) — (6)

Sandpaper, #100 grit — (6)

Heat shrink tubing, 1/4" (0.6 cm) dia. — (6)

Magnifying glass — (6)

Jumper wires with alligator clips — (6)

Centerpunch — (6)

Note:

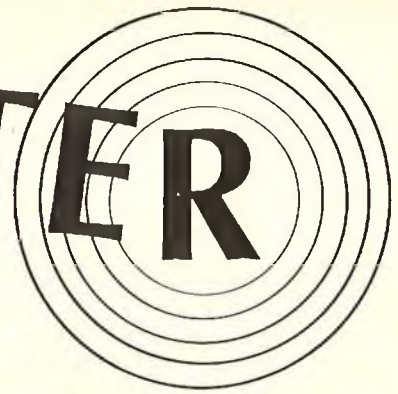
Occasionally a bad IC will cause malfunction. Overheating during soldering can produce similar results. CMOS cookbook (Ref. 7) is suggested reading.

References and Notes

- McGrath, R.A., *Airborne Solar Battery Charger*, Radio Control Modeler, Vol. 18, No. 6, June 1981 (p. 64).
- Coombs, C.F. Jr., *Printed Circuits Handbook*, McGraw Hill Book Co., New York, 1967.
- Obtain from Digi-Key Corporation, P.O. Box 677, Hiway 32 South, Thief River Falls, MN 56701, or from similar electronics supply house.
- Obtain from Zack Electronics, 654 High St., Palo Alto, Ca 94301, or from similar electronics supply house.
- Obtain from drafting/typography supply or service firm. Refer to text.
- Obtain from local hobby shop, hardware store or electronics supply house.
- Lancaster, D., *CMOS Cookbook*, Howard W. Sams & Co., Inc., 4300W 62nd St., Indianapolis, IN 46268 (Sams Book #21398), 1979.

Specific part numbers, brand names and distributors listed, are certain sources for items on parts list. Check locally for equivalent items. In general, you get what you pay for. Don't skimp on permanent tools.

DEAD CENTER



Most model builders of any experience have had the problem — installing a radial engine type cowling on an R/C bird. And the difficulty isn't limited to scale models, either. A round cowl is often used to "doll up" an otherwise rather plain looking sport ship. If you've tried it, though, you've probably had a couple of problems — getting the engine's thrust line to "come out" exactly in the middle of the cowling's center opening and making sure that the cowl stays with the model. Using cowling brackets — tiny 90° brackets of nylon or metal, bolted or screwed to both firewall and cowling — the job is a difficult one at best. We think we have a better way of installing radial-type cowlings.

The "secret" in cowl alignment is to be found in the lowly engine mount. We're talking about those radial mounts like Kraft-Hayes Tatone and Bridi — and others of similar shape and construction. Most of them are designed so that the engine thrust line falls right in the middle of the

mounting flange. If we can design some way to align the cowl with the engine mount, the prop shaft can't help but come out exactly right! So — that's what we're going to do.

The first step toward positive cowling alignment is to make sure that the engine mount is attached to the front of the model, just like the plans show it to be. This is a task we face every time we build a model — locating the thrust line correctly. We assume that we've completed the job of bolting engine to the mount and the mount to the firewall and that the holes have been drilled in the firewall for both fuel line and throttle pushrod. It's time to make a cowl mounting plate.

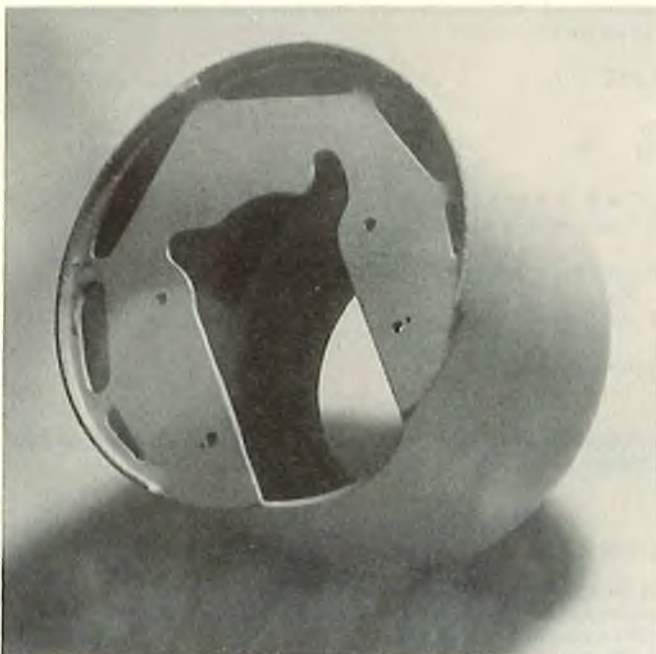
Depending on the size of your model, choose a piece of plywood that is slightly larger than the rear cross-section of the cowl you intend to mount. If your model is small, use 1/8" thick plywood; if it's an intermediate sized bird, use 3/16; and, use 1/4" ply for a .60 powered ship. Don't worry about weight — the cowl plate will

By Col. John A. deVries

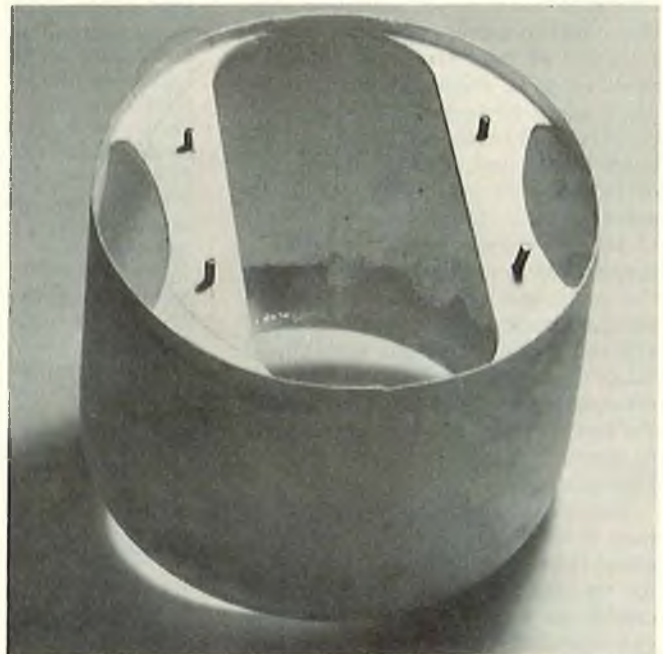
help balance your model and a lot of it will be cut away, later, anyway. Position your cowl, aft edge down on the plywood, and trace around its inner edge. What we're doing is making a "former" that will fit the rear of the cowl, exactly.

Saw out the plywood mounting plate — to the outside of the traced line — and then sand it to just outside the line. As you sand, try the plywood inside the cowl from time to time to insure a good fit. We're shooting for a good, snug fit that doesn't bulge the sides of the cowling. It's a good idea to mark the plywood and the cowling at the same point so that you'll always install the plate in the same relative position. This is particularly important in installations where the

to page 122



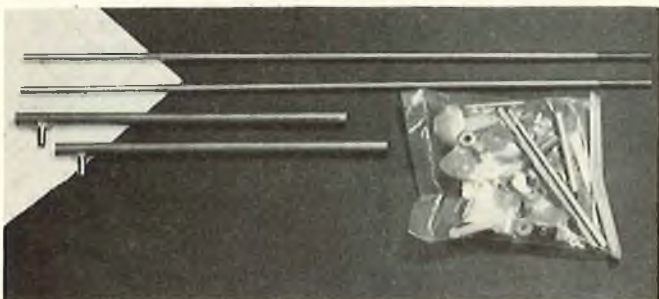
Balsa cowl for a .10 powered model. The fuselage "fills" most of the rear of the cowl mounting plate. Note that the mounting bolt holes are not symmetric and that the engine clearance hole has been extended to include both the fuel line and engine pushrod. The lower cowl line has been recessed to provide for additional cooling air outlet.



Fiberglass cowling for a .60 sized model. The central hole clears the engine with Tatone muffler attached as well as fuel line and pushrod. Interrupted circle shows cross section of the forward fuselage. Although cowl mounting bolts are symmetric, they can be reached with a screwdriver between the cylinders of the simulated radial engine used on this scale model.

RCM PRODUCT REVIEW

Dumas Products, Inc.
UTILITY BOAT



Dumas Products, Inc., 909 E. 17th Street, Tucson, Arizona 85719, has a well founded reputation amongst model boating enthusiasts for producing kits of extremely high quality. One of their latest offerings, the 3/4" = 1' Scale model of the new U.S. Coast Guard's 41' utility boat maintains and perhaps elevates this well deserved place in our hobby world.

This construction kit is aimed at the modeler who likes to build, and has paved the way by including pre-cut and some die-cut parts. The box label, which by the way, features a beautiful photo of the finished boat, declares that it can be built for display, or run with Dumas electric motors and be radio controlled. We, of course, elected the latter option. If you've read this far you must be interested, so let's dig in and see what we have to do to get from a box full of material to the finished boat.

Construction:

The kit comes packed in a substantial cardboard box measuring approximately 3 1/2" x 8" x 38". There are also small photos on one end of the carton that shows the full size Coast Guard boat in action. Opening up the box revealed a wealth of material. We found die-cut ply sheets that would ultimately furnish all the frames, hull sides and bottom, keel, cabin formers, and cabin and pilot house sides and tops. Also in evidence was a plastic bag of deck hardware, some lengths of brass rod, brass tubing of various diameters, wood dowels, and decals. The plans were printed on both sides of a 25" x 38" sheet and were literally covered with construction notes, paint scheme identifications for all parts of the boat, detailed building notations regarding various components, as well as the more conventional top, bottom, and side views. All deck hardware placement was also indicated. An interesting and helpful feature of the plans was a "parts locator." This was a drawing of all die-cut sheets identifying individual pieces. We later referred to the locator on more than one occasion in order to sort out different (but similar) parts.

SPECIFICATIONS

Name	U.S. COAST GUARD 41' UTILITY BOAT
Boat Type	Scale
Manufactured By	Dumas Products, Inc. 909 East 17th St. Tucson, Arizona 85719
Mfg. Suggested Retail Price	\$88.00
Available From	Retail Outlets
Hull Length	31 Inches
Beam	10 Inches
Mfg. Rec. Motor Size	Two 6v Dumas Electric
Recommended No. of Channels	2
Rec. Control Functions	Rudder & Throttle
Basic Materials Used In Construction:	
Hull	Birch Ply 1/16"
Deck & Frames	Mahogany Ply 1/8"
Cabin & Pilot House	Birch Ply 1/16"
Instructions	1 plan sheet, 4 page booklet
Kit Includes	All materials for basic boat, with deck hardware included

RCM PROTOTYPE

Motors	#2004 Dumas, 6 volt electric (2 used) . . . #2022 Dumas Speed Control
Radio Used	Cox-Sanwa #8021, 2 channel wheel steering
Weight, Ready to Launch	8 Pounds

SUMMARY

WE LIKED THE:

Ply die-cutting, wood quality, instructions and plans.

WE DIDN'T LIKE THE:

Waterline was incorrect (see text).



The instructions consisted of two sheets 8 1/2" x 14" printed on all sides and covering more than 70 separate and individual construction steps. A "box" is printed at the start of each step so that it can be checked off when that part of the job has been completed.

Dumas fills the construction notes with solid advice and observations that make the instruction sheet an eminently readable document. Comments on the types and kinds of adhesive to be used, for example, are especially valuable (remember, this is a model that will be in, on, and around

water and aliphatic resins just won't do). We confined our glues to Carl Goldbergs' Super Jet, and Devcon's epoxy — both the 5 minute and regular variety.

As we mentioned earlier, die-cutting of 1/16" birch and 1/8" mahogany plywood was good. Parts came out extremely well and required very little sanding. We found one of the frames incorrect and was replaced by Dumas. This error had already been discovered and corrected by Dumas. Anyone who has a kit with the incorrect frame, just contact Dumas and it will be replaced. This was one of the early kits off the production line.

As the project progressed, we found we were re-discovering the thrill of **building** as opposed to **putting together** our model. In just about every case where we have come across this type of kit we've been impressed with the ease of assembly and the professional appearance of the finished model. And here we must admit that even though the die-cut decks, cabin and hull components did do a lot for us, there was still enough cutting, drilling, sanding and gluing to give a lot of satisfaction when each stage was finished. As a matter of fact, the setting up of the keel, installation of frames, hull sides and bottom, and, ultimately, the decks, seemed to us, a scaled down version of what construction on the full size boat might be like.

Finish:

After all wood components were completed they were sprayed with Zynolyte white primer/surfacer, then sanded and given three coats of Zynolyte white epoxy. Dumas comments that they have found that a glossy finish tended to give the boat a "toy like" appearance, and suggested semi-gloss for a more realistic look. We couldn't find a semi-gloss epoxy and were stuck with the glossy variety — so we waited a few days for some curing to take effect, and knocked the gloss down with a very careful application of Turtle Wax Polishing compound scratch remover — a very mild form of rubbing compound, we think. After this, the hull and cabin sides were masked and the decks and cabin tops were sprayed a flat gray. Next, the bottom was sprayed with red oxide primer which, coincidentally, matches almost exactly the color and surface texture of the real bottom paint on the full size boat. A semi-gloss black water line was then masked off and sprayed. The final touch was brought about by the application of the decals, with the familiar Coast Guard red, white, and blue "racing stripe" on the hull really setting things off.

Deck hardware installation was next, and each step increased the realism of the model. The cleats were die-cast metal as was the cockpit floodlight (mast mounted), a search light complete with swivel and base, and diesel fill pipes and vents. The only plastic in the entire kit (not counting the cabin and pilot house windows) was the radio direction finder antenna housing, a loud speaker, three bubble skylights, and the radar dome. The brass rod was cut, bent, and soldered as per the full size pattern on the plans, and once painted became our hand rails, cabin top grab rails, and cockpit pulpit. Before we leave the deck hardware installation, lets take a close look inside the pilot house. Dumas furnished a die-cast steering wheel, throttle quadrant and compass, and these were the basics for the detailed interior we ultimately ended up with. We painted the steering console and the radar base with a medium brown acrylic artists color, and then "grained" them with a darker shade of the same color. A dark brown piece of felt was glued to the floor (sole, to you navy types) and looked all the world like scale indoor-outdoor carpeting. The throttle quadrant and steering wheel were left natural metal color, but the compass was painted black and then given vertical white degree lines using a very fine artists brush. We upholstered the helmsmans' seat and back, and the radar operators seat with postage stamp size pieces of black calfskin from a pair of ladies gloves, and they couldn't have looked better. Thumbing through an old boating



magazine, we ran across a color photo of a nautical chart, and you just have to know what we did. After cutting it out and gluing it in place on top of the natural mahogany chart table, we fashioned a pair of dividers from a paper clip and glued those on top of the chart. The instruments and depth finder faces were printed on the plans, and so these were cut out and glued onto their proper locations. When completed, the interior of the pilot house looked great, keeping pace with the realistic appearance of the exterior of the boat.

Power:

It should be pointed out here that this kit does not come equipped with electric motors, running hardware, or speed control. This boat is to scale, and with care a very nice display model can result. For those who do wish to build for display only, the basic kit alone will suffice very nicely. For those who want to build it for go as well as show, then the purchase of the motors and attendant paraphernalia is, of course, a must. Two 6 bolt Dumas #2004 motors were installed just about mid-ships on wood saddles as per the excellent instructions. A Dumas speed control #2022 was used, and allowed variable speed forward and aft, as well as a neutral position, of course. Wiring was done so that the motors ran counter to each other, using one left and one right hand prop — thus eliminating torque effects. Four D cell batteries furnished the juice to this set-up.

Radio:

A Cox-Sanwa #8021 wheel steering, two channel system was used. The rudder servo was located aft under the cockpit deck, as per instructions which allowed the use of very short pushrods — a decided advantage. The instructions suggested the location of the speed control and its servo also be mounted under the aft deck, partially projecting into the area under the cockpit. But try as we might, we couldn't get the blame thing to fit without radical surgery. As a result, we ended up installing it just aft of, and between the two motors — an arrangement that worked out very well.

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FLOAT FLY OUTBREAK in Minnesota

By The Twin City Radio Controllers



A crowd of people covered the beach the entire afternoon to watch model airplanes fly.

One wouldn't know it by looking at the pictures, but last year's Twin City Radio Controllers' Annual Float Fly on Bush Lake near Minneapolis almost didn't happen. We were given an idea of the seriousness of the problem by the President of TCRC, David P. Andersen. His warning to us was given in the TCRC newsletter *Flare-Out*. It read as follows:

What's all the commotion about the Mediterranean Float Fly? Apparently it's some sort of insect that attacks the pontoons of water-based airplanes. It probably got started back in Monaco during the Schneider Cup seaplane races. For several years they had those races on the Mediterranean in the same spot, and the destructive little pests flourished in the warm water and the wooden hulls of those exotic airplanes

--- the fastest and most beautiful airplanes in the world at that time. Eventually the insects spread to the other Schneider race countries --- England, the U.S., Italy, and France. I don't know how the recent epidemic started in California; perhaps the recent uncovering of Howard Hughes' Spruce Goose released some dormant hatchlings that survived from the great days of seaplanes.



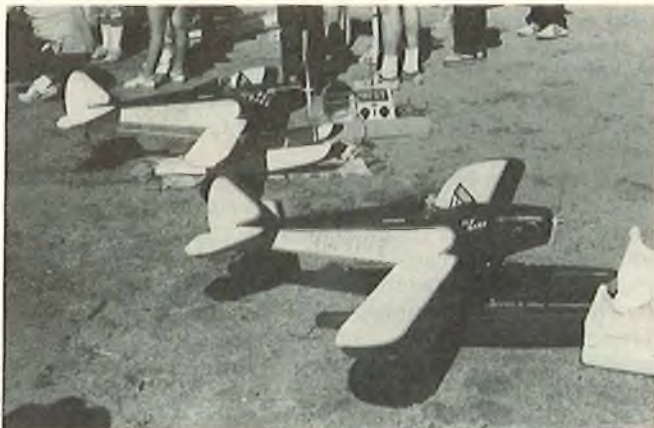
Owner of pest control company kept a stern eye on activity after he completed the inspection for float flies.



TCRC Secretary Bob Davis, a Bloomington police officer, and TCRC President Dave Andersen stand guard for any late comers who had not undergone the float fly inspection.



Bob Davis and Don Martin take their turn at watch for dreaded float fly swarms. Happily none were seen.



Twin Flybaby's built by Gerald Gerrits, back, and Dave Andersen, front, from RCM plans.



An example of crowd enthusiasm pressing planes and fliers to the water's edge.

Closing the California/Arizona border to float-borne airplanes seems a bit extreme to me because I don't think there are enough float planes in all of Arizona to allow the insects to spread. Aerial spraying also seems counterproductive, especially if float planes are used. That might spread the float flies even more.

water, however, they were required to undergo inspection for float flies. The inspection was coordinated by a deputy sheriff of the local law enforcement agency. The actual inspection was under the control of a reputable pest-control company armed with appropriate insect sprays. The wait in line was a bit aggravating,

but one had to keep in mind the necessity of keeping the lake free of the little pests.

The flying site we use each year for this event is the Bush Lake swimming beach. After Labor Day the park system closes the beach to swimming, leaving an ideal spot open for float to page 120



Sherwood Heggen's J3Cub caught during turn around while doing preventative spraying for float flies.

But the biggest danger to us local fliers is the Annual TCRC Float Fly that will be held at Bush Lake. This will be the largest gathering of float planes and flying boats held in Minnesota. And this event is held every year, just like the Schneider races used to be, so there is the danger that the next big outbreak of the dreaded float fly could occur among the beautiful seaplanes gathered there. It would be wise for all participants to carefully examine their pontoons and hulls before setting them in the pristine waters of Bush Lake. Look for the tell-tale worm holes and . . .

Imagine an outbreak of that dreaded float fly right here in Minnesota! Could this possibly happen?

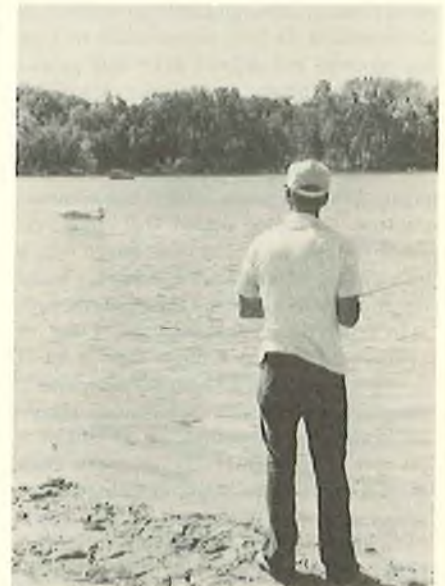
Sunday dawned a beautiful day with 80 degree temperatures predicted. By one o'clock most of the fliers had arrived at the beach. Before the airplanes could be placed in the



Chris O'Connor's Sig Kougar slows down after touchdown. Kougar powered by hot ST60 and riding on 20+ year old floats.



Sherwood Heggen's J-3 Cub about to touch down light as a feather. This pilot/plane received Peoples Choice Award.



The typical scene of the afternoon — man, airplane, and lake. Here Jim Miller urges his J-3 Cub up onto the step.



Don Martin and Bob Davis serving as air-sea rescue team after their turn at watch for float flies.



Jim Miller's Balsa USA J-3 Cub.

YOUR NEXT FIELD BOX

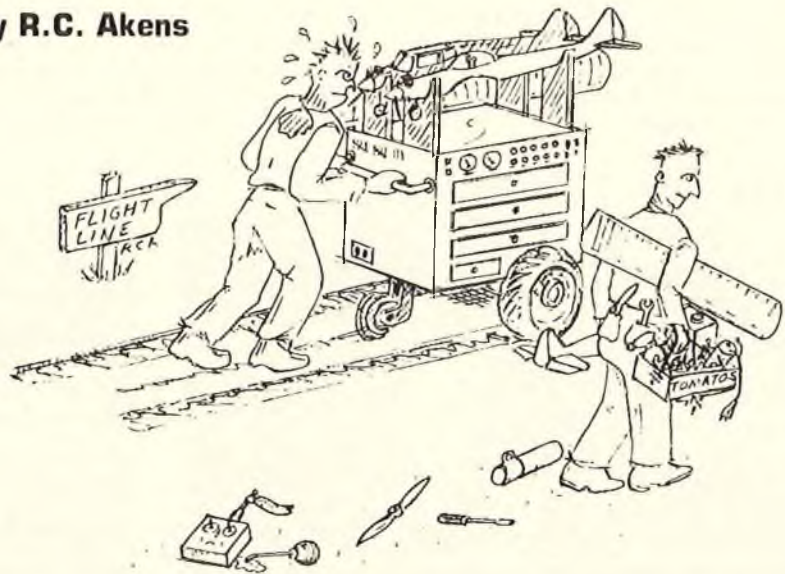
That dream ship that you have been working on all winter is ready to go. You have checked it out in every way and it's going to fly "right off the board," as they always say in magazine articles. You are just waiting for that first nice day so you can pack it into the car and take it out to the field, where you are certain all that justly deserved praise will be heaped upon you. There isn't enough time to complete a new plane and you really don't feel like starting a big project anyway, having just completed your masterpiece. What to do with all that spare time? Of course, you could paint the living room like your wife has been suggesting all winter, but . . . Your eyes fall upon the tired old cardboard box with the picture of the tomato on the side that served all last summer as your field box. The corroded battery has partially fallen through the bottom, where the leaking fuel can has weakened the cardboard. The tools and spare parts are mixed into an unrecognizable mess down in the bowels of the box, where a tube of glue has ruptured and affixed three new props, two glow plugs and your favorite screwdriver to the bottom of the box. Maybe you should build a new field box that would be worthy of your wonderful new plane. You may even build it out of wood this time. Of course, there is that brand new cardboard box under the work bench with a nice picture of a peach on the side, looks like it might be just about the right size too.

In order to get that beautiful plane of yours into the air, you must carry a lot of things out to the field which will never leave the ground (hopefully). Newcomers who do not realize the magnitude of the logistics involved, frequently try to carry their ground support equipment in their pockets, under their shirt, through their belt and in their hands. After dropping their starting battery through their brand new plane's wing and leaving about half of their equipment at the field, they decide to put it all into a cardboard box. After awhile, as a matter of pride, or a deep feeling of needing to carry their entire shop out to the field, they show up with a huge field box, which is nicely varnished on the outside and looks like a hardware store on the inside.

There have been many articles in modeling magazines showing exactly how to construct field boxes, which have worked well for their designers. Because of this, I do not plan to tell you exactly how I built my field box, instead I hope to provide some general guidelines which will help you when you design that "optimum" field box that you have often thought about building.

A field box is, or should be, a means to transport essential ground support equipment to the flying field so that it is

By R.C. Akens



readily available to the flier when he needs it. A field box should not be so heavy that it cannot be easily hand carried. If your field box needs wheels to get from your car to the flight line, it is too heavy. A field box should contain the minimum equipment necessary to: assemble the plane at the field (attach wings, etc.), fuel the plane (at least six times), and start the engine (a glow-driver is a handy addition to this system). This equipment should be in the very best condition, i.e., clean, fully charged, and unbroken, so that everything works when it is your turn to fly. There should be a convenient place to carry your transmitter, if you fly radio controlled aircraft. This area should be lined with foam to protect the transmitter and prevent it from excessive movement when in place. All components that must be accessed after the flier assumes the prop flipping position, should be clearly visible and within easy reach of the flier. This includes the transmitter, the master power switch, the fuel pump switch and any gauges or warning lights associated with starting the engine. Although fuel and electric sources should be separated by bulkheads (for safety reasons), they should both exit the field box at the end nearest the plane to facilitate usage. If you always start the engine on your plane with the field box on your left, the fuel and electric lines should exit (separately) on the right side of the field box. Note: Always examine your design for possible safety hazards when routing fuel or electric lines. If you use a manual fuel pump (one with a hand crank), it should be mounted on the field box so that it faces the flier and can be easily operated by the flier in the prop flipping position.

A good field box should only carry those

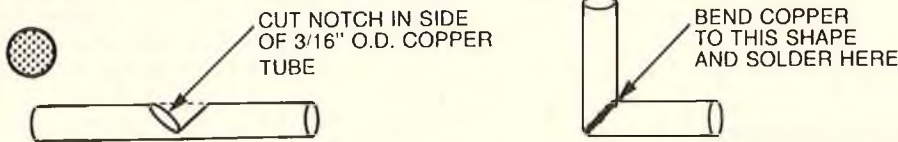
tools and spare parts which experience has shown will be needed by a given flier. It is suggested that a small notebook be carried for an entire flying season, and each time a tool or spare part is needed, indicate it in the book. You will probably find that you are carrying around a lot of things that you never use. It is suggested that a second small tool box be kept in the car (for items which are not affected by extreme heat or cold) to keep those odd and seldom used tools and spare parts which you may need once a year.

It is suggested that the following features be included in any good field box design. Use fuelproof paint to both protect and to beautify your field box. It is discouraging to have your nicely finished field box turned into an ugly, sticky mess after you accidentally exposed it to glow fuel. Build a special (vented) compartment inside your field box to house the battery. I use a small 12 volt motorcycle battery, because it is easy to recharge (use a standard car battery charger per individual instructions) and it provides all the power that is required for flight line needs. This type of battery weighs a little more than some other batteries and if this becomes a problem in your design, use a gell cell, a nicad, or a dry cell as your power source. It is recommended that the battery wiring be designed so that the battery can be easily removed, i.e., battery should be removable by disconnecting only two leads. Battery power should be controlled by a single, appropriately rated switch, externally located and within easy reach of the flier. The field box carrying handle should be located so that the box hangs level when carried full. This might mean that the handle will be off center in some designs because

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A DESIGN GUIDE

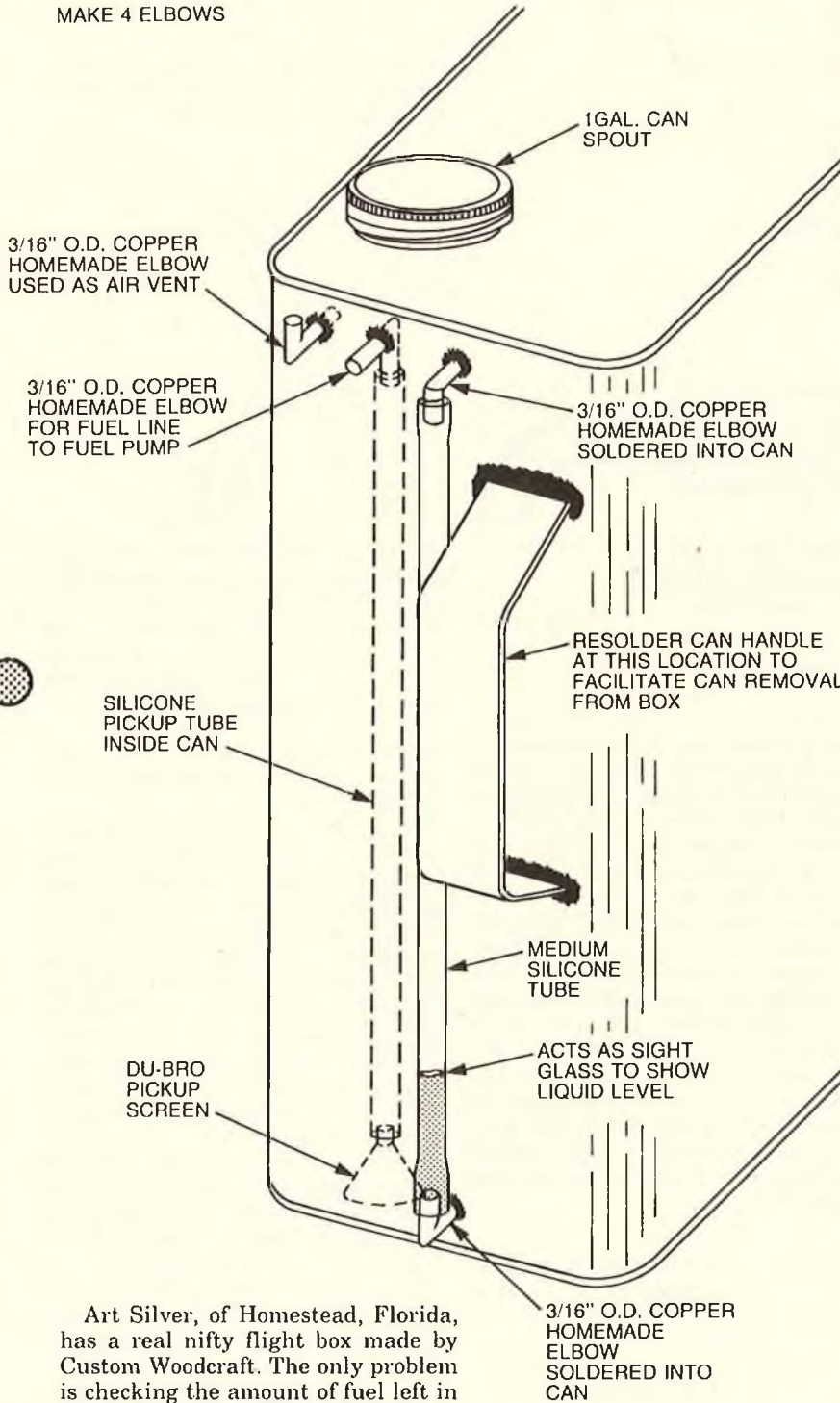
FOR WHAT IT'S WORTH



CUT NOTCH IN SIDE OF 3/16" O.D. COPPER TUBE

BEND COPPER TO THIS SHAPE AND SOLDER HERE

MAKE 4 ELBOWS



3/16" O.D. COPPER HOMEMADE ELBOW USED AS AIR VENT

1 GAL. CAN SPOUT

3/16" O.D. COPPER HOMEMADE ELBOW FOR FUEL LINE TO FUEL PUMP

3/16" O.D. COPPER HOMEMADE ELBOW SOLDERED INTO CAN

RESOLDER CAN HANDLE AT THIS LOCATION TO FACILITATE CAN REMOVAL FROM BOX

SILICONE PICKUP TUBE INSIDE CAN

MEDIUM SILICONE TUBE

ACTS AS SIGHT GLASS TO SHOW LIQUID LEVEL

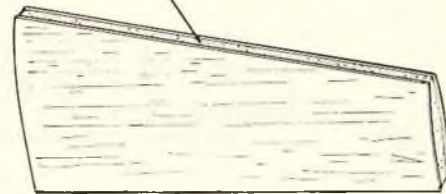
DU-BRO PICKUP SCREEN

3/16" O.D. COPPER HOMEMADE ELBOW SOLDERED INTO CAN

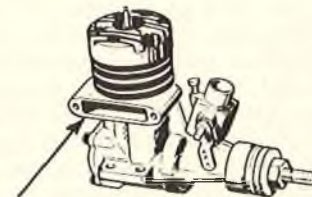
This good building hint came from Bill Murray of Newark, Ohio. When building foam wings and stabs Bill finds it difficult to sand the leading and trailing edges and "see" what he is sanding. It is very easy to sand too much off and get the "soft" core out of square.

To allow better visibility and enable him to "see" what he is sanding, Bill colors the edges with a blue or green (he finds these colors best) felt tip Hi-lite pen. Then when he sands, if he is not sanding square, the color is removed. It still behooves one to be careful but at least it can be seen where the sanding is effective. See sketch.

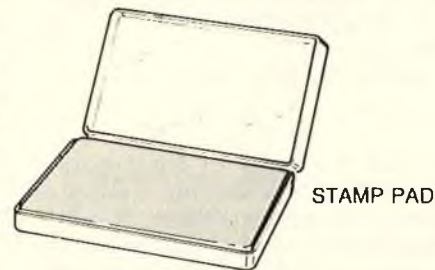
COLOR FOAM WITH HI-LITER FELT TIP PEN



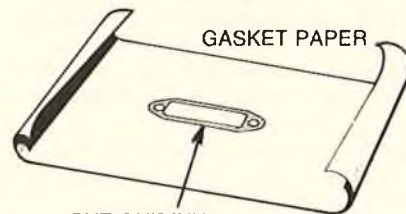
A neat way to cut new gaskets for small parts, especially engine part, is shown in the accompanying sketch which is self explanatory.



PART OF ENGINE TO WHICH TO APPLY STAMP PAD



STAMP PAD



GASKET PAPER

CUT OUT INK TRANSFER FOR PERFECT FIT

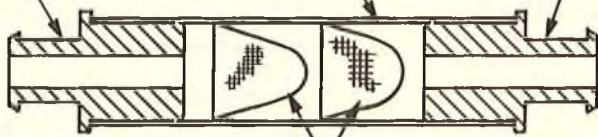
Art Silver, of Homestead, Florida, has a real nifty flight box made by Custom Woodcraft. The only problem is checking the amount of fuel left in the can. It's a real pain trying to remove the can from the box. The drawing shows how he solved the problem.

FOR WHAT IT'S WORTH

FILE OFF LIP AND DRILL WITH 1/8" DIA. TO SUIT BRASS TUBING

CLEAR TUBING

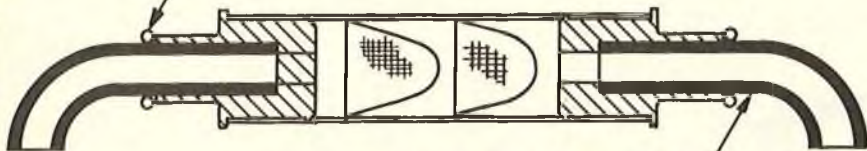
BRASS INSERTS TYP. BOTH ENDS



TWO FILTER SCREENS

STANDARD FILTER

COPPER WIRE SOLDERED IN PLACE AS A KEEPER RING TYP. BOTH ENDS



BRASS TUBING SOLDERED IN 1/8" DRILLED HOLE. TUBING TO BE BENT AFTER SOLDERED IN PLACE. TYP. BOTH ENDS.

MODIFIED FILTER

Mr. Wayne Swayze, of Niagara Falls, Ontario, Canada, solved a problem encountered on his first model. The fuel line kept slipping off the inline fuel filter due to 90° bends in the fuel line. Only after trying all type of fuel line/filter combinations was the following solution finally arrived at.

Materials:

- 1 — Du-Bro two stage see thru filter.
- 2 — 1" lengths of 1/8" brass tubing.
- 1 — 1" length copper wire.
- 1/8" drill.

Solder and iron.

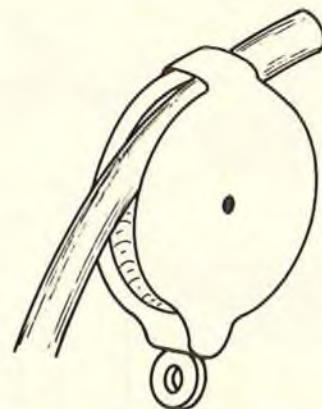
Dan Yarchin of Baltimore, Maryland, describes his method of tinting canopies as follows. Recently Dan figured out a fool proof method of tinting a canopy from the inside only. It is absolutely fuel-proof and scratch resistant since it is inside. He taped a cardboard box on all the outside openings and filled it with 10 lbs. of discount brand flour (\$1.77), then pressed the canopy upside down, down into the flour, which makes a perfect mold with no scratches and the opening facing up. Dan used a package of Rit Dye, poured the contents into an

old open pan and heated some water up in a kettle. Pour just enough water into the pan to fill the canopy. Keep the color darker than you want, since it dyes light. After the hot water is mixed in the pan, pour the contents into the canopy and let set for 30 minutes. The canopy sitting in the flour mold does not distort from the hot water (about 175 degrees). After 30 minutes, remove the canopy, pour out the dye and quickly rinse with cold water and dry with a soft towel. You'll be amazed how even the color is inside. Dan painted the black outlines on the inside also, so it is completely free of fuel fading and scratching. His pilot now has a beautifully tinted canopy and no longer flies into the sun and crashes his plane.

Anthony Lavardera, Bellmore, New York, uses centrifugal force to keep his CA flowing. Tony always had clogging problems with the small application tubes on the instant glue bottles. He tried tapping the bottle, squeezing the bottle, etc., but they were never perfect solutions to the clogging problem.

Tony has now gone through three

bottles of glue without a clog by doing the following: Tie a strong string to the neck of the cyanoacrylate glue bottle. Make it 10" to 12" long with a loop on the end. When you have finished using the glue, put your finger in the loop and twirl the bottle around like a propeller for a few seconds. The centrifugal force pushes all the glue out of the tube and all of the glue in the neck of the bottle down to the bottom of the bottle.



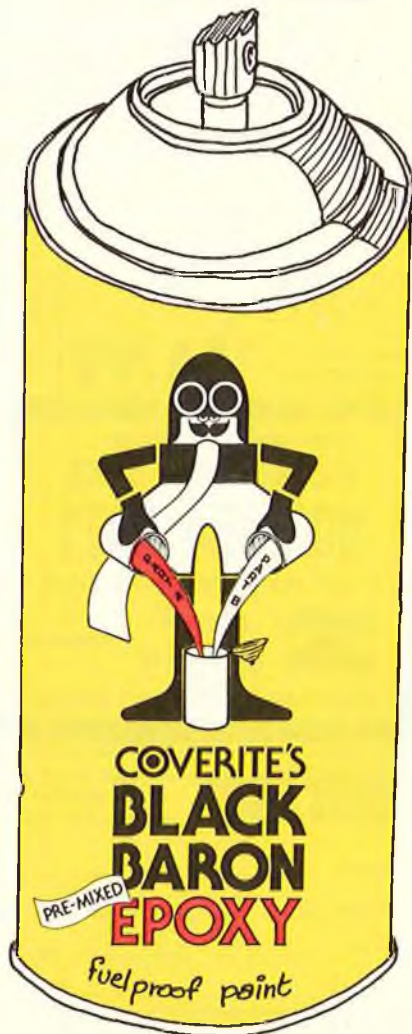
Wendell Seward of Los Angeles, California, discovered this useful item. Drapery pulleys are handy and useful as "hickeys" for bending fuel tubing. The grooved sheave of approx. 1/2" diameter will form a bend with minimal flattening. See sketch.

Thomas Kerr, Riva, Maryland, solves a problem with an old standby product.

A constant problem experienced with a model covered with plastic heat shrink coverings is how to effect a good patch over a damaged area in the covering after it has been in contact with fuel residue, oil, etc. Most of us have tried lacquer thinner, acetone, and other solvents, in an attempt to remove the oil film so that a patch can be ironed on and will stick. Usually the patch falls off all too soon and the frustration begins all over again. Alas, a simple procedure which takes seconds to accomplish and will **guarantee** an absolutely oil-free surface that will accept the patch permanently! Simply spray the area where you want the patch to stick with K2-R and allow the K2-R to dry to a white powder. Dust off the white powder and apply the patch. The patch will stick every time and will stay stuck! Quick field repairs can be made if you carry a can of K2-R and a roll of plastic film tape (moving companies use it a lot) in your field box. Clean the

to page 102

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FOR WHAT IT'S WORTH

from page 92/91

area with K2-R and apply the tape . . . saves a trip back to the hangar.

If you have trouble getting heat sensitive films to stick to epoxied areas (e.g., epoxy-glassed wing center sections), fret no more. Get a tube of Ambroid Cement, brush a thin film of the cement over the epoxied area, let dry, and then iron on your MonoKote, Solarfilm, Econocote or what have you. No more problems! Works equally well on oil soaked areas after they've been cleaned, or any other area where you might be having difficulty getting the film to stick. This idea was submitted by Louis Higgins of Adelphi, Maryland.

Larry Hoffman, of Tokyo, Japan, solves a paint brush nuisance as follows. When using dope or paint to finish a model, a common problem is with the hairs from the brush adhering to the model. To prevent this, before the brush is used for the first time, liberally apply "Hot Stuff" type glue to the portion of the brush where the hairs connect to the handle. After a period of time to harden, the brush can be used without the "hairy monster" problem ever cropping up again.

For the person who is into soaring, you would probably use a high start to launch your glider. A neat and useful way to store the high start is to use a "Cord Caddy," which is an extension cord holder, (Black and Decker makes one). You could probably find it in most hardware stores for about three or four dollars. This neat and useful way to store your high start was submitted by Dale Gerheim of Phoenix, Arizona.

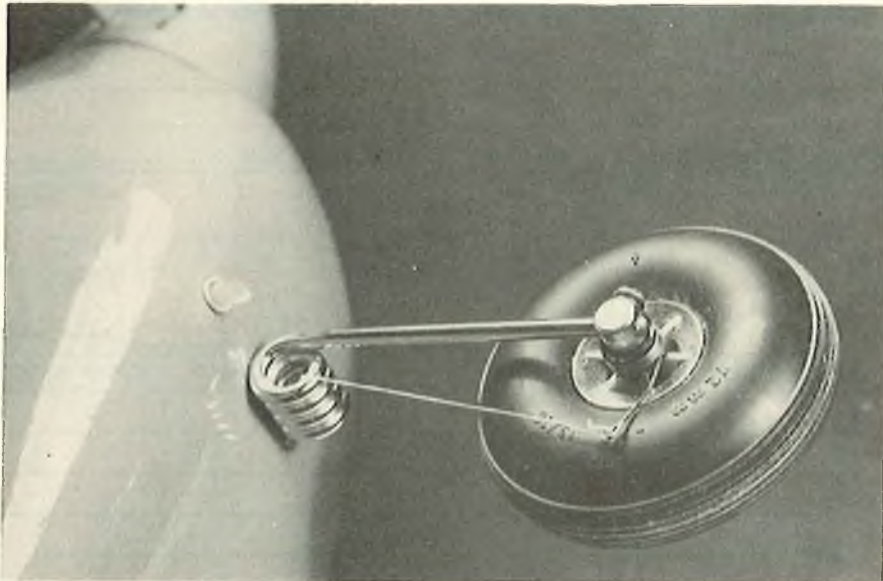
Clair Sieverling of Phoenix, Arizona, tells how he solved a paint problem. Polyurethane paints, such as Formula U, varathane, etc., tend to skim over and eventually dry in the bottle or can, once it has been opened. The problem is caused by the air space in the top of the bottle. A simple cure is to gather a few marbles or small pebbles, wash them, and after using the paint, drop enough pebbles in to raise the paint level back up to the top, thus eliminating the air space. They also stir the paint well the next time it's used, just by shaking. □

Send your hints & kinks to R/C Modeler, P.O. Box 487, Sierra Madre, Ca. 91024 & win a free book from RCM's Anthology Library Series if your idea is used.

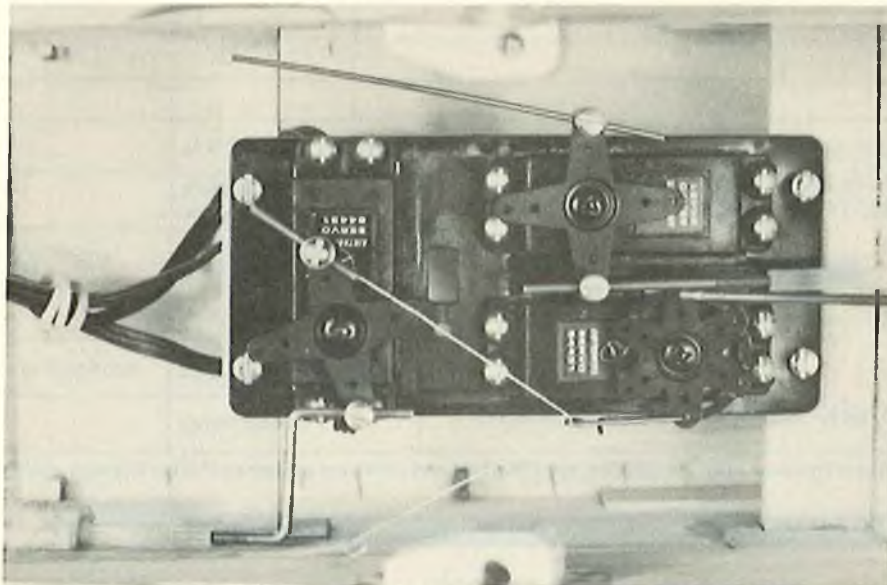
RCM FUNSTER 40 DETAILS



The RCM Funster 40 will be presented as a construction article later this year. The Funster was designed to win the club fun fly contests. This is the most versatile performing aircraft we have ever designed.



The Du-Bro nose wheel brake provides superb ground handling capability. Installation is convenient when used with Goldberg adjustable strut/axle assembly. The stationary end of the brake wire is merely bent around the axle locking screw and snipped off.



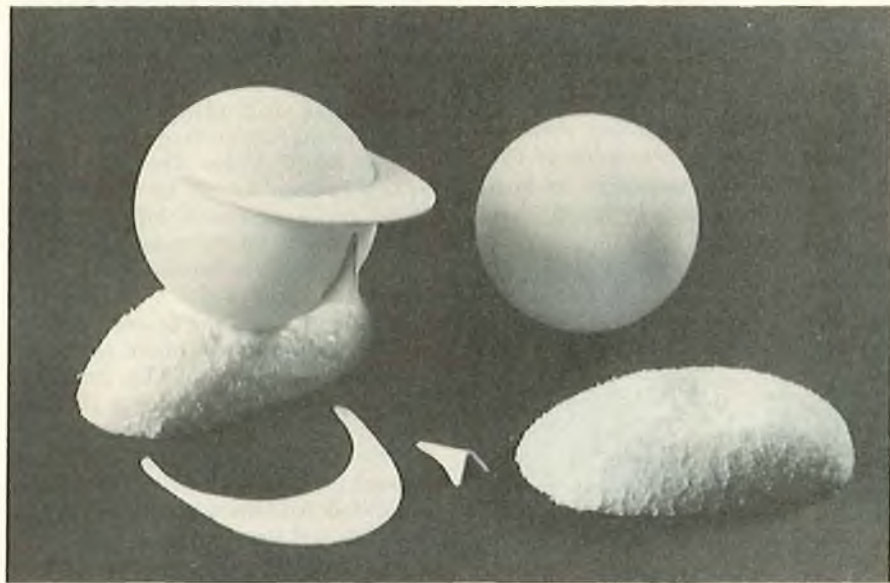
Goldberg 1/2A control line is used to actuate brake. The line runs through a plastic tube from nosegear, through a wire loop on elevator servo, and to throttle servo. Brake is operated with down elevator and low throttle applied simultaneously. End of line is secured in 1" length of 1/16" dia. brass tube with Jet. Tube is adjustable through a pushrod connector on throttle servo arm.

A COUPLE OF HOW-TO'S

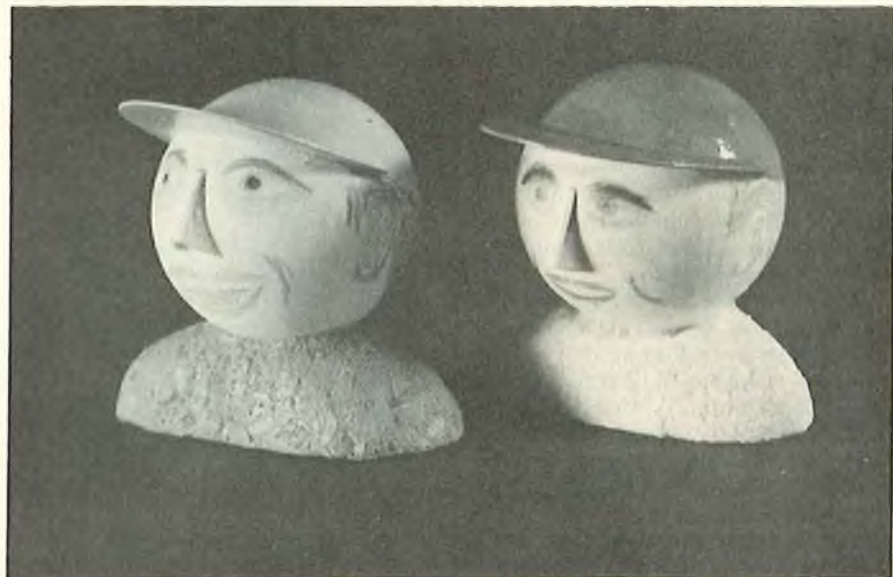
By Dick Tichenor



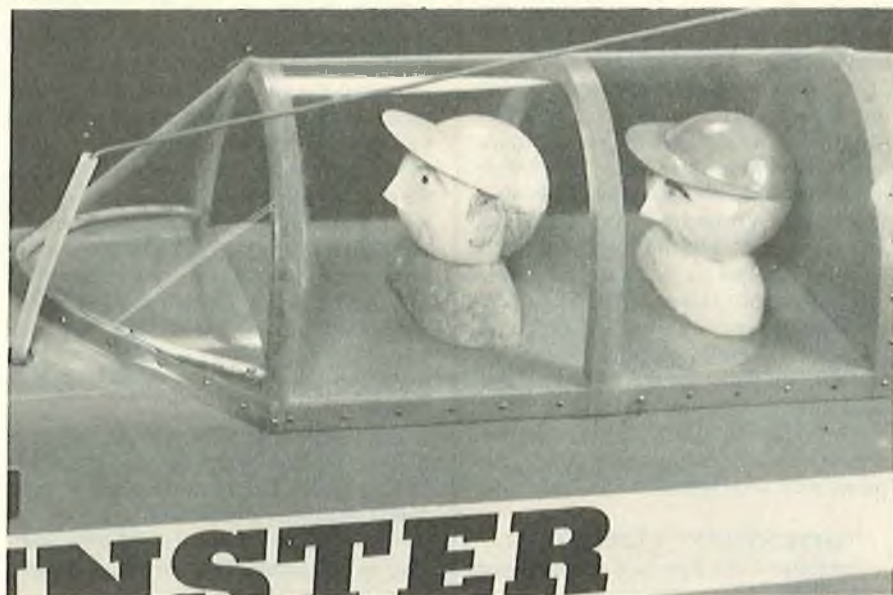
Economical pilot and passenger were made of ping pong balls, scraps of styrofoam, and pieces of plastic. Plastic came from Bank Americard and was stuck to ball with Jet. White glue stuck the head to the foam shoulder.



Shoulders and caps were painted with spray cans. Colored pencils did the rest. What if they aren't realistic, they serve the purpose and make good conversation pieces at the field.



Our crew, Pete and Repeat, are ready to go in a simple and inexpensive canopy. Two pieces of clear butyrate sheet wrap around to form canopy. Pins securing canopy are 1/2" long brass plated pins from yardage store. Antenna mast is scrap pushrod material.



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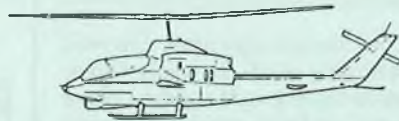
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YOUR NEXT FIELD BOX

from page 86

the component weight is not distributed evenly. This handle should be made of steel or aluminum pipe approximately 1 1/2" in diameter, which makes it easy to grasp and allows you to stow things inside the pipe. I have used this pipe stowage space to keep my primer bottle and, currently, I use it to stow my fuel pump lines when they are not in use.

Spare props are often broken or damaged because they are carried loose in the field box. It is a good idea to design a 1/8" plywood board with appropriately spaced and sized bolts anchored to it to hold the props. I use a board which holds five props up to 13" in diameter with each prop secured by its own wing nut. The entire board slides into a small unused area of the field box for easy access when needed.

It is recommended that the fuel system be designed so that you have a return line coming back to the fuel can in the field box from the overflow or vent tube in the airplane's fuel tank. When this is done, the fuel overflow is pumped back into your fuel can and none is wasted.

It is hoped that these few suggestions will help you design a more usable field box that will allow you to fly more and fret less. □

FLOAT FLY OUTBREAK

from page 85/84

plane flying. It is also a great place for the public to see R/C close-up when we gather each year. Actually, at times the spectators were so intent on seeing close-up that the fliers were pressed to the water's edge while they piloted their planes.

A total of fifteen float planes were on hand with fourteen fliers from three of the Minneapolis area clubs. A count of two Sig Kadets, three Sig Kougars, three Fly Babys built from TCRC plans in RCM, one Sr. Falcon, one AAMCO Trainermaster, one Hobby Lobby Harpoon, one Quick Fly, one original design and two Balsa USA J3 Cubs filled the sky. The spectators for the most part had never seen such an awesome display of flying model aircraft. It was not unusual to hear spontaneous applause from the crowd as planes landed (or is that watered?).

Of interest was the various types of floats being used. All floats were constructed of wood except for a set of Gee Bee floats and the Harpoon flying boat. Both of the plastic types were exempt from the float fly inspection. Float flies are attracted to wooden floats only. Most floats were of

to page 122

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FLOAT FLY OUTBREAK

from page 120/84

original design except for those constructed from the **Fly Baby on Floats** article in the June 1980 issue of RCM.

All planes took off, flew and landed (watered) successfully because the floats had been set up properly. The basic float set-up was to have the step at C.G. and the float at a slightly negative angle to the wing chord line. The latter allows for sufficient rotation for takeoff. For proper bouyancy, each float had sufficient displacement to support twice the airplane's weight.

The afternoon was not without mishap, lest you think we only had fun. Windy conditions created turbulent air and water which made landing somewhat tricky. The inevitable at times occurred when a float would dig into the rough water, bringing the airplane to a sudden splashing halt. Then would come the diligent air-sea rescue team in their canoe to pick up the soggy bird from the water and return it to its master on shore.

At one time during the afternoon we had a real scare. A plane dove into the water for no apparent reason. We immediately wondered if float flies could have gotten past inspection. Could they have caused malfunction in the airplane, bringing it down? A lot of scurrying was done to get the plane from the water before the little pests had a chance to spread. But all was well. The pilot admitted to being disoriented and he just plain "lost it." Inspection of the downed airplane proved this, with not a single fly to be found.

The afternoon did not go without tragedy either. Jim Malone's **Sig Kadet** and Sherwood Heggen's **J3 Cub** met in mid-air. The big Cub's Quadra powered prop ate the tail off the Kadet. The Kadet was not to be intimidated, as it caused a float on the Cub to break loose and hang down. The resultant drag pulled the Cub out of the sky, ending in a spectacular splash. The damage looked worse than it was with both planes being repairable.

As a point of recognition for the best plane/pilot combination, the "Peoples' Choice" plaque was awarded. A team of judges passed among the spectators and asked them which plane/pilot was best. After the smoke had cleared, literally, Sherwood Heggen and his **J3 Cub** with smoke generator got the unanimous nod.

Well, another TCRC Annual Float Fly has become history and is recorded for all the world to see and read. The concern about the floats being infested with flies may have been unfounded, but one can never be too cautious. And because of our caution we will have preserved our pest-free waters at Bush Lake for next year.

Note: Late word from the University of Minnesota Entomology Department informs us that our concern may not be for the Mediterranean Float Fly. Instead we must be on the watch for the more dreaded fresh-water species, the Metropolitan Float Fly. Keep a keen eye for this reportedly aggressive insect in your area, and keep your lakes free from its blight. □

U.S. COAST GUARD 41' UTILITY BOAT

from page 83/82

Sea Trials:

Our maiden voyage was in the bathtub! The bathtub caper was to determine static trim, and we found that she floated dead level but was a bit low in the water according to the waterline. At mid-ship the waterline is approximately 1/4" wide, and the top edge of it ended up about 1/16" below water level. Back to the drawing board everything checked out. The waterline was right where it was designated on the plans. Okay, then we must have too much weight aboard, right? Nope, that wasn't it either. The boat was built exactly to specs and no additional work was done or equipment added that did not coincide with that stipulated. The only thing we can figure is that this, being a scale model, the waterline was designated on the plans to be on the same relative line as that of the full size boat, and the model floats a hair deeper, scale-wise, than the big one. No matter, it is a minor point to be sure, and really the only adverse one we ran across in the whole project! The remedy, of course, was to broaden the waterline by 1/16" at the top edge and not worry about it.

Our final water tests were a delight. The boat immediately drew a small crowd, and the obvious admiration was gratifying, indeed. This boat at 3/4" to 1' scale looks so much like the full size craft that it's hard to believe it came out of a kit rather than a museum display case. Easing in the throttle, we pulled out into the pond and gave the folks a slow "fly by." The admiration became vocal. Our first speed runs found the boat tending to plow just a bit. Back to shore, a very small weight addition under the cockpit deck aft, and she behaved like

a lady at all speeds. Wide open was plenty exciting, but didn't look scale like — unless the big one can turn about 70 or so knots. Confining top speeds to around two thirds throttle looked right, and that was the upper limit we used. Rudder response was excellent except at very slow speeds, and even then was plenty adequate.

Conclusion:

This kit is not for the total novice builder, but if you've already built a kit or two of this type then this one should offer no big problems. We've built our share of kits — both the flying and the floating kind, and must, in all honesty, say that this one gave us a lot of satisfaction. The material, plans, and instructions are first rate. Everything went as it was supposed to, with no surprises, and the end result was rewarding. Dumas, is to be congratulated. □

DEAD CENTER

from page 80

front of the cowl is round and the rear is oval — like in a P-36 or P-47 Thunderbolt. In a lot of cowl installations, the rear of the cowl projects aft of the firewall. If it does, make sure you sand the cowl mounting plate so that it can be recessed the proper amount. It's easy to mark a bit of scrap balsa and use it as a depth gauge.

When the mounting plate fits the cowl to your satisfaction, find its center. If your cowl is truly circular, that's not a difficult task. If it's a slightly different shape, lay the cowl mounting plate on the model's drawings, orient it perpendicular to the thrust line — and draw the thrust line across it. Find the middle of the line you've just drawn and draw another line perpendicular to it from top to bottom of the ply plate. Using the center you've found, draw a circle whose diameter equals the rear diameter of your engine mount. Cut out the circle and sand it so that it's a snug fit around the rear of the engine mount. On partially circular engine mounts and angular ones (like Bridi's), line-up the mount in exactly the same way you aligned it with the firewall — using the center you found. When it's right, trace around it and cut out the resulting shape.

With the engine mount bolted to the firewall, place the plywood cowl mounting plate over it — flat and flush on the firewall. Two tasks to perform after you've made sure up is "up" and down is "down" for the plate. First, locate three or four places for cowl mounting bolts. Choose them close to the center of things but in positions where they won't interfere

with the engine mount or other holes in the firewall. Drill holes through both plate and firewall and use blind nuts and bolts to hold'em together. **Notice how the engine mount holds things in orientation while you're mounting the plate!**

With the plate in position, draw around the front of the fuselage onto the plywood. Inside this line represents two things; area that will provide bearing surface for the cowl on the firewall and where cooling holes won't do us a heck of a lot of good when we cut them out, later.

"Pull" the plywood mounting plate and extend the central hole so that the plywood can be slipped over the engine mount with the engine bolted in place. This usually means cutting a slot as high as the cylinder and as wide as the cylinder plus the muffler. We try to retain as much of the mount hole as possible but, since the plate's been positioned by the mounting bolts, this isn't a critical point.

Inset the plywood mounting plate into the rear of the cowling to the proper depth (use the depth gauge, again) and tack it in place with a few drops of glue around its periphery. Just to prove how spiffy the completed job will look, bolt the engine and mount to the firewall — and the cowl, too. Notice that the ole proppe shafte is exactly centered in the front of the circular cowling!

Three more tasks to complete the job. Remove everything, once again, and 'glass the cowling to the mounting plate. Use resin or epoxy plus fiberglass strips to make a solid joint inside the cowl. Next, locate the fuel line and pushrod holes on the rear of the mounting plate and trim the plywood so that it doesn't interfere with their function. This might mean drilling oversized holes in the mounting plate or merely extending the engine slot to include these firewall holes.

Finally, we've got to cut away the plywood cowling mounting plate to permit a good airflow for engine cooling. The big round hole in the front of the cowl admits a lot of air and we have to let it out. There are a few considerations for locating and cutting exits for cooling air. First, we want to retain as much of the cowl/plate joint as possible. Second, we want to make the cooling holes relatively large, favoring if possible, the side of the cowling that the muffler/exhaust exits. Third, we want to round the edges of the air exits, to keep them from becoming "traps" for engine "goop." Finally, we want to retain as much "beef" around the cowl mounting bolt holes as is practical — for a strong mount. Check the photos to see a couple of solutions to the cooling-air hole problem.

Using the cowl mounting plate technique will result in a strong installation that will retain its alignment. Best of all, cowl mounting bolts will be inside, which is aerodynamically desirable. If you're using the technique on a scale model, with a simulated radial engine up front, you may want to orient the cowl mounting bolts so you can get at them between cylinders. But, everything considered, using the engine's mount to set the cowl, is just about the most precise system we've yet found. □

AIRBORNE POWER MISER

from page 79/74

receiver, Power Miser and servos; soldered connections are less convenient but save weight.

Other electronic uses for a clocked rotary switch are beyond the scope of this article. The application to R/C gliders is an example. For special applications, resistor R-1 can be selected to provide operating frequencies from less than 1 Hz to several KHz. Quad Bilateral Switch 4066 will dissipate 500 milliwatts (mW). The operating voltage for Power Miser ranges from 3 to 15V (see Fig. 13.)

Flight testing should follow final adjustment. Control surface response will be slower than usual, so fly carefully. For pattern flying, fast servo response and smooth operation are especially important. This is not necessarily true for gliders. Slow servo response and flights that appear "lumpy" are acceptable under conditions that dictate long flights rather than perfectly smooth operation. Power Miser can extend battery life by about 38%. Do not expect absolute smoothness of movement; expect the aircraft to stay in the air for a longer time. Delay between movement of the control stick and action at the aircraft is the trade-off for longer operating times.

Acknowledgements:

The author wishes to thank Ray Forbes of Kraft Systems in Vista, California; Don Holloway and Ernie Piini at Dalmo Victor Operations of Bell Aerospace/Textron, in Belmont, California for review and criticism of the manuscript. □

SMOKE SYSTEM

from page 73

relieves the heat affected components and provides an attractive satin luster finish.

The check valve machined from aluminum and is used to prevent

blow-back from the muffler into the pump and diesel fuel tank when the smoke system is not operating.

The high pressure pump is powered by two AA pencells which are contained within the O-ring sealed pump case. The pump is actuated by a micro switch that must be operated by a servo. Harris demonstrated the pump pressure to us by crimping the output line which, in turn, stalled the pump motor rather than merely reducing the pump pressure. Pump pressure can be adjusted by using a wheel collar to restrict the diesel fuel flow between the tank and the pump. Don is having the pumps custom made to his specifications. Each of the components is available individually or together as a complete system. At first glance at the prices one will immediately come on with a "gosh, that's expensive" reaction. Well, it ain't cheap, but after examining the high quality material and excellent workmanship, we consider the Don Harris Smoke System price to be both moderate and fair. Incidentally, the neoprene tubing and the tank shown in our mock-up photo are not included in the price of the system.

Don also has smoke generating mufflers for the O.S. .90 and Webra .91 engines. For any additional information and prices please contact Don Harris, 23668 Shadow Drive, Auburn, California 95603, (916) 269-1164. □

SILENT POWER

from page 72/70

materials to bring you their new Challenger line of high performance cobalt motors for the serious hobbyist. The heart of these motors is the new high-energy, rare-earth magnets. These magnets, although only one-fourth as thick as the previous magnets used in their motors, have substantially more magnetic flux and are practically impervious to overloading and overheating. These magnets will retain their full performance even under the most severe conditions. In order to effectively use this magnetic potential, Astro Flight uses a high-grade silicon steel lamination and heavier case which can handle high values of magnetic flux. In order to handle the higher power that this motor is capable of using, they have incorporated a high-performance commutator which is capable of operation at 35,000 rpm at 350°F. This is coupled with a new silver graphite brush design which can safely commutate up to 25 amperes. The net

to page 126

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12%	13.25	8.75	8.00	7.25	204.00	300.00
15%	14.00	9.25	8.25	7.75	224.00	330.00
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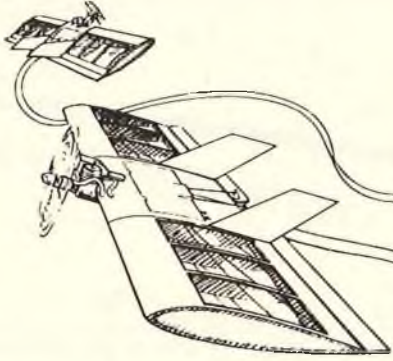
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SILENT POWER

from page 123/70

result is a high-efficiency, high-power motor which can be efficiently used from 5 to 10 volts input and from 5 to 25 amperes load. This wide operating range means that it can efficiently be coupled into many model applications where conventional motors just won't do. Each motor is run and tested before leaving the factory. Just hook up your favorite battery for operation at 6 and 8 volts and with 6, 7, and 9 nicad cells of 1200 mahr capacity.

SAGITTA 900

from page 59

release it. The kit recommends the E.K. version. I have seen both work — equally well, so the choice is yours. The Rocket City does require the F5 former to be cut out to accept the throw arm, so plan ahead. Hot Stuff was used almost everywhere to keep the weight down (45 oz.). The fuselage was fiberglassed with 2 oz. cloth from the nose to behind the wing, then 3/4 oz. back. This added 2 1/2 oz. to the fuselage, but is well-worth it. The hatch and canopy also used 3/4 oz. cloth. One coat of Hobbypoxy white and black was sprayed on with D.J. silver trim tape adding a "flair." The paint and trim added only 1 oz. The wing and tail were MonoKoted.

Flying:

The total finished weight was 45 oz. (kit recommends 42-46 oz.). Next comes the balance — ugh — it took 8 oz. of lead to put that C.G. somewhere near what the plans called for! Perhaps the tail was painted too much. Solution: Build those tail feathers as light as you can and sand that rear fuselage as much as is feasible. It's over 32" from the C.G. to the rudder and only 13" to the small balance chamber — maybe drill out that pine nose block before gluing it in.

It was finally balanced and off to the field we went. It was flown off both a high start (Astro-Flight, 95 paces) and an eight volt winch in 10-15 knot winds. Tows straight up, fast too, especially on the winch. This is one moving bird that likes to cover the area, and it flies best when flown fast — faster than the Aquila and loves to hunt for lift. She gives a nice "twitch" when passing through some lift. You can slow this plane down with up trim — but that is not how the Eppler 205 likes to fly. It can turn on a wing tip (almost anyway) and the stalls are very mild — if at all! Landings can be

"hot" or add up trim and use spoilers to walk it in. As of this writing, no official FAI speed runs were made but, in the hands of a good pilot, this will be the plane to beat on the FAI circuit for a couple of years to come.

Summary:

Many have waited for this kit to be released and whether you are a FAI "freak" or a duration type, this plane will do it for you. A most efficient clean flying machine. Now if Lee Renaud can improve these fingers of mine that hold the sticks . . .

This kit is recommended very highly . . . good lift.

ENGINE CLINIC

from page 56/54

compression. After landing, the propeller would turn very easily by rotating it with your finger. It seems that the piston size decreases or the cylinder increases as it gets hot. I think I read about a similar situation in your column but can't remember what issue it was in.

Please notify me of what steps I should take to resolve this problem or in what issue of RCM this appeared.

Sincerely,
Bernie Woller
Westerville, Ohio

Bernie, nothing lasts forever including model engines. If you have 100 hours on your HB .40 it is probably completely worn out. Undoubtedly somewhere along the way it has seen a few lean runs, picked up some dirt, etc. If the engine lacks compression when hot then it is worn out and needs rebuilding.

Dear Clarence:

The K & B .61 Series 75 RC Engine has a 1/4 x 28 prop stud that is screwed into the front of the crankshaft. The question that I have is why didn't the designers make the crankshaft in one piece like all the other popular engines have?

I have two of these engines and they both have prop studs that are too short to accommodate any of the 11/7 propellers — and if you are using a spinner — you can't screw the prop nut on the shaft because there are no threads projecting beyond the propeller washer to screw onto. When I tried to fasten an 11/7 prop and a Goldberg spinner to the shaft — the nut was halfway on — when the threads stripped out.

Another thing that bothers me is how the prop, spinner and stud stays on the engine when it is running. It seems to me that the engine is trying to shake all this stuff loose and get rid of it.

to page 129

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I like the K & B .61 and it certainly does run well. I would like to see a longer prop stud or a one piece crankshaft put on future engine productions.

*Sincerely yours,
C.L. Faith
Tulsa, Oklahoma*

When I originally designed the Veco .61 (now K & B .61) it had a one piece 5/16" prop shaft. In 1972 I updated the engine and K & B made the decision to change to the 1/4" screw-in stud. This was done for several reasons. Fellows were always complaining about having to drill their propellers (that come with a 1/4" hole) out to 5/16". By using a screw-in stud it can be replaced when bouncing your airplane off the ground in an unplanned landing. Replacing the stud is considerably cheaper than replacing the crankshaft. Economics also played a part. More crankshafts per length of bar stock steel could be gotten from the same length bar.

Your engines are evidently earlier models that did have a rather short stud --- actually the same stud as used on the front rotor K & B .40. This was changed with later models and longer studs are available. The new and old still have the same part number so you will have to specify the new long .61 stud when ordering from your hobby dealer or K & B. If you want a really long stud, order the one used on the K & B 7.5 ducted fan engine — Part #9118. You can cut this off to the length you want.

Dear Sir,

My local parts dealer suggested I write you with a technical question.

He told me you are quite familiar with the Turbax-1 ducted fan, spun by a 7.5cc K & B engine, pipe, pump, and carb.

The model I wish to build favors an upside-down engine installation. However, the language used in the manufacturer's instructions regarding this expresses caution. They seem to indicate it is possible, but don't recommend it.

I would appreciate your opinion on this, if there is any way, in terms of modification or operational technique, that a successful inverted installation could be made.

*Thank you,
Joe Vignolo
Dedham, Massachusetts*

Joe, I am really puzzled as to what the advantage of an inverted engine would be when using a Turbax-1 ducted fan unit. Most of the engine is

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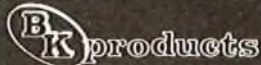
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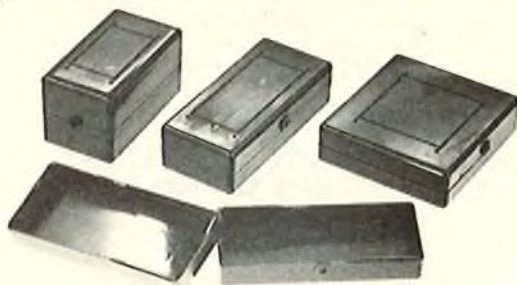
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enclosed within the fan unit to begin with so whether upright or inverted should not affect the model design that much. It is true that part of the head does extend a little but most ducted fan designs are considerably larger than the Turbax-1 unit (fuselage) to begin with.

As far as inverted engines — they are bad news even in conventional aircraft. An inverted engine floods easily, does not idle as well due to the glow plug loading, etc. And you never want to use an electric starter on an inverted engine. A hydraulic lock can easily occur breaking the rod, crankshaft, or both. An electric start is a "must" with a ducted fan ship.

If there is no way around it, then you will have to install the unit inverted. However, you will have to turn the ship over so that the engine is upright for starting. This could be a real pain in the can if the engine dies during the taxi-out, etc., as they often do. The ducted fan engines do not idle much below 4,000 rpm. Inverted you would have to keep the idle speed even higher.

Frankly, I think you are asking for a lot of problems. If you do invert the engine, the Perry pump will have to be kept upright so that the vent hole in the regulator unit is always facing down for drainage. This will require filing a flat on the pump casting inside the engine so that the piston will not hit at bottom center. This has already been done for upright and side mount installation so just duplicate the ones that exist. □

GRUMMAN F9F-8 COUGAR

from page 53

.....between the etches and the X-Acto razor saw #239 is used to cut the epoxy glass. This hatch is a very nice feature, as it allows complete access to the radio, tanks and engine unit. This means that all adjustments and maintenance can be done from top side. In addition the air vents, wheel wells and body flaps were cut out at this time.

The main bulkheads were glued in place with a mixture of Pica Microballoons and Devcon 30 minute epoxy. All of the bulkheads were made of 1/8" lite plywood and the two motor mounts as well as the retract landing gear plates were made out of 1/4" plywood.

The basic construction was completed by attaching each wing panel to the fuselage. This single step took one full evening because extra time was taken to insure the model was perfectly level on a flat surface.

to page 132

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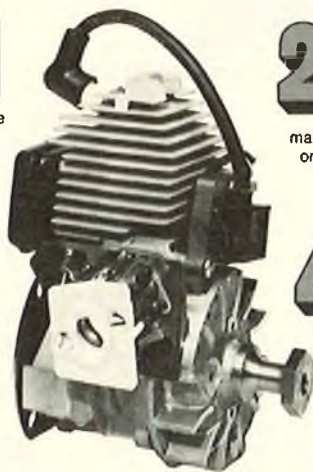
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GRUMMAN F9F-8 COUGAR

from page 130/53

One wing panel at a time was glued on with an epoxy / microballoon mixture. Even though the panels keyed into position, final measurements must be taken to guarantee they are level and in true alignment with the dorsal and stabilizer.

With the basic construction finished we turned our attention to the scale details and some of the working options possible on the Cougar. The construction manual and plans show how to make up and install working navigational lights, operational dive brakes and flaps. Also shown is how to make up the scale nose gear, where to locate the 20mm cannons, radio antennas, recessed and projecting vents, and much, much more.

Covering and Finish:

All of the built-up balsa areas were covered with K & B 3/4 oz. cloth and K & B Polyester Resin. The resin was thinned out and put on in two thin coats. A fillet was then made so that the wing panels would transition smoothly into the fuselage. We found that an extra thick mixture of epoxy and microballoons worked well and was easy to sand. The whole model was given one last light sanding. Acme auto primer was sprayed on the whole plane. A light sanding that removed most of the first coat of primer and another light coat of primer was sprayed on. Finally the entire plane was lightly sanded and was now ready for light, well-thinned coats of auto lacquer colors.

Jet Hangar Hobbies supplies one of the most complete sets of decals we have seen. They contain every conceivable marking and insignia used on the full scale craft. With the decals comes a complete legend that gives the proper location of each marking and removes all of the guess work. Even though the decals are fuelproof to a certain degree, we gave the Cougar one light coat of K & B clear epoxy paint.

Engine and Fan:

The K & B 7.5 Ducted Fan Engine #9100 was installed in the Jet Hangar Hobbies Turbax I. The instructions with this fan unit should be closely followed. All bolts in the fan as well as the engine mounting bolts must be secured with Loctite against vibration. Close attention was given to the balancing of the spinner and fan blades. After several test runs the Prather Reinforced Tune Pipe Coupler was chosen to be used with the K & B 7.5 Tuned Pipe. Prather

to page 134

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GRUMMAN F9F-8 COUGAR

from page 132/53

Coupler Clamps were also chosen as they don't transfer heat as metal clamps will.

Out of the box performance with 25% nitro fuel and an uncut pipe produced over 21,000 rpm's with a slightly rich needle setting. A Royal Tach was used for checking the rpm's and have proven very reliable for ducted fan use.

Two 8 oz. Sullivan tanks were installed in line near the front bulkhead of the model and since they were pressurized off the tuned pipe, and the engine is a pumped version, no problems with fuel draw were experienced.

Radio:

The Ace 7 channel Commander was chosen because it could be increased to 8 channels if needed for more options. The detailed plans even showed the positions for the servos and even indicate the size and type needed for the function intended. Our model used nine servos in all; two for ailerons, one each for elevator, rudder, throttle, flaps, dive brakes, and cycling gear doors and retracts.

Flying:

The Center of Gravity was placed about 3/8" in front of that shown on the plans. We were lucky enough to have access to an asphalt strip and so we first checked out the ground handling with a few high speed taxi runs. The wind was about 4 to 6 knots and steady, so after checking out the glow plug and re-fueling the tanks we started the engine. We advanced the throttle to full power and she came up on the pipe almost instantly. At about the 100' marker we eased in up elevator and found we had to use a little more than we thought we would need to rotate. Once up she climbed out fast and clean. Keeping the take-off shallow we had to only counter with a small amount of right trim as she wanted to roll slowly to the left. After once around we retracted the gear and with the gear up she really moves out. With the gear back down and at a safe altitude we retarded the throttle to about one half power. Response was still crisp and even at about one half to two thirds power she flew with authority. At low throttle she has a surprisingly good glide ratio. Our first landing was made under a little power and a little hotter than we normally land a standard pattern ship.

Later flights proved that the F9F-8 Cougar is as easy to fly as most pattern planes of the same size and is capable

of most all maneuvers needed in sport scale competition. In short the Cougar is a breathtaking performer that will attract more than its share of comment and attention.

Conclusion:

The F9F-8 Cougar's performance exceeded our expectations. We would recommend this semi-kit for the modeler who has building experience and is able to fly and handle a fast low wing pattern ship. The superlative quality of the epoxy glass fuselage, the well-detailed plans, and the step by step photo instruction book make this semi-kit a very good value. □

SOARING

from page 52/50

\$1.50 plus \$.50 handling. Or, for \$4.00 plus \$.50 handling, you get a set of 14 decals, of various sizes.

★★★

Dan Pruss returned from Paris and the FAI rules session with the news that there has been a major change in the speed event. Taking a cue from the LSF as well as from the U.S. World 2-Meter Championship, both of which have flown a 4 lap event, the FAI event will now be 4 laps (2 round trips). The new rule will tend to popularize FAI flying among those who couldn't (or wouldn't) deal with the Kamakaze speed runs. The new event will demand finesse in making turns and still will demand ballast, but the initial dive is shortened and the "Gees" in the turns are lower. Experience shows that 30 seconds for the 4 laps is very good time.

Another major change is in the winch department. Twelve volts only, with a "weak link" insert in the line to give a breaking limit of 88 to 110 lbs. One millimeter monofilament is the standard to be used. And, for those of you who still like to hand tow, there is a 175 meter length option for use in "pulley" systems.

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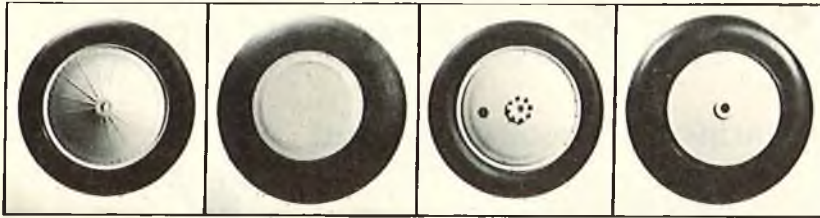
Man-on-man is out for distance, as is the unlimited lap scheme. There are frequency problems in Europe that hinder man-on-man, as well as problems in true random selection.

So, there are the changes in the F3B competition. This year is the team selection for the 1983 Championships. The launching changes were brought about because of the "Canadian Cannon" launching system (see RCM, Dec. 1981 — Soaring).

Howzat! □

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BIG IS BEAUTIFUL

from page 48/47

The probability is that the new engine will be present at Toledo for prospective purchasers to at least admire, and TML expects by that time to be able to announce the availability of the engine for delivery. Price will also be known at that time as well. First production prototypes were running in January and rumor has it they were producing over 20 pounds thrust although rumor did not have what size prop was being used!

So much for the engines themselves, now what about mounting them? There are two distinct schools of thought on what consists of proper mounting of the larger engine. Some claim that the engine should be hard mounted to the fuselage so that the structure will absorb the vibration present in these larger single cylinder engines. The other side claims the engine should be mounted with some 'give' in order to prevent the vibration getting to the fuselage structure and thus to the radio. As we all know, our radios are susceptible to vibration and they don't like it, so, my own choice is to mount engines with some means of absorbing the vibration before it gets to the fuselage. That's not always possible, and I have mounted engines both ways and much prefer the mount which cuts down on the shakes getting to the airframe. I find Lord mounts to be an excellent way to do this as they are not solidly connecting the engine to the firewall and the vibration levels are lower when they are used. They are pretty cheap insurance as far as I am concerned and both automotive and airframe engineers have been insulating vibration from their respective frames for years, so I go along with them. Any method, whether it be Lord mounts, or a rubber pad between engine and firewall, that will cut down on the vibration getting to the rest of the airplane will do the trick. The mount must be safe and one which will not allow the engine too much movement, of course.

As most of you will already be aware, silicone tubing is a no-no with gasoline. It seems to be okay in the beginning, but gas will attack silicone and cause it to swell and get very soft. Don't use it. There is a source of excellent fuel tubing for gasoline powered models and it's as close as your auto supply store. The neoprene tubing used for windshield washers is great, it's available in a variety of sizes to suit any application you might have, and the price is right. While it is a bit stiffer than silicone tubing, you

to page 138

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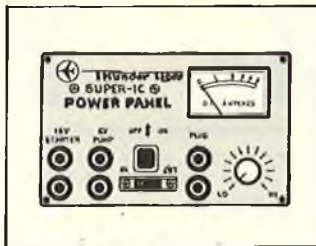
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BIG IS BEAUTIFUL

from page 136/47

can find it in the lighter sizes and even make your klunk tube out of it. Incidentally, speaking of that, Quadra and Quadra USA have a klunk the same as we used in the tanks of the chain saws. It's a bit heavier than a model klunk and also uses a felt type filter which does a good job of filtering right at the tank, and it gets every last drop of fuel out of the tank as well.

Quadra USA also has some great fuel tanks and the hardware for them.

If you haven't seen these, drop Dario a line at US Quadra and ask about them. The tank fitting can be used for other than just making the connections to the tank. I have used them as fill and overflow fittings on the outside of a fuselage. Just drill a hole the correct size in the fuselage planking, treat it with some Hot Stuff, tap it to the correct thread, and you can thread the fitting right into it. A fuel line connected to the inside of the fitting and then to the tank makes a great looking and good working fill connection for your tank. The tanks are a hard plastic and very sturdy, but with some give to them. There are

several sizes available and there should be one in the array to suit whatever requirements we might have.

There are a couple of other points about engines to watch. As suggested earlier, stick with the oil/gas ratio suggested by the manufacturer, especially early in the engine's life. If the engine was designed to operate on 50:1 mixture, the manufacturer will say so. If it isn't, he'll suggest some other ratio, and the minor increase in rpm to be gained by mixing at a lower oil to gas ratio is not worth the potential ruining of the engine.

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your "run of the mill" glow engines and they don't operate the same at all. For years we have equated high rpm with great power and the temptation is to carry this idea with us into gasoline fueled engines and it isn't either necessary, nor even desirable. The Quadra, for example, puts out best at about 7000 rpm (6700-7200) and to increase the rpm beyond that range actually can decrease the power produced. Best thing to do is to use the prop which gives you the best results at about 7000 rpm and stick with it. There's little if anything to be gained by raising the rpm.

The industrial engines we are using

are designed to get in there and grunt a bit and they do their best work when they are under a good load. I started using 18/6 props years ago as they were all that were available at the time, but nowadays I would rarely, if ever, prop a Quadra with less than a 20/6 and prefer even coarser pitches than that. The harder you make that engine work, the better it likes it; the larger, more powerful engines, even more so.

Many of us don't do it and we all should, and that's to experiment a bit by changing props on a new model. Just because you have always flown that particular engine with a specific

prop doesn't mean it will be the same on a different model and that applies equally to glow engines and to gas engines. Always try a couple of props and use the one which gives you the results you want, regardless of what the local expert tells you.

Naturally, all props should be both balanced and tracked, and if you aren't doing it now --- start! An out of balance prop can be a hazard and it will certainly give your engine the shakes. (You'll think it's the engine, but it'll be the prop if it isn't properly balanced.) Sure, it's tough to dynamically balance a prop, but even

to page 142

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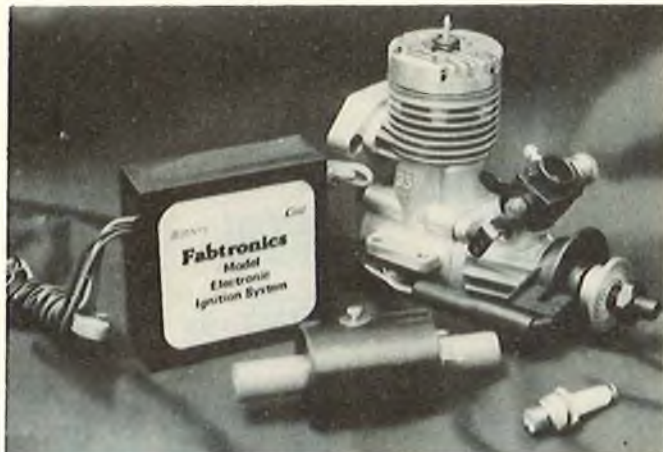


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BIG IS BEAUTIFUL

from page 139/47

a good, thorough static balance will go a long way toward getting rid of potential problems. Tracking the prop means to assure that both blades are running in the same plane and that they are at right angles to the shaft of the engine. Easiest way to do this is to place a piece of card stock at the edge of the prop circle and then put a dab of something on the tip of the prop that will mark the paper. Then, without moving the paper, do the same thing with the other tip. The marks should lie on top of one another. If not, you had better find out why and correct the problem until they do so.

If you happen to tic ground with a prop tip, inspect the prop to make sure it hasn't cracked or thrown it out of balance. Bad props are better thrown away than to risk an accident; even dubious props should not be used. If in doubt, throw it out!

If using a multi bolt hub and the prop strikes something, check the prop bolts to make sure they haven't partially sheared. If they are hard to put back in, discard them too and use new ones. (Good thing to have in your field box, a spare set of prop bolts.)

Engine maintenance is no big deal. Keep the points set accurately where they belong, keep the spark plug clean and properly set for gap, and the gap set correctly between the magnets and the pole pieces. Those three gaps are pretty important and your engine will run better if they are set properly. Keeping the plug clean is much more important than you might think. A dirty plug can cause radio noise which will shoot you down and you'll wonder why. Without the engine running, the radio will work fine but when you start it up, your radio can go crazy, so keep that plug clean. US Quadra has a new plug out that will perform better than the standard plug and it stays clean longer as well. Not a bad idea to try one next time you change plugs. Just like in your car, they don't last forever, and a new plug could make a noticeable difference.

When using gasoline for fuel, handle it with care. Gas fumes and a spark will incinerate you and your airplane, so don't smoke while refueling, vent your tank well (with pressure from the prop blast, if possible, to keep vapors from collecting). Be especially careful when you set up the fuel system that it cannot leak. A small fire extinguisher on the flight line should be a rule in any club where gasoline fueled models are flown. If the club doesn't have this

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rule, make the motion at your next meeting that the club provide one or that one be required to be part of the field kit of those who fly gasoline fueled models. A no smoking rule on the flight line would not be a bad idea where gasoline is present and, for goodness sake, don't let anyone stand in the prop arc while an engine is running.

Hey, look at that, used up the space again and didn't even get to the radio stuff this month. I'll do that next month in more detail than would have been the case if I had combined it with engines as I had intended. See you next month now that we're into a new flying season. □

PIT STOP

from page 44/42

Lavacot drove a perfect race to take the checkered flag, as did Jimmy Welch to take 2nd with Clausen finishing 3rd and Arturo Carbonnel 4th.

Modified Class was next. The horsepower went in and everybody immediately picked up two laps. I told you I thought Kent Clausen had the fastest car in the Stock Main. Well, there was no question Kent was the fastest qualifier in the Modified Class. In the first qualifying round Kent turned 33.67. He was so far ahead of everyone else, he didn't run his other three qualifying rounds. The closest anyone came to him after four rounds was Mike Lavacot with 33.29.

In the Modified "B" Main, Craig Kelley and Pete Fusco raced for first, with Craig holding on for the win with Pete 2nd and Bruce Hickman close behind for 3rd.

Modified "A" Main

The cars were lined up, the green flag raised and Jim Aguirre made it through the first turn with the lead, closely followed by Ron Schuur. I had used some new tire cleaner, which obviously didn't work, because at the start, my car veered left, right into Lavacot and spun him around. He recovered fairly fast, and in a few laps he was racing Schuur for 2nd.

Aguirre was opening up his lead. Lavacot passed Schuur and in the next corner the two cars bumped and Lavacot's wiper arm got knocked off, dropping him out. The Top Qualifier, Kent Clausen had gotten a bad start, but now he was up to 4th and challenging Rick Davis for 3rd. Their little race was slowing them down and letting Schuur get away.

Aguirre now had half a lap lead. Schuur was still in 2nd but now Rick Davis got clear of Clausen and he was now closing in on Schuur, but time

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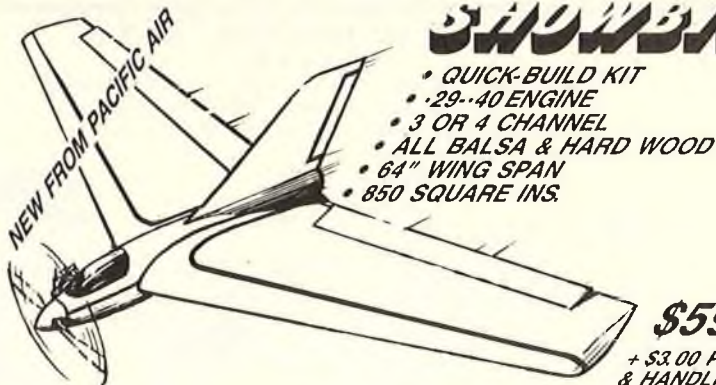
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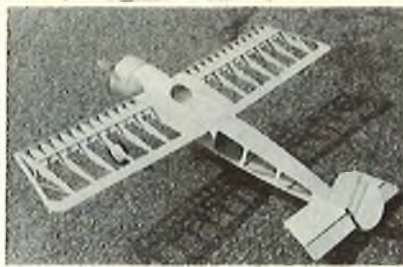
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was running out. Aguirre now had half a lap lead. Schuur was still in 2nd but now Rick Davis got clear of Clausen and he was now closing in on Schuur, but time was running out. Aguirre opened up his lead to 3/4 lap. Rick Davis finally caught and passed Schuur, to finish 2nd, with Schuur 3rd and Clausen 4th. Some really good tight racing was enjoyed by everyone.

After the electrics were run, the track was opened up for the gas cars. The same boards were used to mark the track, and the gas cars were actually able to rearrange the boards. But in the end, the boards always won.

We had racers from all around the country, as well as about eight from Venezuela, some from Canada and Dieter Mueller and Uwe Schildbach from Germany. The weather varied from 70° to 85° with no rain.

The first couple of days of practice, when the track was still a little slippery, the suspension cars had an advantage. Rick Davis, with his Associated RC500 prototype independent suspension car and Arturo Carbonnel with his Delta Eagle prototype IS car, were both running quite well. However, Chuck Phelps and Rich Lee were turning faster lap times, but their times were not as consistently fast as the IS cars. If the traction continued to rise, qualifying could be interesting.

After practicing a couple days with my RC300BD car, I drove Rick's RC500. Quite a difference! The independent suspension car seems so much easier to drive consistently fast. You have the feeling that you know exactly where the car is going to go. It's so smooth, it doesn't really seem to be going fast, yet you are passing everyone on the track in the infield. On the straightaway, it's a little slower, but not that much, and as soon as you get to the corners, it's faster. This coming year is going to be interesting!

The traction was up fairly good by the time qualifying started. I was running pretty good. I only missed the "A" Main by one second in the 5 minute qualifying heats. That's a fairly respectable pace. But when you're running that well, and at the 3 minute mark you see this green and white car go jetting on by, you know he must be flying low. Ralphie Burch, Jr. just simply dominated qualifying. He led every one of the six qualifying rounds and only got faster and faster, finally turning 17 laps and 54 sections. Only one guy was able to come close to him. Chuck Phelps drove a 99% perfect heat, with only one confrontation with another car and turned 17.42. Curtis Husting was the only other driver to turn 17 laps.

to page 147

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PIT STOP

from page 144/42

Rick Davis won the battle of the independent suspension cars taking 4th place with 16.93, but Arturo Carbonnel was right behind in 5th with 16.87. All the other eight cars in the Main were flat pan cars.

But, I think one of the most incredible performances belonged to the guy who qualified 10th. Kim Davis started the week with a PB car, but a radio problem sent the car into the boards, demolishing the front end. Kim didn't have any replacement parts so he went home that night and with the help of Angel Diaz, they assembled a box stock Associated RC300BD and Kim put it in the Main event. That's Incredible!

Super Stock Class

The Super Stock Class belonged to Bob Yelle. All the way from qualifying through the Main event. Bob is one of the top Super Stock drivers in the Mid-West, and he certainly showed everyone how it's done.

Can Am Open Class

In the "B" Main, I decided not to run so that I could prepare to help Curtis for his "A" Main. I jokingly told Joe Sullivan he could have the race and he must have believed me, because he went out and won it! But it wasn't quite that easy. Earl Nestor lead the first part of the race with Joe Sullivan a short ways back. Joe didn't get the lead till near the end of the 1/2 hour race with Earl taking 2nd and Ray Hepner taking 3rd.

The "A" Main cars were next for their 1/2 hour race. All the cars put on

big tires for the Main — all except one. One already had big tires — he had even used them in qualifying. Ralphie Burch, Jr. knew exactly how his car would run in the Main. Everyone else was hoping their cars would be okay. There was a short practice period, then the cars lined up for the start.

The green flag went up and Ralphie jumped in the lead with Arturo Carbonnel in 2nd. The rest of the field got caught in the first corner. Ralphie started pulling away from Art, and by the 5 minute mark, Ralphie had lapped the field.

Chuck Phelps was running strong, but he got hit in the side which shut off his radio switch and the car went punched in the boards. The larger tires on Curtis' car leaned out the motor after 10 minutes and burned out the glow plug. Rich Lee had his brake

to page 150

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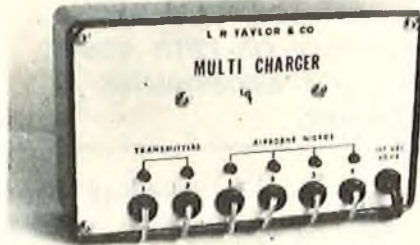
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PIT STOP

from page 147/42

wire come off the servo, so he had no brakes. Dana Smeltzer lost his wing tangling with the boards. Rick Davis thought his car was acting a little funny in practice and after only 5 minutes into the race his homemade shock mount broke off completely. Re-Pete Fusco and Kim Davis both lost muffler hoses. It seemed almost no one wanted to win this race. Only Ralphie and Arturo had no problems.

Ralphie had now opened up the lead to two laps and was still pulling away. Art was holding down 2nd, with Dana Smeltzer far back in 3rd. Rick Davis had repaired his car and he was going quite fast, but he had too many laps to make up. I could hear Ralph Burch telling Ralphie "slow down!" but I think Ralphie must have felt the safest place was way out in the lead. His idea of slowing down is only going twice as fast as everyone else instead of three times as fast.

At the end, it was 14 year old Ralphie Burch Jr. from Denton, Texas, winning by three laps, with Arturo in 2nd over 4 laps ahead of Dana in 3rd. And then came the rest of the casualties. The thing is, Ralphie made it look so darn easy! I don't think there was even a scratch on his body after the race.

The Florida Winternationals Only Get Better.

Q.A.C. QUICKIE

from page 41/36

straightforward process and although this was my first attempt I managed to produce a good one the first time. Carve a large chunk of soft wood to the correct shape and sand smooth. No surface finish is applied. Clear plastic sheet is attached to two wooden runners, heated, and forced down over the mold. Trim carefully and attach to the model with cyano glue.

Finishing:

After repairing any dents and dings with filler paste, sand the entire structure with fine wet and dry paper used dry and wipe off all the dust. This gives a good basis for any finish you may choose but for strength and durability I would recommend the K & B matched finishing system. This uses 3/4 oz. glass cloth, finishing resin, primer, and epoxy paint; full details are available from K & B.

to page 154

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Q.A.C. QUICKIE

from page 150/36

All Quickies have a basic overall gloss white finish to protect their foam structure from heat absorption, and since there are no panel lines or rivets to worry about, a good scale finish should be easy to obtain. Add fuselage

trim lines and registration letters appropriate to the particular version you are building. When all paint has cured, give the model a final polish to bring up the shine. The plans for the full size aircraft emphasize the need for a smooth surface finish, especially on the canard, so the better the finish on your model the better it will fly.

Installation:

In the original model I used a

Skyleader FM four channel radio and a Webra Speed .40 engine. A .40 motor is more than adequate so please keep that hot .60 for your next model.

The engine can be installed sideways or inverted, the latter having the advantage of a fully cowled installation but would need some form of fuel pump as the tank must be mounted high to clear the elevator servo in the canard.



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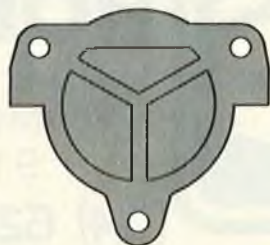
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Since I didn't have a pumper engine I used the sidewinder set-up. Elevator and ailerons servos mount in the centre sections of the canard and wing respectively, throttle servo in the tank compartment with rudder servo, receiver and battery in the wing opening. This layout helps maintain the balance point without the need for ballast but obviously extension leads are required from the receiver to the

motor and elevator servos. Don't forget — up elevator requires a downward deflection of the elevators and down elevator an upward deflection. Set up the linkages to achieve throws of $\pm 1/2$ " on rudder, $\pm 3/8$ " on elevators, and $\pm 3/8$ " on ailerons. Don't hesitate to add ballast to achieve the correct balance point — a heavy model will fly but a tail heavy one won't. The ready to fly weight

should be between 5 lbs. and 6 lbs.
Flying:

Now for the interesting bit. Be assured that no matter what doubts you or your flying buddies may have when you arrive at the field with your new creation, you and they are in for a pleasant surprise.

After the usual range check, engine test, Scotch, cigarette and whatever
to page 158

ORIGINAL GLEN SPICKLER

Quickies

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QUICKIE 500

Wingspan: 50 In. Area: 500 sq. In.
Engine: .19 - .40 - .55 Channels: 3 - 4
Material: All wood

The original "500" club racer is fast, easy to assemble and very stable to fly. All wood parts are machine cut for precise fit. This is a proven, classic aircraft design.



QUICKIE 200

Wingspan: 35 In. Area: 214 sq. In.
Engine: .049 - .051 Channels: 2 - 3
Materials: Wood fuselage, foam wing

This is a fast and stable half A design. It uses an easy to finish wood fuselage and foam wing. It can be totally ready to fly in less than one day.



QUICKIE SPORT

Wingspan: 50 In. Area: 500 sq. In.
Engine: .29 - .40 - .55 Channels: 3 - 4
Material: All wood

A quality model designed for Sunday flying and fun events. Strong, simple construction utilizes all machine cut parts, full size plans, fuelproof plastic canopy, etc., etc...

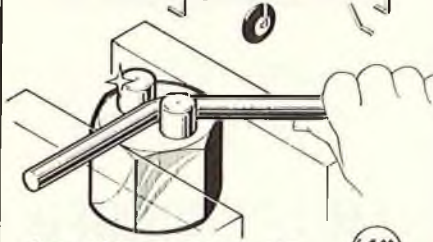


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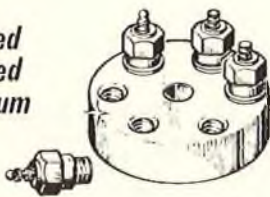
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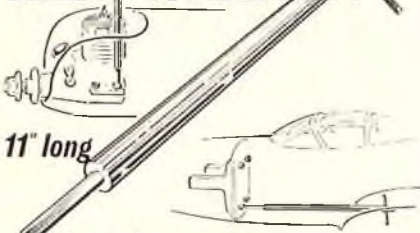
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Q.A.C. QUICKIE

from page 155/36

else you can think of to prepare yourself and model, set Quickie into the wind and slowly apply power. Correct any tendency to swing with gentle use of rudder and, when the speed has built up, a touch of elevator will lift her off. On this first flight just fly in big circles at a reasonable height getting the feel of the aircraft and convincing yourself that it is not going to fall out of the sky. You will find Quickie flies fast and groovy with a good deal of stability yet with crisp response to roll and pitch controls.

Let's try a landing. This needs setting up some distance out since the model has a fast and flat gliding angle and takes some time to slow down. Slow speed performance is remarkable with the elevators seeming to act as flaps; this is one model you won't land short with. A reasonable touch down is desirable to avoid damage to the canard which, although strong, is, in effect, the undercarriage of the aircraft and as such is highly stressed in a bad landing. Subsequent flights will increase your confidence in the design and you will soon be ready to clean up in Stand-Off Scale competition. Incidentally, my own Quickie won the 1980 Irish Nationals Stand-Off Scale event held in very wet and windy conditions. Loops and rolls are no problem and yes, the real thing has been rolled flown by none other than Bob Hoover.

Quickie is an aircraft certain to create interest whenever flown so good luck and have fun with this unusual design. □

FLYING LOWE

from page 35/34

about 2" to accommodate the nose gear.

My suggestion to Dave would be: Don't do it unless you also lengthen the tail moment (fuselage length between wing and tail quarter chords). Let's address this subject since the reasoning is very basic to all models: In a word, a long nose is good only for appearance and balance. The longer the nose, the higher will be the pitch and your moments of inertia and its bad effects on damping. It will also move the center of lateral area forward and reduce directional stability; it will, also, have a small

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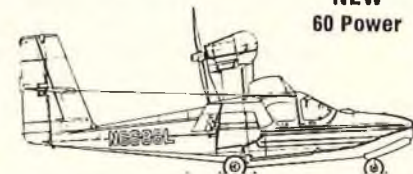
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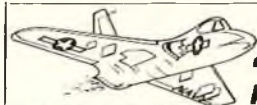
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FLYING LOWE

from page 158/34

effect on longitudinal stability. Since a tractor configuration (engine in front) is destabilizing in yaw (due to the side thrust component in yaw), it will be worse with a longer nose and further reduce damping of yaw transients. I cannot conclude that Dave's mod will be unflyable, but it will not fly as well as the original design. The landing gear solution for

Dave, if he still wants to do it, is to use as short a nose strut as possible and, if necessary, extend the cut out into the wing leading edge. I did this on the Phoenix 6 and 7 in order to keep the nose moment short. I stretched the nose on the P-8 to ease the building problem but added tail volume (fin area x moment arm). In the final analysis, nose length, tail length, fin area and location of the center of lateral area represents a good compromise which makes the aircraft adequately stable directionally, and at the same time permits good maneuverability. It is always found in

models by "cut and try."

Pattern Progression:

A letter from Wally Pollock of Madrid, Spain, asks about a logical progression in model designs for improving flying proficiency. He wonders what to select next after a high wing aileron trainer. This is not really an easy question to answer since the choices are many; so, let's deal with the basics from the beginning:

First of all, I feel that every aerobatic ship should have aileron control. I have written about this before, but I feel that aileron control is

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a much more natural control arrangement and is certainly a far more positive roll control than that achieved by yawing a dihedral wing. The wing should have modest dihedral and the aircraft good directional stability to make it turn properly without having to add rudder --- for easy learning. The ship can be high wing, mid-wing or low wing as long as it is not spirally unstable (proper match of dihedral and rudder area). Progression in models basically is restrained by one's ability to accommodate the increasing speeds and maneuver rates. Everyone

progresses at a different rate; for example, Bob Violet's teenage daughter, Patty, is now flying a hot "Arrow" in competition after only six months total flying experience. This is due to good coaching from father, Bob, and good natural ability, plus the fact that a fine pattern ship is really easy to fly! In fact, Patty does a better job with the "Arrow" than with the fixed gear "Kaos" that she normally flies!

One of the best all around trainers still flying is the "Ugly Stick" series. It flies extremely well and is most forgiving in that it is almost impossible to stall.

I would suggest that you steer clear of pipes and retracts until you really know what you are doing and feel you need them to be competitive. There is no question but what a strong piped engine is an advantage for all classes of competition --- as well as retracts --- but you certainly don't need them while learning the basics.

The question of .40-.45 engine size versus .60 resides mostly in cost and model size. Larger aircraft fly better, pure and simple; if you can afford it, okay. If you must keep model size down for transportation reasons, etc., then that is a compromise that you

to page 168

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FLYING LOWE

from page 161/34

make. Please don't misunderstand what I'm saying --- smaller ships are a lot of fun and have a place --- but, you can't beat the aerodynamic realities of size.

Well, this will probably stir up a hornets nest; so, we'll leave it for now --- just want to know if anyone out there is reading this stuff!

SUPER LR-1A

from page 33

Covering:

Three-quarter oz. K & B fiberglass cloth and two coats of K & B polyester resin were applied to the wing, fin/rudder and stab/elevators. The entire airplane was then given a coat of K & B primer, sanded and painted with Ditzler Delstar acrylic enamel brown, blue, yellow, and orange. These color coats were sanded lightly and a clear coat of Ditzler Delclear acrylic urethane was applied. The numbers were cut from Top Flight MonoKote trim.

Engine:

The engine is a Terry Prather Super Tigre X-40 using his short pipe and held in by a Prather engine mount. A Kraft 11 oz. fuel tank holds the go juice.

Radio:

A Kraft 4 channel using KPS-12 servos provides the guidance. There is ample room in this airplane for radio installation.

Flying:

Keep the C.G. in the nose heavy range. There is no problem keeping this airplane with the C.G. limits. The control travel is shown on the plans as 1/2" elevator travel and 1/4" aileron travel --- use them. The prototype trimmed out with 1/2" elevator travel and 3/16" aileron travel.

The Super LR-1A is designed for Formula I competition. That is exactly what it will do. The airplane is straight and steady between the pylons, will turn No. #1 as tight as you need and takeoffs and landings are no problem. An outstanding, competitive Formula I racer.

Conclusion:

The Super LR-1A is designed and produced for the experienced flier. Having built and flown a Formula I before is all the experience that is required. If you are the type of person who replaces most of the wood in a kit, then try a Super LR-1A, you will definitely be money ahead.

POWER BOATING

from page 31/30

will be able to use only the ten new 75 MHz frequencies. In addition, channel 112 will be added on 75.650 MHz which brings the number of usable non-aircraft frequencies to 11.

At "I" + 8 years the non-aircraft frequencies will number 23 (channel 100 through 122). Each of these channels are on odd frequencies spaced 20 KHz apart starting with channel 100 on 75.410, 101 on 75.430, 102 on 75.450, etc. At this time our old radio gear will not be usable because the channel spacing is too close for interference-free operation.

Let's all hope that the FCC will approve our new frequencies as soon as possible. It's been a very long time in coming. We finally will have enough channels to safely race more than a few boats at a time.

★

Dear Howard,

As of yet, I'm not into much boating although the few modelers here who are seem to have as many ideas on antennas as there are boats.

I've built the Dumas "Windy" air boat and I would like to know the correct treatment of the antenna as far as matching, tuning, termination, loading, etc. At the present time, I've shortened the receiver antenna wire by an amount equal to the length of my whip, from tip to terminal. The excess is coiled up on a dowel between receiver and whip base.

I've enjoyed your RCM articles. Whatever happened to the Women's Regatta that was to be on Real People T.V. show? Maybe I missed it. Keep up the fine articles!

Sincerely,
Alan Welling
Brownsville, Texas

Alan, you have done exactly the right thing as far as I know. I have used a very similar technique successfully for years and would, therefore, recommend that your treatment be used by anyone setting up a boat. Because of the close proximity of our boats while racing you can get away with a lot of things that reduce radio range. The receiver antenna length should always be equal to that at which the factory supplies it. Don't cut it off and don't add length (an extra whip) to it. As long as you keep the antenna length proper, you can stuff the antenna just about anywhere you like. I suggest that you use at least an 18" vertical whip antenna on a boat but I have seen some fellows run successfully with the antenna running around the inside of the top deck only! I can't bring myself to trust that type of installation.

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POWER BOATING

from page 169/30

The Real People T.V. show segment taped at the K & B Ladies Day Regatta was, to my knowledge, never put on the air.

Dear Howard:

Sitting here in the north, with the temperature at -15°F., I thought it might be a good day to drop you a line. I was sitting by the fire reading back issues of RCM and couldn't help but wonder about the lack of information on model power boating, especially in areas such as this with almost no activity. If it weren't for columns like yours, we would be doing even more re-inventing of the wheel than we are doing now. On reading your columns I am amazed by the available equipment mentioned that I have never even heard of. Makes it too easy to do dumb stuff in a world where it's easy enough to do dumb stuff already!

I have a Prather 40" Deep Vee with a HB .61 that runs beautifully. Probably not the fastest in the USA but very, very reliable and the fastest here.

I am now building a new boat for next summer. It's based on a JVS 60-90 size offshore tunnel. It will have a Picco .65 piped engine. I would like to

use flex drive. I am a machinist, so will make strut, brackets, rudder, etc. My first question stems from the angle of the engine in this hull. It is very shallow. Can I use an S-bend in the flex drive successfully? Any ideas on how to rig a drive in this hull would be appreciated. I'm not opposed to solid shaft drive, but it seems to me that the angle at the engine and at the strut would be a good place for vibration to set up.

How are shear set-ups done on rudders? I have never seen a Steve Muck rudder and can't tell from catalog pictures. I'm having a hard time swallowing the fact that we need two servos on rudder and yet they are "shearable." I can understand Octura's with glass filled nylon tiller arms but not Muck's. Also, are dual servos on the rudder necessary? I will use Futaba S-27's. Have you actually witnessed stalled rudder servos or is this all redundancy, just to be sure? Vern Schmidt says this hull has seen 70 mph so if I need two rudder servos I'd like to know now!

How about trim plates? I lean toward using them. I was thinking about power trim on the plates but note that you don't believe in this. I guess, after reading your opinion, I tend to agree. How far should tabs extend beyond transom? Where can I purchase

turnbuckles for trim plates? I don't really like to turn small left-hand threads! Or maybe you have another way to hold trim plates in position?

Do I need an anti-spin fin per deep vee practice? I don't use one on my deep vee, but note that you do.

Where should the fore-aft C.G. be? I think I read 1/3 forward from transom. Is it critical? I would guess that it is. It seems to me that with tunnel hulls, especially fast ones (read faster than .21 outboard tunnels!) we are concerned more with aerodynamics than water handling of the hull. In fact, Vern Schmidt's letters to Jerry Dunlap in Model Builder magazine is what lead me to his hull. (Sept. '81 MB.)

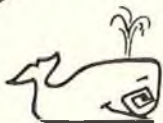
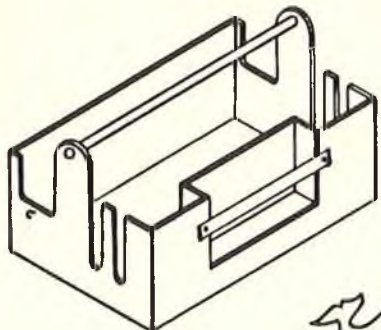
Now, on to the engine. This is my first fling at an all out Schnuerle ported, ABC racing engine. I settled on the Picco mostly because they were new and exciting, probably to my chagrin! Having no prior experience with these monsters, I don't know where to start.

First, I don't like throwing this expensive engine into a new boat, with all untested stuff, and just tossing it on the water. I do realize these ABC motors are less critical to a lean run, but I'd rather be sure of a good running one before putting it into the boat. The exhaust location precludes running the engine on a test stand. Can I reverse the

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crankcase and run the intake and exhaust on the same end? I could make an adapter to put a propeller on it and run it on a test stand. I did this with the HB, but didn't have to reverse the case. My concern is whether or not reversing the case would change the engine's running characteristics enough to make the effort not worthwhile. Or maybe my concerns are totally unwarranted. Maybe I can just crank the needle open 5 or 6 turns and start there. Opinions?

I notice on the intake ports of this engine, that the casting of the aluminum doesn't match up with the ports machined in the brass sleeve. I'm sure the machined parts in the sleeve are at the correct timing. The aluminum is below the brass at the top of the two front (rear?) ports. Will going to the trouble of matching the ports pay off? Having built many two stroke motorcycle racing engines, I'd guess it would pay. The mis-match is .030 to .040 by eyeballing through the exhaust port.

How about head spacing? There are two aluminum shims between the sleeve and head. I've called World Engines' Harry Roe and he said there were varying opinions on this. What's yours? More nitro, more head spacing? The inverse? What are the theories on this?

I noted in your coverage of the NAMBA and IMPBA Nats that most winners use 40% to 60% nitro fuel. Where do you get it? Mix your own? If so, what is the formula and what oil do you use — castor or synthetic? Or a mixture? What else goes in the fuel mix? Anything you could tell me about nitro percentage, head spacing, pipe length relationships would be appreciated.

Where should I start with propellers? I've never seen a JG so if you could stick with Octura props I'd appreciate it. Tom Perzentka seems to think X series would be best. I tend to agree. X455, X457, X460? What's your opinion? Tom didn't know anything about Picco engines so really couldn't recommend a prop.

Again, I'm sure a lot of people besides me appreciate your column and I realize at times it must be frustrating getting material and meeting deadlines, but keep it up. You're all a lot of us have. Thanks a lot.

Tom Hesselman
Hortonville, Wisconsin

Sitting here in California (it's February and a sunny 65°F. here today) I'm really glad that I'm not where you are, Tom! The fire sounds great but I'll take my warmth from the sun! Your offshore tunnel hull project sounds very interesting. You can and

should use an S bend, flex drive system for this boat. The flex drive system is much easier to set up and maintain than a solid shaft system, especially for novices. I would suggest using an Octura 1450, X450, or 1455 prop to start off with. Use the first prop size for low nitro fuels and work up for higher nitro fuels. Run the strut parallel to the sponson bottoms with its centerline about 1/2" below the sponson running surface.

Shear rudders are made so that when the rudder strikes a solid object, the blade rotates back out of harms way. Usually this is accomplished by using a high strength bolt to fasten the rudder blade to its pivot bracket. A second weaker pin or small soft bolt is used to hold the blade in the water. This second component breaks upon contact and allows the rudder blade to pivot. The shear rudder system manufactured by K & B also has a spring which tends to return the blade to its original position after striking something. Without the spring you lose all steering if you hit something. Safety shear rudders are really great for sport boating because it saves you repair work and money. I do not, however, use them on my racing boats. I have experienced loss of control after striking very small pieces of debris

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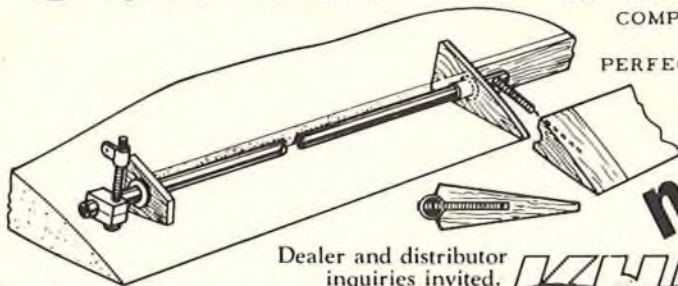
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POWER BOATING

from page 173/30

when using break-away rudders. Since the frequency of striking large objects is small where we race, I would rather take the chance of tearing out the boats' transom than losing a heat because of losing steering control in a minor encounter with debris.

If your boat is capable of speeds over 55 mph I would advise using double rudder servos. At these speeds the force acting upon the rudder blade is large enough to damage the gear trains of the S-27 (and almost any other servo I can think of). I have also witnessed rudder blade torque requirements (the force required to turn the rudder blade) that exceed the output torque of a single servo. By hooking up two servos in series with the rudder blade, the boats in question turn much better. I would strongly recommend that you use two steering servos in your boat.

I would also suggest using adjustable trim plates. I would use plates approximately 1/4" beyond the transom. Small versions of the plates shown elsewhere in this column would work fine. You usually will not need an anti-spin fin on a tunnel hull. If you mount the engine where the manufacturers suggest and the radio gear in the radio compartment the C.G. will come out in the right place.

The Picco .65 is a fine motor and will give you good service. I would, however, suggest that you replace the carb that comes with the engine. The Picco carb is a very simple rotating barrel and has no high or low speed stops. As a result it has been found that when you adjust the high speed needle to the proper setting the resulting throttle response is very poor. I suggest using an O.S. Max 7F carb (it comes on the O.S. Max .90 engine). This carb has both high and low speed needles which allows you to have a great idle and better high speed performance than the original carb. The pipe should be set at 11" from the exhaust port to the pipe maximum diameter. From tests that we have conducted using high nitro fuel I would suggest that you set the head clearance at least .020". The combustion chamber apparently is a bit too small when high nitro fuel is to be used. This is not too surprising since this motor was designed in Italy probably with high performance on FAI fuel in mind.

I would not recommend that you run the engine before installing it in your boat. You can reverse the case and run it on the bench with a suitable

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POWER BOATING

from page 175/30

airplane prop. If you do this, however, the motor will wear itself in for this direction of rotation. To install it in your boat you will have to reverse the case again and the motor rotation with respect to the case will be opposite the previous case. If you run it in your boat, the motor parts will then experience a different wear pattern for this rotation. Usually this will deteriorate motor performance. Most engine experts recommend that modern ABC racing engines be broken in with a load that is as close as possible to its intended use. Just be sure that the first couple of tanks full of fuel are run with a slightly rich needle setting. Matching case passages to the liner ports is worth the trouble if you are interested in top performance. This is probably one of the easiest ways to pick up a few hundred revs over a stock engine. Do

not change any of the liner port angles but do all your matching work on the case. I have already mentioned what I believe to be the proper head clearance for this engine. In general, as you increase nitro percentage, the combustion chamber compression ratio should decrease. If you keep the same head, therefore, the head clearance should be increased as nitro percentage in the fuel increases.

You can buy high nitro fuel from many sources. Look through the ads in RCM for the closest supplier to you. You can mix your own fuel very easily once you find a source of supply for the ingredients. I have had very good luck with the following mixture: 20% Klotz synthetic oil, 40%-60% nitromethane (98% pure), and the remaining 40% to 20% is methanol alcohol. We use synthetic oil in fuels where the nitro percentage exceeds 40%. If castor oil is used in fuels with more than 40% nitro the fuel components will not mix permanently but will tend to separate in layers very quickly. Castor oil has the highest temperature for lubrication breakdown but burning it

in a fuel produces varnish. Synthetic oil is not quite as efficient a lubricant as compared to castor oil but it does burn cleaner. As long as you do not try to run your motor too lean, either oil does a good job.

Well, that about does it for another month. Send your questions, comments, race results, etc., to the address at the end of this column. If you desire an answer before magazine publication, enclose a stamped, self-addressed envelope so I may answer your letter by return mail. Howard Power, 766 Broadway, Seaside, California 93955. Phone (408) 394-1200. □

GIVE IT A WHIRL

from page 16/14

manufacturers who will display there. I am told that the show is scheduled for the 5th and 6th of February next year and you can take my word for it that I shall visit there again. A great effort, Bob Pfeiffer and gang. This is the

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GIVE IT A WHIRL

from page 176/14

activity which we need to keep the movement strong and the public interest up. See you next year.
1981 Japan R/C Helicopter Nationals

I was fortunate enough to receive a video tape from one of my Japanese connections which showed the finals of their 1981 helicopter championships. These were held in December in Tokyo and 30 pilots participated. We must remember, however, that their

helicopter championships consist of a series of regional competitions from which the 30 top pilots are selected to proceed to the final competition. The original number of contestants must have been much higher.

These 30 pilots make four flights to the F.A.I.-F3C patterns (see previous column on this subject) on the first day and, as a result of this flying, five finalists are selected to proceed to the second day. I'll run through the maneuvers briefly for those of you who are not familiar with the rules. My descriptions result from watching the top fliers on the video tape so they may not be fully complete.

First I should mention that, from what I saw on the video tape, the Japanese Nationals are not held in the comfort and convenience that ours usually are. The field on which the championships were held appears to be mostly dirt with some grass here and there. The circles from which the fliers conducted their flights were marked with chalk on the dirt. Obviously then, everytime a helicopter landed, a cloud of dust and chalk rose up. It also appeared to be quite windy. Another interesting factor is that every finalist flew a scale helicopter.

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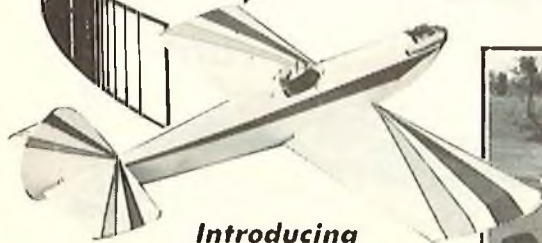
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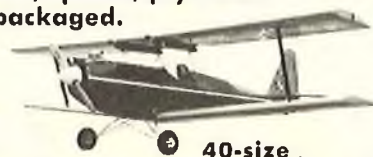
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who I am watching as I write this column, the maneuvers were as follows:

Take-off from the center circle and hover stationery at about 6' for 15 seconds; fly backwards for 15' to another hover position. After a momentary stop, fly forward 15' to the original position and again halt the motion. Fly forward 15' and again go into the hover; fly backward 15' and, after a short hover, land.

The next maneuver was a take-off from the center circle and a very slow tail-in 360 degree flight around the pilot, finishing up with a landing. It was very apparent, watching these

fliers, that they don't have the time restraints which we have with our flying — everything was done much more gracefully and certainly gave a completely different impression. The maneuvers were conducted slowly and used up plenty of airspace. There didn't seem to be any time restriction on their fliers — at least, if there was, it was very adequate.

Next, the helicopter took off vertically to about 10' altitude, hovered briefly, and then flew a "figure 8" course in front of the pilot at this altitude. This was not a constant heading "figure 8" but was the usual "figure 8" such as you would do with a

'plane. Despite the gusty wind this maneuver was also done very smoothly. After landing again, a take-off and a vertical climb was made to about 50'. The 'copter was then flown out about 300', did a procedure turn and flew back over the pilot. It then did a 180 degree turn, came in and landed in the circle.

Now for the part which really startled those of us watching the tape. The pilot's helper turned the helicopter around so that the nose was facing the pilot (at a distance of about 15' away from him), then the pilot lifted the helicopter off very smoothly,
to page 184

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from page 179/14

nose in --- ever tried this? Purposely, I mean! The take-off and the momentary hover were done very precisely. The pilot then flew "nose in" around himself for 360 degrees at a radius of about 20', finally finishing up in a stationary hover, nose facing the pilot again. Then, incredibly, the helicopter descended slowly and smoothly to a very accurate landing. This part of the competition was very impressive to watch and I take my hat off to all the Japanese finalists for doing this very difficult maneuver so smoothly.

After the "nose in" hover and landing the helicopter took off again and, after climbing to about 150', did one very large loop. Incidentally in all of the flights that we saw the loops were extremely large in diameter — maybe 100'. After the loop the helicopter carried out one axial roll. The Japanese fliers again impressed us very much with the precision of their rolls. The fact that they were done so slowly gave the impression of being "four point." Maybe they were!

The last aerobic maneuver was a stall turn followed by a 540 degree spin on the descent. Again, we noticed a high standard of flying. The helicopter was flown to an exactly vertical attitude with the nose pointing straight up. It then rotated exactly 1 1/2 turns (540 degrees) around its main shaft while descending and finished this maneuver pointing absolutely vertically towards the ground before recovery into level flight. This, of course, is how this maneuver should be done but so very few pilots manage to get that verticality, either in the climb or in the descent.

Finally, each one of these pilots (though we must remember they are the chosen few of the expert group) executed an autorotation. In every case that I saw the 'autos' were very well-done and the touch-down was made mostly within the 3' diameter circle. Only one helicopter landed with the tail striking the ground, and tipped sideways causing the blades to hit the ground. Remember, too, that all the ships that were flown were scale.

Well, the winner of this competition was pilot Suwabe who was flying a beautiful scale Hirobo "Jet Ranger" SST. I must admit that while I am fiercely proud of our standard of flying in this country and I believe that we can hold our own with fliers of all countries, this Aerobatic but realistic flying by the Japanese modelers,

using scale ships, was an eye opener and, as I've said in previous columns, a direction which I feel we must inevitably head.

It was nice to be able to get such a vivid impression of their flying by means of the video media. We must do more of this interchange since helicopter flying can really best be communicated by visual means. By the way, the video tape of helicopter flying which was described in last month's column turned out to be very popular, not only with hobby stores and clubs but also with individuals who live in areas remote enough that they never see an R/C helicopter actually fly. If you want one of these tapes, contact 'Heli-Center West.'

Advanced Helicopter Radios

Many of these new radios are "on their way" and I'll write about them shortly. Meanwhile have a look at the version just shown in the French "Modelle" magazine, March 1981 issue.

Helicopter Meet

Activity is still proceeding on the planned National Helicopter Meet and, because of the availability of certain top fliers from other countries, it seems that October is the best month for this to be held. We have already had the offer of several very suitable sites and of support from several leading manufacturers, both model and full size. I hope by the time you read the next column we'll have much more concrete information to tell you about this meet, but I'm now quite convinced that it can and will be held and that it will be a successful and rewarding meeting for all of those who decide to attend. Anyway, mark down October as the time to do it and I'll let you know where you have to go as soon as the precise date and venue are known.

See you next month.

SUNDAY FLIER

from page 13/12

All of these factors can lead to some troublesome times. Not too long ago I watched a test flight on a new model. It took off, stalled, and plopped back to good ole' Mother Earth. Fortunately, it didn't get high enough to do any damage. Unfortunately, the modeler didn't wonder why it happened, other than to figure, correctly, that it stalled. So he took it off again, only this time kept it on the ground until it was going at a good speed. It took off nicely and started to climb out. Then he started a turn. When it was broadside to the pilot's view in the turn, it was obvious that it was not

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climbing, and the nose was pointing well down. At that point, the modeler eased back on the elevator to bring the nose up, and that was where he made the mistake. The model stalled, one wing dropped sharply, and the model crashed. This time the model was high enough that the crash was severe. A subsequent analysis of the design profile showed that the body of the plane would actually be pointing downward at a slight angle even when the plane would be in level flight. The resulting optical illusion of a shallow dive made the modeler try to raise the nose, and that bought the farm.

So, the next time you want to lay out the profile for a new design, take some of the foregoing factors into consideration. Don't be like the lazy kid in aerodynamics class. When the instructor asked, "This is the angle of incidence, and this is then angle of attack; what's the difference?"

The kid looked at the diagram, then at the teacher. After a short pause, he replied, "Yeah, I feel the same way. Who cares?"

Now let's get into another phase of incidence settings and the reasons given by designers for their preference. I am referring to incidence settings in biplanes. It's a complex subject, and all I plan to do in this particular column is to go into the simplest phases. Undoubtedly that will lead to a barrage of letters (good!) on why one setting is better than the other. Then we'll publish the representative ones, and let the fur fly.

For starters, take a look at Figure 2. The wings, the stab, and the thrust line are all set a zero angle to the reference line, and the wings and stab all have symmetrical sections. Will that airplane fly straight and level, with the reference line horizontal? What do you think?

Now look at Figure 3. Same plane, but different angular settings on the wings and stab. Will it fly straight and level, with the reference line horizontal?

What about Figure 4? And finally, is Figure 5 the way to go?

At one time or another, every one of the above wing and stab arrangements have been used by various designers. Sure, there were variations in the angular differences --- like three degrees of decalage, or one and one half degrees of incidence, etc., but the basic variations are all there. And, they all flew. So what's the difference? (C'mon, let's not go through that again!)

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Take Figure 2. Theory; no, it won't fly with the reference line horizontal, because there isn't any lift provided by a symmetrical wing at zero degrees angle of attack. But, if you trim the elevators so they are at a slight upward angle to the reference line, the airplane will fly, although at a slightly nose high angle. Trim the elevators up, but with the elevator trim setting slightly towards the uptrim setting. Now, when you want to fly the model inverted, roll it over, or do a half loop, push the elevator trim towards the downtrim setting, and you can fly upside down without having to constantly hold down elevator to keep the nose up while inverted. Well, at least that's the theory.

The reasoning behind the settings in Figure 3 is that it should fly straight and level with the reference line horizontal, and through a fairly wide speed range, because the positive setting on the stab will compensate for increased lift at higher speed by forcing the nose down slightly and thus decreasing the angle of attack of the wings. And, the positive decalage will give the airplane a better stall characteristic, since the upper wing will stall first, and the lower wing, still flying, will bring up the tail before the stall is complete on both wings. Great for sport fliers.

Some aerobatic pilots actually prefer a hard snap stall, so they use the settings in Figure 4. In this case, the lower wing stalls first, and since the lift vector of the upper wing is in front of the center of lift of the biplane combo, it pulls the nose higher into the stall. Great for loops with a snap roll on the top.

Finally, there's the "Gosh, I don't know which is best, so I'll figure the wings are the same as one wing, set them at the same angle, and put in some downthrust" setting. That's Figure 5.

In all of the above examples, I've assumed symmetrical sections. Naturally, the minute you go into semi-symmetrical or flat bottomed sections, you've got a different ball game. I understand that some full scale designs, like the famous Christen Eagle, use different sections as well as different settings. Exotic stuff, right?

And how are you going to find out which is right for you? Easy. Build your model the way you think you want it to be, then go fly it. However, leave room on the wing saddles, stab setting, and firewall to make those final little angular changes.

Then tinker with it until you get it right.

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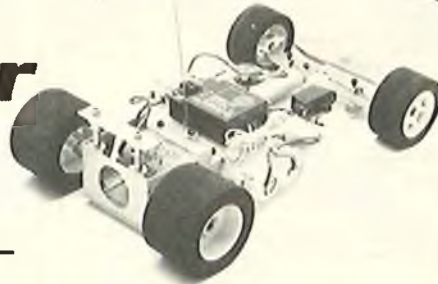
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CUNNINGHAM ON R/C

from page 11/9

about 50 degrees, and does most anything that you want, even knife edge. It is truly a fine weekend flier, impressive looking, easy to carry, and the engine is a piece of cake, very easy to start and always runs good, with little adjusting. It also flies inverted well.

Archie goes on about some future building plans. In an earlier phone call he and I discussed the Evra, and I told him that I had one of the early ones, but it was a bear to start. The only way that I could get it running was with an assist from an electric starter. We would cram the starter on the prop hub, depress the starter lever, then flip the prop (a two man operation). This would usually get the engine going, but darned hard on the starter. Archie told me that he had a rope pully on the front of his prop and the engine started easily every time. The next day I called Hobby Lobby and ordered one from Jim Martin. In our discussion he told me that the Evra has been tough to hand start, but with the rope pull it's a different thing. I tried the rope starter last weekend, and it started on the first or second pull each time. The engine runs good, is very inexpensive and easy to mount, so I plan to get a lot of flying time on it this spring. I'm going to rework the nose of my Doppie Decker Bipe, remove the Max .90 and install the Evra 190 with an aluminum cowl. That is, if I can find the correct size aluminum mixing bowl to use for a cowl. Besides, the Max .90 is targeted for my new 7' Turbulent, the third in the Turbulent series.

★

Now, for something completely different. The other day I heard a bit on the radio about some trouble in Fairfield, California. Bob Bingham was kind enough to send me some newspaper clippings, so in case you missed this newest and greatest use of R/C, give a listen. Seems as though the winter migration of starlings decided to call the cemetery in Fairfield their home away from home for a time. Only a couple of million or so birds. The trees were full, the tombstones were taking on a kinda streaky white look, and those who had to visit the cemetery had to do so under the cover of umbrellas. And the sound --- well, reports have it that the sound was enough to wake the de... well, any how, it was a bunch of noise. The local citizens tried fireworks, lights, all kinds of ways to drive out the winged visitors, but nothing would work. You guessed it, the local R/C club rose to the occasion. Maj. Hal Biestek and club prexy Rick Keefer directed a

to page 194

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CUNNINGHAM ON R/C

from page 192/9

strike force of R/C aircraft that scared the heck out of the starlings and convinced them that some other vacation spot would be better. According to reports, no birds were lost but at least six R/C aircraft bit the dust routing out the intruders. Low passes amid the tombstones is not conducive to long lived aircraft, but chalk up another plus for the use of R/C. Bet no one complained about the noise an R/C bird makes when in combat with a million starlings. Congratulations!

Over the years I've reported to you about many, many uses of R/C aircraft in solving everyday problems. From air samples over cities to air samples over semi-active volcanos; to R/C aircraft tossing hand grenades at holed up gunmen; to target drones; to wire stringing over the alps; to --- you name it. If you know of any strange and different use of R/C, drop me a line and I'll pass it along to our readers. There are probably more unusual uses of R/C than any of us can imagine.

★

Now that flying time is here again over most of the country, it is time to get out and give all the new aircraft a

test flight. Lots of modelers spend the winter building, and the spring and summer flying. If you go out to test fly a new aircraft, or if your old standby spent the winter gathering dust, do yourself and your model a favor and spend a bit of time checking over the model before its first spring flight. If the radio has been sitting unused all winter, use it a while before you take it out to fly. I hope that you kept charging and discharging the batteries all winter. Bet that you didn't work the radio much while it was setting around. Of course, the electronics didn't get lazy setting around, but bet that the servo motors

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didn't get much of a workout.

Before taking it out for the spring's first flight, take an evening out and work the radio for an hour or two. Charge up the batteries the night before, then just work the sticks for at least an hour, letting each of the servos operate as much as possible, this will help to remove the accumulated dust and corrosion and will show if a servo motor needs some further attention, or if one of the servos will tend to up and quit in an embarrassing moment (kinda like swinging a golf club or tennis racket for a bit before you go out to hit a few balls — gets the muscles working). It

won't hurt to run the engine a bit too before going out. Open up the needle valve to a real rich setting, and start it up. Let it run rich, and slowly lean out to a flying setting. If you leave it at last summer's setting, chances are that a bit of congealed oil will cause it to run too lean for a while, which is not much good for any engine.

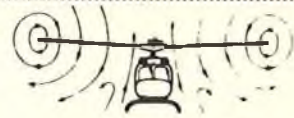
I didn't get to some of the things that I wanted to talk about this month, so will save some of these topics for next time. Do want to remind you that the Fifth Annual Jumbo R/C Fly-In will be held at Thunderbird Field just west of Forth Worth, Texas, July 17 and 18. This Jumbo Fly-In is for all big birds,

minimum span of 84" for a monoplane, and 60" for a biplane. Any type of engine power is allowed. Again this year we will be giving away a portable TV set in a drawing to be held among the entrants and a radio will be raffled off. We have had a great time at this Fly-In the past four years. This one promises to be bigger and better than before. It's a fun time for all, so make your plans now to attend. If you need further information, write to me at 2440 Colonial Parkway, Fort Worth, Texas 76109. No pre-registration is required. This will be an official IMAA Fly-In co-hosted by the Forth Worth Thunderbirds and the North Texas

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Miniature Aircraft Association. All of you Southwestern fliers, grab your hats, suntan lotion, and big birds, and head on out to T-bird field. I'll look forward to seeing you there.

One last word, I have been calling the biggies "jumbo" models ever since this type of aircraft got started because the words Quarter Scale simply do not mean anything. I see that this is beginning to be picked up around the country as more people realize that Quarter Scale can mean anything from a Pitts with a 4' plus wingspan to a 747 with a 49' wingspan. "Jumbo" may not be the right word, but let's decide on something that is meaningful to this type of aircraft. For that matter, I often refer to R/C models as miniature aircraft rather than as model airplanes. I, for one, hate to have people think that we're playing with toys. We are engaged in the greatest hobby/sport in the world. A painter creating an oil on canvas is no more of an artist than we are, yet the natural tendency is to look on an "artist" with awe, and to look on us with a head shake. Nuts. We create, and we do! This sure does beat sitting in front of the tube watching the world go by. 'Nuff of this soap box, back to the building board. See you at the Jumbo Fly-In. □



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FROM THE SHOP

from page 4

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We have been advised that Revell, Inc., will be releasing to the market a limited production run of their 1/4 Scale Wasp engine later this summer.

The Wasp engine comes as a kit molded primarily of clear plastic and was described as the visible radial aircraft engine. When assembled, all of the accurately reproduced internal parts (pistons, connecting rods, valves, rocker arms, etc.) operate when the propeller is turned.

Our interest in the engine is slanted toward the R/C Quarter Scale builders who can use the detailed external parts to good advantage, be it the entire nine cylinder radial or fewer cylinders possibly reworked for a different type engine.

We well remember this engine when it was introduced several years ago and have often wished we had picked up a couple when they were available (20/20 hindsight). The suggested retail price will be about \$45.00 (damn inflation) but we can watch for the discount toy stores to bring that down a bit.



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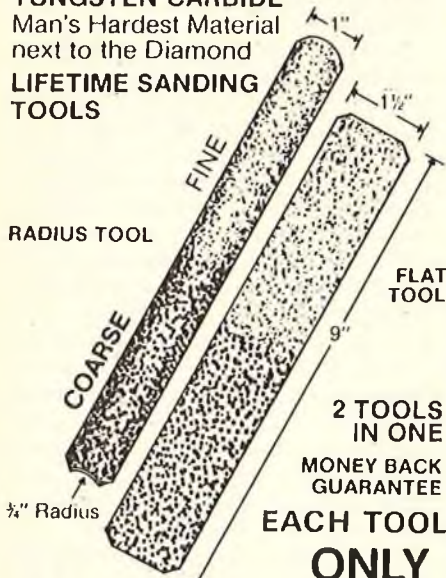


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Our first chuckle for this month comes from Ian Gallie, Renfrewshire, Scotland. Oh boy! we can relate to this. Dear Mr. Dewey,

You may be surprised to hear from Bonnie (but windy) Scotland, but we get your fine magazine over here too, and we really enjoy the informative articles and great designs. I have now completed a "Double Eagle" with a Webra rear exhaust 61 and tuned pipe and I can't wait for the wind to drop to gale force so I can fly it.

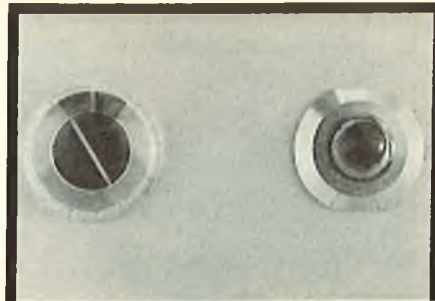
What has really made me write to you, though, is the letter from Bob Dick in the January edition on "Reverse Hallucination" I'm surprised to see you give publicity to such an out-moded theory. This Bob Dick must be a mere tyro. To modellers like myself, who've been at it since Pontius was a pilot, the real answer is obvious — time travel.

Anyone who knows me will tell you I'm a very neat and methodical builder. If, say, I wanted my X-Acto knife now, I'd go up to my workroom, open the door slowly (otherwise you disturb the balsa shavings on the floor), duck under that long shelf bracket I hang models from while the paint dries, move the Dremel Saw to one side so that I can lift up that quite big piece of 1/4 sheet balsa that's bound to come in handy one day, and there's the knife, right next to that klunk tank with only a small hole in it. Easy, see?

The trouble comes when you're building. A tension builds up in the fabric of time, probably triggered by the excitement at what is sure to be the best model yet. As soon as you put down that knife it flicks out of existence into the fourth dimension, and travels forward in time, usually only for a few minutes, and then re-appears when you're not looking. So the reason you can't find things is because they're not there! Often you can actually see small things vanish. Haven't you ever dropped a small washer, watched it hit your shoe, and marked the direction it flew off in — and has it ever been where you saw it go? You always find it later in quite a different place. I think it's because the earth moves onward in its orbit while the object is flying through time.

There are few things you can do to circumvent this dreadful scourge. One thing that always works though, is to get your wife to help you look for it. The presence of another person always breaks the time warp and she is sure to find it. Also it makes her feel superior to find something that you can't, and it also lets her nag you about the mess in the room. This cheers her up no end — see how easy it is to make someone happy?

By the way, if you or any of your colleagues on the magazine ever pass through Glasgow Airport, ask for me at



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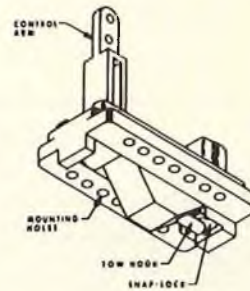
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Yours aye,
Ian B. Gallie

Next we have food for thought from Floyd Manly, Midland, Michigan. We know that there was a long, cold winter in Michigan and cabin fever contributes to frustration.

Dear Don,

I'm trying to figure out what it takes to be a national champion. I read RCM every month, forward and backwards and sideways, but all it does is confuse me.

Even the picture of Tony, Steve, and Don is confusing. Oh, I can see that they're all using JR radios, Webra engines and IM accessories, but gee, each is holding a different airplane. I've got all the JR, Webra, and IM stuff, but which plane should I buy? And should the engine be upright with a rear pipe, or side mounted, like Don's?

I thought maybe I needed more experience, but I'll betcha I'm older than Junior, and have crashed more airplanes than he has. I hate to think that I'll have to get as old as Tony looks with the gray hair temples --- but I guess so --- because Steve was only 2nd.

Still looking for a common denominator that would make me a winner, besides the JR stuff, I've been studying their pictures for hours and can't come up with one. For instance, Tony and Don both have long haircuts that cover their ears. This should help minimize distractions. But --- Steve's is short. Don and Steve are wearing sunglasses (to cut down glare?) but Tony isn't. Is he trying to confuse me by taking them off for the photographer?

Tony is wearing a long sleeve checkered shirt, but doggone it, the other two have short sleeves --- and they're striped. Look at the pants --- two dark and one light. Even the shoes are no help. Don's got on earth shoes, Steve is in loafers, and Tony's look like they have cowboy heels.

Don also printed this picture in his February column, but he was no help. All he talked about was his moving to Florida --- I should have such troubles.

I'm waiting for an answer. Meanwhile I'm trying to average out the factors by letting my hair grow longer, wearing sunglasses, a striped long sleeve shirt, dark pants, and tennis shoes (as a compromise between earth shoes and loafers).

I just can't bring myself to fly a pink airplane, but if I can find some Circus Circus stickers, I'll try them.

Think I'm on the right track?

Regards,
Floyd

That about does it for this month. Happy landings for the 1982 flying season. □