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RC MODELER

THE WORLDS LEADING MAGAZINE FOR RADIO CONTROL ENTHUSIASTS

THIS MONTH

Jennie Petersen poses with husband Bryce's Focke–Wulf TA–152H featured on page 28 of this issue.

THIS MONTHS COVER
Featured in this issue is Tony Dowdeswell's famous F.A.I. Mustang which can be built as Bardahl Miss or Miss R.J. Ektachrome transparency taken in England by Tony Dowdeswell.

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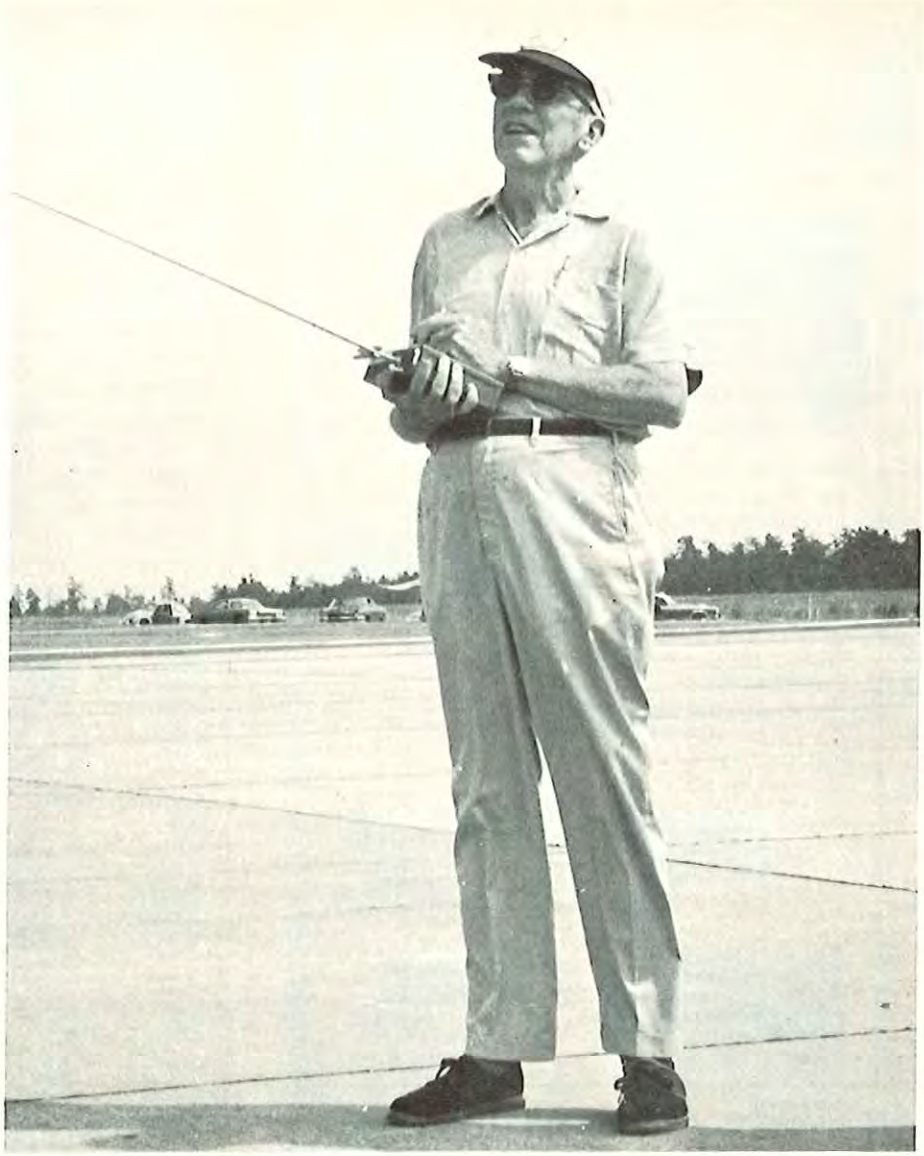
APRIL 1972

IN MEMORIAM



HOWARD G MCENTEE

IN MEMORIAM - - - - HOWARD G. MC ENTEE

The following is an extract from the Charles River Radio Controllers Newsletter of February 1972, from the column entitled Soaring With Dick Jansson:

"We must initiate this series of articles with a very sad note . . . one that is personally very grim. January 13, 1972, Howard G. McEntee passed from among us mortal souls to rest in our memories forever. Never have so many unknowing people (hobbyists) owed so much in the pursuit of their avocation to one person.

Howard was a hobby magazine editor, article writer, innovator, inventor, promoter of radio control interests. He did all this in the most quiet, humble and benign fashion, as was his personality, such that the average modeler is completely unaware of the momentous imprint indeliably inscribed into the hobby of radio control modeling left by Howard G. McEntee. Anyone who had even a chance meeting with Howard felt that they had a friend in him.

Published in the January issue of RCM, and reprinted above, is a picture of Howard Entee as we'd like to remember him. This shot was taken in Lakehurst, New Jersey on August 15, 1971, and was Howard's last model flight - - - and it was a soaring flight of beauty - - - near the end of the third round of flights where the lifting air had disappeared and Howard put up a 10 minute max flight. That's how Howard was - - - he did things - - - he showed the way - - - when others found the going tough. He made it look so easy that the rest of us were put to chagrin.

After that August flight Howard put up a tough fight to live against ironic and impossible odds. I know that he did so without a moment of hesitation - -,- - - Know that Howard G. McEntee will be well remembered."

We can only add that Howard McEntee, among his almost endless accomplishments, was primarily responsible for the radio systems you see on the hobby shop shelves today. For it was Howard who, by his many articles as a writer and editor, took radio control from its origin among amateur radio operators and passed on the know-how to modeling enthusiasts the world over.

An A.M.A. member of many years standing, Howard McEntee was made a member of the Academy's Hall of Fame in 1971. He will be sorely missed, but always remembered, by all of us.

A man of quiet dignity and creative greatness.

HOWARD G. MCENTEE - - - - a pioneer. To his memory this issue of R/C Modeler Magazine is humbly dedicated.

Letters

A MATTER OF IMAGE . . . . .

Don:

On and on the conversation goes about juniors and seniors, the matter of image, and the high cost of R/C.

I am 45 and have been building for 20 years, but that doesn't make me a senior, because don't you see, I build and fly toy airplanes.

Talk about image. I am the President of a firm of Consulting Engineers. I have many representatives of manufacturers of building equipment (hospitals, office buildings, etc.) seeing me to persuade me to specify their equipment. Some of them are Presidents of their companies. This one particular chap is President of his company and has been seeing me for over 10 years. We have strayed from business conversations many times, chatting about our families, sports, etc.

One day during a lull in the conversation I pulled a picture of my VK Neiuport 17 out of my briefcase to show him, for two reasons. First, I get a kick out of showing off this beautiful ship, and secondly, I wanted to see his reaction. Now remember, I've known this guy 10 years.

To my surprise he was working on several R/C projects, and has been flying R/C for 11 years.

The point is that neither one of us wanted to seem silly in each others' eyes because we fly toy airplanes. After all, we both have responsible positions. What would it do to our business if people knew this?

I've been to parties with non-flying friends and mentioned the unmentionable, and the only reaction is a smirk, and a quick change of subject.

At the field, the spectators, young and old alike, the ignorant and the educated, all ask the same old questions about strings and batteries. I explain, explain, explain.

I know about images, like it or not, image is important in today's society, and you had better have the right one to succeed in anything, whether you be President of the United States or a file clerk.

Not many people without good jobs can afford R/C. A young boy has to save a hell of a lot of his allowance to even buy the kit, never mind the radio, engine, and the endless supply

of wheels, links, pushrods, tanks, covering, etc. We are carrying an expensive monkey on our backs. Besides, most teenagers over 16 have cars and girls on their minds.

This is how most 12 year olds get acquainted with flying machines. He bugs Dad for a plastic ready to fly "Ukie". Happily, Dad and son rush to the nearest school yard. Ten minutes later, it's a pile of junk on the asphalt. Dad is out ten bucks on another foolish toy, and son, between his tears, has the impression that only real airplanes can fly. Want to bet they buy another?

Sad? You bet it is! Most of us are trying to change things but I find myself ending up most times on the defensive, although I always start with a positive attitude.

How to educate the public? I don't know the answer; the world needs a lot of education in regard to war, love, minority groups, etc. The list is endless. This is supposed to be a hobby. Do stamp collectors have a program to educate the world?

I am not a defeatist, just a realist. I am a very happy guy enjoying the hours I can spare on a hobby that gives me much relaxation from the tensions of my work.

Why does the public have to understand?

The public doesn't understand a lot of things I like, such as racing cars, progressive jazz, long hair, and mod clothes, why do they have to understand my toys?

My philosophy is, be polite, be reasonable, use common sense at all times and try to change things within the rules of the system, if you think they need changing. And while we are at it, we ought to try a little understanding ourselves.

Sincerely,
Gordon R. Desmond, Jr.
Morrisville, Pa.

A PLUS FOR SIX METERS . . . .

Don:

In the January, 1972 issue, Mr. Roy A. Cartier K4AC of Winchester, Virginia, expressed belief that I was in error in stating that there is not much activity on the upper end of the six meter band which could possibly create interference for the R/C enthusiast flying on six meters.

According to the most recent edition of the FM Net Guide, there are approximately twenty stations in the

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VIEW POINT

DON DEWEY

RCM's Jim Simpson, in cooperation with the Council Bluffs RC Club (Cobras), has come up with one of the finest beginners programs we have seen to date. Called the Falcon Tournament, this is an event designed to allow a beginner to learn to fly while becoming involved in a contest early in his learning stages. Consisting of 3 flight events, the Falcon Tournament will be AMA sanctioned and is an event that should be scrutinized by every club in the country for use in encouraging beginners to become proficient in RC and to take an early interest in contest activities. We have heard of no finer program for the beginner than the Falcon Tournament, and the Council Bluffs RC Club members are to be thoroughly congratulated for its conception. In addition, this "one-design" meet is a great tribute to one of the finest modelers it has been our privilege to meet and know, Mr. Carl Goldberg. The following is the outline for the Falcon Tournament as conceived by Jim Simpson and the Cobras, and which we hope will become an event utilized by clubs throughout the country:

THE FALCON TOURNAMENT

This tournament is designed as a plan to allow a beginner to learn to fly R/C as well as improve the proficiency of all involved. There are many other benefits which will become apparent throughout this outline, such as improved club attendance and cohesion.

To begin with, participation will not be restricted to club members but each entrant must present a current AMA and FCC license prior to official entry. The Carl Goldberg Models Falcon 56 aircraft will be used and engine size will be restricted to a .20 or smaller. Bonus points will be allowed for minimum weight and the idea is to build an easy-to-fly, lightweight, slow airplane.

The radio used must be a proportional system with no maximum limit on controls, however, minimum acceptable controls are elevator, throttle and either rudder, ailerons or both. All flying competition requires only takeoffs, left turns and landings so no advantage accrues for other than primary flight controls.

The Beauty Contest will be the first event. Points will be awarded for the prettiest and the lightest airplanes. Judging will be as follows: The airplanes will be lined up with the prettiest one on one end and (naturally) ugliest on the other. The prettiest airplane will get ½ point for each plane it beats, and so forth down to the last two planes which will get 1 point each. Judging will be done from 25' to encourage "iron on" finishes which are light and easy to repair. **After** the beauty lineup each airplane will **demonstrate** flight controls in operation then immediately be weighed. Points will be awarded – the same as for appearance portion – with lightest plane getting ½ point for each plane it beats and the last two will get 1 point each. Thus it behooves each member to keep his plane weight a secret until this event. Place ribbons will be awarded for each of these events and the point totals will determine starting order for the last contest. Highest points start first. Back up, or spare airplanes, may be used in the tournament and need not be processed at this event, however, they must be identical to the original entry in color scheme. This is to encourage originality.

Qualification day will be the first flight event. Prior to this day all participants have had ample time to get with the "instructors" and learn how to takeoff, turn around and land. This event will give them a chance to prove it.

The participant may have a coach but must fly the entire flight himself. He will place his aircraft on the runway to suit himself, start the engine, set the throttle to idle, and stand behind the plane when ready to go. The starter will drop the flag at which time the contestant will advance the throttle and take off, fly past the "judge" (stationed 500 feet upwind) who will flag as the aircraft passes. The coach will call "turn" and the contestant will execute a left turn, fly downwind past the starter and make another left turn to complete the first lap. Five laps will be flown, and end as the aircraft passes the fifth lap. The flyer will then fly a normal landing

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Sample of Falcon Tournament Entry Blank:

FALCON TOURNAMENT ENTRY BLANK

NAME _____ COLORS:

ADDRESS _____ Main: _____
Trim: _____

CITY & STATE _____

PHONE NO. _____ ENGINE _____

AMA NO._____ FCC NO. _____

TYPE RADIO _____

EXPERIENCE: AGE _____ YEARS IN MODELING _____

OCCUPATION _____ Years In R/C _____

OTHER INTERESTS _____

_____

MARRIED: YES _____NO _____

Name	Colors main	trim	License # AMA	FCC	Engine	Test hop date	POINTS Beau.	Qual.	Musical	Race	Total

Throughout the tournament, only takeoffs, left turns and landings are required. Nothing More!

engine clinic

By Clarence Lee

By the time you read this column, Winter should be about over and the warmer weather commencing. However, at the time of this writing it is late December and the cold weather just starting. Every year with the onset of the colder weather the letters start coming in pertaining to starting problems with the engines. In many cases the sender will feel that it is a characteristic or possibly a design fault of the particular make of engine. The following letter is a typical example of those I receive.

Dear Mr. Lee,

I've been meaning to write you for several years and finally found the chance. Quite frankly I look forward to reading your column every month.

Why did I write you now after all these years? Well for one thing, you plugged your Veco designs so much I decided to buy one this past year (series 71 – .61 displ/Perry Carb). Did it meet my expectations? Yes, it did until the weather got cold here on the east coast. My experience with this engine is that below 40 degrees F it is almost impossible to start (for the first time). It usually takes an "array" of electric starters, various booster batteries, plus a new glow plug for good luck to get me running. Possibly I should learn the real techniques from your friend, Darrell Yonkers, up in Alaska. Be that as it may, I still like my Veco, power wise, very much.

As a result of my starting difficulties, I've become quite familiar with several of the popular brands of electric starters. Before buying one of these units I thought it would be nice if you could run a little survey for your readers, much in the manner as you did with mufflers, spinners, tanks, etc., in the past.

What are the best techniques for using a starter? Do you prime first? Do you turn it over first and then prime? And so on.

Most important on my mind is what effect these starters have on the engine itself. It seemed to me when we were cranking my Veco that a great deal of force is exerted on the front bearings and housing. Would you please comment on this! By the way these starters raise havoc with plastic spinners. Especially the kind which do not employ hold down screws.

How about some comments?

Very Truly Yours,
Bob Aberle
Hauppauge, New York

Bob, all engines become harder to start in the colder weather. However, this has more to do with the fellow doing the starting and his technique than the engine itself. It only takes three things to make these things run: Compression, fuel, and fire. If the engine has good compression, you supply it with the fuel, and the glow plug is hot, it is going to run. Regardless of the temperature. However, two things work against you in cold weather. The extra drag induced by the thickening of the oil in the engine and the lack of fuel vaporization. The extra oil drag that makes the engine stiff can easily be overcome if you get into the habit of loading your engine with 3-in-1 oil after every flying session. This should be done whether the weather is hot or cold as it also helps to neutralize any corrosion tendency that glow fuels have. If you do get into the habit of doing this the engine will always be free when you go to the flying field. Now, most fellows start their engines by choking which is perfectly acceptable in temperatures above 60 degrees. However, if the temperature is below 60 degrees you are going to have a hard time getting the engine to start by choking. This is caused by lack of fuel vaporization. In warm weather the fuel vaporizes easily and reaches the combustion chamber for ignition. In cold weather it lays in the bottom of the crankcase in a puddle without reaching the combustion chamber. So you keep choking and choking until the engine finally kicks. When it does this you suddenly find the engine flooded. All the raw fuel in the crankcase finally got to the combustion chamber. Now the engine won't start because it is flooded and more exasperation follows. There is a very simple and easy solution to this, and that is a small exhaust prime. If the weather is cold you know the engine is going to be difficult to start so get yourself a Tatone prime bottle or an old nose spray bottle, fill it with fuel, and keep it in your tool box. When you start the engine, choke it two or three times to draw fuel from the tank to the carburetor. Next, give it a small exhaust prime and flip the propeller several times to get the fuel distributed. Then connect the starting battery and give it a hard flip. The engine should take off running in one or two flips every time. You will have to experiment a little with the correct amount of exhaust prime so as to not get too little or too much, but this is not hard. It is very important that you have a hot starting battery. The glow plug should glow orange – not dull red. Many fellows seem to think that if they cup their hand around the plug and can see a bare glow that this is all that is necessary. This is wrong. Even in warm weather a plug that barely glows red will cause the engine to keep kicking but never take off running. Also be sure you flip the prop SMARTLY. Many fellows have starting problems simply because they do not flip the prop hard enough and are just giving the engine a fast pull through. If the engine is marginal on compression it is not going to start unless it is flipped hard.

Now, as for the use of an electric starter, you really shouldn't need one

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Feedback

RADIO CONTROL ACTIVITY AND NEWS BRIEFS

Open Pylon Event at Hawaii State R/C Championship hosted a variety of planes: Dennis Ryusaki's 'Caprice' (Kraft-Veco); Bill Fushberger's 'Big Bippy' (Orbit-Webra); Bub Cowan's 'Aeromaster' (Heath-Enya); and Ben King's 'Kaos' (Kraft-Webra) wait for the start of a heat.

1971 HAWAII STATE R/C CHAMPIONSHIP

George Duerksen won his third consecutive Grand Championship at the third annual Hawaii State R/C Championship Contest on August 14-15, 1971. Eighteen-year old Brian Onaga of the Kapiolani R/C Club took first in A Pattern, Carrier Event, and Limbo to finish just 5 points behind George. Flying for the Hawaii R/C Club this year, Duerksen won B Pattern, Open Pylon, Formula I Pylon, and also placed in Carrier, Egg Drop, and Glider.

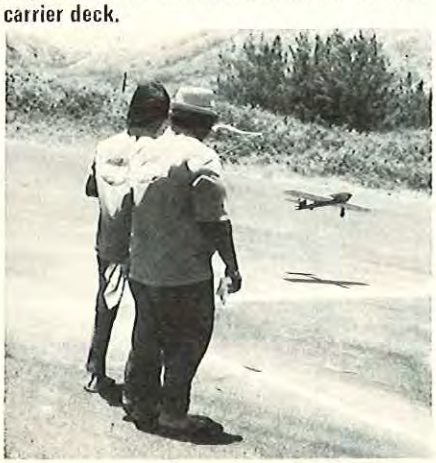
The Carrier Event is a modified spot landing with a 35 by 70 foot rectangle representing the carrier deck. 5 minutes is allowed to make as many touch and goes as possible on the deck, and extra points are awarded for landing and stopping on the deck.

FAI Glider was dominated by Hawaii Silent Flyers as Currie Lee maxed all three flights to take first place.

The two-day contest was held in perfect weather at Bellows Field, an inactive air base in Waimanalo. This new flying site has proven to be ideal.

Modelers visiting in Hawaii are welcome to use our facilities. Anyone interested should write to Gary Johnson, c/o Pete's Modelcraft, Kahala Mall, Honolulu, Hawaii 96816, for information about future races.

18 year old Brian Onaga drags in his R/C 'Nobler' to the carrier deck. Object of event is to take off and make as many touch-and-go's as possible in 5 minutes and land on 35' x 70' carrier deck.



Bob Anderson carries out Currie Lee's Cirrus to the launch pad. Currie won F.A.I. sailplane event with three consecutive maxes at 1971 Hawaii State R/C Championships.

PUBLIC RELATIONS MADE EASY

Have you been looking for a good project for your club that could involve everyone from beginner to expert and stimulate interest among club members? Are you tired of your neighbors' skeptical looks and quiet whispers when you take your "toy airplane" out to fly? Do you wish you could find some means to make John Q Public aware of your existence so as to reach more potential club members? Would you like to do your thing to improve the public image of RC as a mature, socially acceptable sport such as golf or car racing? Have you decided that a good local public image is up to your club and not the AMA unless the Executive Director of AMA, John Worth, is a member in good standing in your club?

Well, if you have answered yes to these questions, a shopping center with an enclosed mall in your town may be the solution. How does a shopping center mall enter into the picture? Quite simple, actually. Most shopping centers with malls are willing, even anxious, to have displays of public interest such as those that could be provided by the local R/C club.

Our club, the Capitol City R/C Club, recently held such a display at the White Lakes Shopping Center in

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KEN WILLARD

On the left is the 385 wing. Center wing is flat bottomed 385 section. On right is the "laminar" section. Smaller wing on fuselage is Eppler 387. Cirrus wing not shown.

This month I want all of you soaring enthusiasts to pay particular attention. I'm going to reveal the results of some extensive tests which I have been performing on wing airfoils. Now, if you use the information carefully, you will undoubtedly win every contest that you enter, quickly pass all the tests the LSF levels require, and then retire from R/C soaring because there will be no more worlds to conquer.

O yes – one little thing. In addition to selecting the right wing section for the type of contest you plan to enter, you will have to do a couple of things on your own. First, you'll have to locate the thermals – the wing section won't do that for you. As a matter of fact, neither will a thermal sensor – it'll just tell you when you hit one.

Then, after finding the thermal, you'll have to center your plane in it for circling in the rising air. And after you've drifted a bit downwind, you'll have to decide whether the thermal has petered out and it's time to come back and find another.

Finally, of course, you'll have to position your plane for the precision landing.

Except for these details, as I said, if you use the right wing section, you can't miss. Well, come to think of it, there's a couple of other minor points, like the trim of your wing in relation to the stab, the ratio of the wing area to the stab area, the distance from the wing center of pressure to the stab c.p., the dihedral, or maybe polyhedral required to stay inside small thermals. And maybe a couple of other things I've overlooked. But you should be able to figure all of these things out as you go along.

And when you do, please send me the data. I haven't quite made it in the past forty years!

But back to the tests on airfoils. Ever since I began to concentrate more on sailplane, I've been intrigued with the various wing sections which are used, and all of them with good success, depending on the user. You hear a lot about such old favorites as the Clark Y, the NACA 6409, and, for faster sections, the NACA 2412 and the Davis laminar flow section. Then the more recent Eppler sections like the 385 and 387 began to get more and more attention. And, of course, the section used on the Graupner Cirrus, which varies from a sort of "modified Clark Y" at the root to a slightly semi-symmetrical tip section.

Every flyer swears by the section he uses – and can usually point to some hardware in the form of a trophy or two to support his belief. The Cirrus has won many contests, to be sure. And so has the flat bottomed section which Rick Walters uses on "White Trash." The Windward does all right with a flat bottomed section – won the Nats. And I've had good luck with both the Eppler 387 on the Maxi-Sailer, and the Eppler 385 on the TopSailer.

So which section is the best? Or does it really matter, so long as you have a reasonably good section, and the real facts are that it is far more dependent upon the skill of the pilot.

Shortly after the 1971 LSF Soaring Tournament at Livermore my curiousity got the better of me, and I decided to run my own tests. I already had two wings for the TopSailer, one with the Eppler 385 section, the other with a laminar flow curve, and I still had the old Eppler 387 wing from the Maxi-Sailer. And I figured I could borrow a set of Cirrus wings from one of my friends. Marshall Watson turned out to be the patsy. He was just as curious as I was.

Since the wings were not all exactly the same size, but virtually so for all practical purposes, considering that my "laboratory" was the open sky, and it was pretty hard to get controlled conditions, I decided just to make a simple calculation, and ballast the TopSailer so that each wing would have the same loading. The other "control" that I had was to make the tests very early in the morning, before the thermals started. Since the weight variation was, at most, only about three ounces, I ignored that for the most part, but to make some adjustment for it, I did stretch the high start rubber a few more feet for the heavier model. I'll be the first to admit that these tests weren't the most accurately controlled that were possible, but at least I did try to give each wing an equal chance.

For the tests, I used my high start which is comprised of 120 feet of ¼" surgical tubing attached to 300 feet of 15 pound test fishing line. I stretched the line to 700 feet for the point of release, going to about 725 feet for the heavier models. The models weighed about 2¾ lbs., with the heavier ones around 3 lbs. At this weight, in still air, the high start would get them up about 300 feet. In this regard, one of the interesting by-products of the tests was to observe the difference in angle at which the various sections would tow up without stalling out. I used exactly the same towhook location in each case.

The tests were made over a period

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CUNNINGHAM ON R/C

Chuck Cunningham's modified Sun Fli with added turtle deck.

No doubt many of you readers by this time have heard that the noted radio and TV personality, Paul Harvey, has become interested in the great sport of building and flying radio controlled models. I first found out about his interest the day after Thanksgiving. Paul mentioned, on his radio broadcast, that he and his son had spent a wonderful Thanksgiving day working on their latest bird. Having been a very staunch fan of his for many years I wrote to him that day, welcoming him to the hobby, and telling him now much good I though he was doing for all of us interested in this sport by making his participation known. A few days later I received his reply, which is reprinted below. You can tell from reading it, he's hooked!

Dear Chuck Cunningham:

What a delight to receive your November 26 note. I had been following your columns closely enough to notice that you did not deliver, in December, the 'more knowhow' you promised in November.

I've learned there is a dearth of how-to information for the novice and anticipate each morsel with relish.

Young Paul and I got 10½ lovely flights out of our first Comet and have since completed the high-wing Du-Bro and have the low wing model two-thirds finished - - - so we are utilizing inclement weather as you suggested, building up a fleet.

I will remember your request for a workshop picture.

The Harveys' first 'invention' to add to your substantial accumulation: Where wingover rubber bands may interfere with aileron controls, snap a one-inch section of small diameter ballpoint pen (sliced lengthwise) over the hinges thus to shelter the exposed horn.

Sincerely,
Paul Harvey

Welcome to the fraternity Paul, and we all hope that you have many, many successful flights.

•

The pictures with the column this month are of my slightly modified Sun Fli IV model. The "slight modification" is in the addition of the cockpit and turtle deck treatment that makes a slightly ugly (sorry about that, Joe) but beautiful flying aircraft, a much prettier bird. This turtle deck treatment can also be used on the very popular Kaos. Simply turn the plastic canopy around, and use the pointed end first. Cut off the rear portion, and save this part for another aircraft. Make a simple structure of bulkheads and 3/16" sheet to form the turtle deck, or carve one from a solid block of balsa and glue in place. Fair the structure into the vertical stabilizer with spackling paste, sand smooth and you've got a different looking airplane. By the way, this aircraft has a paint job that I mentioned a couple of months ago. One coat of auto primer, then only one coat of K & B Super Poxy, brushed on. Works great, and really gleams in the sunlight. The wings are covered with Super Mono-Kote, with trim by 3M decorator tape. All very simple and fast.

•

The answers to the questions that I asked in the January issue have been coming in thick and fast. I haven't started to try to break down all of the answers yet but will do so by the next issue, and I will feed this information back to you. On first glance I find that the longest letters are written by modelers living in the cold climates. The shortest, by those basking in the warm sun of California. Most of those answering are more interested in smaller aircraft than the .60 size, and most don't really care if it is semi-scale or not, but whether it flies and flies well. More on this in the future.

This does bring me to a question that has been bothering me some lately – just what does the average modeler mean by the word "fly"? So often in a construction article you see the words "flies beautifully", or "it flew right off the building board", or "Boy! does that thing really fly." The word really means different things to different people. To the expert flier the word "Fly" means that this is an aircraft that can do any maneuver cleanly, with ease, and looks good doing it. To the glider pilot it means a bird that will float through the air cleanly, picking up each rising current of air, and getting the most out of it. To the beginner the word means he got up in the air – "landing" means that terrible time trying to get the aircraft down on the ground again without a smash. To some designers,

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F.A.I.

MUSTANG F.A.I. AS SHE APPEARS ON THE PLANS, PICTURED WITH KDH MINI-RETRACTS, LEE-K & B .40 AND KRAFT RADIO USED. ALL-UP WEIGHT 4 POUNDS, 11 OUNCES.

MUSTANG

BY TONY DOWDESWELL

Why the Mustang?

This model started, from the very beginning, as a publishing venture soon after the F.A.I. pylon racing formula was adopted on a 'provisional' basis at the end of 1969. Personally, I prefer my racers to look like racing aircraft. I think it is a great pity that F.A.I. rules have not adopted a positive 'scale' appearance requirement, but that should not prevent us from getting the scale appearance into our F.A.I. racers at no cost in performance.

In looking for a subject as a racing model for F.A.I. racing, the P-51 Mustang is the obvious choice – take a look at any of Reid Kinert's *Racing Planes Annuals* and you'll see what I mean. In fact there are, and have been, more Mustangs used in full size air racing than any other single type of aircraft, so it's a natural candidate.

There are so many glamorous colour schemes to choose from. My own **four** prototypes have used the highly colourful schemes of the late Ed Weiner's Bardahl Miss and Chuck Hall's Miss R.J. Others that come immediately to mind are Howard Keefe's Miss America and Clay Lacy's passionate purple No. 64 (complete with Snoopy emblem).

If you care to go back a bit in

Prototype No. 2, "Miss R.J." was actually modified back from a P-51D airframe, just like Chuck Hall's full size original. Foam wing on this model. Kraft radio and Lee Custom K & B .40.

racing history and fancy the P-51B (also shown on the plans here), there's a chance to model Paul Mantz's famous red and white No. 46 thrice Bendix Trophy winner, or even Bill Odum's superb, though ill-fated, No. 7 Beguine. Then, if you object to the excess fuselage depth caused by the underwing air scoop, the '51 will accomodate you, sir . . . Anson Johnson's all-yellow No. 45 had the scoop removed and the intake relocated to the wing leading edges where the gun bays had been.

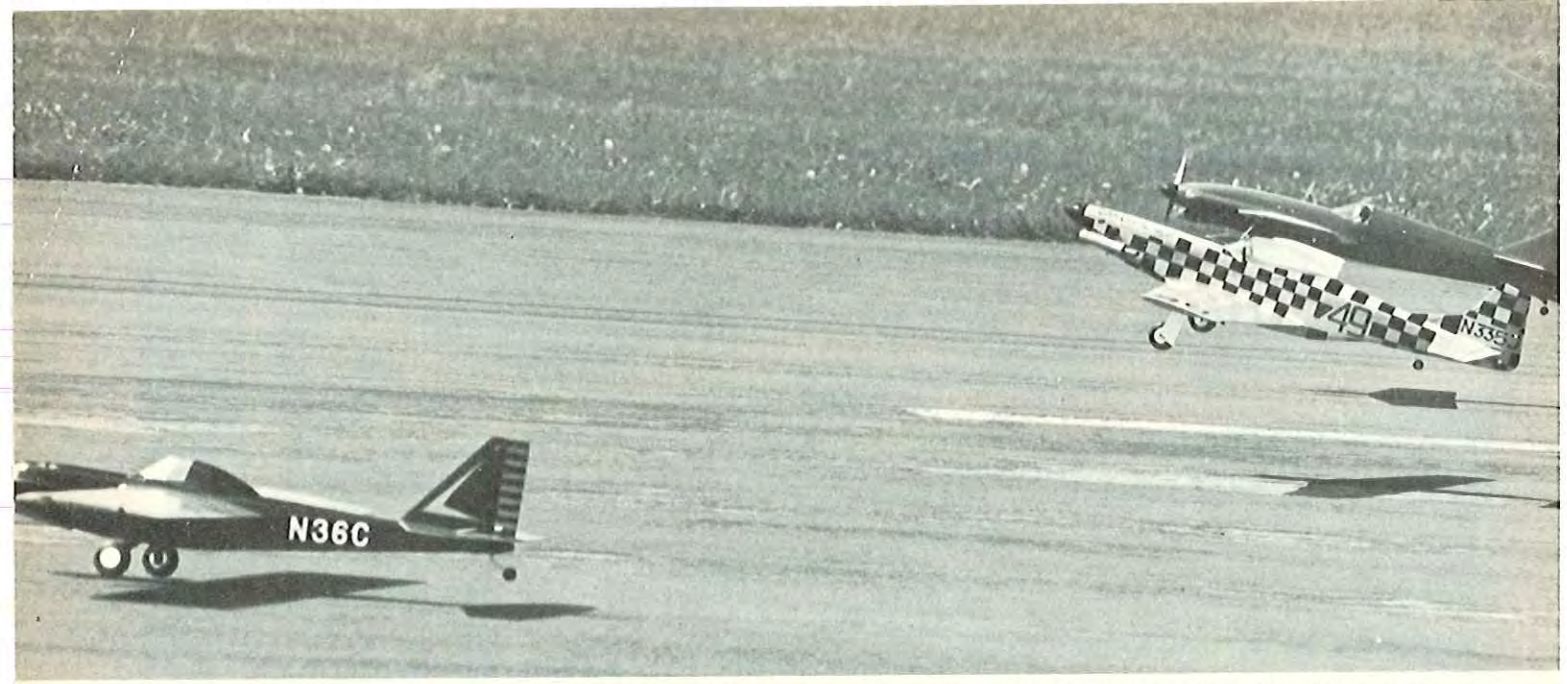
The choice is almost endless, and it was with this sort of thought in mind that my first Mustang F.A.I. was drawn up and took shape early in 1970, racing for the first time at the National Championships in May that year. The model proved quite fast, but the pilot, unfortunately, was not and we made it no further than the semi-finals.

Prototype No. 1 ended in spectacular fashion at the Cotswold pylon race meeting in August 1970 in a magnificently over-cooked attempt to recircle the No. 1 pylon in the first lap of the final. It was a basket case par excellance, but the radio continued to work!

Prototype No. 2 Mustang F.A.I. was in the shape of Miss R.J. and was first raced at the beginning of 1971, getting into the final of the first race meeting of the season despite a very new engine and a near 5½ lbs. weight less fuel.

Prototype No. 3 represents the model drawn here. It is basically the same design as Numbers 1 and 2 but the outline has been improved to make it look a lot more like a Mustang. Here, of course, is one of the problems of the game – making 700 square inches of wing and tailplane plus 7 x 3½ inches minimum depth and

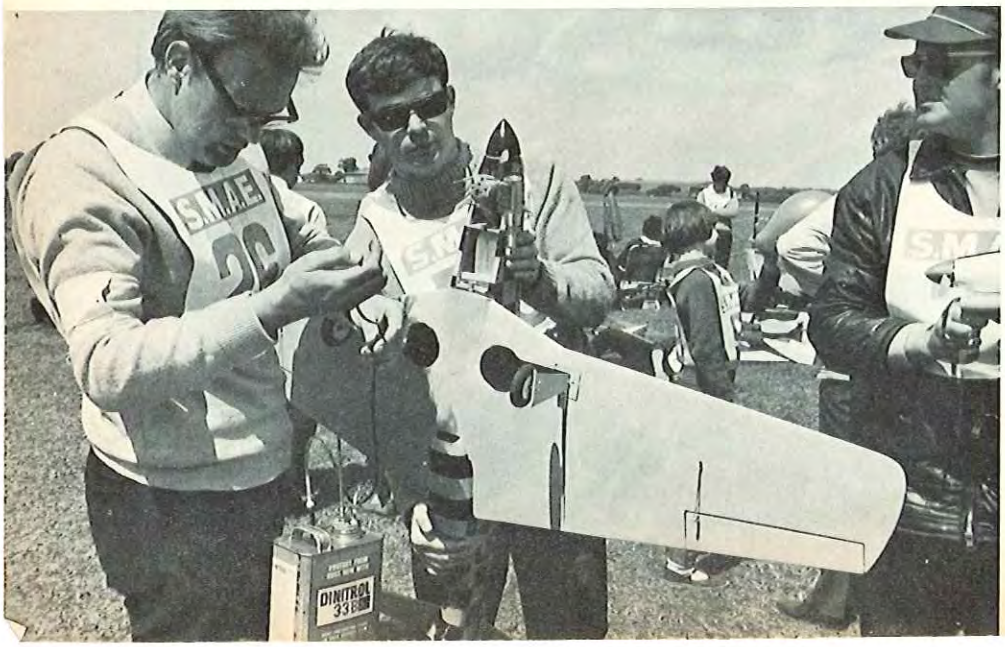
Mustang F.A.I. built by John Evans of Scarborough, England, features K.D.H. Mini retract gear. Kraft radio, K & B .40 with KO muffler.



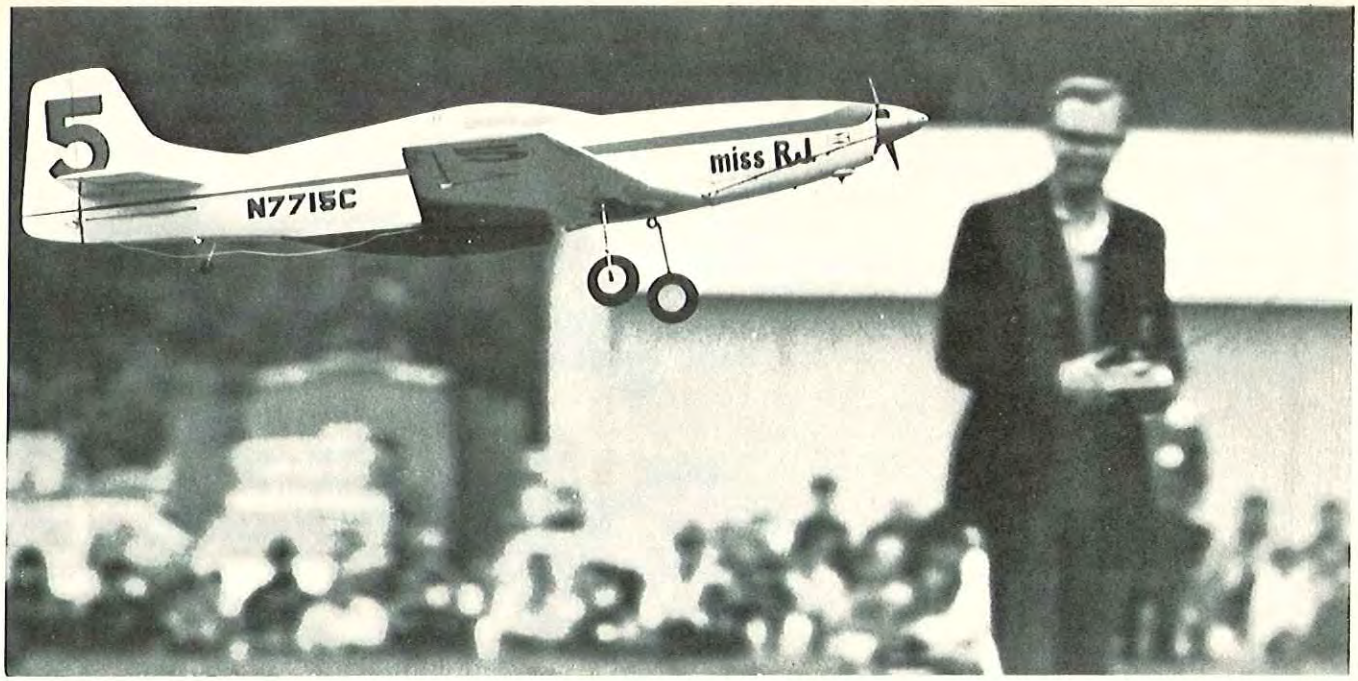
In England they do pylon the man's way, that's to say, they all go together at one drop of the flag at takeoff. Takeoff collisions are a rare thing and the effect of four models exploding into the air at once is not lost on the spectators. Here, the author's prototype No. 1 lifts off with the models of Fred Coombes on the left, and Roy Yates in background. Note rudder of Mustang in shadow indicating right rudder held on for takeoff. Wide track undercarriage of Mustang F.A.I. imparts beautifully smooth takeoff characteristics.

KDH Mini-retracts in retracted position. Operation is improved by shortening spring to 2/3rds of original length, reducing load to servo. RMK servo tagged up with special British Skyleader amplifier to plug straight into receiver like normal servo - - - no extra batteries required!

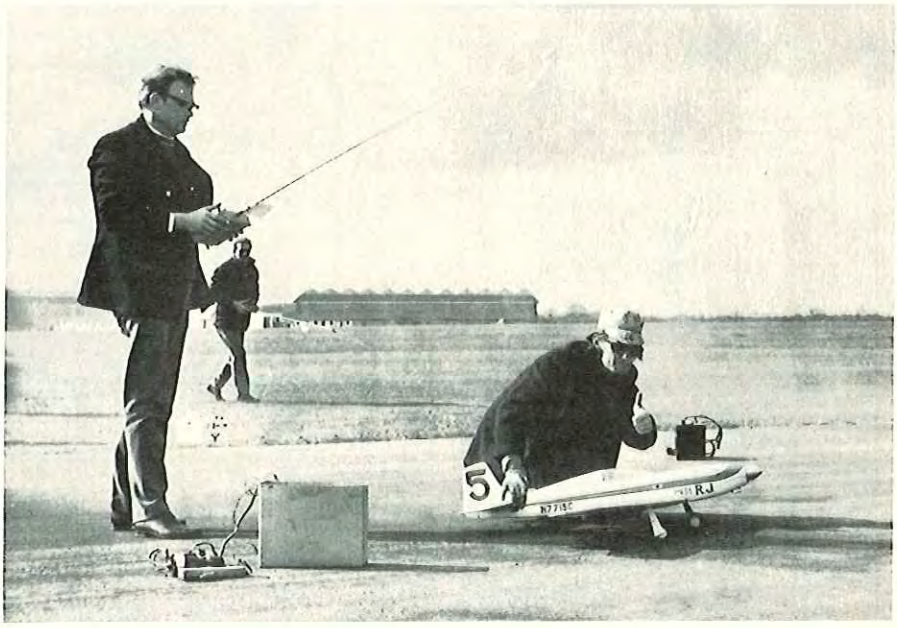
Nose close-up showing Super Tigre S.56 air scavanged type muffler. Large muffler right behind engine creates much drag. Next step is to incorporate muffler within cowl. Reworked T/F 9 x 8 prop shown – T/F 9 x 7 Speed prop., cut to 8¾" worked best with K & B .40. "Bardahl Miss" decals available from designer on request, also "Miss R.J."



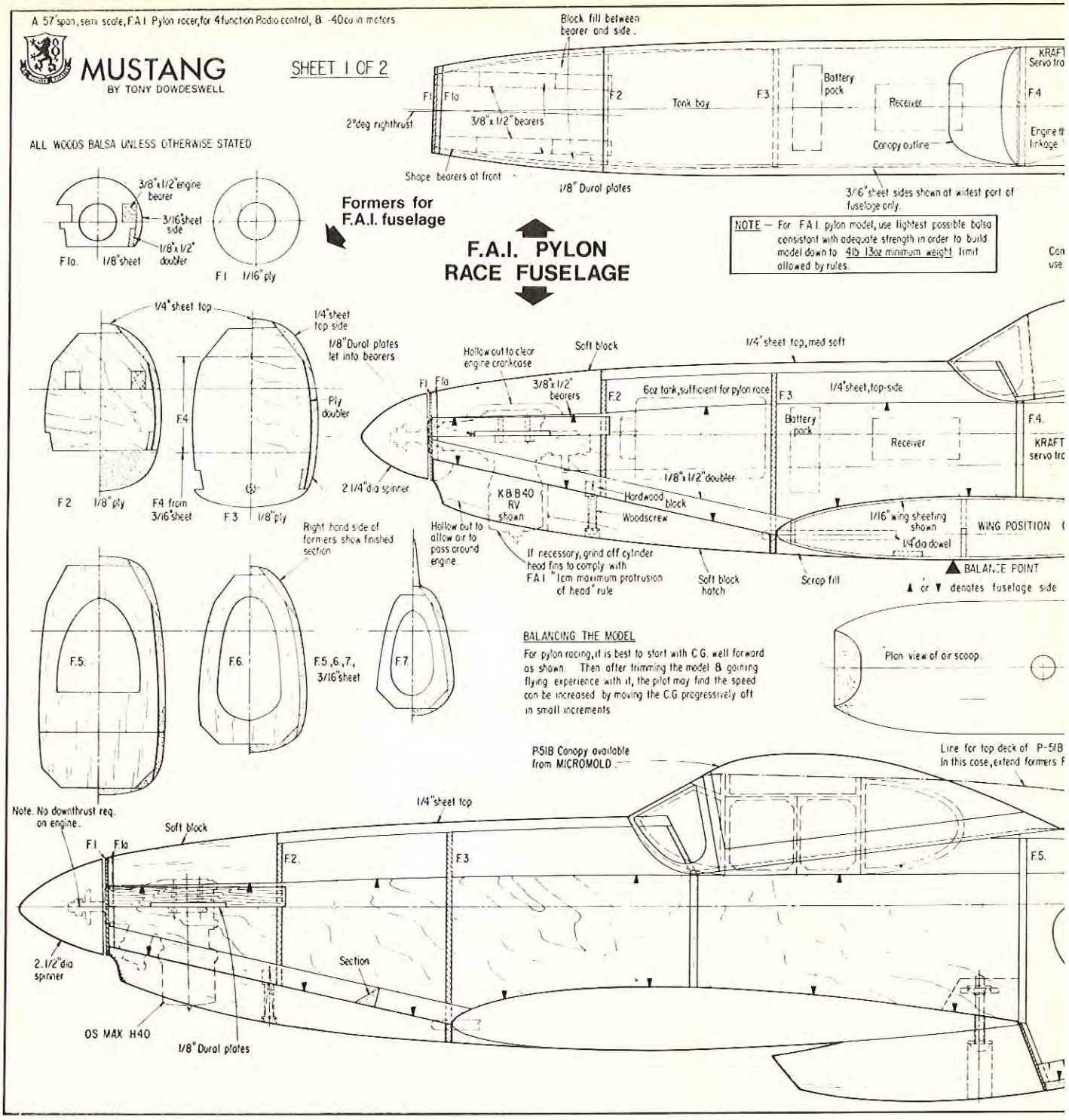
Tanking up with "Bardahl Miss" No. 2 at 1971 British Nationals. Profile of this machine reshaped to better resemble a '51D. Note access to both engine and tank bays. K.D.H. mini-retract gears have been made to work very effectively with R.M.K. retract servo. "Bardahl Miss" covered with yellow and black Solarfilm.



Prototype No. 2 follows lines of Chuck Hall's "Miss R.J." Had fixed gear, Lee Custom K & B .40. Eric Wall holds model ready for takeoff at right. Above, a dead stick landing.



LEFT: Details of KDH retract gear installation on John Evan's Mustang. Non-scale wheel covers allow better streamlining. ABOVE: Photo detail of engine cowl on Evan's Mustang. F.A.I. rules allow engine cylinder protrusion of only 1 cm. from cowl. Arrangement for adequate cooling essential.



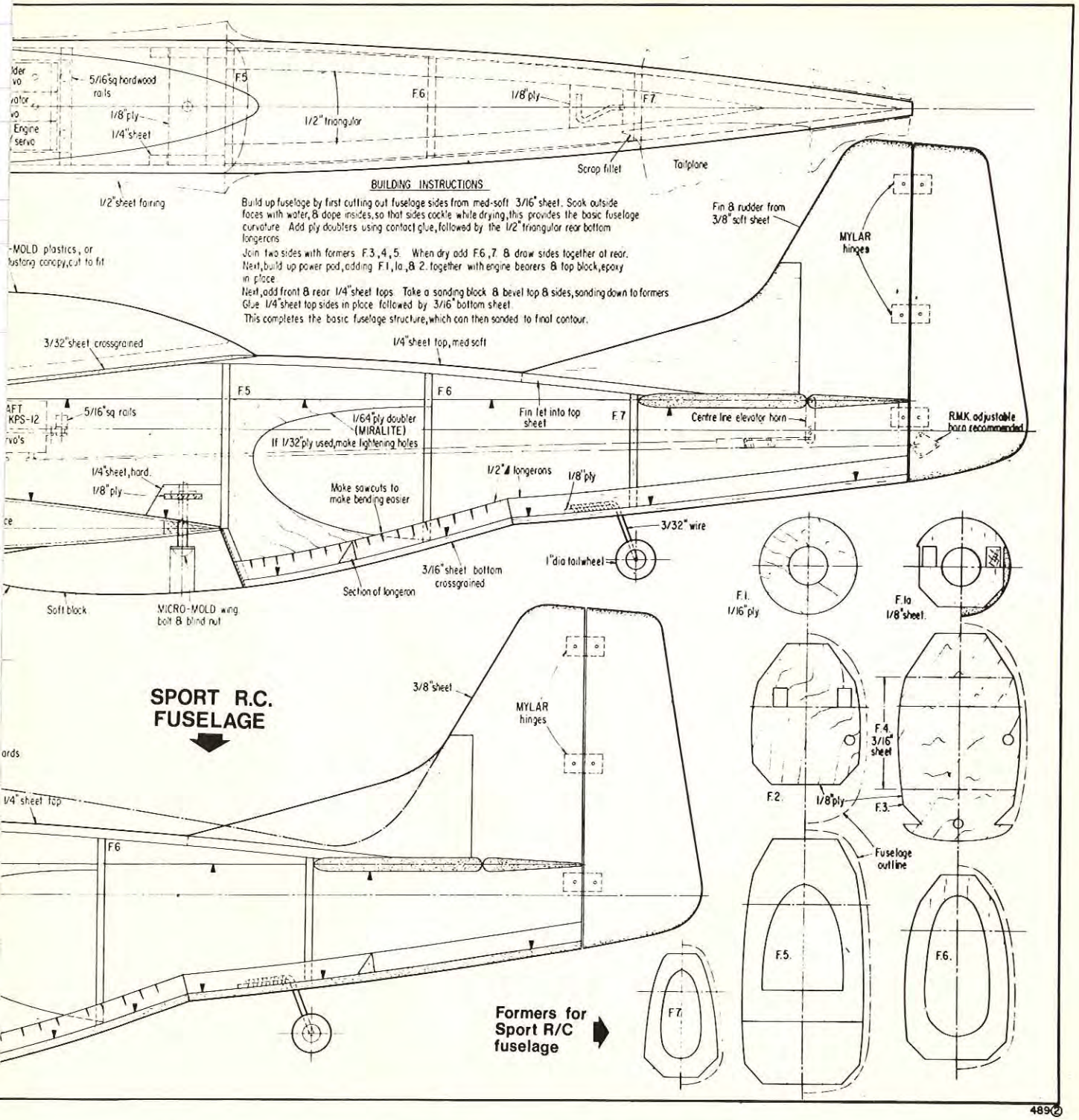
wide fuselage take on the scale appearance from which the F.A.I. model specification is so very far removed. It took a great deal of bending and stretching of the lines and curves of the full size, but finally I think it is as near to 'Dutch' Kindleburger's original shape as it is ever going to get . . . and I think it looks good.

Prototype No. 3 was the model I raced at the Nationals this year and did quite well until the semi-finals when I over-cooked the engine on the start line and, the retracting undercarriage which had operated faultlessly throughout the heats, failed to retract fully. Subsequently the model has done well. It has also shown itself to be quite fast. The retracting undercarriage has proved quite reliable and it certainly makes the Mustang look right in the air. So much for the fact that I'm now a confirmed retract addict!

Mustang F.A.I. is a dolly of an aeroplane (airplane to you American blokes) to fly and race. It has no vicious characteristics at all, it grooves beautifully straight down the pylon course, and turns on a sixpence, thanks, of course, to the light wing loading, characteristic of all F.A.I. racers.

Takeoffs and landings with this machine are also a pleasure, due to the relatively wide wheel spread and, while other racers are screwing left and right when the starter's flag drops, a little right rudder will hold Mustang F.A.I. straight as a poker as it pulls away low for the scatter pylon!

●



CONSTRUCTION

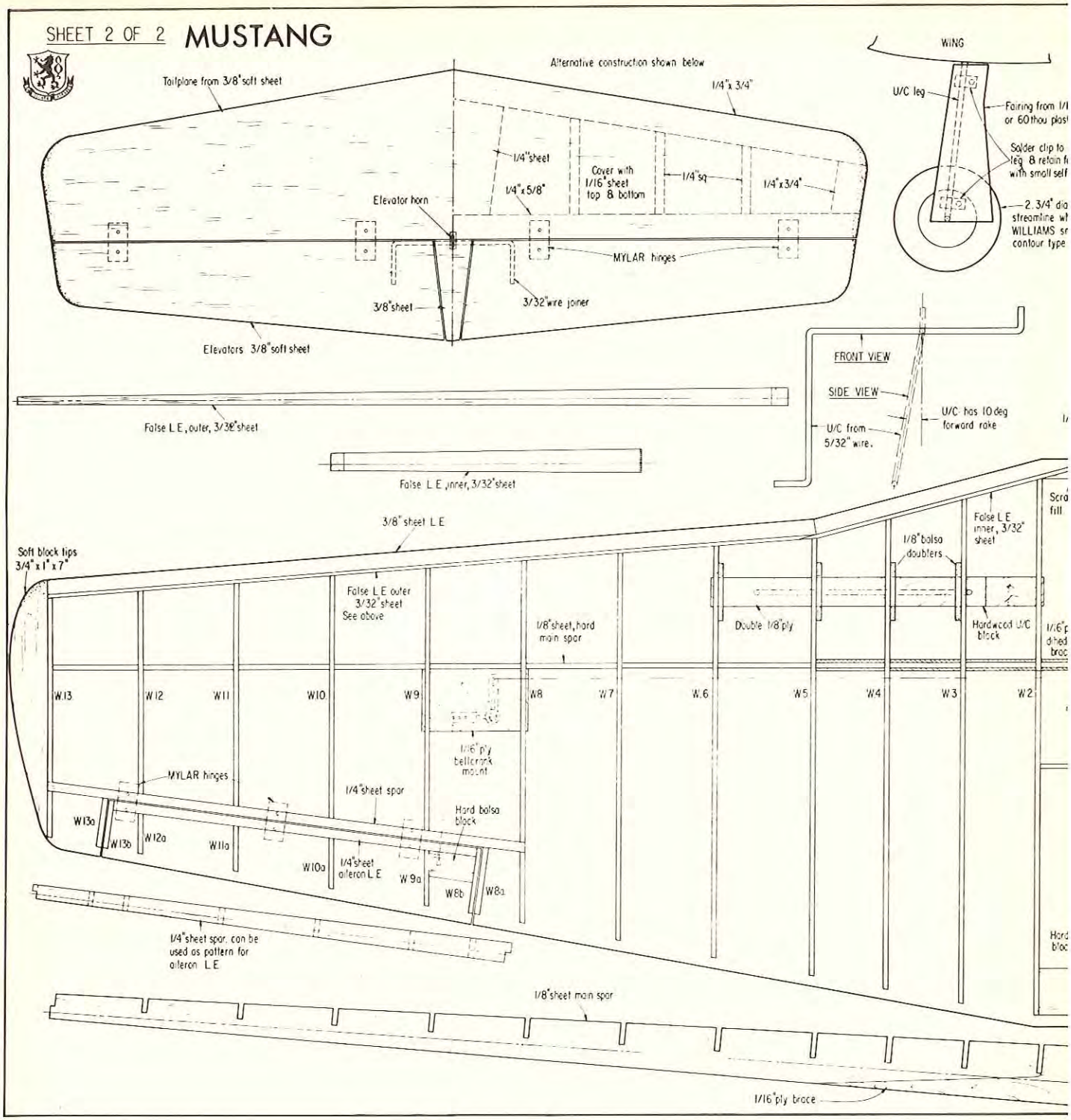
Rule No. 1 of construction in this model is to **watch the weight**. Remember that at 4 lbs. 13.7 oz. minimum, the F.A.I. racer is almost as light as your Formula I craft, so it is absolutely imperative to select the very lightest balsa consistent with strength.

Wing:

I think that the wing is always the most sensible place to start building. In this case, the object was to produce the least amount of structure consistent with strength.

This wing uses the egg crate method of assembly and starts with the cutting of the spar. Decide at this stage whether you prefer to make the wing in two separate panels, joined on completion, or whether to build the wing all in one bit over the plan with spars and ribs jigged to suit the dihedral angle and wing taper. Personally, I prefer the latter, in which case the mainspar is made up complete, but if you prefer to make two separate panels, then make two spar halves, gluing the ply spar reinforcer to only one half.

Slot the ribs into place and add the false leading edge, lining up the ribs at the trailing edge at the same time. Actually, construction is straightforward R/C model practice so I don't intend to bore you with a complete 'glue A to B' construction sequence, but I would like to add that I 'cheated' on the wing skinning sequence by making a jig out of the bottom halves of the 'gloves' provided from the foam blocks from which the cores of prototype No. 1's wings were made. By



cutting away the top halves, I made a jig 'tray' into which complete bottom skins could be placed to take up the contour of the lower wing chamber. The spar and rib assembly was then glued in place.

If you happen to have a pair of foam wing 'gloves' in your workshop, that reasonably resemble the wing section used in the model, this construction method may be well worth a try.

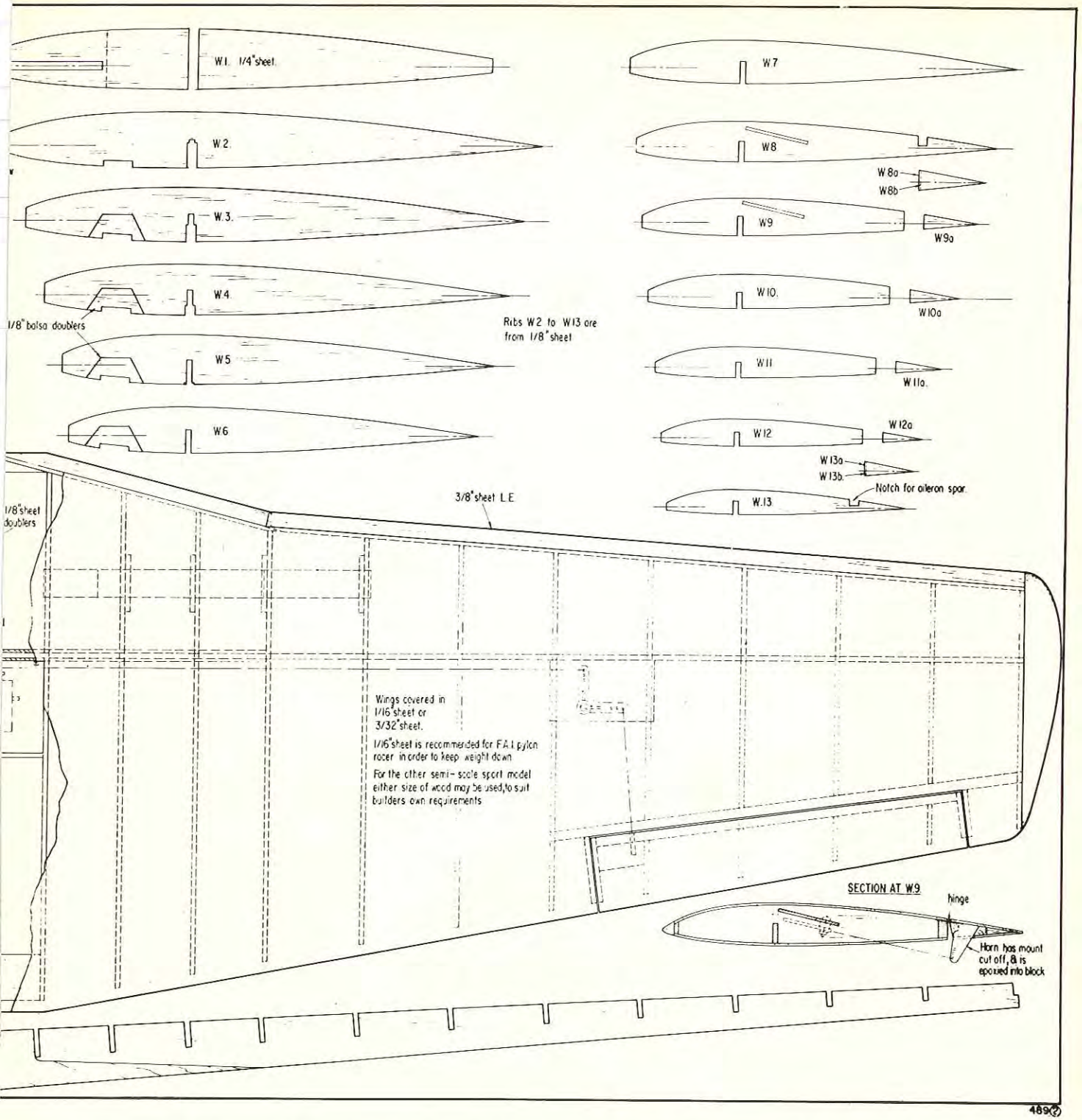
Fuselage:

The basic fuselage construction uses what I call the Jack Stafford method. Since the first time I saw it was on the plan for Jack Stafford's Chipmunk.

Here you cut the two basic fuselage sides and soak the outside surfaces in water, while the inside surfaces are doped. When dry, this produces a slight inward curl to the sides which suits the curvature of the fuselage perfectly when the sides are offered up to the fuselage formers.

Doublers of 1/64" ply (1/32" will do if you can't find the thinner variety) are then contact cemented into place. Begin joining the fuselage with F2, F3, F4, and F5, and then add F6, and F7, drawing the rear ends together.

Thereafter, build in the engine bay from F2 forward, taking absolute care to achieve a **perfectly** solid engine mount. Remember, at this stage, that a weak or flexible engine mount means lost rpm's so be sure to make it **solid.** Most important, in this respect, are the



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1/8" metal facings to the engine bearers, glass fibred into place.

The next step is to start building up the fuselage shape, starting with the rear underside. At this point, match up the wing to the fuselage and align the wing bolt and retainer nut. Next, cut and shape the stab from **light** 3/8" sheet. Make up the stabilizer complete with elevator and horn and build into the fuselage, adding the elevator push-rod. At this point, the fuselage is beginning to take shape and, after laying in the elevator pushrod (the elevator horn is built in), the top deck can be added. Glue on the top sheet first and, when set, bevel the edges of this and the top edges of the basic fuselage sides to take the top deck sides.

When all has set, the fuselage can be sanded to section. The rest is just a case of wielding the balsa knife, and I simply refuse to treat you all as though your last model was a North Pacific chuck glider.

If there's anything you choose to change, modify or improve (yes, there's plenty of room for the latter) feel free to do so . . . it's your racer!

O yes, if anyone wants the Bardahl Miss or Miss R.J. decals, I have them for $1.50 per pair. Write to me c/o RCM, and they'll forward your request to me here in Great Britain. □

BE SURE TO ORDER YOUR FULL SIZE PLANS FOR THE F.A.I. MUSTANG. SEE PAGE 104.

BY BRYCE PETERSEN

focke-wulf TA152H

With the introduction of the Taurus by Ed Kazmirshi, a new age was born for radio control - - - a model that gave the pilot full command. The skidding turn and rudder roll was finished in serious competition. Almost overnight, the complete aerobatic pattern became possible depending on the skill of the pilot. One might say that the age of the R/C fighter was born. Inherent stability in designs became a "no-no" (except in trainers) and words like symmetrical, track, and grooving, became commonplace. Radio control aviation reached maturity.

Models of famous fighters with silver wings flashing through the sky became commonplace instead of a pipe dream of yesteryear. Now, anything is possible, depending on the skill and daring of the designer. It is with this thought in mind that I offer the meanest one of them all – the Focke-Wulf Longnose. I say "mean looking" because it scared the hell out of Spitfire and B-17 pilots. It was the last of the famous Focke-Wulf series and, perhaps, the finest propeller-driven fighter ever produced, flying higher and faster than its opponents. To illustrate its increased performance over previous Luftwaffe fighters, read about the following incident:

Kert Tank, (the designer) was flying a TA-152H over Germany and was attacked by a flight of P-51D Mustangs. Kert put it to the wall and the Focke-Wulf leaped forward, leaving the startled Americans far behind.

The first of the Longnose Focke-Wulf series entered combat in the Winter of 1943. The Longnose cowling housed a twelve cylinder Jumo in-line engine of 2,060 hp. It regained a margin of superiority from the RAF in fighter-versus-fighter combat. Only ten of the 152H series entered combat and were used primarily to fly cover for the ME-262 jet fighters while taking off and landing. Because the Luftwaffe literally ran out of fuel, many of the Longnose fighters were destroyed on the ground. If you are one who does not subtract from a design because the creators lost in the war, you should recognize this fighter as one of the greatest.

Model Flight Characteristics

Ground handling is excellent at medium taxiing speeds. Gunning the engine will pull the nose down, so advance the throttle with caution. Take off – start your rollout at low throttle. The model will takeoff comfortably at one-half throttle. If full throttle is used the model actually leaps forward so fast it will outfly the pilot's reflexes. At half throttle the ship acts exactly like a Falcon 56 with a .30 for power. There are no problems with wing drop off or stalling with this model, so cool it on takeoff and the judges will love it. Once airborne, go to full throttle and prepare for action.

Design Changes from Scale to Improve Performance

The total area of the stabilizer has been increased ten percent to ensure pitch stability. Landing gear length has been shortened ten percent for better ground handling, especially when landing.

Airfoil Section

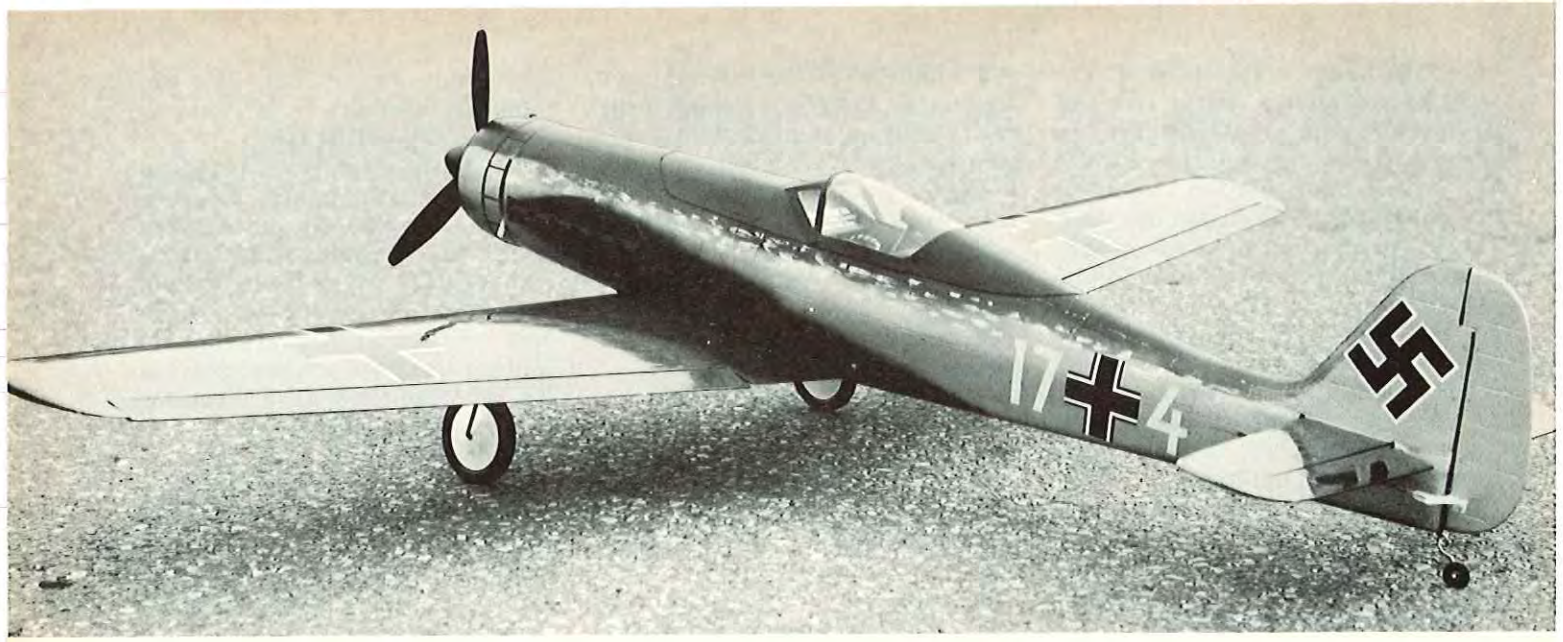
A unique airfoil section has been incorporated where the center of lift in the center of the wing is at the center of gravity. As the airfoil continues out toward the tips, the center of lift is moved back to fifty percent. This will give the tips a slower stalling speed, adding to stability, while landing at very slow speeds. It was noted during flight tests that you can approach a stall with the nose level and the wing center section will stall first, causing the nose to drop slightly. The tips, however, are still airborne. The wings remained level until the center section recovers. This is called 'stair-step stall and recovery.' The high aspect ratio wing contributes to the excellent slow, stalling speed, but will slow down the roll rate. For this reason, full span ailerons are used.

CONSTRUCTION

Follow the drawings and photos up through the basic fuselage and wing construction. The solid block turtle back and cowling will cost you a little green at the hobby shop but is worth it. For those of you who prefer aluminum cowlings, it has been my experience that balsa cowlings give you far better performance without the usual fatigue cracks associated with aluminum. You can also sand out better air vanes around the engine for cooling. Using thinned epoxy to fill the soft balsa will give you great structural strength. Any large bubble canopy will fit and the windshield frame must be custom fit to match it. Thin, stiff cardboard with epoxy will work well for this. When fastening the 1/16" sheeting to the sides of the fuselage, always secure the sheet along the straight edge first and let dry. Then moisten the sheet on the outside and bend it around the formers.

Covering

Super MonoKote was chosen because of its weight advantage, beauty, and its ability to show rivet marks using a marking tool. The colors are green and silver. When using MonoKote, always overlap at the joints so the material will bond to itself. Before applying MonoKote try to dry out your model for a day or so. Any moisture left in the wood will come



out in the form of blisters on your finish. If this happens, prick the blisters with a pin and reset the MonoKote with your iron. I found that Testor's enamel in spray cans will bond to MonoKote if you rough it a little with steel wool.

Power

The HP-40 R/C was chosen because of its advanced engineering design and obvious quality. Let me state from the beginning that this is the finest engine I have had the pleasure to own. From the first run on the test stand, it was obvious that this engine is a breakthrough in the 40-Class engines. It will idle down to a whisper for full stall landings. When the throttle is advanced, you have enough power to go straight up.

Landing Gear

The one piece landing gear is constructed from 3/16" piano wire and buried in the main wing spars. It is simple to fabricate and gives a superb knee action. The aircraft can be flown onto the ground at a fairly steep angle and will bounce right off again.

Rubber bands versus Nylon Bolts for Wing Mount

Most modelers feel that rubber bands are obsolete. Perhaps they are if you have enough runway for emergency landings. If you fly from the middle of a hayfield like most of us do, rubber bands can save you an afternoon of flying!

Propeller

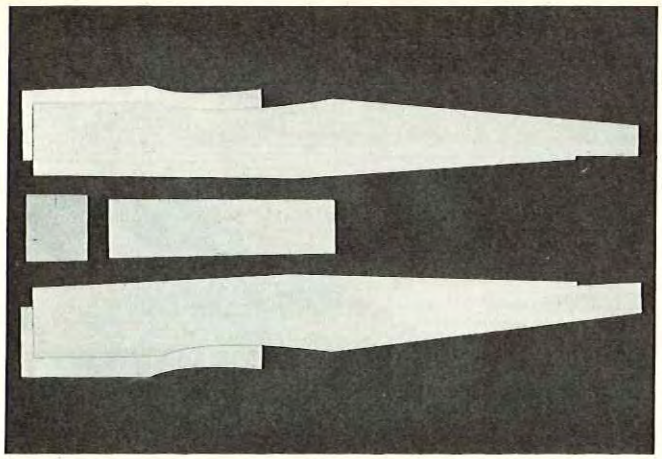
A nylon three-bladed 10-4 Tornado propeller is the airscrew and is a perfect combination for both appearance and performance. Boil it in black dye for ten minutes for added strength and scale appearance.

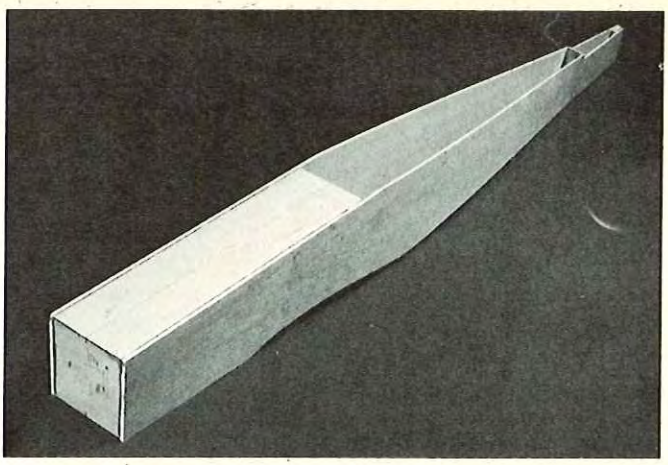
Contest Trail

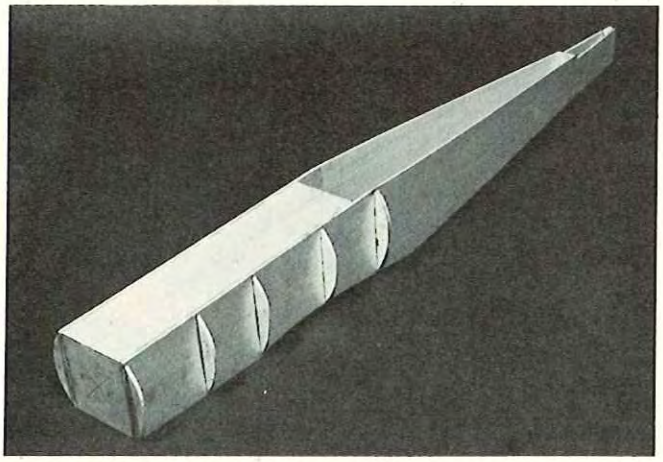
The model first entered the stand-off scale competition at the Area III Championships last October. It suffered because of the rubber bands and other modifications during the static judging (the judging was really tight). In the air, it was far out in front and won first place performing like a well-trimmed pattern design. The airplane is more capable in the air than my nervous thumbs can guide it. It can give you the edge you need to win – it has for me. My Series 71 Kraft system provides the control (bless its dependability) and the total weight of the ship is three pounds, eleven ounces using KPS-10 servos.

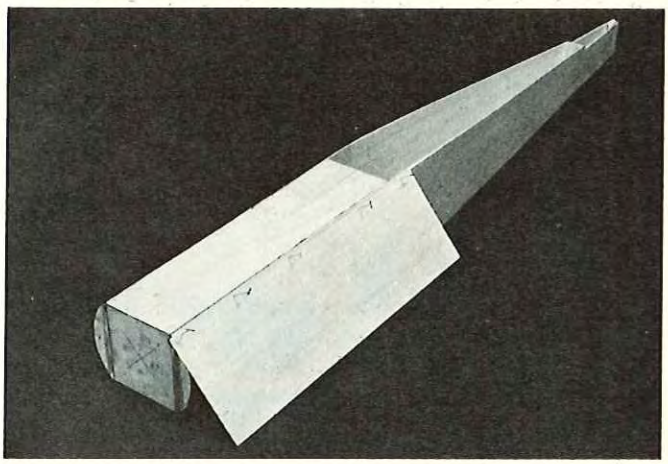
If the competition is tough in your area, I suggest you fasten the wing with Nylon bolts and add 1" to the landing gear length.

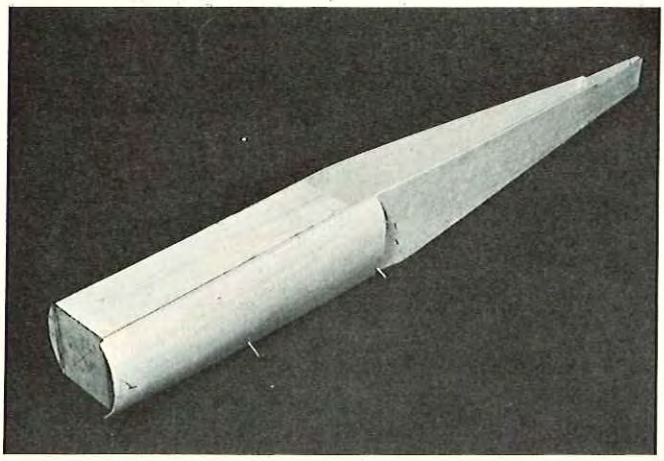
Impressed? Then start right away on this one. If it gives you the pleasure it has given me, how can you miss? □

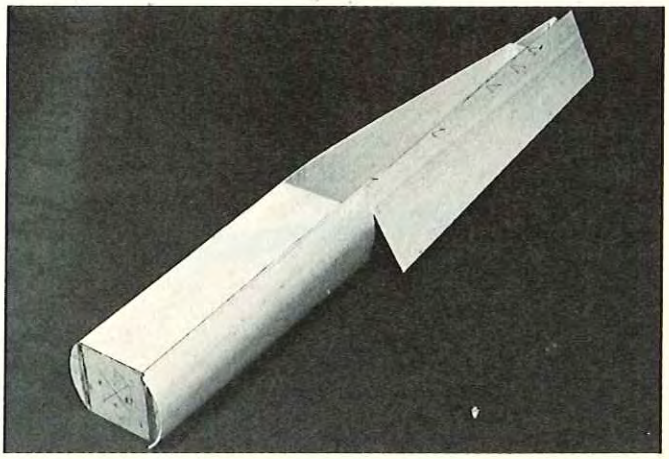


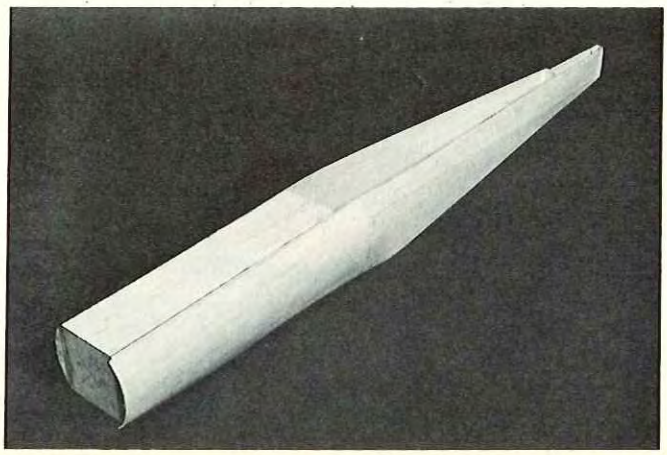




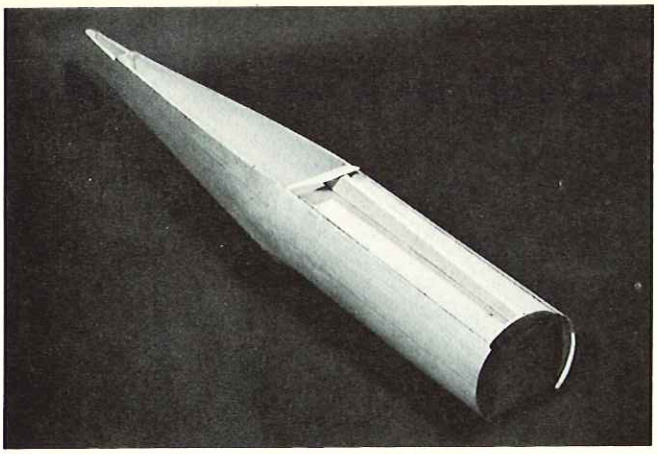


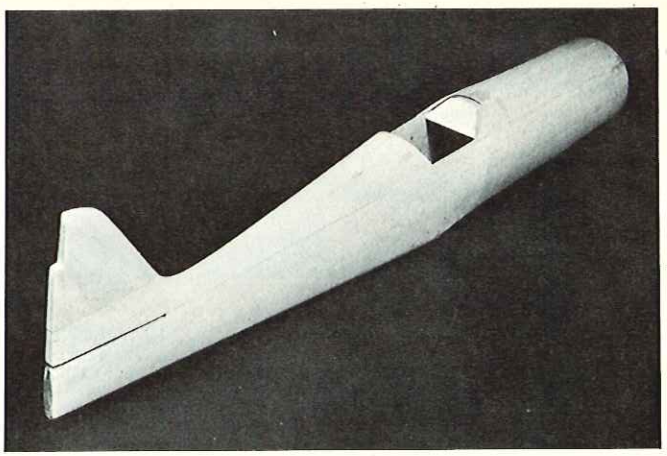


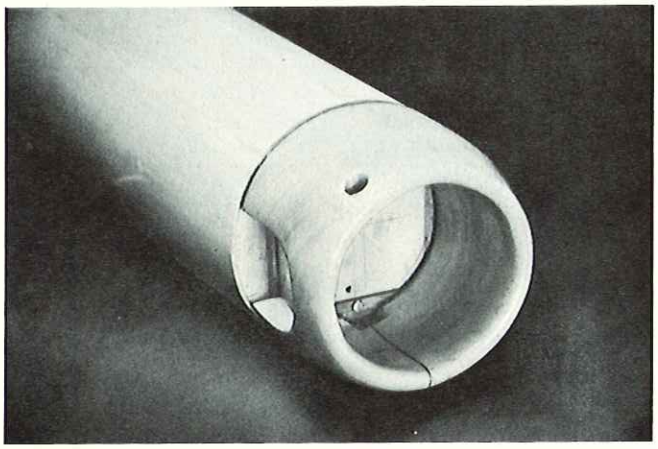


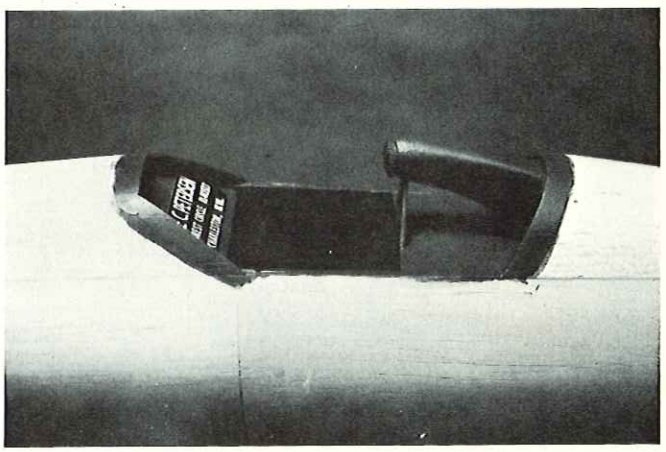


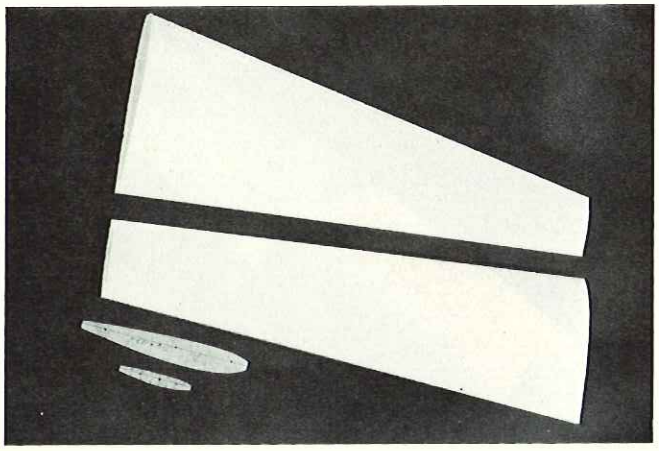
TOP ROW, LEFT: Fuselage parts for basic box construction. RIGHT: Step two is to assemble the fuselage "box". 2ND ROW, LEFT: Adding the side formers. RIGHT: Adding the forward contour sheeting. ABOVE, LEFT: The completed front sheeting. RIGHT: Adding the rear side sheeting. LEFT: All fuselage side sheeting completed.

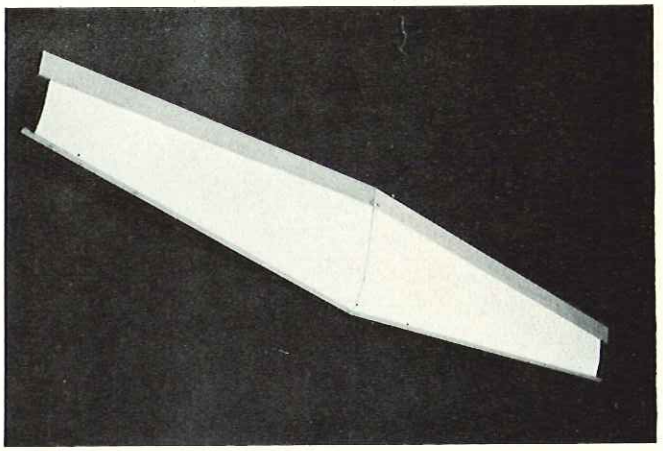


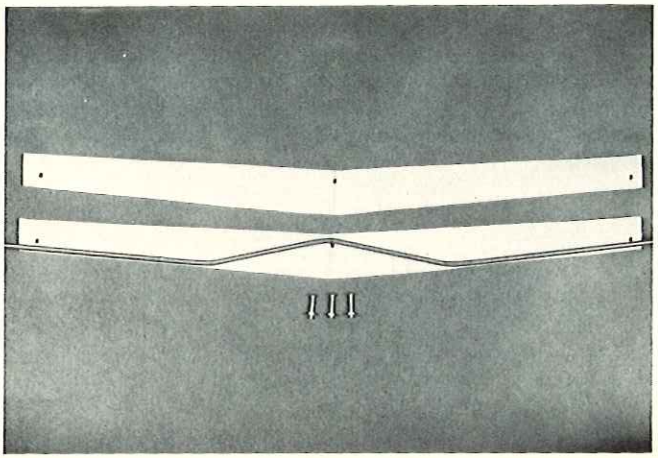


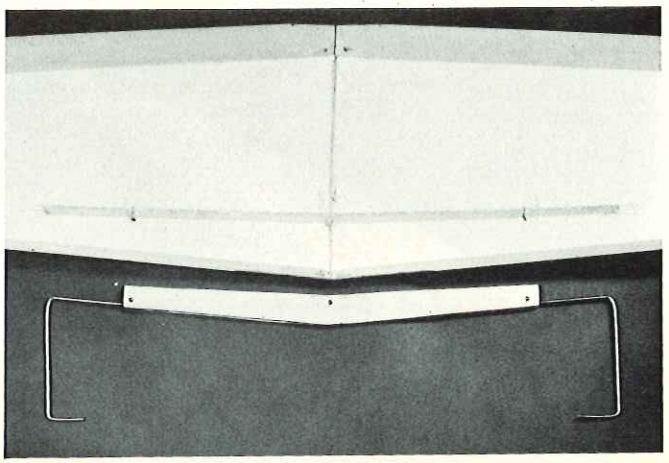


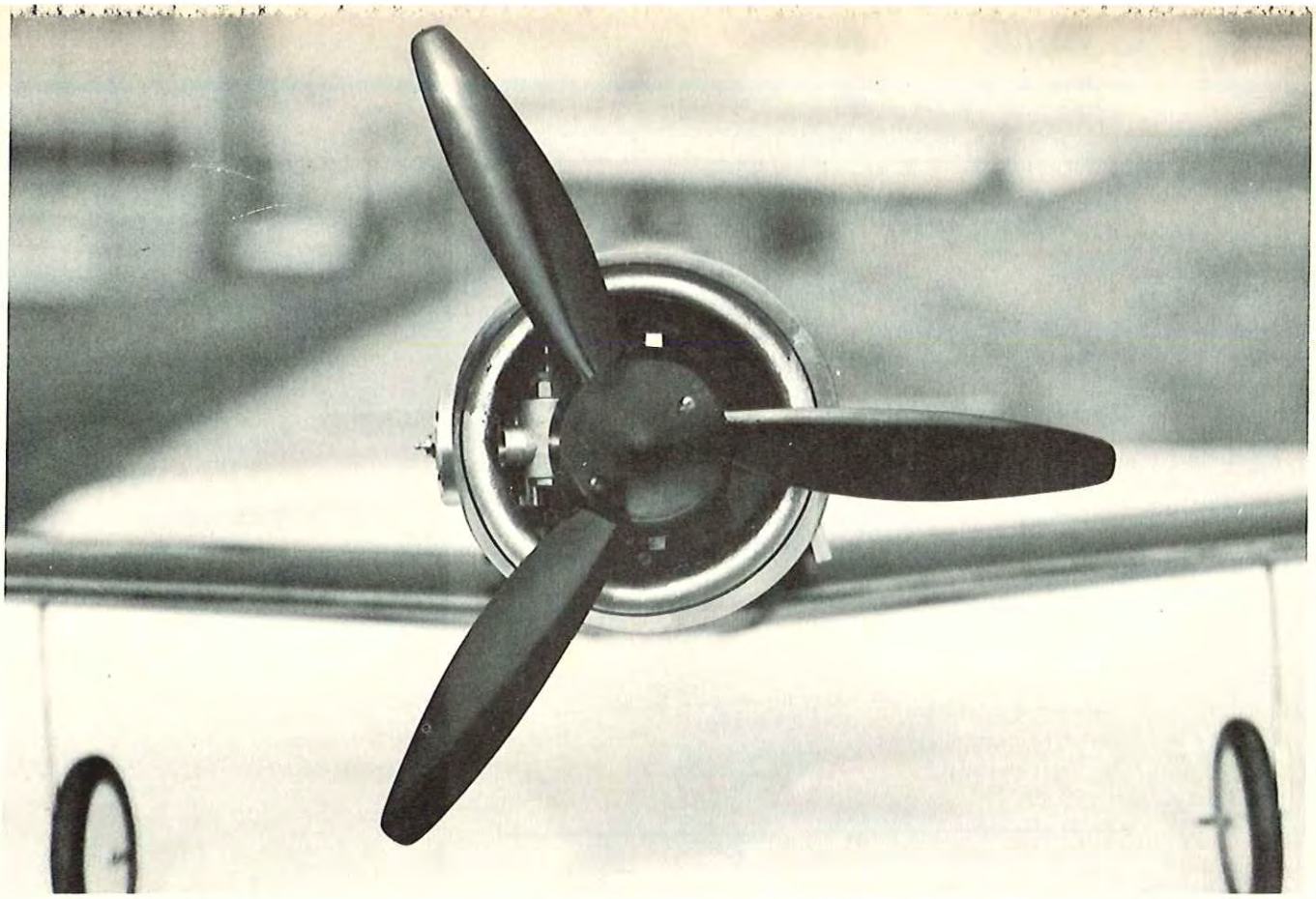




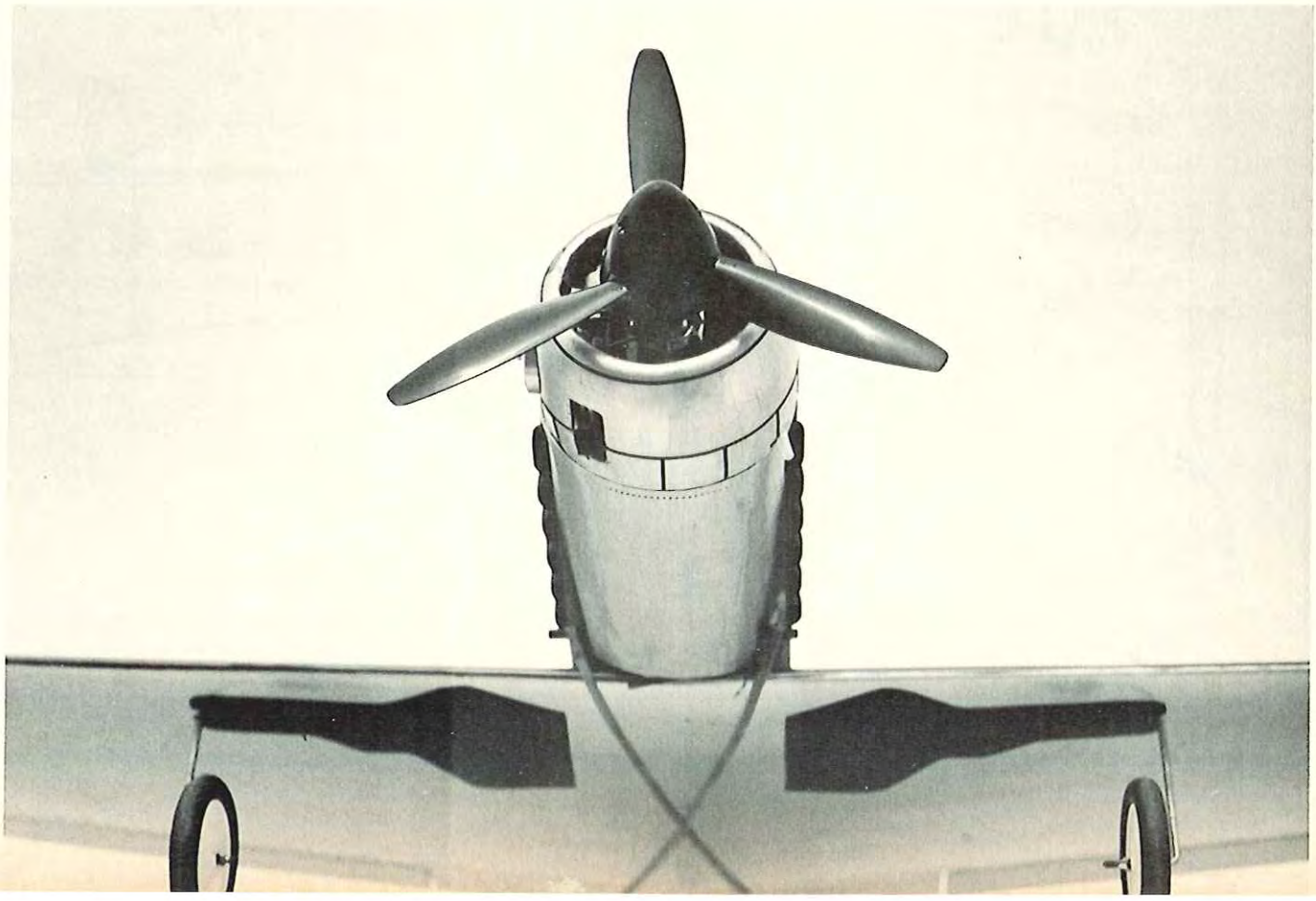


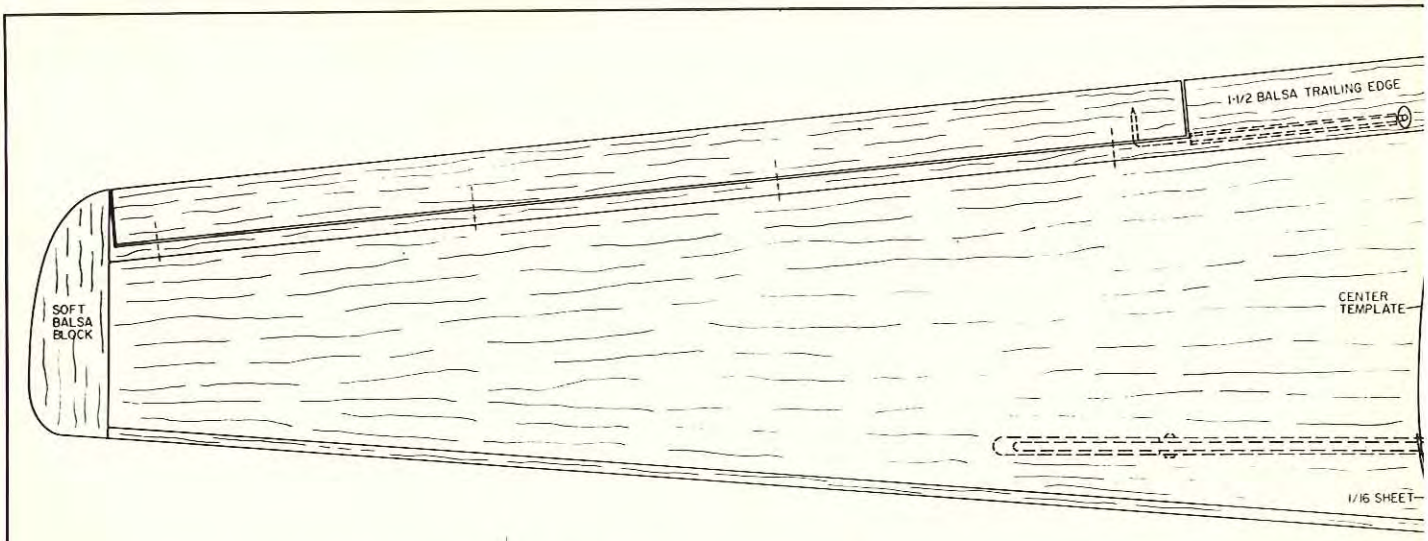


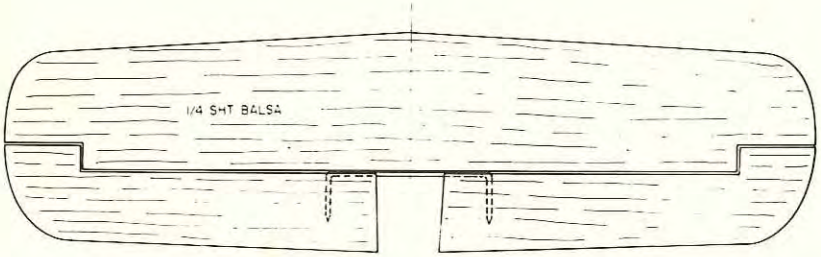




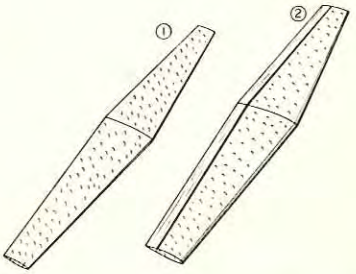
OPPOSITE PAGE, TOP ROW, LEFT: Adding top stringer and formers to fuselage. RIGHT: Top sheeting and vertical fin added. SECOND ROW, LEFT: Finished cowling fitted to fuselage. RIGHT: View of cockpit detail. Note name on instrument panel. THIRD ROW, LEFT: Completed foam wing cores and plywood cutting templates. RIGHT: The leading and trailing edges added to foam wing cores. BOTTOM ROW, LEFT: Detail shot of main landing gear components. RIGHT: View of cut-out in foam wing cores for landing gear. ABOVE: Three bladed prop adds to scale detail. BELOW: Rubber bands used for rough field flying. Wing hold down bolts would add to overall appearance and can be added as builder's option.

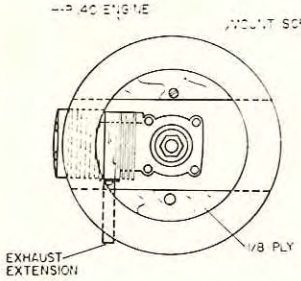




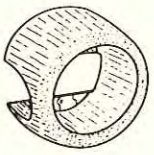


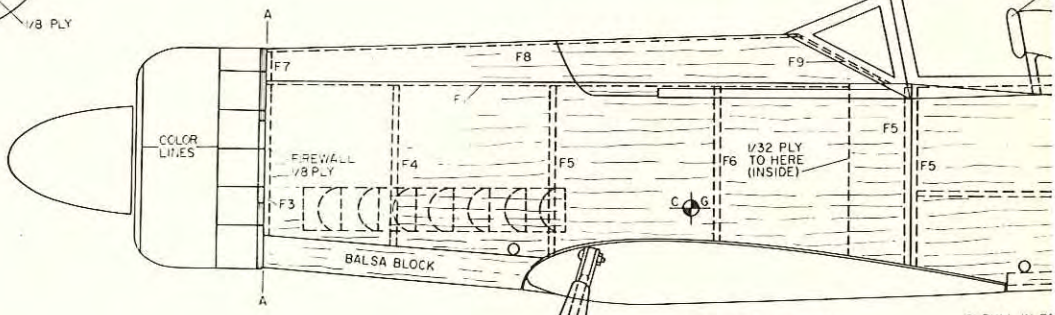
1 JOIN FOAM CORES TOGETHER WITH EPOXY AND SAND SMOOTH ALL IMPERFECTIONS
NOTE - RAISE TIPS 2 1/4" WHEN JOINING TOGE
2 ADD LEADING AND TRAILING EDGE BALSA WITH EPOXY. SQUARE TIPS WITH SANDING BLOCK

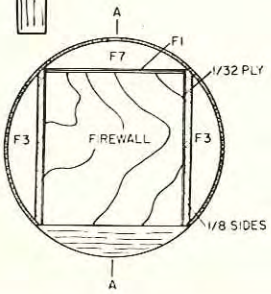


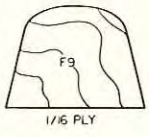


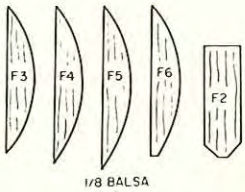
COWLING - CUT FROM SOLID BLOCK OF BALSA WITH BAND SAW - CUSTOM FIT ENGINE

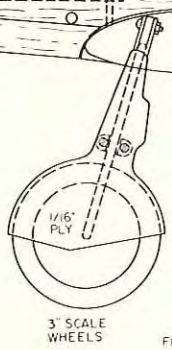




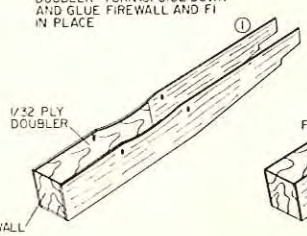




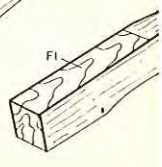


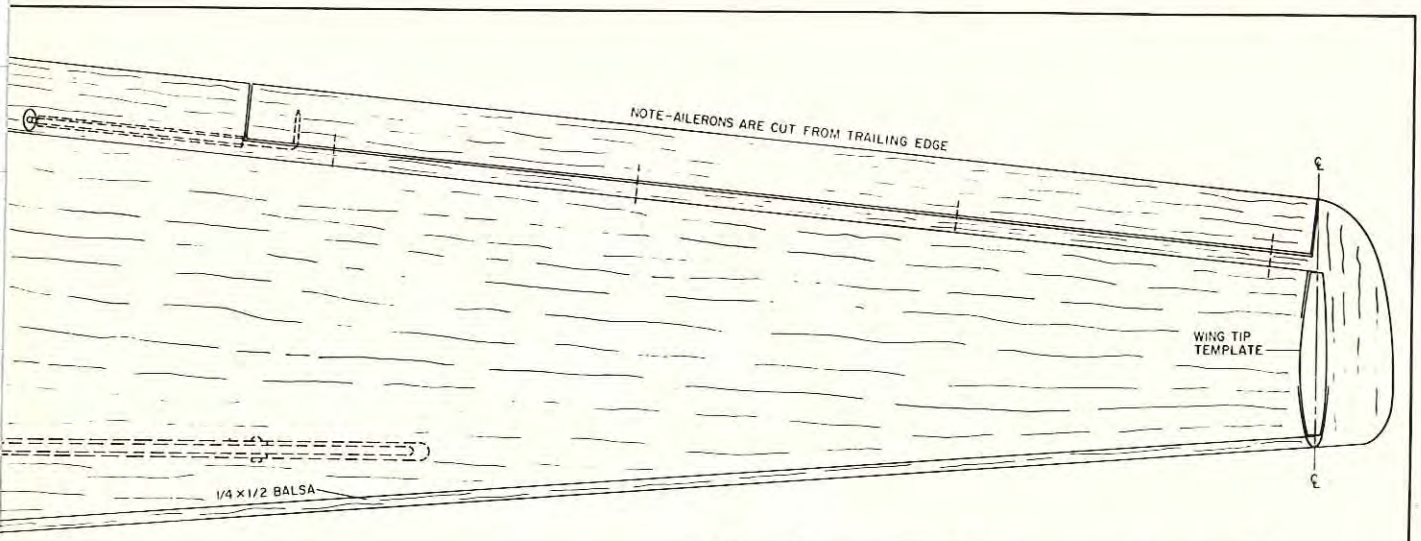


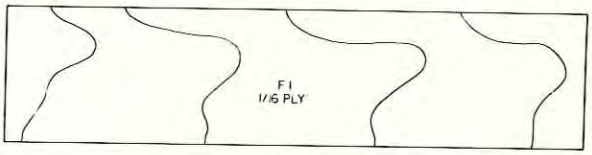
1 CUT OUT SIDES AND 1/32 PLY DOUBLER - TURN UPSIDE DOWN AND GLUE FIREWALL AND F1 IN PLACE



2 PULL IN RE TO EXACT SECURE F2

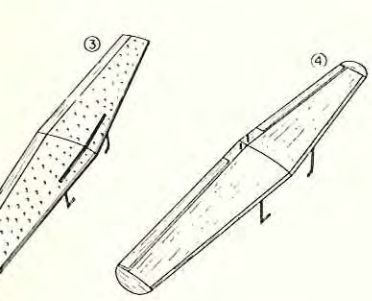


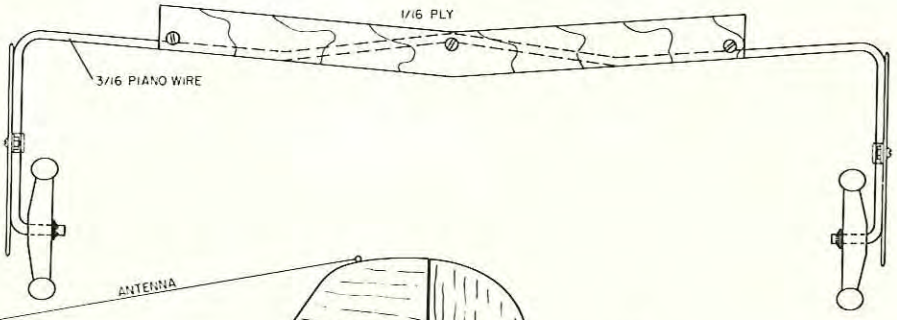


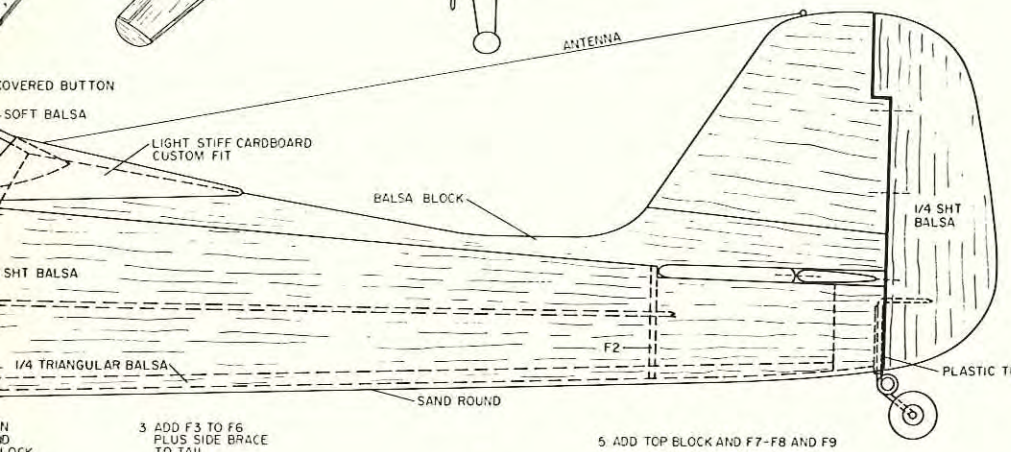


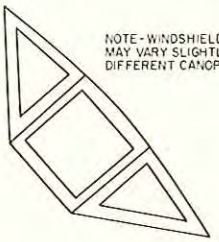
3 CUT OUT GROOVE FOR LANDING GEAR BE SURE TO SLANT IT FORWARD MOUNT LANDING GEAR WITH GENEROUS AMOUNT OF EPOXY

4 SHEET WING WITH 1/16" SOFT BALSA ADD TIPS AND SAND TO SHAPE CUT OUT AILERONS AND MOUNT HARDWARE RESAND WING AND COVER WITH MONOKOTE

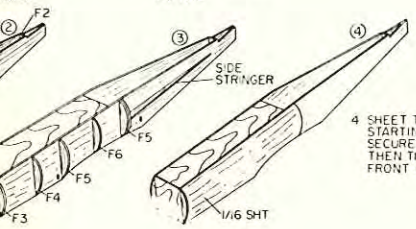








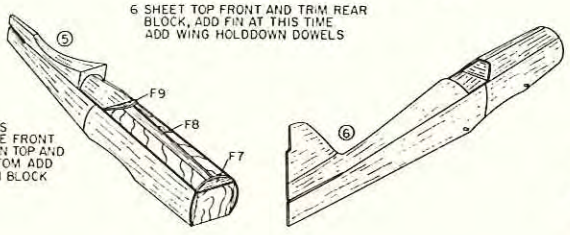
3 ADD F3 TO F6 PLUS SIDE BRACE TO TAIL



4 SHEET THE SIDES STARTING AT THE FRONT SECURE FIRST ON TOP AND THEN THE BOTTOM ADD FRONT BOTTOM BLOCK

5 ADD TOP BLOCK AND F7-F8 AND F9

6 SHEET TOP FRONT AND TRIM REAR BLOCK, ADD FIN AT THIS TIME ADD WING HOLDDOWN DOWELS



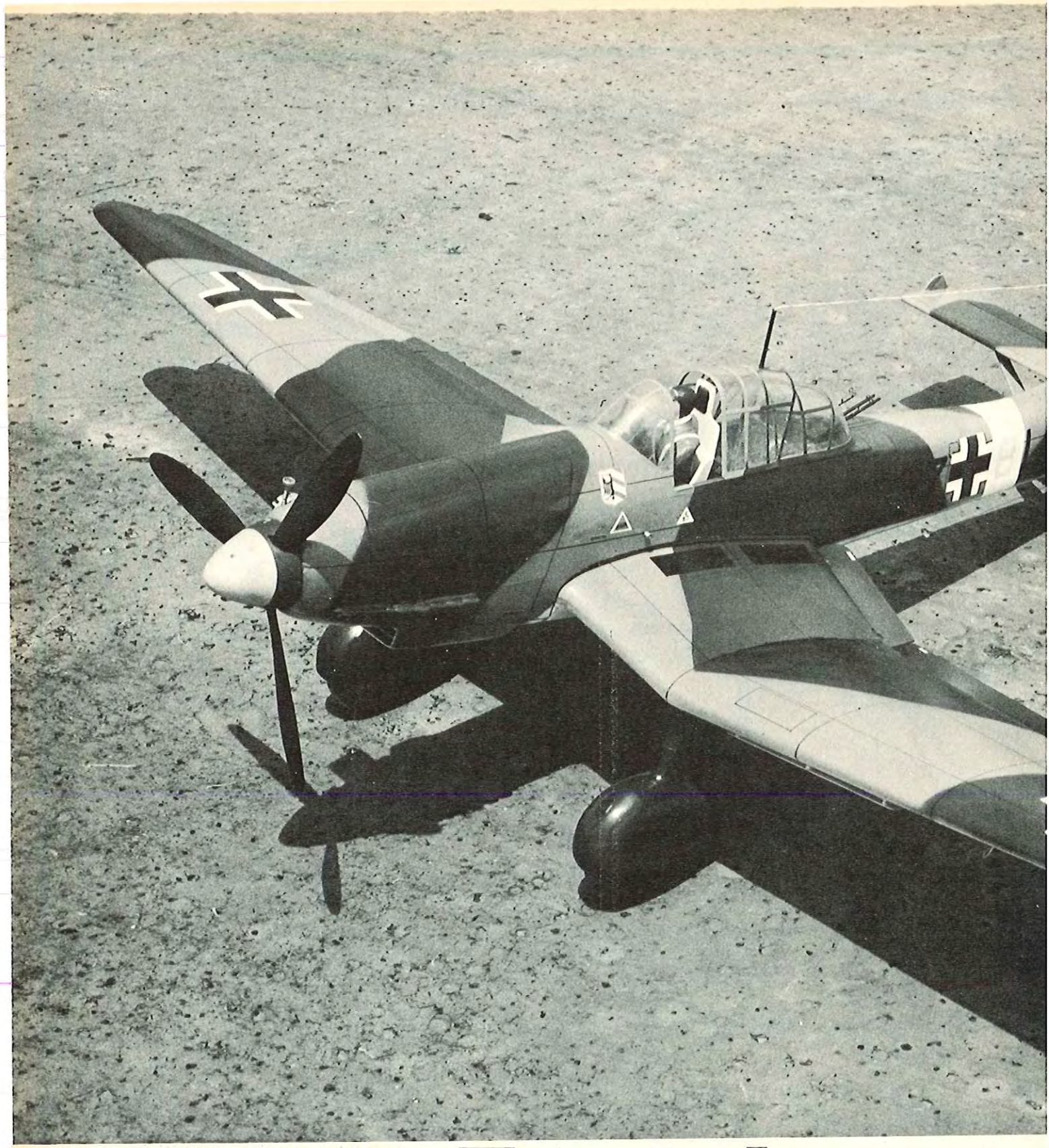
WING SPAN-58 1/4"
WING AREA-450 SQ IN
WEIGHT-3.8 LB
KRAFT-KP4-HP .40 ENGINE
POWER-.30 TO .45

HIGH PERFORMANCE-SEMI SCALE

FOCKE·WULF
TA·152·H1

DESIGNED AND DRAWN BY	BRYCE PETERSEN	INKED BY	LEE DAWALD

0 1 2 3 4 5 6



JU87D-5 stuka

A .60 powered semi-scale version of one of the most famous aircraft of World War II. For "Stand-Off" scale events and general sport flying.

BY PAT BYRNE

I've always been a scale nut and when I got to the point where I could expect to successfully put an RC plane into the air and bring it back 75% of the time, I had to go scale. If I'm a scale nut, I'm an even bigger WW II type nut, and bigger yet, German WW II. In the first place WW II German aircraft just ooze character, even their designations sound colorful; FW190, ME210, AR131, HE111, and on and on, a myriad of weird and wonderful aircraft, the result, I suppose of a vigorous and imaginative aircraft industry going full tilt in a major war. On top of this the color schemes are varied and colorful, and when you add the insignia, squadron badges, armament and ordnance, the result, to me, is a scale fans delight.

One big problem though, is that unless you're Dave Platt, you won't win many AMA Scale meets. The weird and wonderful means a lot of detailing that will be necessary to make the model competitive, and real good source data on exact dimensions are a little hard to come by. For the ordinary scale builder, though, the "20 foot", or California scale, rules give you a chance with detailing and nit-picking carried to a reasonable level. Thus, you can still enjoy the sight that used to chill a WW II dog face; a Luftwaffe fighter or bomber boring in for a strafing run.

So that's the background for this model, one of the most weird and wonderful WW II German ships, the JU87 Stuka, reasonably to scale with reasonable detailing. The model picked was the JU87D-5, a late 1943, hopped-up version of the most famous early WW II JU87B. One reason for selecting the D-5 was the slightly more streamlined look of the ship, due mainly to the Jumo 211 engine installation which resulted in displacing the large chin radiator of the JU87B with separate twin radiators under the wing and installation of a smaller oil cooler under the engine. The main reason for selecting the D-5, though, was the bigger wing span – 49 ft., 4 in. – versus 45 ft., 4 in. of the earlier variety, which helps with the biggest single scale goal of any good scale RC design, low wing loading. The scale is 1¼" to the foot; the more traditional 1½" to the foot would result in a monster, since the JU87 was a big plane. The result is a nice size ship that performs beautifully without straining an ordinary 60 engine. So, if scale is your game and you want something a little different, grab a copy of Profile No. 211, buy a Monogram ¼" scale plastic kit of the JU87G (a JU87D with 37 mm anti tank cannon) and follow me! Meingott! ach du liever! and Duetchsland uber alles!

FUSELAGE CONSTRUCTION

The fuselage starts like any other balsa RC fuselage with two ¼" sheet sides, ply firewall and formers. To provide some additional strength through the narrow section between wing and cockpit 3/4" x 1/8" spruce reinforcement is notched into the formers, but no other doublers are used. Instead, after the fuselage is completed, the tank compartment and stress points back to the rear of the wing are lined with glass cloth and resin. The cowl ahead of the cockpit is formed by 1/4" sheet set at a 30 degree angle, capped by a sloping 3/8" slab. At this point mount your engine on a Tatone mount, sidewinder like mine, or inverted, (never upright, it will ruin that beautiful long cowl). Then build the tank hatch/oil cooler of ¼" sheet and spot glue to ½" triangular stock ahead of the wing cutout. Finally, build up to a 2¾" diameter spinner with ½" and 3/8" thick blocks. The aft fuselage is a simple box with ½" triangular stock inside, the only complication being the faired slope to the fin which is built up with scrap and Epoxolite. To guide the reduction of this mass of flat block and sheet to a rounded fuselage, cut out a series of templates at each fuselage station, then start hacking away with an X-Acto knife and coarse sandpaper.

EMPENNAGE

After a general roughening out of the fuselage, cut out the fin and stabilizer from ¼" sheet and epoxy in place, then build up the area ahead of the fin as noted above, lay in a fillet between fin and stabilizer with Epoxolite, and reduce the entire fuselage to finished dimensions. The tailwheel system should then be installed along with hinged rudder and elevator, and your favorite pushrod system. Finally, finish off with 1/8" stabilizer support struts and tip plates cut from 1/16" plywood.

COCKPIT

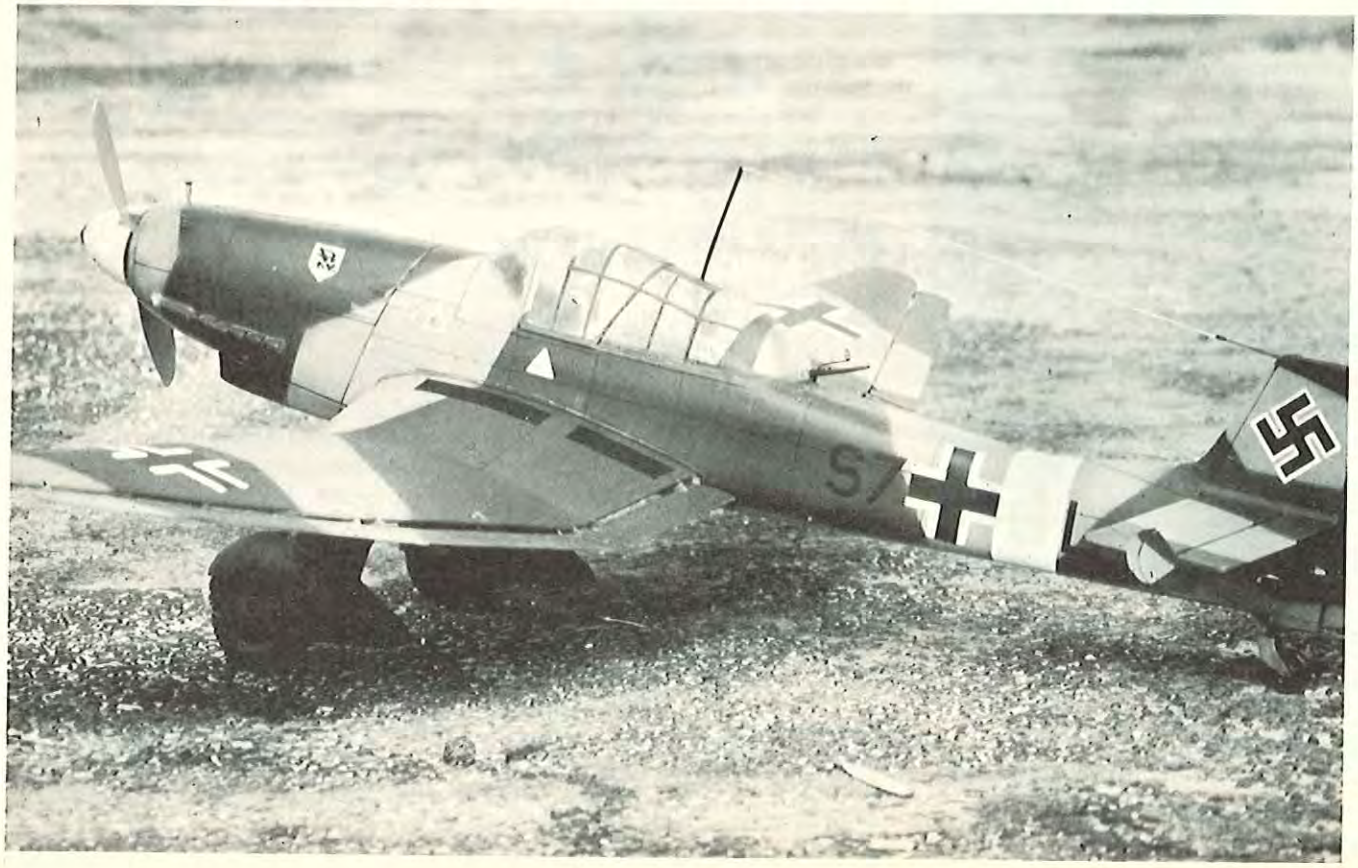
This is the beast that almost dissuaded me from the Stuka in the first place, that canopy is something else! But if you haven't learned to form your own, you just ain't going to get anywhere with WW II scale, so there's no time like now. It really isn't too tough. I used the technique outlined

by Dave Platt in the February 1971 issue of RCM. First, a two piece balsa block form was spot glued into the finished fuselage, the junction of the two blocks being the sloping rear of the pilots sliding section. The balsa was then carved and sanded to the canopy shape and removed. A coating of polyester resin was applied and sanded smooth. The blocks were then set up on a mounting pedestal and clamped to a support near the kitchen stove. The two sections were formed by quickly pulling .040 plexiglas down over the form after heating till flexible in the oven at 450 F. I found the pilots wind screen and canopy could be formed in one piece by pulling down and back, but the larger rear section was made in two pieces as was the full scale canopy. The fixed, sloping section is simple to form. The rounded gunner's canopy is tougher, but was successfully formed by pulling forward and down. If this is your first try at canopy forming, you might find heavy celluloid or butyrate easier to work with but, for strength and appearance, you can't beat plexiglas. After forming the canopies, trim away the excess stock with a fine saw or hot knife, and, if you want a moveable pilots canopy, split the windscreen from the canopy.

Build up the two level cockpit floor and give the entire area a few coats of filler and flat black. Then add instruments, gun sight, throttle quadrant, etc. and pilot and gunner. The pilot takes a little more work than usual since his entire upper body extends above the cockpit rim. I mounted a Williams pilot on a built-up balsa upper torso with arms, crudely carved. The finished result, when painted, looks fine. After all internal detailing is complete, epoxy the canopy in place. The sliding pilots canopy is arranged by epoxying 1/16" O.D. nylon tubing to the bottom of the canopy. Fine music wire was then run through the tubing and bent to form sliding rails and epoxied in place. The result is a simple, effective, sliding canopy. The last task is the forming of the canopy frame. Some builders merely mask off the clear areas and paint on the frame with the finish paint job; others use strips of shim brass or styrene sheet. I prefer a different system since I seem to have trouble getting paint to stick, and the strip approach sounds like hard work. I lay out the frame members, one direction at a time with masking tape, and spread on a thin layer of Epoxolite. After the Epoxolite sets for a few minutes, smooth it with a damp finger and peel off the tape. The result: a raised canopy frame that sticks well, is strong and looks good.

WING

The Stuka's wing is, of course, its most distinctive feature, and, like the canopy, looks tough to build. I was determined to stay away from all those different size ribs and complicated spar structure so I decided on a foam wing. Actually it wasn't too difficult a job; a careful set-up and a good end cutting jig with adjustment for cutting various angles was all that was needed. I reversed the accepted practice of cutting the airfoil first and then the end, or dihedral, cut. First, I cut the taper to allow the pattern ribs to protrude the width of the trailing edge stock to provide a starting rest. Then I cut the proper dihedral angle on both ends of the selected section by transferring the angle from the front elevation layout of the wing. Finally, I carefully spotted and secured the pattern ribs and cut the segment. The result was a set of cores that went together perfectly. After you have cut your cores and are satisfied with their fit, use a hot knife to cut out grooves in all panels for the reinforcing spars, landing gear blocks and aileron and flap pushrods. Considerable thought went into the pushrod system. They must be flexible enough to easily route through the gull wing and yet be slop free and low in friction. Ultimately, a 1/8" O.D. teflon outer and 1/16" O.D. inner was selected, was easily routed and has



ABOVE: Detail view of sliding cockpit, pilot location and wing junction.

ABOVE: Engine position . . . don't use anything but a .60! BELOW: Front quarter view with cockpit closed.

given excellent service. The only problem was the inability to use conventional 4-40 threaded ends for clevis attachments. Instead, a tight fitting music wire was slipped into the inner teflon rod and epoxied in place. These wire ends were formed into "Z"s for connection to servo arms and surface horns. Adjustment is limited to trim range on the transmitter, but this has been no problem.

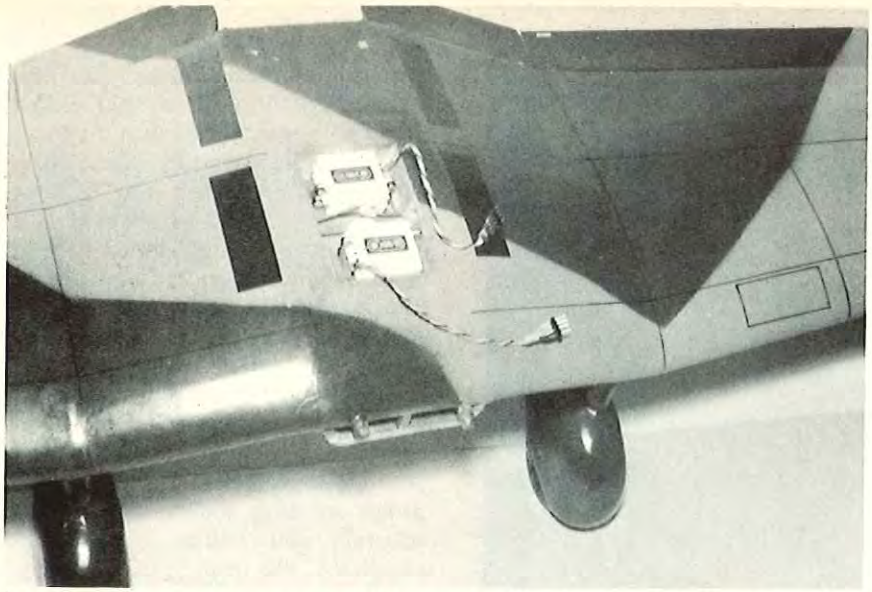
Assembly of the wing is started by joining the outer two panels and covering with 1/16" balsa as unit. The inner structure consisting of center section and two adjacent panels are joined with plywood spars. The outer panels are then joined to the inner structure and routing of pushrods completed. The inner structure is then covered with 1/16" sheet. Tip blocks are added, then the entire structure is sanded. The simple flap/aileron hinge system has worked well, the 1/16" plexiglas supports are roughened with sandpaper and then slipped into saw cuts in the trailing edge of the wing and liberally epoxied. The flaps and ailerons are cut from 3/16" sheet or trailing edge stock; grooves for the supports are cut by a saw and hinge pins recessed from the bottom surface. After fitting, check to see that the pins are epoxied in place and the reinforcing tape is glued in place.

LANDING GEAR

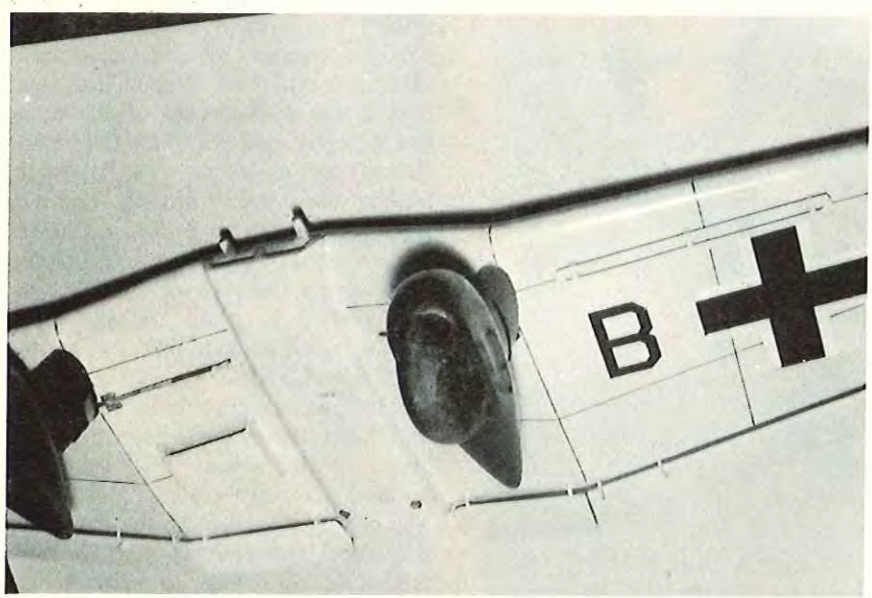
The landing gear is built up around 3/16" wire struts using balsa or fiberglass. The Hobbypoxy "Easy Does It" method was used on the prototype. The pant is slipped down the wire over the wheel and epoxied in place and reinforced by bolting to a metal clip soldered to the gear wire. The streamlined leg is then slipped over the wire, epoxied to the pant and faired with Epoxolite. This entire unit is then free to spring and absorb landing shocks. A sheet aluminum fairing closes the upper strut area while leaving the assembly free to flex.

FINISH

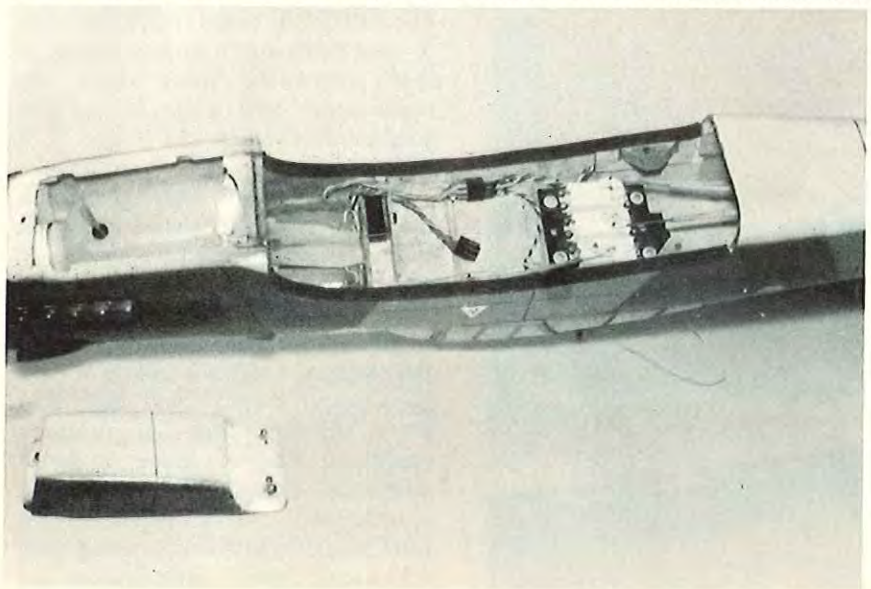
Use your favorite finishing method; the prototype was finished with silkspan covering followed by 3 coats of clear dope. Aero Gloss military flat dope was used for the color coats. Originally, the model was finished in the standard Luftwaffe colors of dark green upper surfaces and light blue lower. This was a little drab so, after a month or two of flying, a desert scheme of dark and light earth in a splinter pattern was applied. Mono-Kote insignia and fuselage letters were cut out and applied, while fuselage and



ABOVE: Aileron and flap servo installation in the Stuka's wing. BELOW: Underside of wing.



BELOW: Front hatch removed showing tank installation. Orbit servos installed three across.

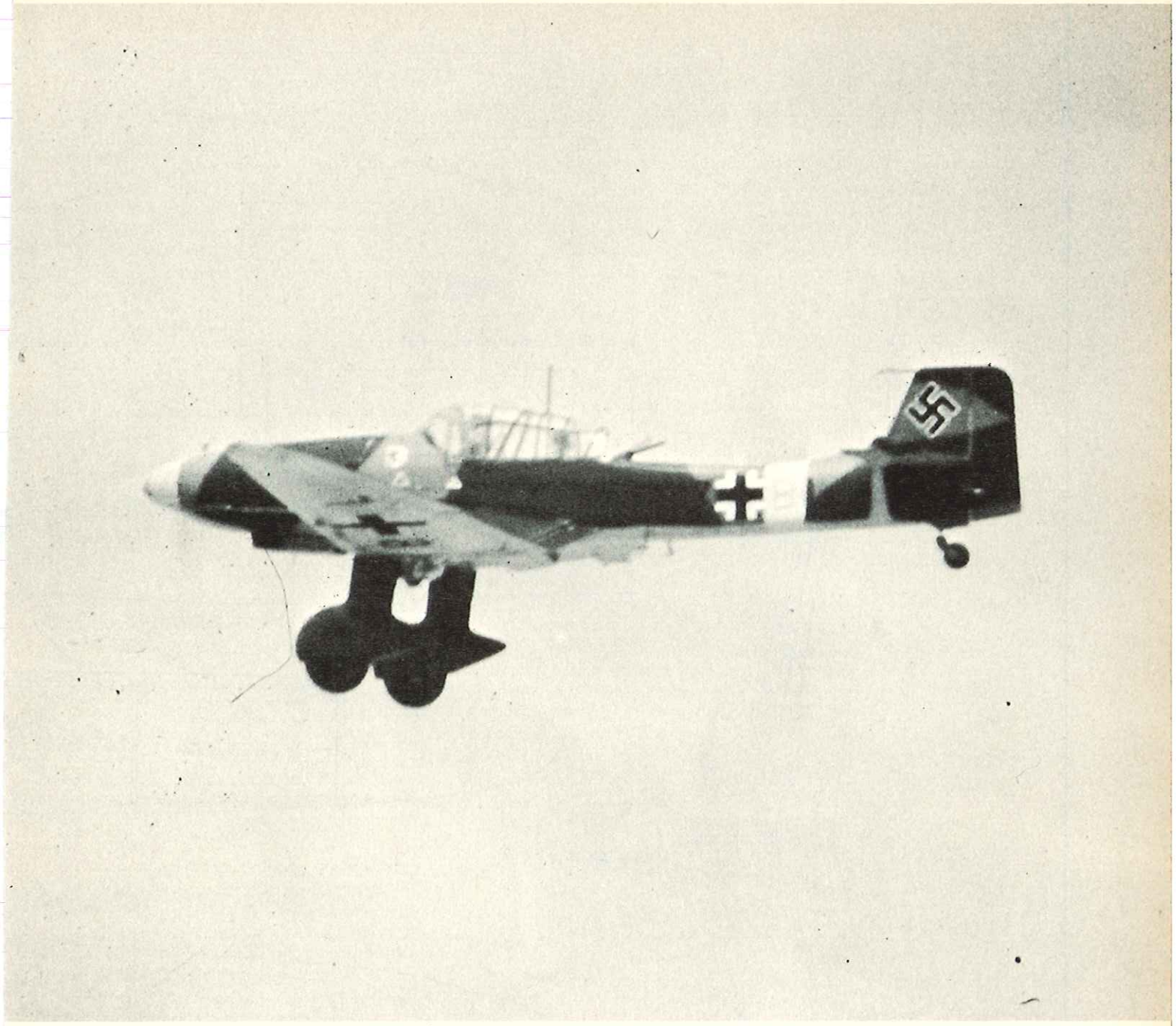


wing panels, access hatches, etc., were outlined with drafting ink and the entire plan sprayed with 2 coats of Aero Gloss flat clear.

Final detailing can suit your fancy. The twin MG81 guns in the cockpit were built up with brass tubing and bits of wire. Tubing was also used to simulate MG151/20 cannon in the wing. A bomb drop mechanism was installed, tied to the flaps, and a 500 kg bomb was carried. Another fascinating approach would be to build up the huge 37 mm Flak 18 cannon of the JU87G. Photos in Profile 211 and the Monogram JU87G kit provides adequate information on these guns. Other details like steps, wing walks, dive brakes, etc., go a long way to giving the model a realistic look. The radio antenna running inside the hollow mast and then back to the tail takes care of the antenna nicely and duplicates the original. No adverse effect on radio operation has been noticed but watch routing near the servos.

FLYING

In its original form my Stuka weighed 6¾ pounds, ready to go with a 5 channel Orbit installation and Enya .60 engine. This calculated to a wing loading of 27.6 oz./sq. ft. which met my goal of staying below 30 oz./sq. ft. This limit has been evolved from past experience with home brew scale designs and is considered an upper limit for ease in landing. Power loading with the .60 engine calculated out at .089 cu. in/lb., a high figure in my experience which was confirmed later. The Stuka was too fast at full throttle compared to what a realistic scale speed should be, thus I generally cruise at half throttle. After all these calculations there was no excuse but to put the thing in the air. I've always felt that this hobby is so fascinating because of the combination of craftsmanship and flying challenge, and the first flight of an unusual scale project is the most challenging. I am always scared to death but wouldn't miss it for the world, and I wouldn't consider a proxy pilot. Thus, I arrived at the first flight apprehensive, but curious to see the answer to a lot of questions; like how would those Mickey Mouse ailerons work? Would those tiny tapered outer wing panels induce aileron stall, etc. To make a long story short, the Stuka leaped off in about 30 feet after a straight takeoff run and handled beautifully. Landing was handled pretty carefully, a slight amount of power was kept on and the



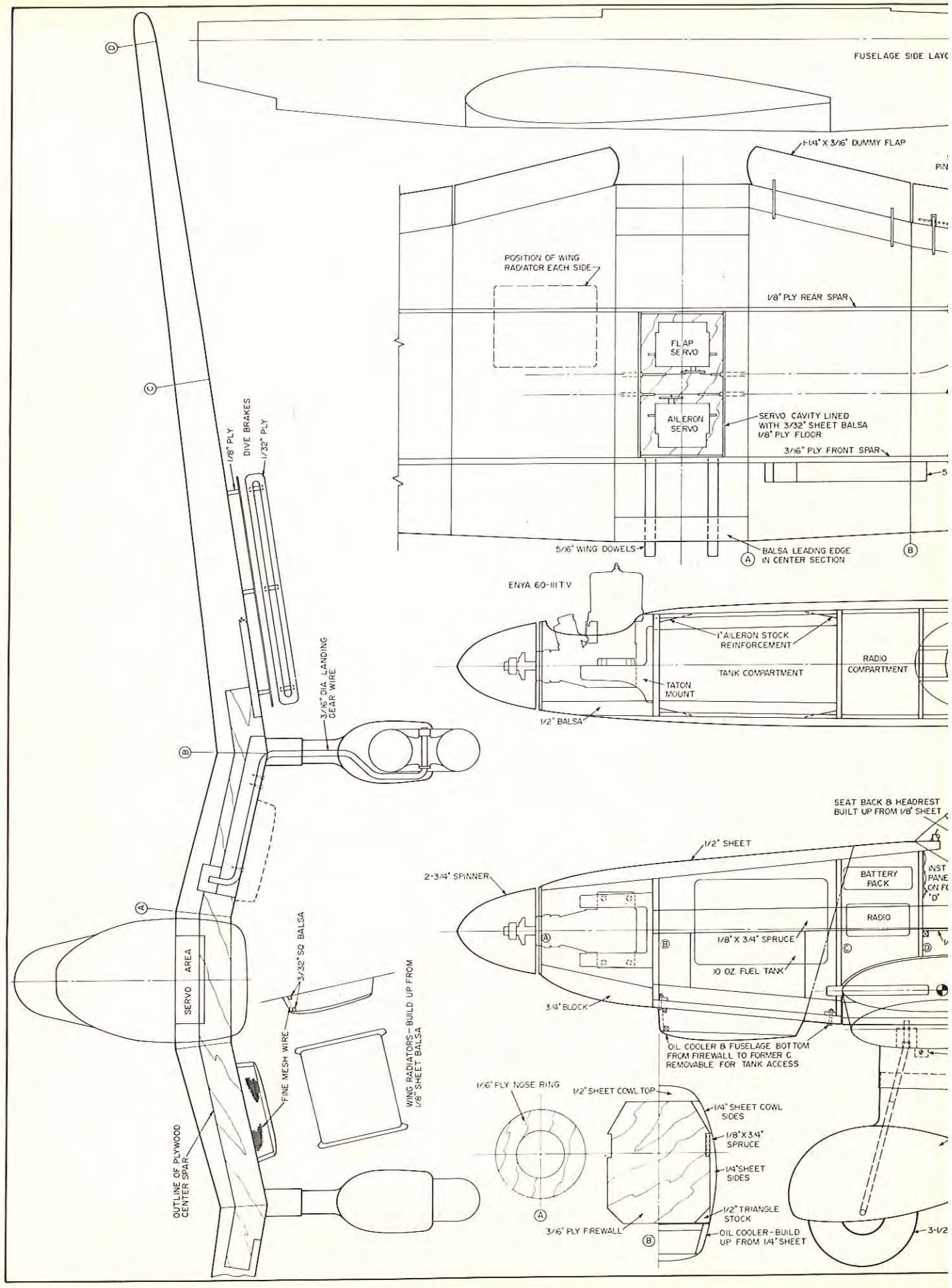
Pat Byrne's JU87D-5 Stuka in flight. Grainy photo due to extreme enlargement from 35 mm print.

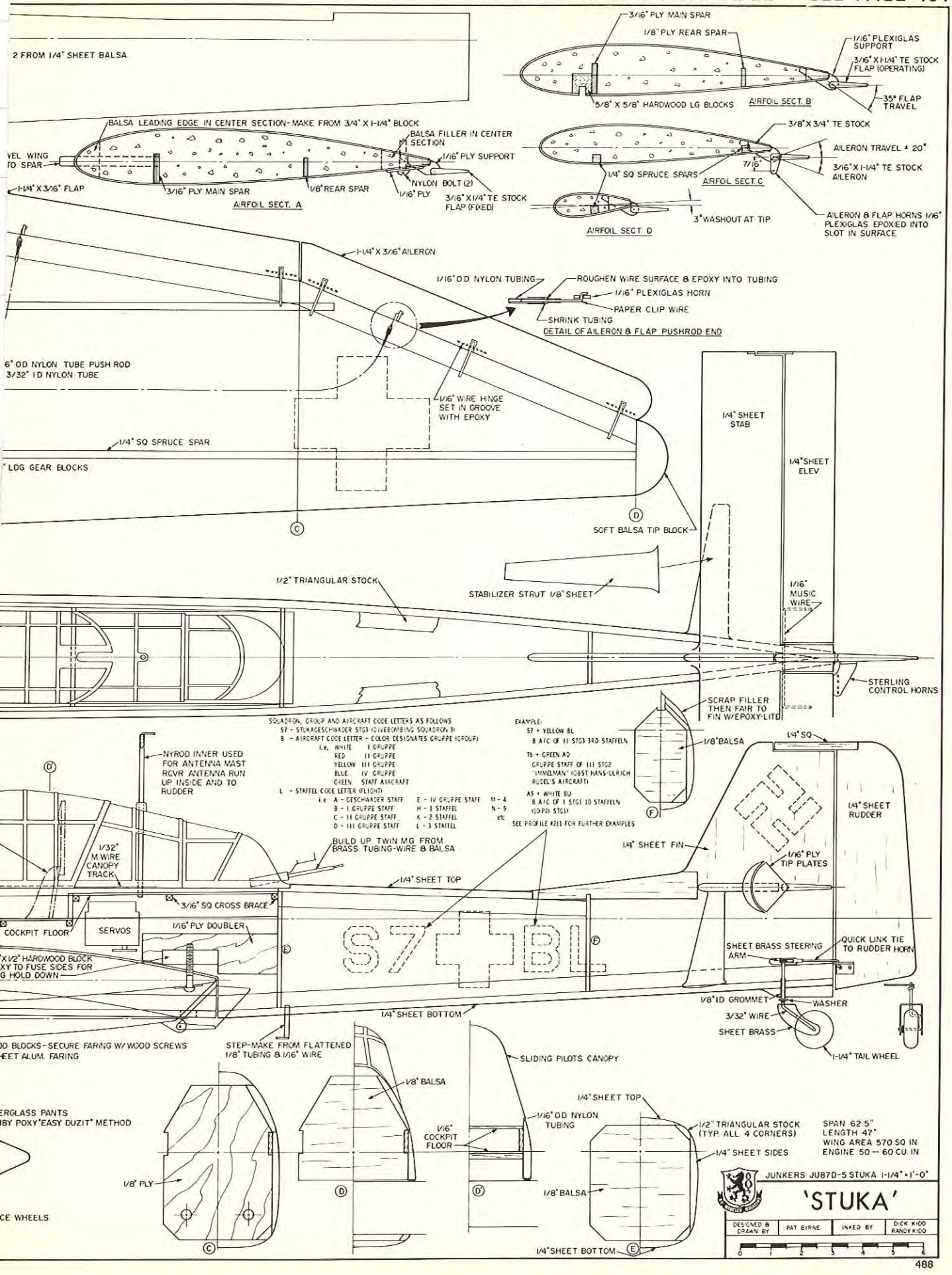
ship flown in to a wheel landing to insure against a stall and snap. Subsequently I learned to use the flaps, they did not appreciably change the trim and did provide extra lift to allow slower landing speeds and beautiful flare landings. The prettiest landings were still flown into a two wheel contact under power, but I found I needed plenty of runway to shoot them this way.

After a year of contest and Sunday flying a couple of bad accidents had occurred and repairs to the wing and weight increases began to cut into the landing performance, thus it appears that 7 lbs. is about the maximum weight practical unless you have plenty of runway. One mistake I made was trying a .45 displacement engine once, since I rationalized I wasn't using the power in the air. Takeoffs were so doggy I finally yanked the thing in the air after an unusually long takeoff run one day and you guessed it, it finally snapped. The lighter engine had let the C.G. drift back and the attempt to pull it into the air did the rest. My advice is stick to the extra power, at least a strong .50 unless you beat 6½ pounds.

One final point - - - you will find that landing gear position and C.G. location are important relationships to keep from nosing over. If anything, my Stuka spent more time on its nose than it should, a product of my desire to keep the C.G. forward and the backward spring tendency of the landing gear. My ship used 5/32" landing gear wire, while the drawing shows 3/16" to eliminate this tendency. My recommendation is to try out the location shown and be ready to move the gear slightly forward if you find nose-over is a problem.

That's the Stuka story, welcome to the staffel and good luck on your bomb runs, Wolfgang!


FUSELAGE SIDE LAYO
1/4" X 3/16" DUMMY FLAP
POSITION OF WING RADIATOR EACH SIDE
1/8" PLY REAR SPAR
FLAP SERVO
AILERON SERVO
SERVO CAVITY LINED WITH 3/32" SHEET BALSA 1/8" PLY FLOOR
3/16" PLY FRONT SPAR
5/16" WING DOWELS
BALSA LEADING EDGE IN CENTER SECTION
ENYA 60-III TV
1" AILERON STOCK REINFORCEMENT
TANK COMPARTMENT
RADIO COMPARTMENT
TATON MOUNT
1/2" BALSA
1/8" PLY
DIVE BRAKES
1/32" PLY
3/16" DIA. LANDING GEAR WIRE
SEAT BACK & HEADREST BUILT UP FROM 1/8" SHEET
1/2" SHEET
2-3/4" SPINNER
BATTERY PACK
RADIO
1/8" X 3/4" SPRUCE
10 OZ FUEL TANK
3/4" BLOCK
OIL COOLER & FUSELAGE BOTTOM FROM FIREWALL TO FORMER C REMOVABLE FOR TANK ACCESS
SERVO AREA
3/32" SQ BALSA
FINE MESH WIRE
WING RADIATORS - BUILD UP FROM 1/8" SHEET BALSA
OUTLINE OF PLYWOOD CENTER SPAR
1/16" PLY NOSE RING
1/2" SHEET COWL TOP
1/4" SHEET COWL SIDES
1/8" X 3/4" SPRUCE
1/4" SHEET SIDES
1/2" TRIANGLE STOCK
3/16" PLY FIREWALL
OIL COOLER - BUILD UP FROM 1/4" SHEET


2 FROM 1/4" SHEET BALSA
3/16" PLY MAIN SPAR
1/8" PLY REAR SPAR
1/16" PLEXIGLAS SUPPORT
3/16" X 1-1/4" TE STOCK FLAP (OPERATING)
5/8" X 5/8" HARDWOOD LG BLOCKS
AIRFOIL SECT. B
35° FLAP TRAVEL
BALSA LEADING EDGE IN CENTER SECTION - MAKE FROM 3/4" X 1-1/4" BLOCK
BALSA FILLER IN CENTER SECTION
1/16" PLY SUPPORT
NYLON BOLT (2)
1/16" PLY
3/16" X 1/4" TE STOCK FLAP (FIXED)
1-1/4" X 3/16" FLAP
3/16" PLY MAIN SPAR
1/8" REAR SPAR
AIRFOIL SECT. A
3/8" X 3/4" TE STOCK
AILERON TRAVEL ± 20°
1/4" SQ SPRUCE SPARS
7/16"
3/16" X 1-1/4" TE STOCK AILERON
AIRFOIL SECT. C
3° WASHOUT AT TIP
AIRFOIL SECT. D
AILERON & FLAP HORNS 1/16" PLEXIGLAS EPOXIED INTO SLOT IN SURFACE
1-1/4" X 3/16" AILERON
1/16" O.D NYLON TUBING
ROUGHEN WIRE SURFACE & EPOXY INTO TUBING
1/16" PLEXIGLAS HORN
PAPER CLIP WIRE
SHRINK TUBING
DETAIL OF AILERON & FLAP PUSHROD END
6" OD NYLON TUBE PUSH ROD
3/32" I.D NYLON TUBE
1/16" WIRE HINGE SET IN GROOVE WITH EPOXY
1/4" SQ SPRUCE SPAR
LDG GEAR BLOCKS
1/4" SHEET STAB
1/4" SHEET ELEV
SOFT BALSA TIP BLOCK
1/2" TRIANGULAR STOCK
STABILIZER STRUT 1/8" SHEET
1/16" MUSIC WIRE
STERLING CONTROL HORNS
SCRAP FILLER THEN FAIR TO FIN W/EPOXY-LITE
1/8" BALSA
1/4" SQ
1/4" SHEET RUDDER
1/4" SHEET FIN
1/16" PLY TIP PLATES
NYROD INNER USED FOR ANTENNA MAST RCVR ANTENNA RUN UP INSIDE AND TO RUDDER
SQUADRON, GROUP AND AIRCRAFT CODE LETTERS AS FOLLOWS
S7 - STUKAGESCHWADER STG3 (DIVEBOMBING SQUADRON 3)
B - AIRCRAFT CODE LETTER - COLOR DESIGNATES GRUPPE (GROUP)
i.e. WHITE I GRUPPE
RED II GRUPPE
YELLOW III GRUPPE
BLUE IV GRUPPE
GREEN STAFF AIRCRAFT
L - STAFFEL CODE LETTER (FLIGHT)
i.e. A - GESCHWADER STAFF E - IV GRUPPE STAFF M - 4
B - I GRUPPE STAFF H - 1 STAFFEL N - 5
C - II GRUPPE STAFF K - 2 STAFFEL etc
D - III GRUPPE STAFF L - 3 STAFFEL
EXAMPLE:
S7 + YELLOW BL
B A/C OF II STG3 3RD STAFFEL'S
T6 + GREEN AD
GRUPPE STAFF OF III STG2
"IMMELMAN" (OBST HANS-ULRICH RUDEL'S AIRCRAFT)
A5 + WHITE BU
B A/C OF 1 STG1 10 STAFFEL'S (OLD 2) STG1)
SEE PROFILE #211 FOR FURTHER EXAMPLES
1/32" M WIRE CANOPY TRACK
BUILD UP TWIN MG FROM BRASS TUBING-WIRE & BALSA
1/4" SHEET TOP
3/16" SQ CROSS BRACE
COCKPIT FLOOR
SERVOS
1/16" PLY DOUBLER
S7 B L
SHEET BRASS STEERING ARM
QUICK LINK TIE TO RUDDER HORN
1/8" I.D GROMMET
WASHER
3/32" WIRE
SHEET BRASS
1/4" SHEET BOTTOM
1-1/4" TAIL WHEEL
STEP-MAKE FROM FLATTENED 1/8" TUBING & 1/16" WIRE
SLIDING PILOTS CANOPY
1/8" BALSA
1/4" SHEET TOP
1/16" O.D NYLON TUBING
1/16" COCKPIT FLOOR
1/2" TRIANGULAR STOCK (TYP. ALL 4 CORNERS)
1/4" SHEET SIDES
1/8" PLY
1/8" BALSA
1/4" SHEET BOTTOM
SPAN 62.5"
LENGTH 47"
WING AREA 570 SQ IN
ENGINE 50 – 60 CU IN
JUNKERS JU87D-5 STUKA 1-1/4" = 1'-0"
'STUKA'
DESIGNED & DRAWN BY
PAT BYRNE
INKED BY
DICK KIDD
RANDY KIDD
0 1 2 3 4 5 6

The Fournier RF4D powered sailplane is an ideal single channel sport machine for after work relaxation.

FOURNIER RF4D

A SINGLE CHANNEL, .020 POWERED SAILPLANE FOR RELAXED FLYING BY BOB PECK

The Fournier model is a dream – it has clean flowing lines, cowled in engine, and flys as good as it looks. The model started a couple of years ago when I saw an article on the Fournier in *AOPA Pilot Magazine* and I wrote to Phil Paul of Aero Sport in Lanchester, California, who represents Sportavia, the German company that manufacturers the Fournier plane. Phil was able to obtain some 1/20 scale three view drawings of the Fournier RF4D, from the factory in Germany, which I used to make my 1/10 scale drawings.

The full size plane was designed in France and is built in Germany by Sportavia. It is a single seater with a single retractable main wheel and small outriggers on each wing. It is powered by a .40HP Volkswagen engine which gets her up where the fun begins.

The RF4D is stressed for aerobatics except for certain high speed manuevers and has a glide ratio of 20 to 1, which is good considering it is carrying the extra weight of an engine. Its cruise speed is 112 mph and stall speed is 40 mph.

It was in a Fournier RF4D that the Czech pilot, Mira Slovak, made the outstanding flight of 8500 miles from West Germany to California only to crash on his final landing in California where he was very nearly killed.

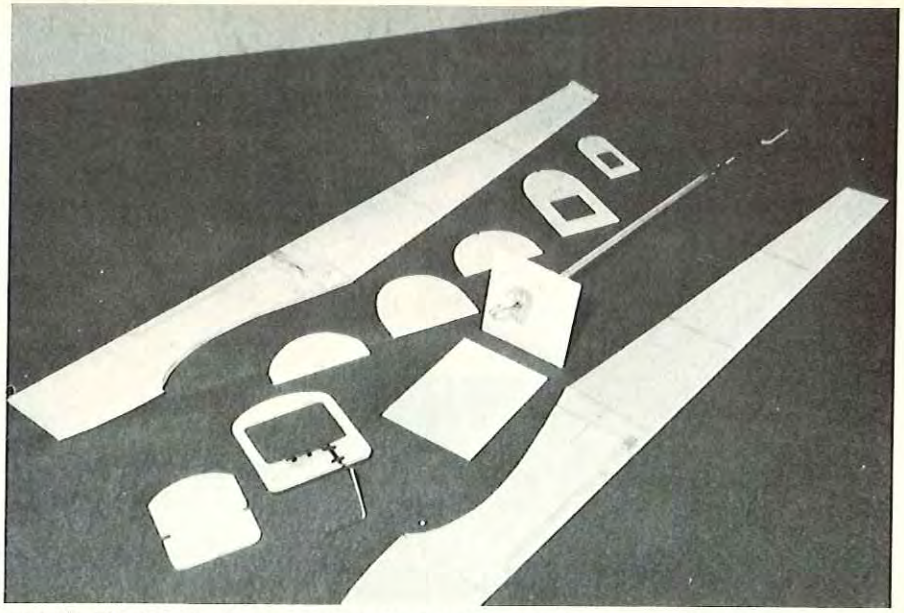
The model presented here is exact scale except for an enlarged stab and rudder, slightly increased dihedral, and balanced rudder design. I used the balanced rudder to reduce the load on the Baby Adams actuator. I also used the Ace Baby RO pulse radio system which weighs about 3 oz. The complete plane with Cox Tee Dee .020 weighs 10 oz. With 182 square inch wing area, this weight gives a fairly low wing loading for good soaring. Some readers may like to use a lightweight galloping ghost system such as the Ace Mini-GG actuator to have rudder and elevator control.

CONSTRUCTION

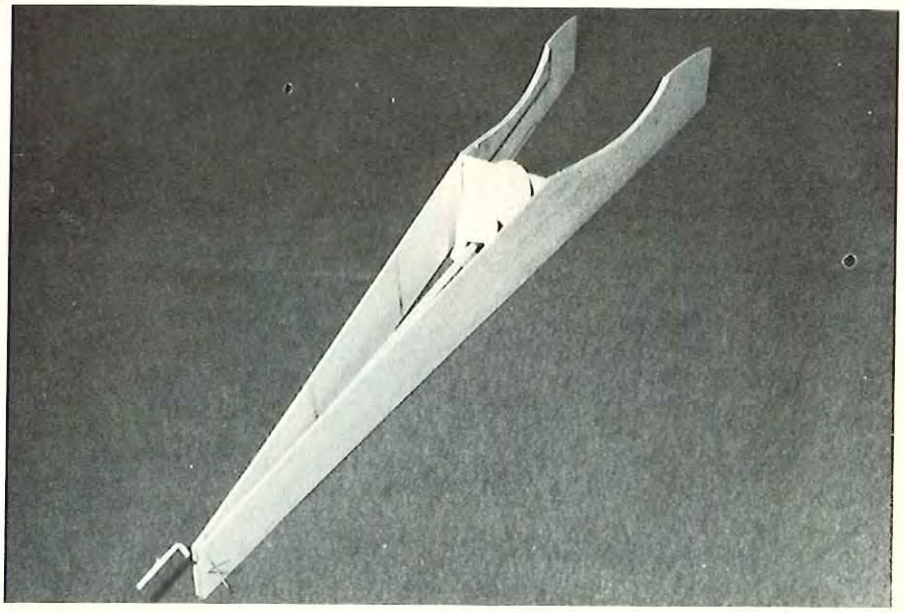
The wing is built in three sections:

Right, left and center. Cover the bottom of the center section with 1/32" sheet balsa at this time. Choose hard straight balsa for the wing spars and leading and trailing edges, so that you don't build in any warp problems. I like to install the antenna in the wing for a neater appearing finished model. When building the left wing, lay thin hookup wire in the notch for the top spar before installing the spar, itself, leaving about 6 inches hanging out the wing root to run through the center section and up to the radio. Solder a connector pin, removed from an old connector, to the end of the wire for the disconnect to the receiver. Cement the wings to the center section with 2½" dihedral under each wing. Gusset all spars at the dihedral breaks using plenty of glue and then sheet the top center section. Next, add the wing skids and epoxy in place. Cover the wing with light silkspan and apply four coats of thinned down clear dope and two coats of colored trim.

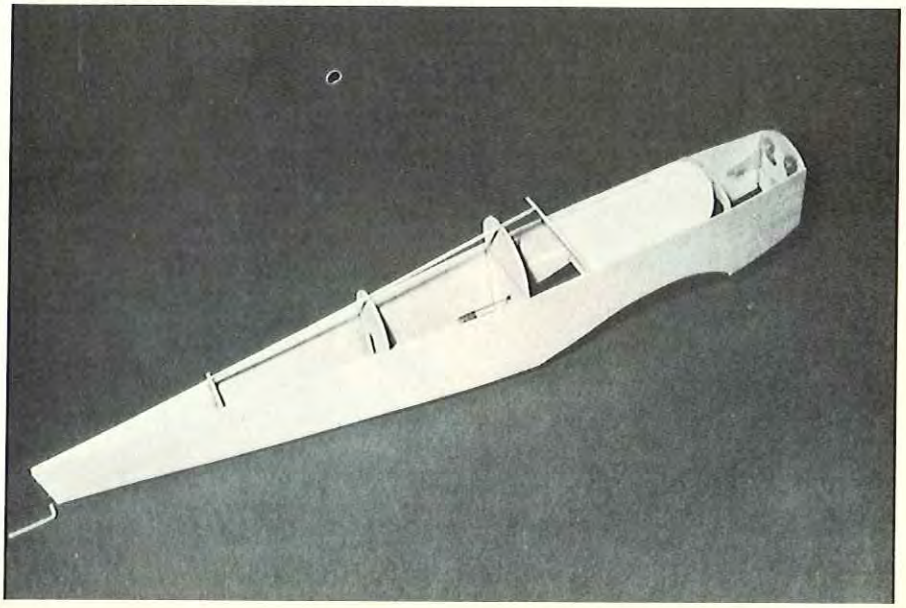
The stabilizer and rudder are made of 3/32" light but firm balsa. The stab will require splicing the trailing edge to the main section if 3" wide sheet is used. I use nylon hinges on the rudder as I believe they make the most reliable hinge when properly installed. It is important that the control linkage not have the least bit of binding and works freely but not sloppily. Before installing the hinges, drill a slightly oversized hole in the hinge half which has only one pin retainer on it. This will help to make the hinge work freely, especially if there is any misalignment during assembly. Cement the hinges and 0.030 music wire control linkage in place with epoxy. Build the fuselage from light firm balsa, first cutting out the fuselage sides. Choose the firewall outline to fit the engine you are going to use – F1-A for the Pee Wee .020 or F1-B for the Tee Dee .020. Trim the front of the right fuselage side 1/16" shorter than the left in order to have the proper right thrust built in. Mark the former positions on the inside of the sides and glue on F9 and F10. Before assembling the fuselage, build the 1/8" square hard balsa torque rod integrally with F3 as follows: Install the bearing in former F3 and insert the wire part through the bearing in F3 and bind it with thread to the torque rod. Also attach the wire part at the other end of the torque rod at this time. The idea is to build the torque rod in from the beginning of the fuselage construction. Building upside down, glue

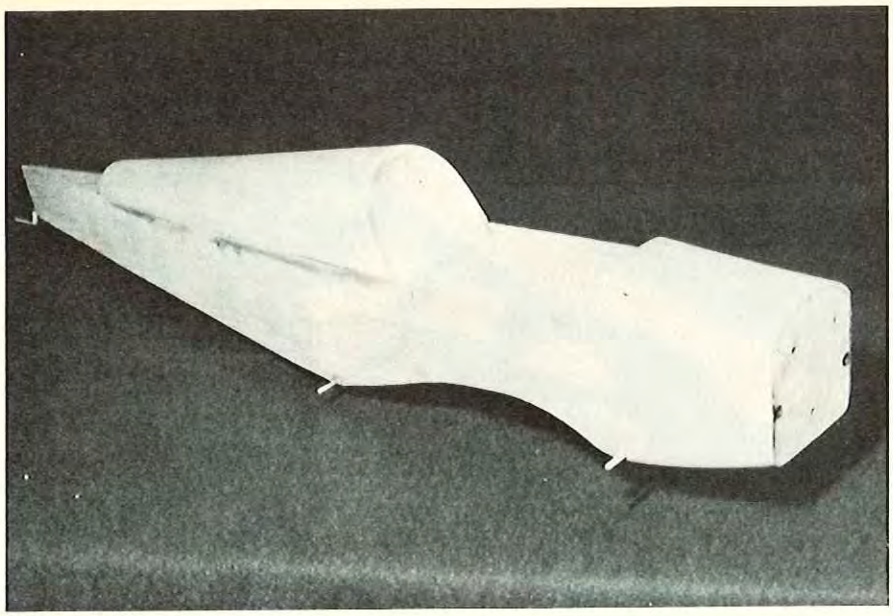


ABOVE: All of the fuselage parts ready for assembly. BELOW: Joining the sides.

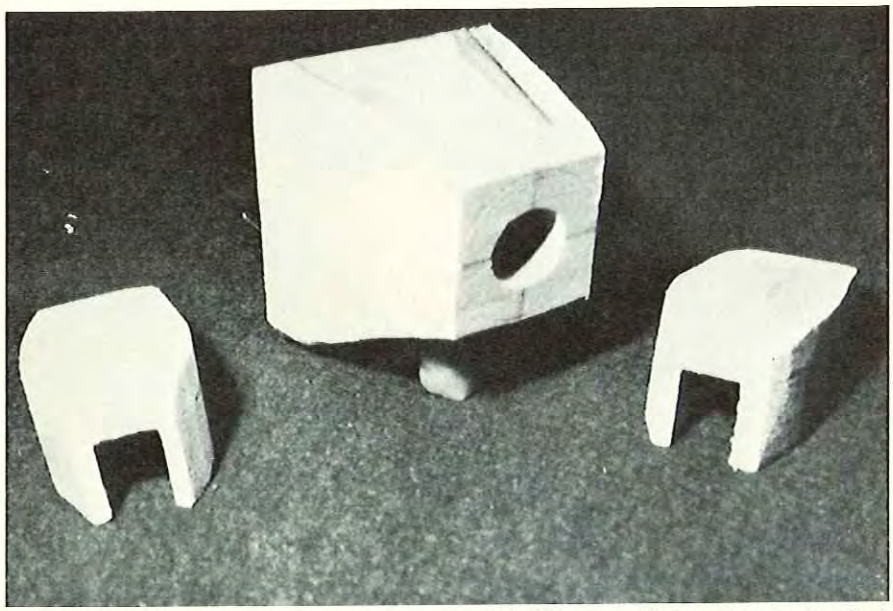


BELOW: Adding the formers and stringers.

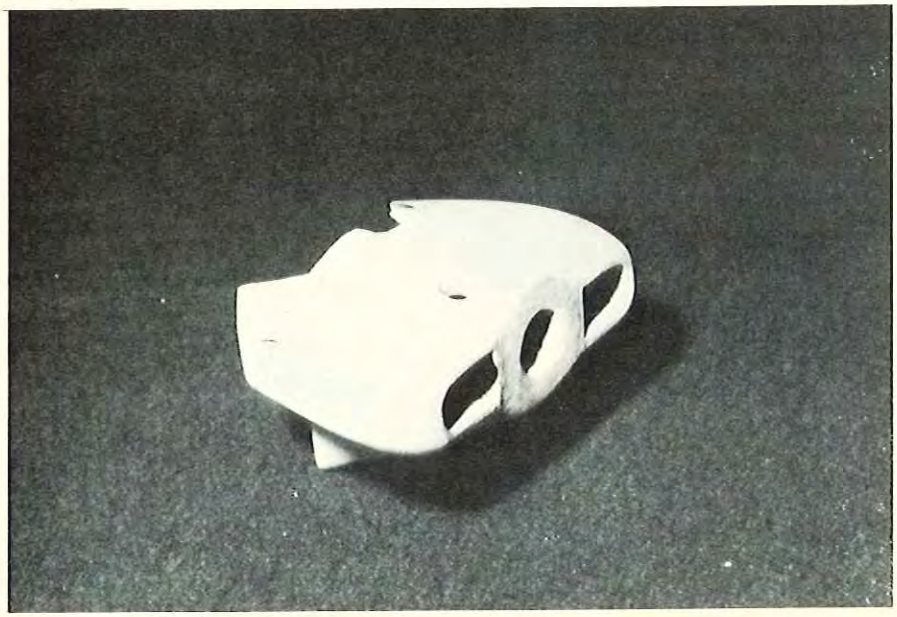




ABOVE: Cowl and turtledeck sheeting in place.



ABOVE: Rough shaped cowl and cheek blocks. BELOW: Assembled cowl ready for final sanding.



the back edges of the fuselage sides together with the torque rod in place and F4 and F5 strung loosely on the rod. Cement the bottom section of F3 in place. Check that the rod moves freely and that all parts are lined up; then let dry. Now add the rest of the formers and sheet the top and bottom. Cement formers F1 and F2 with epoxy and also epoxy in pieces of fuel line for the cowl attachments. Epoxy the 2-56 nuts on the back side of F1 for the motor mounting screws.

Be sure not to glue the actuator mount F10 since it is designed to be removable. Attach the Baby Adams actuator to F10 with thread and glue. Cover the actuator arm with shrink, or teflon, tubing so as not to have any metal to metal contact in the control linkage. Also, cover the arm with tubing at the rear of the torque rod for the same reason.

Glue on the rudder and stab and fair in the rudder to the fuselage with soft balsa blocks. Also glue on the canopy now, feathering the edges to blend in with the fuselage. Mask the canopy to protect it during the finishing process. Apply two coats of sanding sealer, sanding between coats, then spray two coats of color and two coats of trim.

In order to start the engine with the cowling in place, mount a small two-pin connector at the bottom of F1. Make glow plug clips from .025 music wire and wire to the two pin connector.

The cowl is built in three pieces: The center and the two side nacelles, all built up from 5/16" sheet balsa. Start by making the cowl attachment wires and pressing them into the fuel line at F1. Now glue together the pieces for the rough center section and carve the inside to fit the cowl. Attach the wires, and tack glue to the wires still in place at F1 and let dry. Now carefully remove the cowl from the fuselage and thoroughly epoxy the wires in place. After they are dry, fit the cowl back on the front of the plane and trim to fit with F1. Next the nacelles, each of which is made from three pieces of 5/16" and glued to the center section. Now finish the outside shape, then hollow the inside as necessary to fit the engine and to provide good air flow. Finish with two coats of fiberglass resin to help strengthen it for those rough landings. Sand and paint with two coats of colored dope and trim. After all trimming is complete, paint the fuselage

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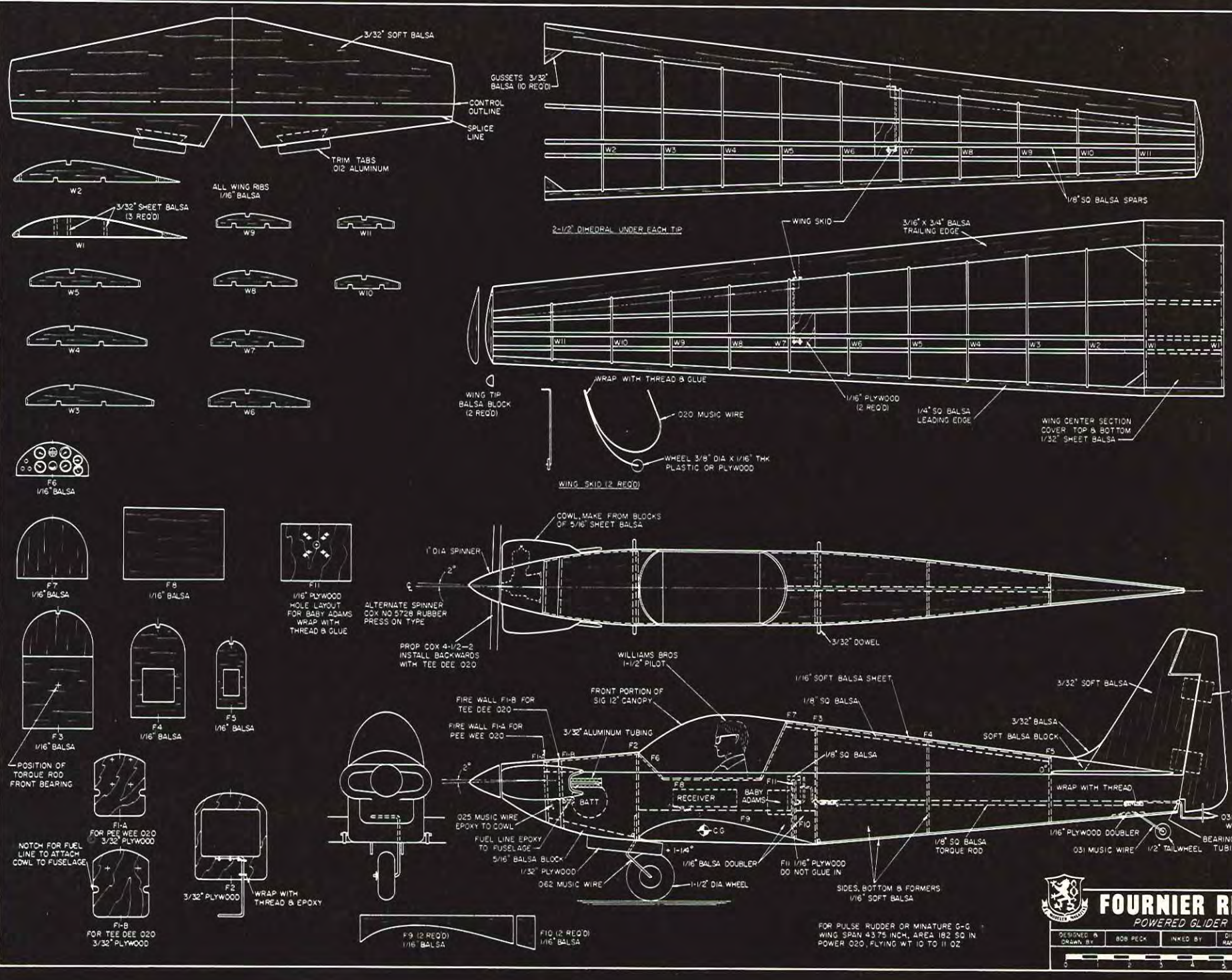
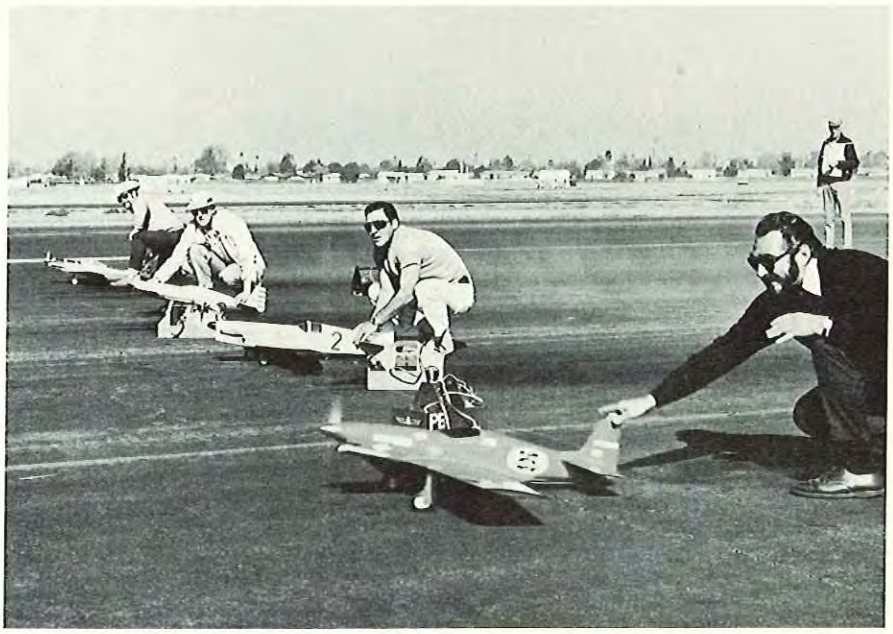


PLANS AVAILABLE — SEE PAGE 104

Terry Prather WINS F.A.I. Races at Los Alamitos

F.A.I. TIMES IN 1:50 BRACKET AS BIRDS CLUB SPONSORED RACES SEES PRATHER, STAFFORD, AND SMITH DOMINATE FIRST THREE SLOTS.

BY DICK TICHENOR



Starting line action - - - Lane, Lee, and Sakert hang on while McCan goes - - - -

The BIRDS Club Inc., of Carson, California, held their F.A.I. Races at Los Alamitos Naval Air Station on December 11, 1971 and, with very limited promotional effort, attracted 20 F.A.I. pylon entries. Interest in F.A.I. racing is increasing, particularly with the possible World Championships being planned in England in August of 1972.

The F.A.I. contestants were mainly Southern California's leading Formula I flyers. All of the models were exceptionally well finished and detailed, with Jack Stafford's Mustang kit dominating the design field. Retractable landing gear appeared on about half of the entries. Speeds flown at the F.A.I. race were only slightly less than the established Formula I times with the heat winners averaging less than 2 minutes, in fact about 1:54.0.

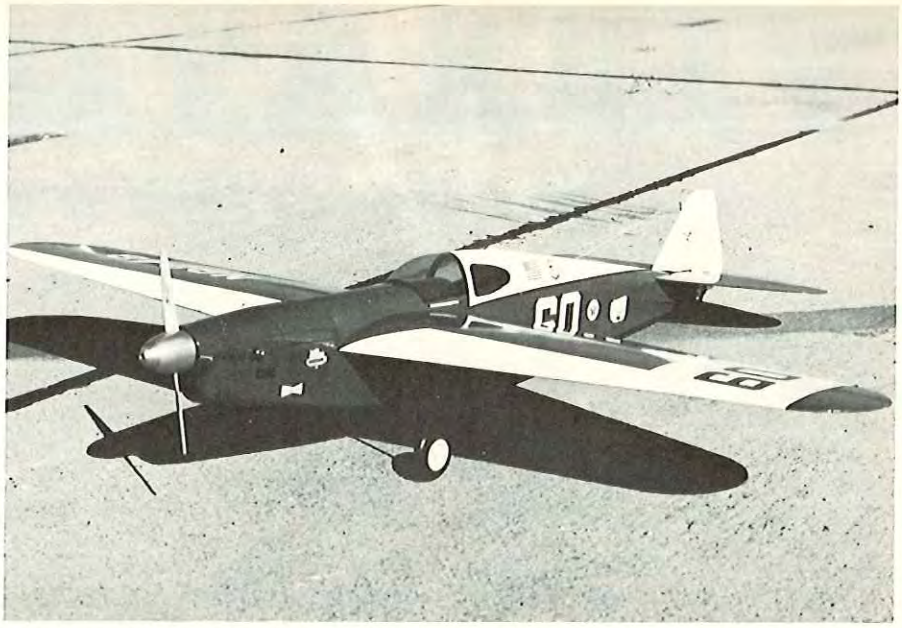
John Elliott was Contest Director for this most successful race. Slightly higher than usual entry fees were charged with the proceeds being used to pay the flagmen, timers, etc. This approach seems to lessen the pain for the group of people necessary to man a well run set of races.

Terry Prather won first place honors, with Jack Stafford placing second, and Bob Smith taking third. Bob Upton was fourth and a three way tie of McCan, Riggs, and Sato was in order for fifth place.

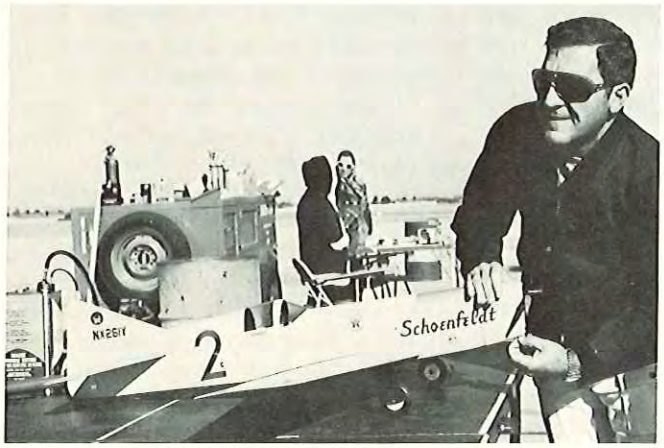
It would appear from this preliminary F.A.I. race that our racing enthusiasts are eager to get to England in 1972 and to do their thing for world honors. □

Jack Stafford's Mustang took second place, featured Goldberg retractable gear.

First place winner, Terry Prather, services his Mustang.

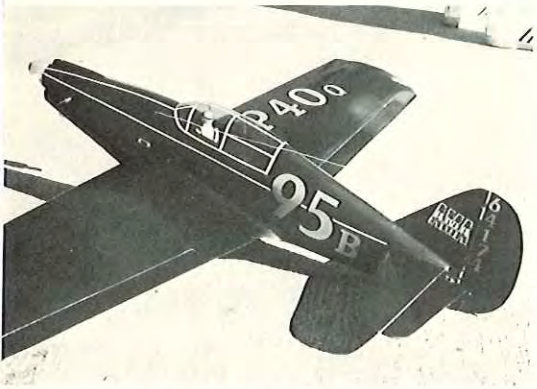


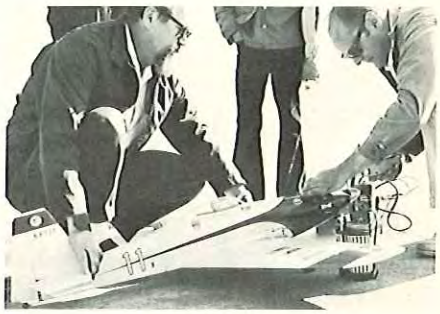
Ray Van DeWalker flew Folkerts Special. Racer featured extensive use of corrugated cardboard in fuselage construction. New Wisenewski engine powered fast ship.

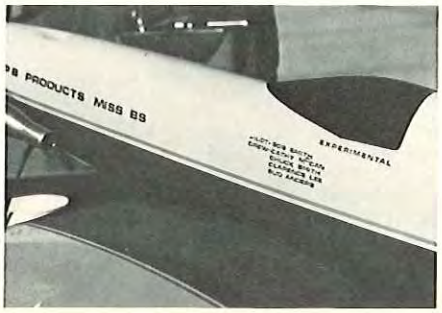


Jan Sakert preparing Dick Riggs' Schoenfeldt 'Firecracker.'

1/4 Midget, left has homemade retracts. F.A.I. Mustang has Goldberg retracts. K & B Super Poxy finish on Paul White's entries.







TOP ROW, LEFT: Jay Replogle's fast P40Q is black with gold numbers. CENTER: Jan Sakert's beautifully finished Mustang with Goldberg retracts. RIGHT: NMPRA Prexy Bror Faber tachs his Minnow as Howard Nupen assists. RIGHT: Impressive crew list on Bob Smith's third place racer. FAR RIGHT: Multicon retracts cycle in Joe Martin's Minnow.

VIBRATION...

...and how to keep it out of your radio

BY DENNIS VOLLRATH

This hobby of ours has never been the same since someone made a successful flight with a radio controlled model airplane.

A few years ago escapements and reeds were the going thing. They did the job, but had many shortcomings. The model was in trouble if vibration ever got to one of the receiver reeds, so great care was usually taken to shock mounting the installation.

Next, the proportional radio system hit the market. After a few years of redesign, changes and so on, these rigs became pretty reliable.

But time marches on, and these same radio sets are being asked to guide ever faster models, fitted with teeth rattling, bone jarring, one-lung monsters known as the modern glow engine.

An article, in RCM, several years ago made very clear how much vibration exists in our equipment, especially at the servo location. If you want a surprise, run up your Enya .60, and place a finger on one of the servos. UGH! With this stuff going on, eventually something just has to quit, resulting in the usual heartbreaking crash.

All of us take great pains in the receiver installation. We carefully wrap it in foam and gently insert it into the fuselage. As a result, few failures occur in the receivers now in use.

But the servos must be firmly screwed to the servo rails. Grommets are used to reduce vibration. But, I found, no matter how loose the servo screws are, considerable vibration still gets through, as those who have had servo failures have found out.

I should mention that I am a Service Technician, with seven years experience in industrial solid state equipment. Naturally, I repaired my rig each time it quit (four times in six months, a total of 24 hours flight time).

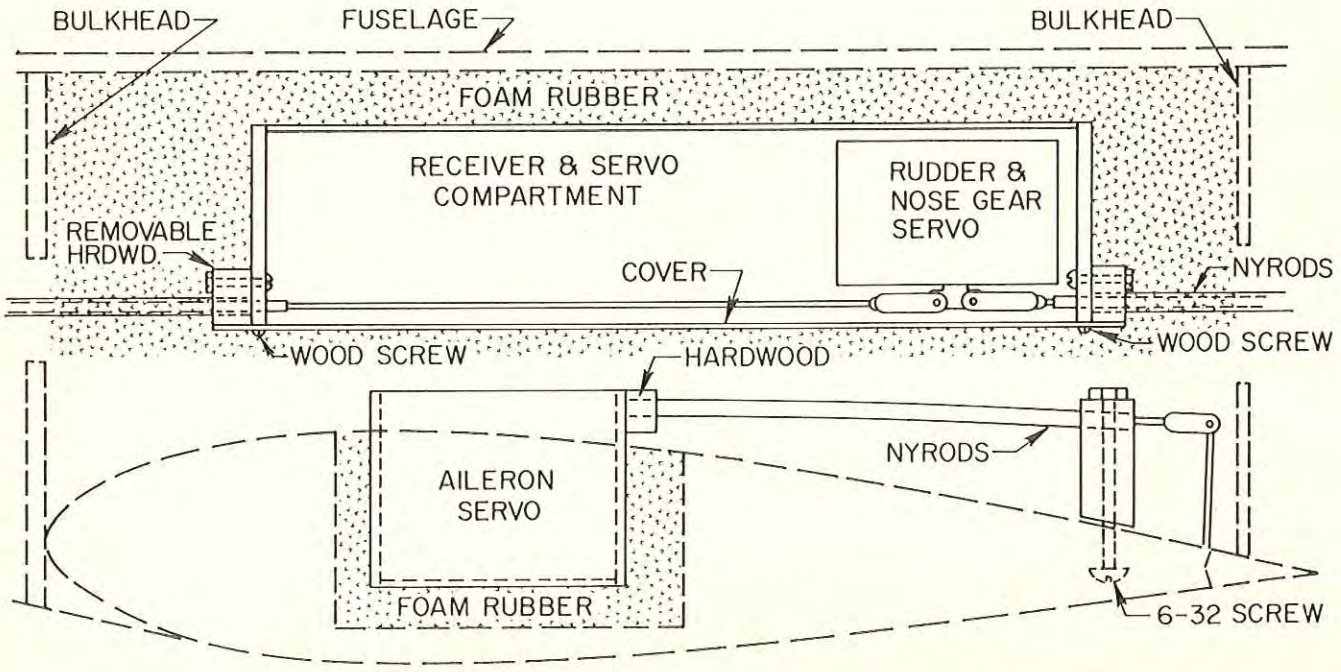
After the fourth failure cost me a servo, engine and airplane, (all of which I identified the cause – broken or fatigued solder joints!), I felt a better way just had to exist. **After** the last crash, an idea came to mind.

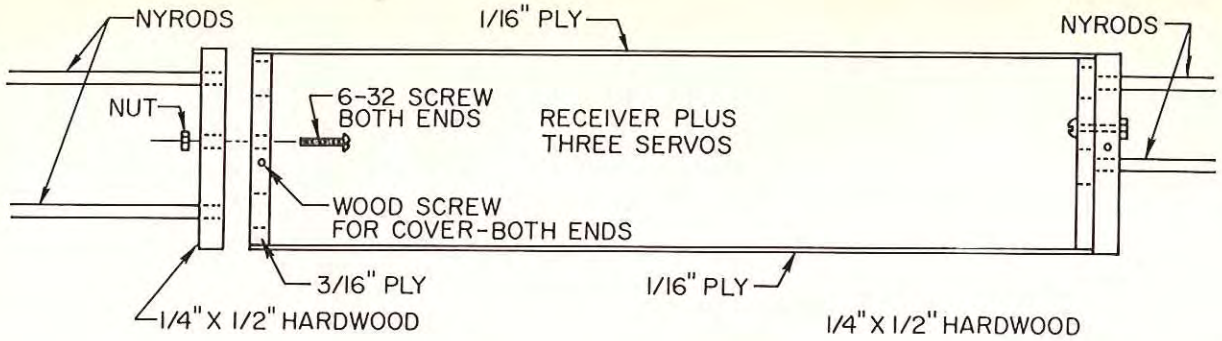
My models had been using the very convenient NyRod system. As we all know, one end of the outside NyRod tube is epoxied at a fuselage exit near its respective surface, for instance, the elevator. The other end is epoxied near the elevator servo. Thus the elevator is connected to the elevator servo by means of an inner nylon tube. The outer tube provides a reference position between the servo and the elevator. The thought hit me – why the hell am I screwing the servo to the airplane and epoxying the NyRod **near the servo?**

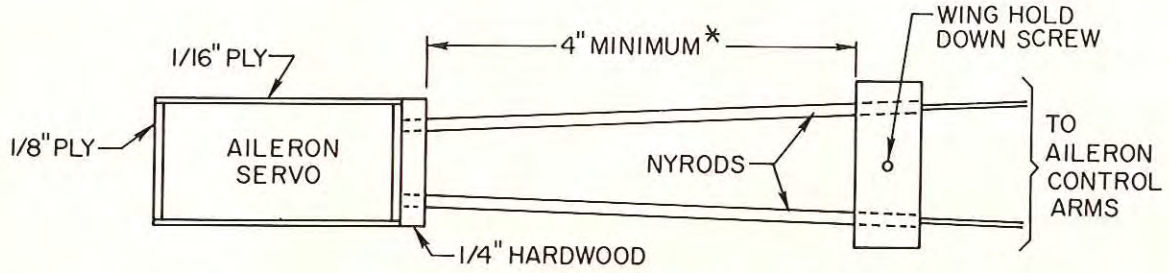
Why not put the servos in a plywood box, and run the NyRods to the box? Might as well put the receiver and wiring in the box too! Now only three wires lead from the box; battery lead, aileron lead, antenna lead!

I then placed the three servos, switch and receiver on a piece of paper and sketched out a box of the approximate dimensions that would be required for my rig. Because of the wide variety of radios, airplanes and so on it would be impossible to make a universal box to hold any radio rig, so only a basic sketch is included. (I might state that a small amount of 5-minute epoxy will greatly speed up construction of this thing.)

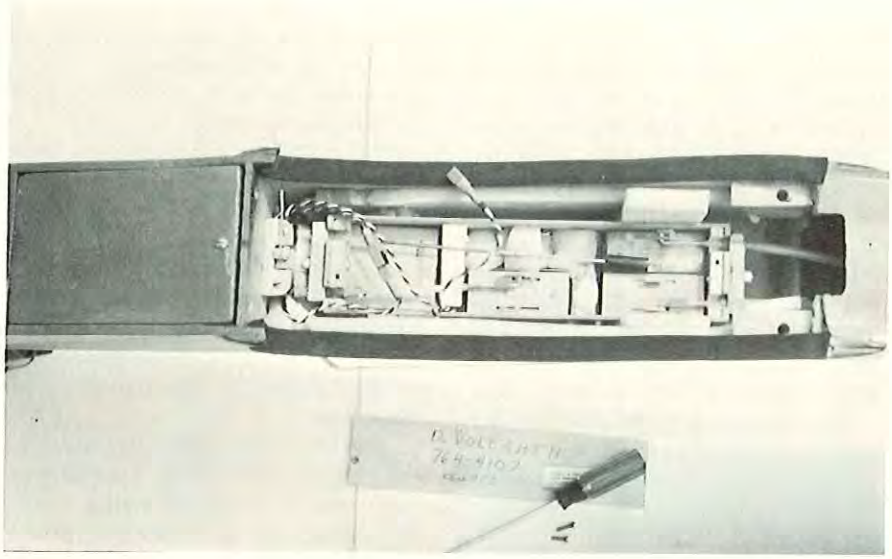
I had 1/16", 1/8", and 3/16"

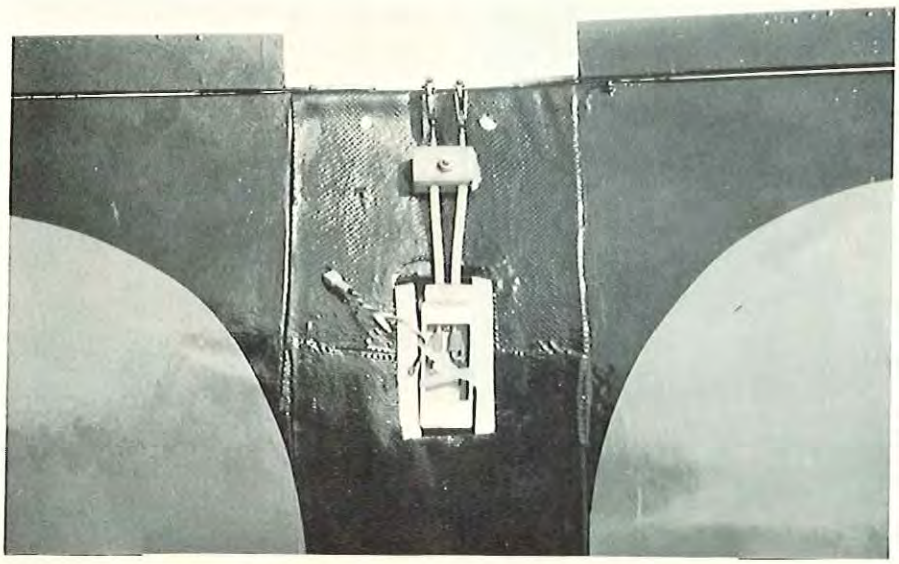






* IF 4" MIN. CANNOT BE POSSIBLE USE "BARN DOOR" CONNECTIONS OR LIGHT GRADE NYLON TUBE AND CABLES.





plywood sheets on hand, so these suddenly became a box for the airborne radio. The top cover, right and left side were made of 1/16", the bottom of 1/8", front and rear, 3/16".

The NyRods are epoxied into a short piece of 3/8" hardwood. They are spaced such that they will line up with their respective servos.

A 6-32 screw and a **locknut** (with the nylon insert) is used to hold the hardwood block to the radio box. Thus, the removal of just two screws, plus NyRod connections allows the entire radio system to be removed from the model. While you are cutting the hardwood blocks, make several extra sets for those future models.

Now, the receiver box and servos can be wrapped in a soft foam rubber blanket. Please don't jam in the foam, just use enough to support the box plus about one inch of styrofoam between the front of the box and the bulkhead (in case of pilot error?).

The aileron servo can also be fitted with a similar arrangement. A small, tight fitting box is constructed for this servo, with provisions for attaching two NyRods. Another hardwood block is bolted near the ailerons.

Now, NyRods are connected between the servo and aileron through the two outside tubes and, again, vibration isolation is the result. For the record, NyRods may be too stiff, for the short distance involved. I used the nylon tube, steel cable type, which

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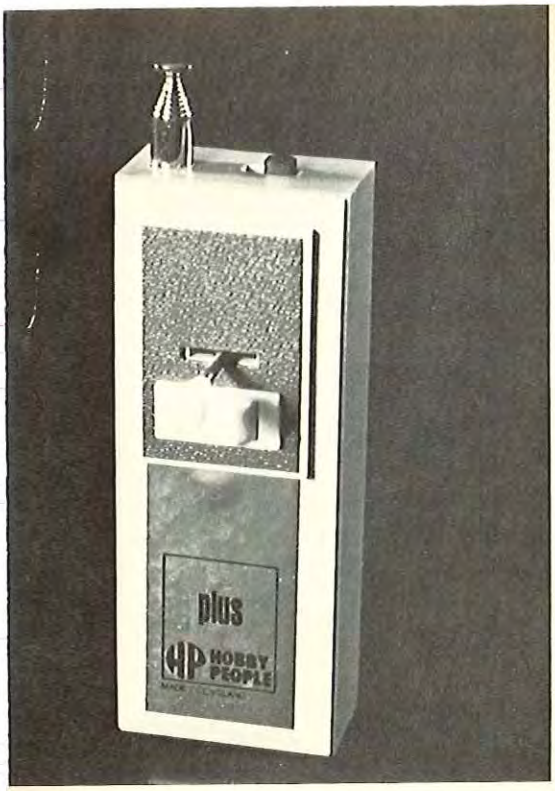


RCM PRODUCT REPORT

THE HP 1+1 proportional system

A TRULY REMARKABLE LOW-PRICED DIGITAL SYSTEM FOR THE BEGINNER.

The photos to the left and right show the unusually compact transmitter, measuring a scant 5-5/8" X 2-1/8" X 1-1/4".

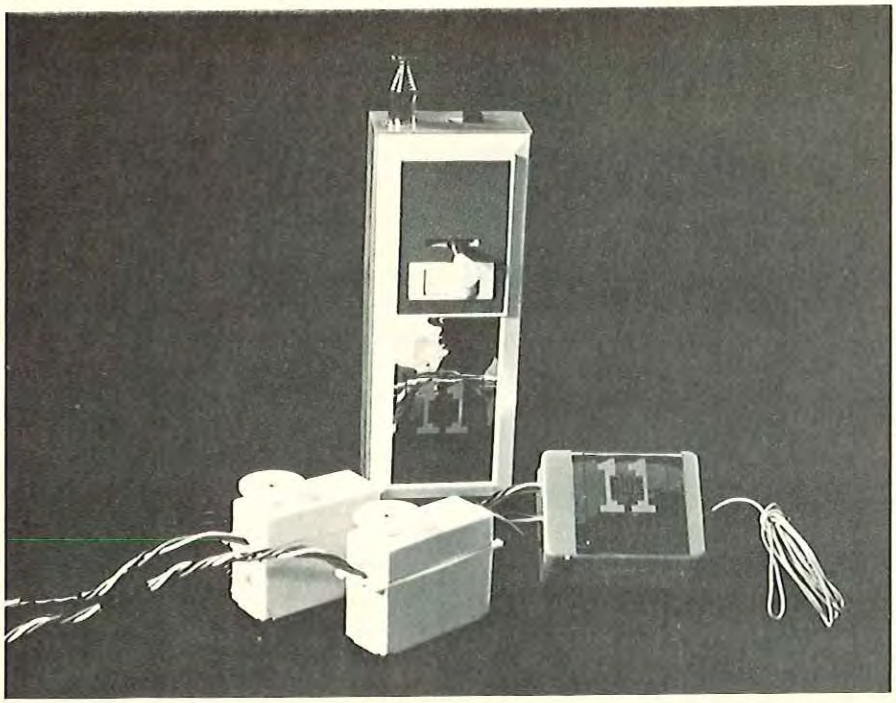
The introduction by Hobby People, 130 East 33 rd Street, Los Angeles, California 90011, of their new 1 + 1 digital proportional system introductory priced at $59.99, has been one of the greatest booms for the newcomer to radio control, the younger flyer on a limited budget, as well as the sport flyer and lightweight enthusiast who wants a simple, small aircraft to fly between regular, weekend-only sessions at the local field.

Imported by Hobby People from England and designed and manufactured to the highest standards of quality, the 1 + 1 is designed to provide fully proportional control of the rudder while the second servo is a 3 position sequential throttle servo. The receiver, two servos and battery box weighs 6 ounces and will fit into a space 2" x 7". In spite of the compact nature of the 1 + 1 system, there has been no sacrifice of the servo power or resolution – in fact, the output power of the servo equalled that of most high priced digital systems. The transmitter is crystal controlled and 100% pulse modulated. Six 27 megacycles spot frequencies are available and the power output is 450 milliwatts. Current consumption of the transmitter is 60 milliamps. The transmitter uses a 9 volt Ray-O-Vac #1602 battery which was good for 14 hours of continual use. The operating temperature of the tramsmitter is from −20° Centrigrade to +50° Centrigrade.

The receiver is a crystal controlled superheterodyne with a 455 KHz intermediate frequency. The quiescent current consumption of the receiver is 15 mA. Receiver sensitivity is approximately 3 uV. Battery voltage for the transmitter is 6 volts and is designed to operate in the same temperature range as the transmitter. The dimension of the receiver is 2" x 1½" x 1".

The servos, as previously mentioned, consist of a digital proportional servo and a sequential motor servo. The former has a mechanical power output in excess of 3 pounds with a current consumption (running) of 50 mA and a stalled consumption of 600 mA. Centering is ± 2 degrees. Servo dimensions are 1-7/8" x 3/4" x 1½". The rotation of the digital servo is continuous and approximately 90° while the sequential throttle servo has a 360° rotation phase in 4 steps of 90° each. Current consumption for both servos is identical.

The transmitter is unique insofar as the compact size is concerned since it measures 5-5/8" high x 2-1/8" wide x 1¼" deep, with an antenna that

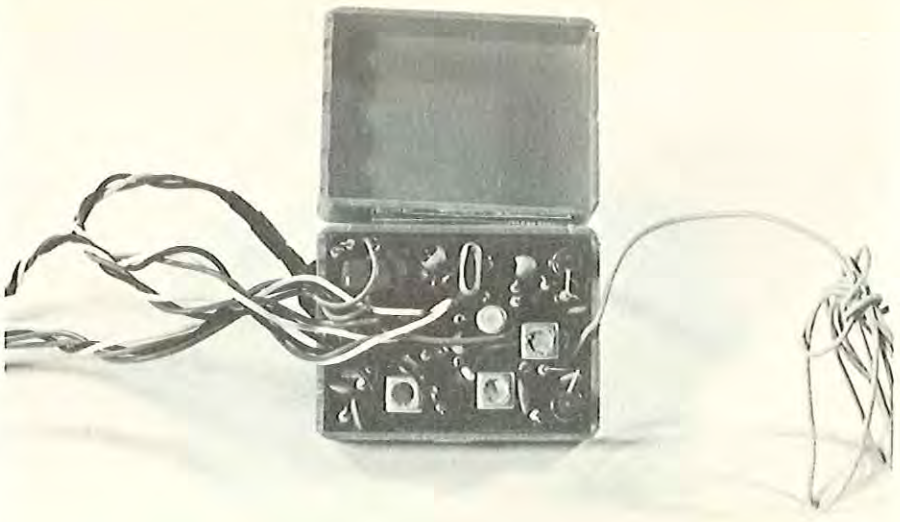


The complete HP 1+1 Proportional System, less battery pack and switch harness.

collapses almost completely within the transmitter case. The operation of the transmitter is very simple and will present no problems even to the novice radio control modeler. The spring loaded self-centering stick is the proportional output control which will turn the proportional servo smoothly through its working arc. This servo is ideal for rudder control on both aircraft and boats. Directly below this stick on the transmitter is a spring loaded switch which controls the sequential servo. Each time the switch is pressed, then released, it will cause the sequential servo to turn through 90°. The simplicity of the transmitter operation makes the whole outfit an ideal training system for the newcomer to RC.

The sketch accompanying the article shows the proper connection of the 1 + 1 system. The airborne battery box uses 4 standard AA pencell sized alkaline energizers. Be sure to observe positive and negative poles when installing as coded in the battery box. For the throttle servo, we highly recommend the use of the Du-Bro # OR-98 Throttle Over-Ride assembly or the Dumas #301 Servo Saver throttle override. This will extend battery life and allow full servo travel without causing a stalled servo condition.

When installing the 1 + 1 system be absolutely certain that all plugs are correctly together and the color coding is observed. Avoid using one long wire from your pushrod from the servo to the rudder as this will flex during flight and also may interfere with the radio range. The airborne battery pack should be taped or rubber banded so that the pencells will not accidentally pop out of place. The receiver should be wrapped loosely in foam rubber and carefully inserted into place in the plane. Do not force the receiver into the plane as the vibration of the engine may cause the receiver to work improperly. Also be sure to wrap the battery pack in foam rubber to protect it from severe impacts as well as vibration. Be sure to keep the airborne antenna away from all servos and battery wiring. Extend the antenna out to the top of the rudder with a small rubber band attached to it. When installing the switch, make sure it is mounted on the opposite side of the engine exhaust so that the oil will not get into it. Servos should be mounted on ¼" plywood mounting rails using wood screws and rubber grommets. Be sure not to tighten the screws down firmly since the grommets act as shock mounting. Be sure to notch the servo mounting rails so that the molded servo wire extension will not interfere with servo mounting.

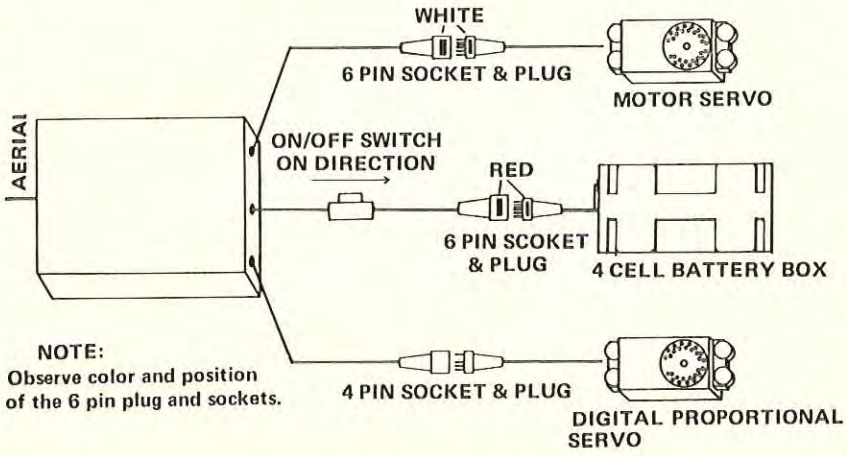


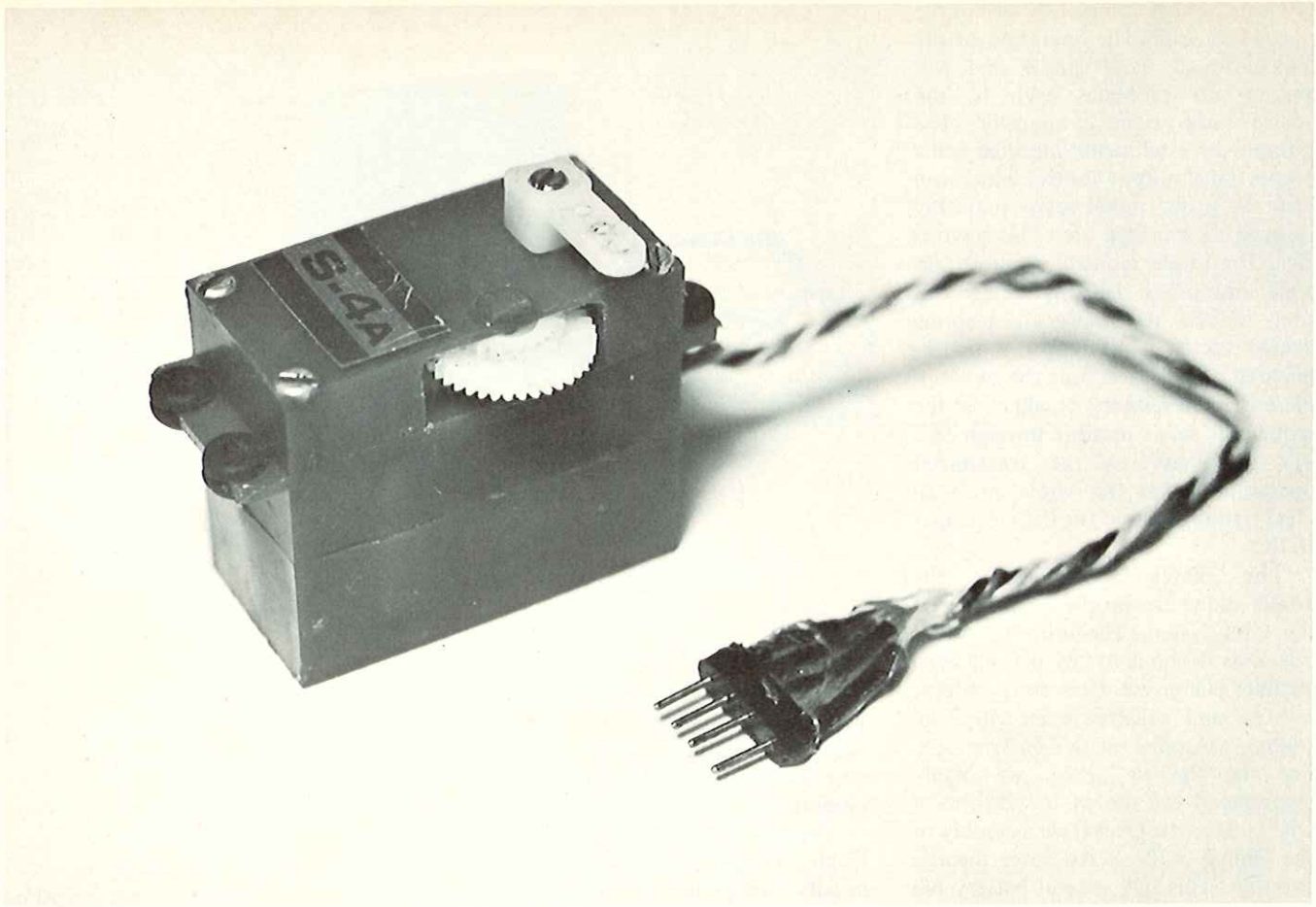
A view inside the HP 1+1 receiver. Size: 2" X 1½" X 1".

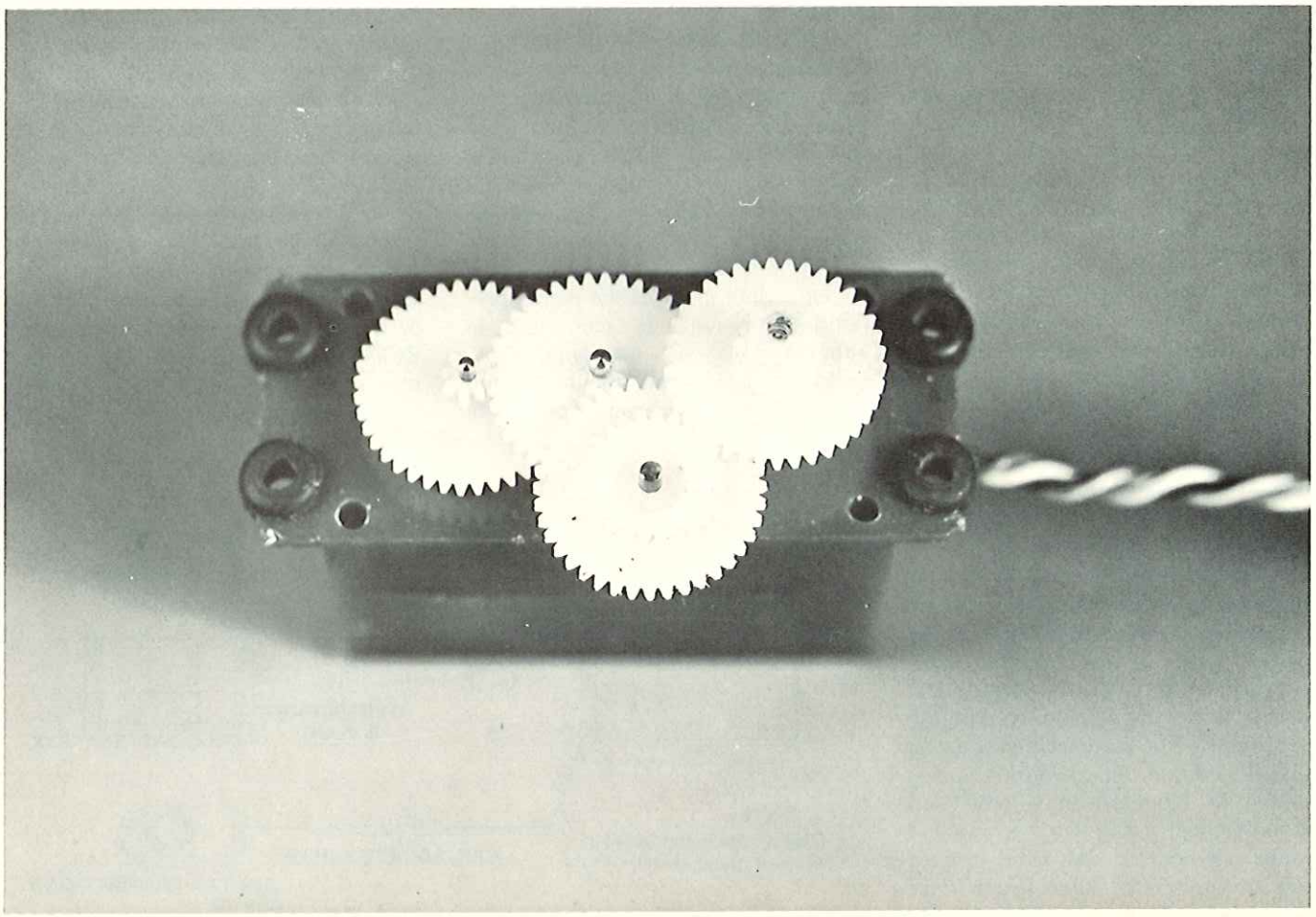
The instructions accompanying the Hobby People 1 + 1 system are unusually complete and include flight trimming, flying instructions, and how to do basic aerobatics with your 1 + 1 system.

R/C Modeler Magazine has thoroughly tested the Hobby People 1 + 1 system and has numerous flights using this system in various sized aircraft. One of the most remarkable features of this system is its truly phenomenal range. On numerous ground range checks, we found that the 1 + 1 system had a ground range far exceeding most of the digital proportional systems in our shop. In airborne tests, we encountered no problems of any kind, no glitches, and in fact, experienced completely trouble-free flying. One interesting experiment was the use of the sequential throttle servo as a positionable elevator servo when installed in a Showmaster prototype designed by Ken Willard. Although definitely not recommended for the beginning RC flyer, the application of the throttle servo to a 3 position elevator servo was quite feasible and enabled the aircraft to do loops and other maneuvers. The object of this test was to determine the practicality of using this servo as an elevator trim servo for use in rudder only type gliders where the addition of elevator control for trim purposes would be desirable.

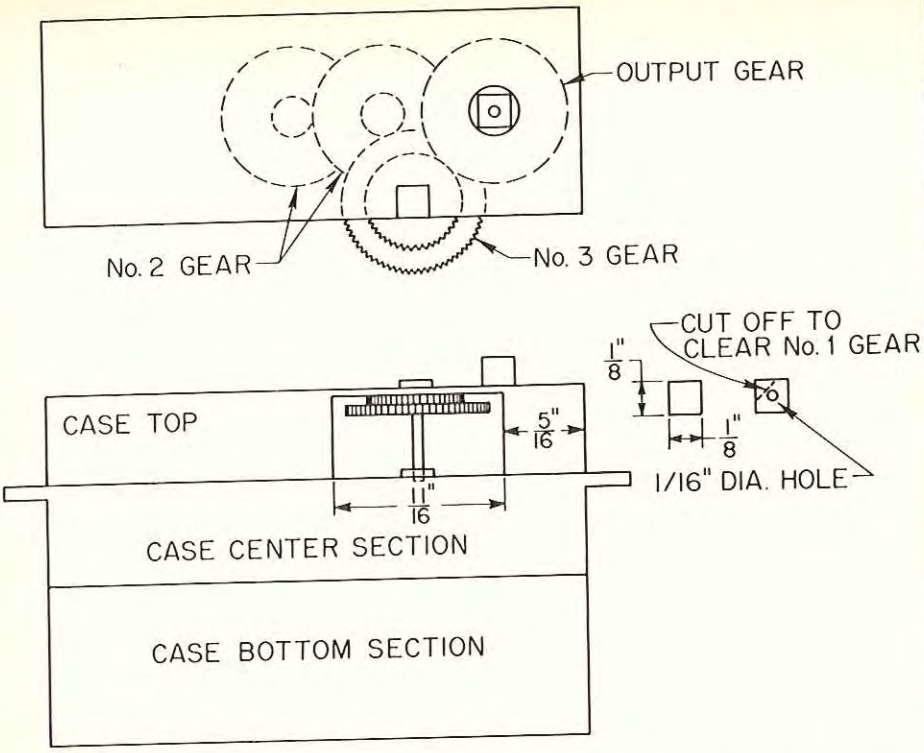
We are extremely impressed by the Hobby People 1 + 1 system, from the design and compactness of the radio all the way through to its excellent performance under varying conditions. RCM has thoroughly Tested, Approves, and Recommends this system to your consideration. □




S-4A



MODIFYING THE WORLD ENGINES S-4 SERVOS FOR RETRACTS



BY D.D. RIFFEE

Photos by Bryce Peterson

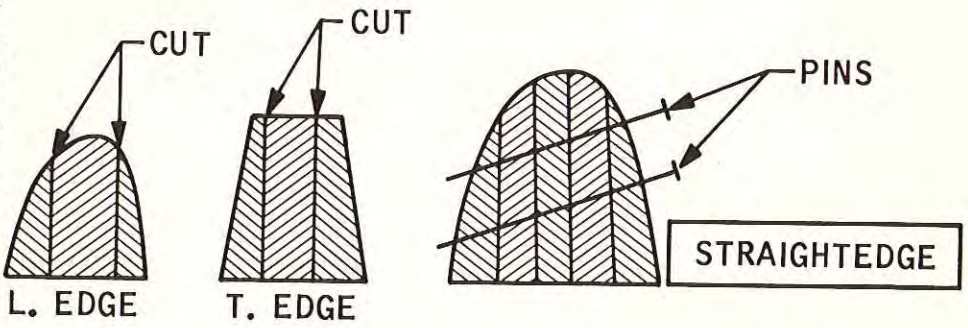
Since I have been building a set of retracts (Jan. '71 RCM), the article in the February 1971 RCM on modifying the KPS-9 servo to operate retracts really was a Godsend. My retracts don't need 180 degree servo, but since they worked marginally with the power from my S-4 servo, I decided to add a gear to the gear train as in the article. Upon examining the gear train in the S-4 servo. It became apparent that it had to be done in a slightly different way since the gear train spacing and unused space are different. By following the directions you will come up with an S-4 servo that is powerful enough to operate any retracts without putting a strain on the servo or drawing a lot of current and running your battery pack down (like in the middle of a flight). My servo has a pull of approximately 19 pounds, so don't put your finger in the wheel well when that wheel comes up or you may end up with a stub! Another side benefit is that the landing gear retracts at a more slowly scaled speed. The cost is only thirty five cents for the gear and a couple hours of work. So, that's it. It takes longer to describe than to do and I don't really mind the gear sticking out of the side of the servo case as long as it gets the job done and it does!

CONSTRUCTION

(1) Remove servo case top.
(2) Remove #3 gear.
(3) Replace #3 gear with the new #2 gear.
(4) Take servo case top and cut side out as in drawings.
(5) Cut two 1/8" square pieces from the scrap plastic that was removed from the servo case, and drill one with a 1/16" diameter hole in the middle.
(6) Make a gear shaft from 1/16" music wire, 3/8" long.
(7) Put #3 gear on the new shaft and place it so that it meshes with the new #2 gear and the output gear. (Carefully locate the holes in the top of the servo case center section and case top).
(8) Drill new shaft holes 1/16" diameter, but make sure hole in top of servo case center section is only 1/32" deep.
(9) Take the 1/8" square plastic with the 1/16" hole in the center and epoxy over hole in case center section with the holes lined up.
(10) The large pinion on #3 gear will need to be filed down slightly.
(11) Put the new shaft in the hole in the case center section and then slip #3 gear on the shaft and slip case top in place.
(12) Reverse wires to servo motor.
(13) Operate servo. If no binds occur, epoxy 1/8" square plastic over hole in top of case.

FOR WHAT IT'S WORTH

Heavy, preshaped structural members, such as leading and trailing edges, supplied in kits are usually too warped to produce a straight wing. To correct this, the member can be sawed into an odd number of pieces and laminated back together. Elementary stress analysis of the member will show that an odd number of laminations will produce the greatest straightening effect. Donald B. Patterson, of Troy, Michigan, who submitted the accompanying sketches, saws the member lengthwise into an off number of pieces with a thin blade in a jigsaw. Then, he coats the mating surface with a slow drying epoxy and pins the member back together while lining up any rib notches or other details. Then he pins the member down to a flat surface with one side against a straightedge. When the epoxy hardens, the piece will be straight and stay straight. Don used this method on the leading edges, trailing edges and spars for a DeBolt Jenny wing with excellent success. The sketch shows a typical lamination pattern and proper location of the straightedge while the epoxy hardens.



The following is a method of applying balsa sheet to a fully sheeted wing which will give you a close, almost invisible joint with practically no wasted sheeting.

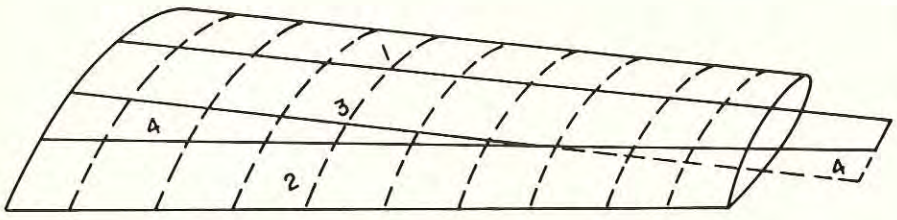
Start by using a straightedge such as a T-square and trim off just enough of both edges of all sheeting to insure the edges are straight. Following the sketch, glue sheets #1 and #2 in place using Titebond glue. Lay sheet #3 next to sheet #1 and let it overlap sheet #2. Now lay your straightedge along the edge of sheet #2 and over sheet #3. Scribe sheet #3 with your X-Acto knife. Remove sheet #3 and cut off piece #4 on the scribed line.

Lay pieces #3 and #4 in place to make sure they fit with good closed joints. If piece #4 is too short, another piece can be used to extend it using the same method for cutting as described for sheet #3. Make a few short marks at random across the joints with a felt tip pen to ensure realignment after the glue is applied. This is especially important when using contact cement, such as for foam wings, since there is no second chance to align these sheets once contact is made.

Glue sheets #3 and #4 in place with Titebond glue. Use Pactra model airplane cement on the edges where the sheets are to join. Push the sheets towards the tip wedging them between sheets #1 and #2 and forming a tight joint where the edges meet. Hold in place with pins or masking tape.

This method works equally well for built-up or foam wings, constant chord, or tapered wings. For foam cores, use 3M 77 instead of Titebond. Fit all sheets before applying contact cement and mark the core with a ballpoint pen to ensure realignment once the contact cement is applied. Glue sheet #1 first, then sheet #3, sheet #4, and finally sheet #2. When the glue has dried, remove the pins or tape and trim off the excess around the edge of the wing. Sand to suit.

You will be amazed at the results of this process.



Bob Aberle, of Hauppauge, N.Y., submitted this idea for a fused plug in the battery charging circuit of your proportional system. By design, our battery packs must be charged for long periods unattended. A potential short in the charger circuit could lead to severe transmitter damage before the household circuit breakers are activated. As a suggestion, install a "fused plug" on the end of the charging cable and place in the usual 115 volt AC plug. These excellent devices have been used by ham radio operators for years. They are manufactured by the Elmenco Corp. and others and are available at most electronic parts suppliers. The price is about 49 cents plus the cost of a small box of fuses. The result is piece of mind, knowing your $100.00 plus transmitter or charger is well protected. The first step is to cut off the existing plug, then separate the zip cord wire approximately 1½". Remove ¼" of installation from each wire and tin the ends of the wire with solder. Disassemble the fused plug and solder the wires to the terminals. Finally, assemble the plug and install two 1/8 Amp type 3AG Littlefuse. Now plug it in and relax – you are fully protected.

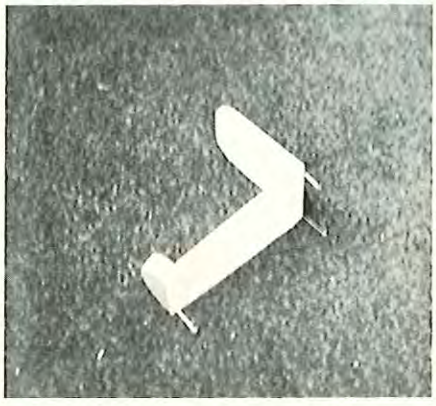
BUILDING A FIBREGLASS COWL the eazy-est way

BY MAJOR JOHN D. WOODS

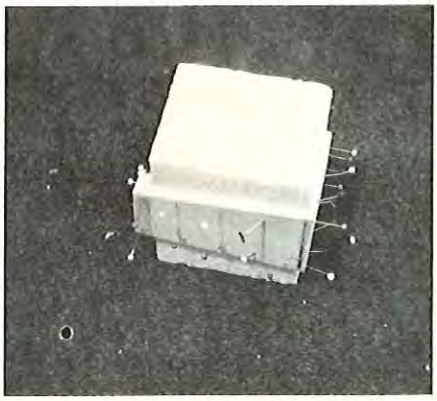
If you are just an average modeler with average modeling skills you can build a cowl to fit that new dream ship of yours in 8 easy steps. I know you say you have heard that one before, with male molds, female molds, plaster, release agents and 24 easy steps and 3½ weeks later you can have the cowl of your dreams! Take it from me, this one is easy and fast and accomplished with easily obtainable and easily workable materials.

Two materials relatively new to cowl making enable this to be both a new method and an easy one – Foam and Silicon Rubber.

To get on with it **Step One** as shown by picture #1 is to build a frame from 1/8" hard balsa that is 1/16" smaller all the way around than the space you are attempting to cover with the cowl. The 1/16" allowance is for the thickness of the fiberglass plus the thickness of the finish; 1/16" is about right for 3 layers of cloth and a Hobbypoxy finish. If you decide you want more glass or a thicker or thinner finish allow whatever you deem appropriate. The cowl that is being constructed in the picture sequence is a half cowl but the method works just as well for a full cowl or any number of fiberglass parts for that matter.

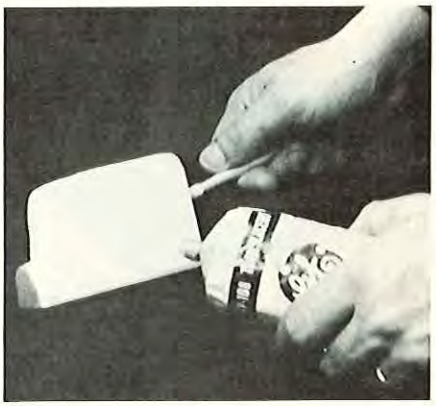


Step Two consists simply of cutting a block of foam (preferably expanded polystyrene) to fit the frame and gluing it in place with contact cement or epoxy. Allow to dry thoroughly before proceeding with the next operation.



Step Three: Carefully sand the foam to shape using 50 Grit *Garnet* paper to get it to the general shape, then use 80 Grit to bring it down to the exact desired shape. One thing to remember here is that foam sands very easily and you can over sand if you go at it with too much gusto. Also, do not sand into the frame since it is already the shape or size that you want. I have also found that stroking the sandpaper in one direction works the best because there is less chance of rolling the foam beads out of the block with the sandpaper. This is also the reason for using Garnet paper – it cuts rather than dragging on the surface.

Step Four involves rubbing the silicon rubber all over the mold in a *thin* layer. Do this quickly with your fingers making it as smooth as you can but don't worry if there are small ridges of rubber. This is the inside of the cowl and it will be a bit rough, but then it is the outside you want to look good – right? Allow this to dry completely. At least 24 hours in a warm room will usually be sufficient.



Step Five: Cut 2 pieces of Sig Fiberglass cloth or equivalent and 1 piece of Hobbypoxy cloth about 1 inch larger than the surface of the mold. Place one piece of Sig cloth on the mold and cut as necessary to allow the cloth to conform to the shape. Don't worry about overlapping cloth, just be sure the whole surface is covered. Mix a quantity of Hobbypoxy II glue sufficient to do the whole surface and dob it gently into the cloth with a small flux or glue brush. Make sure the whole surface is coated to at least ¼" out from all edges and just let the cloth stick straight out from the edge of the mold. If you try to tuck it around the edge the glass will lift and separate from the mold. This is shown clearly in picture #5. When this layer has cured, lightly sand any runs or roughness down and apply the Hobbypoxy cloth in the same manner. Don't try to ad lib here and use all the fiberglass cloth because the Hobbypoxy cloth adds considerable body to the finished product and greatly adds to the integrity of the cowl. Allow to cure thoroughly and sand again with 80 Grit Garnet paper. This layer will require more sanding than the first but, here again, do not try to make it look like a finished cowl; just knock off the roughness. Now apply the last layer of Sig cloth the same way the first was applied and

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Proponents of fuel gulpers still wonder how they get 'em back! Shot at Torrey Pines Gulls contest.

SOARING

WITH DON DEWEY

The Torrey Pines Gulls held their monthly club contest on Sunday, December 12, 1971, with Jim Haldy ending up in first place and Mark Smith and Kelly Pike taking second and third in that order. The club contests are open to anyone who shows up with an airplane, FCC license, AMA license, and 50 cents. The December contest was a 3 minute Precision Time and Spot Landing event. In this contest the pilot hand launched his sailplane out over the 300 foot cliffs of Torrey Pines. Then, as the timer counted off the seconds, the pilot lined up to the spot landing. The perfect score was a time of exactly 180 seconds from launch to touch-down with the nose of the sailplane coming to rest over a ¼" spot. To make the contest more interesting, the landing zone was located on a slight downgrade. The rules permitted the pilot to make a touch-and-go landing to stop the clock, then he could go around again and concentrate on the spot landing phase. Paul Denson acted as Contest Director. Guests included Ron and Mitch Neal, of Model Dynamics, manufacturers of the Gryphon kit.

Pilots meeting at Torrey Pines in December. Eat your hearts out, you snowbound Easterners!

Paul Denson launches his Windward at recent Torrey Pines contest.

•••

December 5th at Copeland Park in Norfolk, Virginia, was not a very good day for soaring, either for man or bird. In fact the birds were the smart ones for they stayed in their nests where the Tidewater Model Soaring Society members should have been! Anyway, the adventurous glider guiders of the Tidewater group braved the elements and held a soaring meet with one Duration event for a 15 minute max. The real contest seemed to be one to determine who could hold onto their transmitter the longest and still have feeling left in his fingers! There were a couple of bad breaks early in the contest for two of the Tidewater pilots, Larry Horacek & Lee Darby, who nosed their sailplanes in and were out of the competition. The contest results were as follows: 1st place, N. Smith flying his Cirrus for 932 points; in 2nd place, R. Crane with an Amigo II for 834 points; in 3rd place, P. Byrum, flying a Kurwi for 790 points; 4th place, V. Powell, flying a KA 6 for 773 points; 5th place, P. Pierce, flying a Zip II for 415 points.

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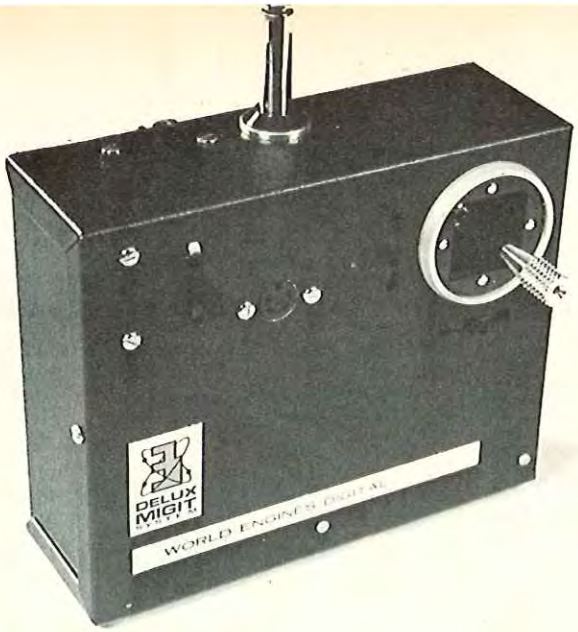


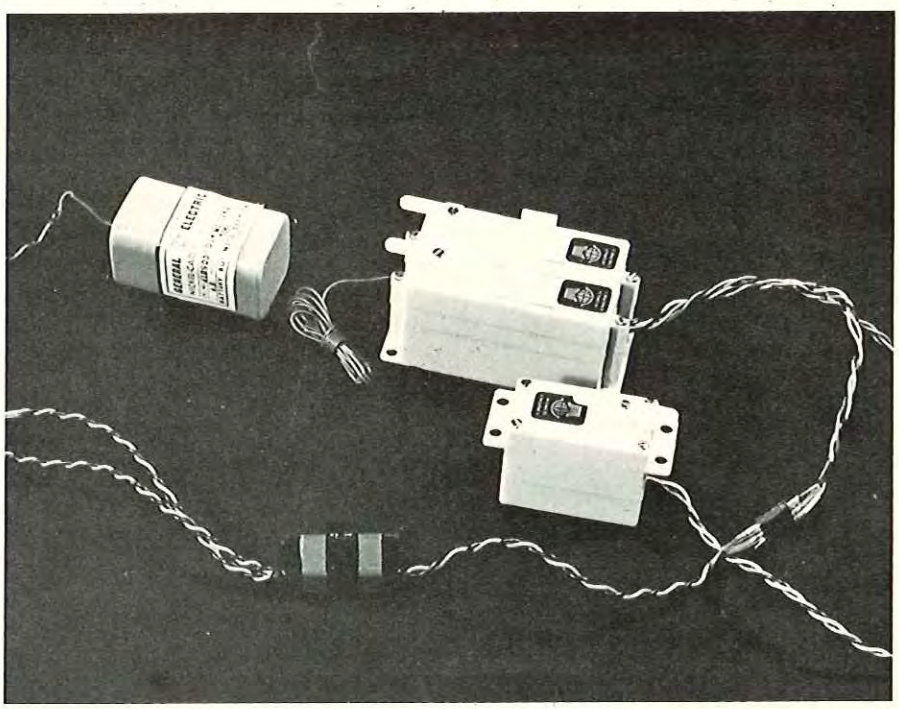
RCM PRODUCT REPORT

WORLD ENGINES DELUX MIGIT

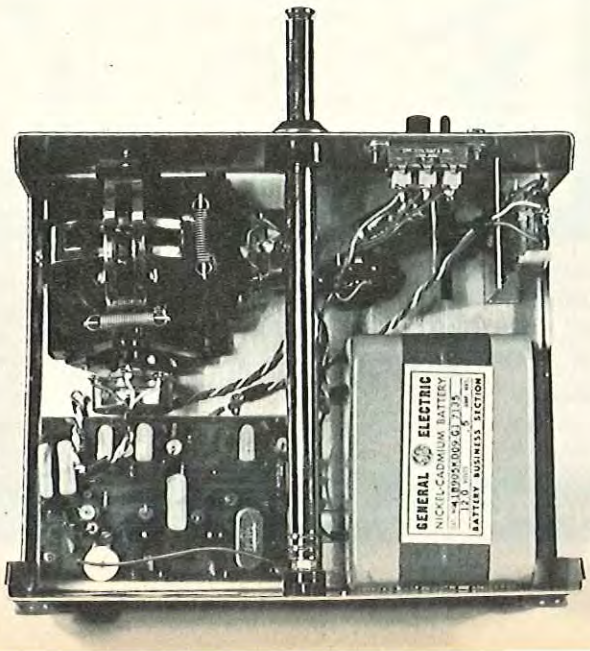
NEW THREE CHANNEL DIGITAL PROPORTIONAL SYSTEM OFFERS MAXIMUM VERSATILITY COUPLED WITH TOP PERFORMANCE.

ABOVE: The World Engines Delux Migit transmitter is a convenient size designed for minimum fatigue. All controls are located for ease of operation and maximum convenience. Excellent control stick action. Antenna collapses to minimum height for ease of transportation and storage.

RIGHT: The complete Delux Migit system features a very small 500 MaH nickel cadmium battery pack; two channel "Brick" housing two servos and three channel receiver-decoder; rotary and linear servo outputs on "Brick"; and small but powerful third servo.



BELOW: A view inside the Delux Migit transmitter illustrates the well engineered system which evidences the high quality of workmanship for which World Engines systems have become renowned. All American components used throughout.



Our review of the new World Engines, Inc., (8960 Rossash Avenue, Cincinnati, Ohio 45236) Delux Migit 3 channel proportional system will be brief. If this were to be a lengthy review it would contain only superflous adjectives describing the merits of this fine new system.

Basically, the Delux Migit is a 3 channel system in "brick" form featuring a receiver and 2 servos housed in a single case measuring 3" long by 1-7/16" wide by 1¾" high. Both linear and rotary outputs are featured on the "brick," and base mounting is utilized for maximum convenience for installation in your aircraft. Leading from the 2 channel "brick" is a switch harness to an extremely small General

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Electric 500 milliamp nickel cadmium pack which measures 2" long by 1-1/8" wide by 1-1/8" high. The entire 2 channel system weighs 8 ounces with an additional ounce and a half for the third servo, if used.

The transmitter is small and compact measuring 6-1/16" long by 5" high by 2" deep. The primary control stick, controlling roll and pitch modes (or yaw and pitch) is a closed gimbal type of stick with excellent centering and with a serrated metal control knob for ease of handling. The pitch trim lever is located to the left of the stick while the yaw or roll trim is located directly beneath the stick. On the left hand side of the transmitter is a third channel control lever for operating throttle. The on/off switch is located on top of the transmitter and is protected by a switch guard to prevent accidentally switching the transmitter on and leaving it in that position. The transmitter antenna collapses down inside the transmitter itself, the latter clad in an attractive black vinyl covering. The third servo is World Engines Model S-5, featuring a rotary output and measuring 1-5/8" long by 7/8" wide by 1½" tall, excluding mounting flanges and output arm. A separate charger is provided to charge the nickel cadmium packs in the transmitter and receiver-servo "brick."

The World Engines Delux Migit is made entirely in the United States using U.S. components and is manufactured by a company with many years of "know-how" in the digital proportional control field. This system is the most versatile one of its kind we have tested due to the dual outputs of the system and the availability of the third extra channel. It is recommended for any sport flyer and highly recommended for sailplane enthusiasts due to the fact that it has more throw and a greater trim range than is available on most digital proportional systems. It would be extremely difficult to fault this radio and our only suggestion would be to use a more flexible type of control arm since the rotary output arms, being extremely long, do have a tendency to break rather than flex in case of severe impact.

The World Engines Delux Migit, priced at $185.00 complete, has been thoroughly Tested, and is Approved and Recommended by RCM. □

VIBRATION

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is quite flexible. The same system can also be used for barn-door ailerons, just run the NyRods crosswise. Again, the aileron servo, being isolated, can be inserted in very soft foam.

Since my change to this new radio mounting system, I have burned 19.5 gallons of fuel in two different engines, and two different airplanes. Only once did I ever have a glitch. This was traced to worn out brushes in the aileron servo motor! A bit of work cleaned up this motor, and now it rests in the engine servo position.

Incidentally, this 19.5 gallons amounts to about 50 hours airborne time on the radio system, that with only one glitch that lasted about ½ second!

So, in summation, I have proven to myself that this system works, so why don't you try it, and save some of that scarce commodity . . . . money! □

FOURNIER RF4D

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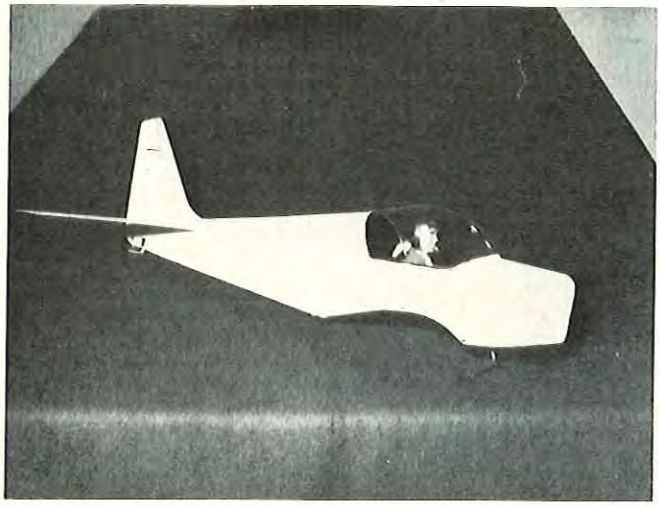
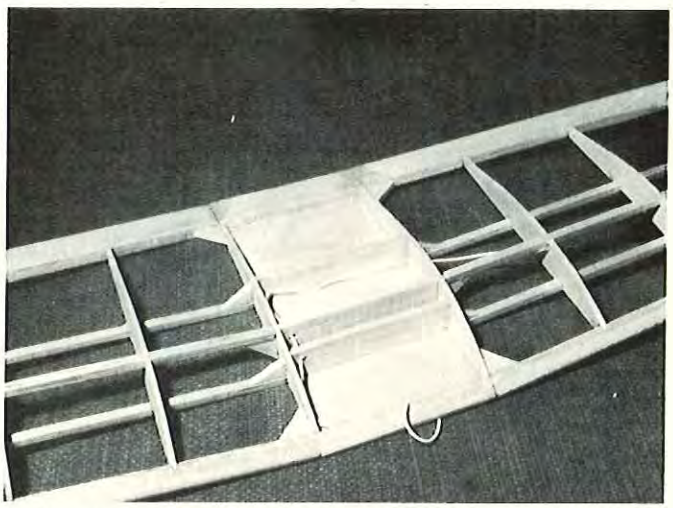
and cowl with a single coat of clear dope.

Install the radio as shown on the drawings with the 225 mah nickel cadmium batteries surrounded in foam rubber and stuffed up behind the firewall. You may still have to add some weight to the nose to obtain the proper balance.

Be sure to rotate the gas tank 90 degrees before mounting the engine. You may have to do a little looking to find a 1" diameter spinner as there does not seem to be anyone manufacturing the smaller size spinners at the present time – there are a few still around at the model shops, though. I hope some manufacturer will take note of this and come up with some



Completely assembled fuselage (less cowl).



Center section of wing showing internal antenna.

spinners for the .010 to .049 size engines as the trend is towards more R/C planes in this size. If necessary you can make a spinner out of balsa or use the Cox 5728 rubber spinner.

Before flying, check the plane to see that all the flying surfaces are properly aligned and free of warps. If there are any warps, steam them out or apply another coat of dope and pin the wing with a little opposite warp while it dries to straighten it out. Check to see that the control linkages work freely with no binding and your Baby Adams will work like a charm. Test glide your Fournier with the radio working and adjust for a smooth straight glide.

Okay, let's see what she will do! Note, if you're using the Cox Tee Dee, put the 4½-2 prop on backwards (I didn't the first flight and she climbed nearly out of sight even with a lot of turning to keep her down). Putting the prop on backwards makes a surprisingly big difference in thrust. You will probably want to experiment with various fuels and props to fit your plane.

Flying should be easy as the Fournier is very stable and forgiving to any mistakes. I would be interested in hearing about your model or if you have any questions write me: Bob Peck, 6274 Lake Arago, San Diego, California 92119. □

FIBREGLASS COWL

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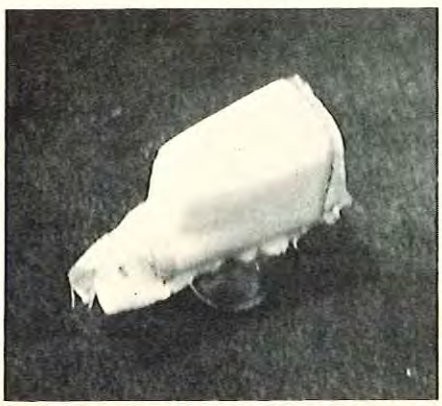
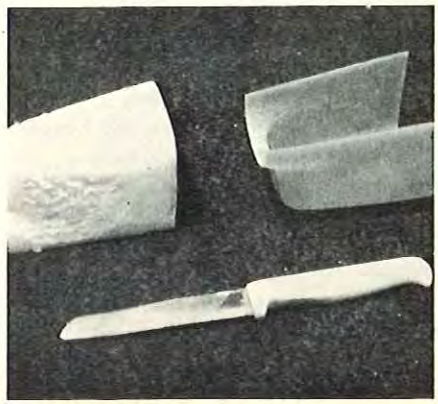
allow to cure.

When this one has cured completely wash the surface with a mild solution of Ivory liquid then rinse it with clean water and dry. Do both of these operations with a cloth and do not allow the water to contact the bare wood since it will swell it. Brush on a coat of Hobbypoxy II and allow to cure, then sand with 80 Grit paper again. The cowl should now begin to swell your breast with pride. Brush on one more gel coat of Hobbypoxy II and finish sand with 100A Garnet and top off with 180 Silicon Carbide paper. Cut the excess cloth from the edges of the mold with a pair of tin snips as close as 1/8" if you can, then block sand the edges down to the mold all the way around being careful not to sand the wood since this would make your cowl smaller than you originally intended.

Step Six: To separate the cowl from the mold take a thin bladed knife, similar to the one in picture #6, and carefully slip it between the rubber and the fiberglass working from the edges inward. Don't worry if you roll up the Silicon Rubber or cut into the foam because this method was not designed for mass producing cowls. When you pop it loose rub out any loose pieces of foam or rubber found to still be adhering to the inside of the cowl.

Step Seven: Cut a 3/32" plywood frame, approximately ¼" wide, the same size as the mold or 1/16" smaller than the opening to be cowled. These two dimensional shapes should be the same if all went well in steps 1 through 6. Notice in picture #7 that for a half cowl the cross pieces are left in until the plywood has been epoxied in place and has cured. This is not necessary





for a full cowl. When the plywood framing has cured, cut the cross pieces out with a razor saw and brush the entire cowl including the plywood frame for the last time with a thin coat of Hobbypoxy II. When this cures, wash again to remove the epoxy "wax" and sand with progressively finer garnet paper until it is smooth.

Step Eight is the final adaptation of the cowl to fit the selected engine and addition of any goodies you might desire like to simulate exhaust pipes shown in picture #8. The small round holes shown are done with a rat tail file. The larger holes, (for example, as for an engine head) or for the cooling louvres are best accomplished as follows: Drill with a 1/16" drill bit around the penciled outline of the desired shape making certain that the outside diameter of the drilled hole does not extend outside the penciled outline. Space the drill holes as close together as possible. Now cut through the small 'Lands' between the drilled holes with a #11 X-Acto knife blade and remove the excess fiberglass. Sand the hole to shape with 80 Grit paper wrapped around a ½"-¾" hardwood dowel. You will find this method of cutting holes very effective and easy to accomplish. I find the best way to hold a cowl on is with 4-40 bolts through a plywood reinforced plate epoxied inside the cowl at the same time as the plywood framework is glued in. If you have a better or a pet method, have at it. As for finish: Just about anything you like will adhere to the Hobbypoxy II surface but I usually use Hobbypoxy paint as well.

If you have shied away from building cowls because you thought they were too hard, or beyond your capabilities, try this method, it will probably change your mind. I have built at least 15 cowls using this method and have always been pleased with the result as I am sure you will be. □.

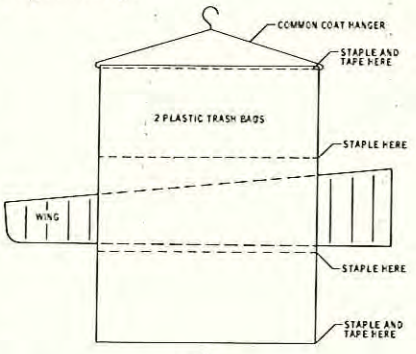
SOARING

From Page 60

The Tidewater Model Soaring Society 1971 Grand Champion is Ned Smith who accumulated 6,458 points with his Cirrus during the year.

SAILPLANE HINTS & KINKS

Dave Shadel of New York has found that plastic trash bags, available at your local supermarket, are excellent as sailplane wing racks. The drawing that Dave submitted is self-explanatory.



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15 year old Franz Martinsen of Hayward, California, submitted the following idea: "Since my father's

hobby is photography, he enlarges many pictures. In order to protect them well he uses heat shrinkable material similar to the polyester films being used today. For covering wings I found the material can be used just like these films. It is heat sensitive and can be shrunk over ribs in the conventional manner. However, Varathane polyeurethane paint is the only paint that sticks well to this material. Dope adheres well but flakes off with use. I would recommend the material only for sailplanes since it is not fuel proof, the adhesive being affected by normal glow fuels. The important thing is the economy of this material. You can cover a wing for 1/10th the price of the conventional covering materials. It comes in 200' rolls and is 28" wide. The price is only $20.00 for the roll compared to a similar amount of a conventional commercial film which would cost approximately $200.00. It comes in two finishes, matte and glossy. Use only the glossy for the wings since it is much stronger. It is available from large photography stores and is made by the manufacturers of the Sealector iron that you use for heat shrinking your polyester films." □

TAKE A LOOK AT THIS..

Jetline Products, Box 22, Bellevue, Tennessee 37021, has introduced their 180° servo. Intended for use with mechanical retract gears through the operation of throttle control, this servo eliminates the need for a fifth channel. Power for the servo is 4.8 volts or 4AA size pencells. Over 4 pounds of static thrust is available from Jetline's new servo. The price is $19.95 direct from Jetline Products.

Ace RC Inc., 203 West 19th Street, Higginsville, Missouri 64037, has produced an Owners Manual for their Commander 72 series of pulse proportional systems that equals or surpasses the manuals provided with the larger digital proportional systems. If you are looking to put the fun back in flying, and want something you can fly in a small area after work and between flying sessions with the gas gulping monster that you fly on Saturdays, we strongly suggest that you look into the new Commander 72 series of single channel proportional systems manufactured by Ace RC. It is interesting to note that Ace RC is currently selling more single channel systems than ever before in their history! This is simply because many RC'ers have discovered the fact that they can fly a small .010 to .049 airplane in a vacant lot or school yard every evening for an hour before dinner at less than a tenth the cost and with far less fuss and bother than the big ship that has to wait for the weekends and the regular flying field. We suggest you take a look into these 3 ounce systems and put some fun back into your flying.

*

Joy Products Company, Inc., P.O. Box 374, Menominee, Michigan 49858, announces the release of their new super scale kit of the famous Aeronca Collegian popularly called the C-3. The Joy C-3 kit is a superb scale kit with all outlines, ribs, etc.,

accurately scaled. The model may be flown with 2, 3, or 4 channel radios. The kit is complete and includes the following: cast aluminum motor mounts, pinned hinges, scale aluminum control horns, brass turn buckles, rigging cable, brass rod wing struts, all formed wire, ABS cowl, foam seat material, instrument kit, complete decals, documentation, all sanded grade "A" balsa, all parts die-cut and 2 sheets of rolled plans. Scale is 2" = 1", with a total wing span of 72" and a flying weight of 5½ to 6 pounds. Power is from .30 to .40. Price of the kit is $49.95.

*

Cannon Electronics, 13400-26 Saticoy Street, North Hollywood, California 91605, announces the release of their new Executive IV R/C System. This system reflects a major price breakthrough for an American built four channel set. It is completely assembled with four servos and all other components normally supplied with four channel systems. It features a beautiful, practical, hi-impact plastic cased transmitter. The transmitter has perfect balance, and this, along with the contoured case, makes the most comfortable feeling package flown to date.

The servo mechanics are by D & R Products (they make the famous Bantam servo) and are the finest available today. Also featured is a separate shock-proof isolation transformer battery charger for the nicad powered transmitter and flight pack.

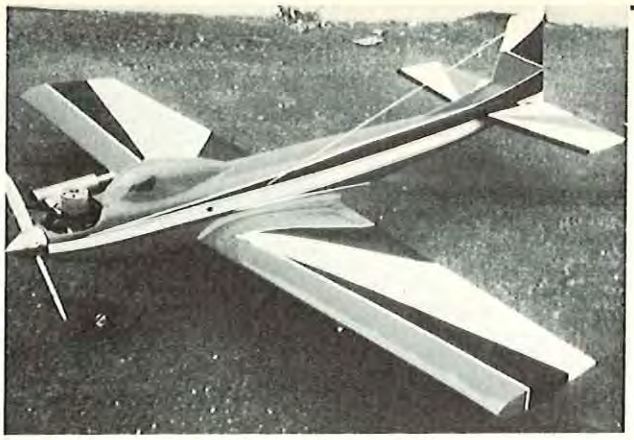
The New Executive IV system makes extensive use of integrated circuits. The decoder section of the receiver utilizes two I.C. chips, which greatly increase reliability and stability over older type decoders. The integrated circuit in the servo amplifier incorporates a bridge circuit design. This allows use of the latest three wire servos and 2 wire battery system. The servos are small, powerful, (more than enough power to fly the hottest 60 powered models), very fast, extremely smooth in operation, and have the excellent centering usually found only in sets costing hundreds of dollars more.

The entire system is small, lightweight, (about 10 oz. including a 500 Ma. pack) and presents the most attractive overall appearance seen to date.

Model introductory price is $209.95. Regular price is $249.95.

*

One of the handiest items we have seen is a new 12 volt soldering iron from Universal Developments, P.O. Box 5253, Orange, California 92667. Designed to operate from your 12 volt



El Camino

The EL CAMINO is capable of all A.M.A. and F.A.I. maneuvers. It features a tapered progressive airfoiled wing. The kit is of highest quality, all parts are accurately machined. An outstanding feature is the indexed construction which makes it easy, fast and accurate to assemble. Kit includes all necessary hardware.

Wing Span: 58"
Wing Area: 625 sq. in.
Weight 6¼ lbs.

KITTED BY J & E ENTERPRISES
6910 Oran Circle
Buena Park, California 90620

car battery, or from your 12 volt motorcycle starting battery, this English made soldering iron comes with an extremely long cord and 2 large aligator clips for attaching to the 12 volt battery. A fine pointed tip is included along with a complete booklet on how to solder and how to use your 12 volt iron as a field repair item. Retailing for $7.95 with extra tips priced at $1.20 each, we believe that this unit will be an invaluable field repair tool for any RC'er. Tested, Approved, and Recommended by RCM.

*

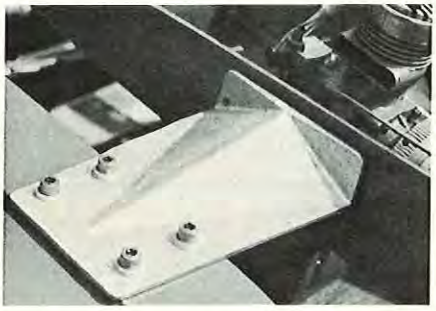
The new AME Heat Gun from Aero Model Engineering, 4241 Harbinson, La Mesa, California 92041, is designed to provide exactly the right amount of heat for shrinking Super MonoKote or Solarfilm. This heat gun, when used in conjunction with a pad of Kleenex, provides an absolutely scratch-free and beautifully finished surface without the scratches and iron marks normally associated with the application of these polyester films with standard

household or travel type irons. No better way of applying Super MonoKote has yet been discovered than with the use of a heat gun, and the AME heat gun is the finest we have tested to date. Tested, Approved and Recommended by RCM.

*

Octura Models, 8148 No. Milwaukee, Niles, Illionis 60648, has released their Wing Dings. These units are high strength aluminum casting weighing 5½ ounces per pair and are used to facilitate building an outrigger type RC model power hydroplane. Designed to be used in conjunction with either the Octura 5-50 or 4-40 motor mounts, the Wing Dings provide fast, strong construction of outrigger type hulls. Holes for mounting

sponsons are drilled, but side mounting flanges are undrilled to permit adapting to the builder's individual requirements. The Octura Wing Dings, suitable for hulls from 30 to 40" long are priced at $6.75 per pair.



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Kraft Systems, Inc., 450 W. California Ave., Vista, California 92083, 1972 line is a great step forward in radio control. Years of research and design effort have culminated in one of the most reliable and nearly perfect R/C systems yet developed. Nothing has been compromised. The following summarizes the new features.

(1) **Servos.** The new custom integrated circuit has been designed by Kraft Systems to produce the ultimate in digital servo. It should not be confused with other integrated circuits used by competitive manufacturers. There are 57 transistors, 5 diodes, 63 resistors and 2 capacitors housed in the integrated circuit package to produce centering and tracking accuracy better than 5%, virtually zero drift with changes in temperature and voltage, uniform duty cycle in both directions, and excellent damping characteristics.

Additionally, the design incorporates a bridge type output which means that the servo motor operates on the full battery voltage and that only three wires are required for operation. This also permits system operation even though one battery may be dead or shorted.

(2) **Control Sticks.** To take advantage of the inherent accuracy of the new servo, the control sticks have been redesigned, incorporating a new potentiometer specifically developed for accuracy and minimum drag. This new stick features centering and tracking accuracy of better than .5% which produces a system accuracy with the new servos of better than 1%.

(3) **New Batteries.** All previous types of battery packs have been dropped in favor of a new pack using a special heavy duty, vibration resistant battery design, which should end the battery problems that have plagued all radios in the past. In addition to vibration resistance and superior cell construction, the new cell features fast charging and the packs can be fully charged in four hours. These new cells are used for both the transmitter and the receiver.

(4) **Transmitter.** The new transmitter cases are smaller for greater convenience and better feel. An entirely new RF section is employed for higher RF output.

(5) **Antenna.** A new positive locking antenna has been designed which retracts into the transmitter case. When retracted, it is disconnected and RF radiation is at a minimum, thus avoiding interference with other radio control systems should the switch accidentally be left on.

(6) **Dual Conversion Receiver.** This new design is optionally available at extra cost and will perform reliably in many areas where existing receivers do not. It has an extremely selective RF front end, combined with dual conversion, to virtually eliminate all spurious responses. Image response is down more than 50 db.

(7) **Single Stick KP-2S.** Because of many requests, a single stick version of the KP-2B will be available. It features the same 2-axis control stick used in our 3, 4, and 6 channel sets and should enhance the already great popularity of this system.

(8) **Compatibility.** Kraft has tried in the past to maintain a reasonable compatibility from one line to the next. However, there is a definite break away for 1972 in some respects. The '72 servos are compatible with '71 sets but not earlier models. All earlier model servos ('67 and later with proper plugs) are compatible with the '72 receivers. However, '72 servos and earlier servos cannot be mixed.

All battery packs are interchangeable with appropriate plugs, and the center tap wire has been retained in the system, both for compatibility with earlier servos and also to permit the Multicon retractable landing gear amplifier to work without modification.

The '72 models KP-2B and KP-2S have been redesigned electronically and now use the same encoding and decoding scheme that is used throughout the rest of the line. This means that 2 channel airborne systems can be matched to any 1968 or later Kraft

transmitter. Previously, KP-2B systems, were not compatible with the rest of the line.

In addition to the above, all systems will be run in for 24 hours on a special test fixture prior to final alignment. Pre-aged crystals will be used throughout to virtually eliminate long-term alignment drift.

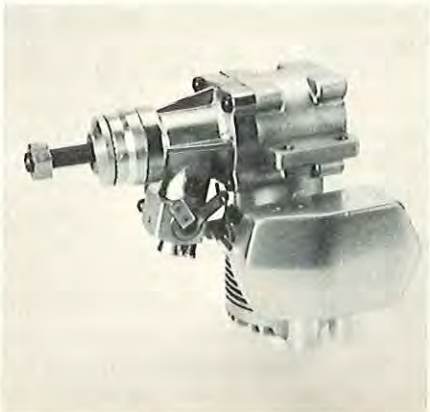
Dual frequency sets will have specially matched crystals, making it possible for our service stations to conveniently repair them. The dual frequency option is not available with the new dual conversion receiver.

*

Tatone Products, 4719 Mission Street, San Francisco, California 94112, now has a new exhaust manifold available. This manifold was designed primarily for scale models with inverted, cowled in engines such as the Ryan STA and other similar type planes. Cast in aluminum, this manifold is deep and narrow in cross section and contoured to fit inside most cowlings. It has two exhaust tubes to allow maximum exhaust removal and minimum heating. To keep the inside of the cowling clean, two lengths of special rubber exhaust tubing are provided for each manifold. These are attached to the exhaust tubes and exit through the bottom of the cowling. Also included is a mounting strap and hardened stainless steel screws for attaching the manifold to the engine.

This manifold is made in one size only at the present time, for engines .45 to .80 disp. Price is $5.95, Catalog No. EM-S.

Some may prefer to use this manifold as a regular muffler or on upright engines. In this case, the tubes would have to be re-positioned. As a special service, Tatone can install the tubes to the customers specifications at 50 cents per tube. □



CUNNINGHAM ON R/C

From Page 18

when discussing their aircraft, they mean that the airplane will takeoff, fly around in a docile manner, and is easy to land. Many modelers tend to get somewhat confused as to their ability to "fly" and tend to try an aircraft that is a bit more than they can handle comfortably. When they read the words "this is a flying dude" they tend to think that the aircraft will fly by itself. I really feel that all of us who have been in this game for sometime are not as helpful to the newcomer as we could be, simply because we confuse him with the word "fly". When you read an advertisement for a new kit, take the time to study the aircraft to determine just what type of plane it really is. Don't get conned by the word "fly". If the aircraft is designed to "fly the entire AMA pattern with ease" chances are that you as a beginner would be better off to look a little further. This airplane is going to be beyond your capacity for control, and once ready to take to the air, may be returned to kit form in a very short order!

Perhaps the biggest single drawback is that we really don't have positive categories into which to place each aircraft. Also, some planes are touted as a "trainer" when they more rightly should be advertised as an "advanced trainer". It is impossible to regulate the industry, so the alternative is for the modeler to take the time to reason for himself just what seems to be the best airplane for him. This is tough to do without some degree of help from a more experienced flier, but just by making a reasonable assessment of most aircraft you can determine if it will be good for you or not.

Have you ever purchased a new kit and, after examining its contents, started wondering just why in the world the designer and kit builder decided to make it such a blasted pain in the neck to build? The same holds true for many magazine plan models. Some aircraft are a beast to build. For those of you new to this sport it can come as a great surprise to find out how so many people can make it so tough to get a reasonably simple job done. But, if you have purchased one of these tough kits, then your only course is to build it just as designed, even though you may be slightly swearing under your breath all of the time that you are gluing stick A to stick B. The main, underlying purpose in building the aircraft is to get a machine into such condition that it can take to the air and do what it is supposed to do - - - fly. (There's that word again). When you're building it, be it of simple or complex construction, build it strong. To build it strong, you make good glue joints with a good strong adhesive. One that will dry rapidly, and yet, when dry, will be strong and flexible. There is one quick dry epoxy glue on the market (not Hobbypoxy and not Devcon) but generally sold in hardware stores, that does dry fast, but it is as brittle as glass. When flexed, it will shatter. This epoxy is absolutely worthless for our purpose. By a strong glue joint, I mean one that has good adhesive spread between the surfaces, and a little slopped around the joint to give added strength to the structure. Some few years ago when radio sets weighed between thirty and forty ounces the structure of the aircraft had to be very strong just to keep the radio in place on landing. Lots of builders and fliers believed that you had to use very light wood, and very light structure wherever possible to make up for this great radio weight and the weight of the beefing up around the radio area. This was fine provided your aircraft didn't slap the ground a little hard on landing. But if it just bounced in on a raunchy touch with the ground, you generally had a basket case. Today, with the super-light radio equipment and super-super power engines, you can build your dream ship out of harder, more dense balsa, and add the extra luxury of good glue joints and well-braced structure. One of the easiest ways to do this is to use both spruce and plywood at critical places in the fuselage framework, and in the wing center section. I don't know how many planes I have seen fold up and die in the air because the wing center section folded up under the strain of a high speed dive and quick pull out. Just a little added plywood and fiberglass at the center section would have saved an entire aircraft. When you are building your aircraft, make good glue joints, and add a little extra muscle here and there, even if those complicated plans don't show it. A very good example of what I have been talking about was in the center section of the Jensen Kwik Fli II kit. This kit, in all

other ways was a real beauty, but at the center section of the wing it was a nightmare of overlapping spars, trimmed to a special way. I built one several years ago, and must confess that when I came to this part of the structure, said, "What the heck," then I cut off the overlapping spars with my Zona Saw, added a bit of plywood bracing, wrapped the wing center with a band of fiberglass and had a super tough wing. If you're building a plastic model ARF and the instructions say to liberally coat the center section dihedral brace with epoxy and glue the wing halves together, by all means, **don't** spare the epoxy. This dihedral brace and epoxy are the only thing between you and a crash, so use lots and lots of epoxy. If you do it the way that the manufacturer instructs you to do, you will come out o.k., but if you skimp on the epoxy here (and in this case I strongly recommend Hobbypoxy Formula II 'cause it dries slower and will allow you to mix up a large quantity all at one time) you may have less than happy results.

While on this subject of sticking wings together, a lot of builders seem to have trouble getting two halves of foam wings lined up at the center section. When you are ready to stick the two covered sections together to make one wing, line everything up on a dry run, but don't use any glue yet. Line them both up and be sure that the trailing edges match, and that the very center of the wing leading edge matches on each half. Make some marks with a washable nylon tip marking pen to aid you in making this joint again in the same place. Next, get several round toothpicks handy to use as joining pins. Mix up a batch of Formula II glue and smear it all over the center dihedral brace and the wing halves, and cram some into the dihedral cavity in each wing half. Put the dihedral brace into this wing half and get as much epoxy down into the cavity along with the dihedral brace as possible. Next, smear epoxy glop all over the other wing cavity and slide this half over the dihedral brace. Bring the two wing halves together and look to see if your marks line up. If they don't, juggle the wing halves around until they do. Then take an ice pick and make small holes in the leading edge of each wing half near the center section, then insert the round tooth picks into these holes so that they enter into one half and stick into the other half. Do the same at the trailing edge. Make sure everything is lined up. If it isn't, now is the time to change it. Later will be too late. Too many builders make the mistake of gluing the dihedral brace into one wing half with quick drying epoxy, and then when it comes time to glue the other half to it they can't get the joint perfect because there is no adjustment to the rigidly set side. When you are sure that your glue joint is perfect then set the wing aside to dry. I usually prop my wings up on a couple of foam blocks set about ten inches out on either side of the center joint. I use a piece of wax paper, lying on top of the building table, to catch any of the epoxy that may ooze out of the joint. Let it all set up completely, and when it is dry, you will have a wing that is perfectly joined.

•

The Fort Worth Thunderbirds are going to hold a pattern meet that may be of interest to all of you fliers who live in the Texas, Oklahoma, Louisiana, and New Mexico area. This will be for all classes, and is to be held April 29 and 30. The main feature of this meet will be to provide an early contest stressing good fun, good food,

and good drink. The Thunderbirds will host a free banquet Saturday night, complete with Barbecue and all of the good brew that you can hold. Prizes and awards will be in keeping with their usual high standards, but the emphasis for this contest is to get the season started right, and to provide the contestant with a real Fort Worth welcome. For further information, write to the Contest Director, George Ware, 609 S. Lake Street, Fort Worth, Texas. This is an AMA sanctioned event.

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One further reminder, the third annual National Fun Fly will be held at Thunderbird Field in Forth Worth, Texas, June 17 and 18, so start making your plans now to attend this fun event. More about this years meet will be in future issues.

Good Luck, and Good Flying. □

SUNDAY FLIER

From Page 16

of several weeks, so different air conditions existed, and it was necessary to double check in some cases; what might appear to be best under one set of conditions could be different under warmer air, or even the barometric pressure could change the air density. So, I cross checked and flew each section against the others several times.

First, since I already had the wings, I flew the Eppler 385 section against the Davis type laminar flow section. I almost knew in advance what the result would be, since I had been

flying these wings in contests, and would select whichever section I believed to be most suited for the conditions. I knew, for example, that the 385 would float on a lighter thermal, and, because it was slower, could turn inside a smaller one. But, if there was a wind, then I'd use the laminar section because it was faster, and when the thermals drifted downwind, you needed the penetration to get back upwind faster without losing too much altitude. Also, I'd use the laminar section if there was a speed event in the contest.

The tests turned up some interesting comparisons. The 385 section, on the average, took about two minutes and 45 seconds to descend; the laminar flow section averaged twelve to fifteen seconds less. Roughly, then, about an eight percent decrease in performance. Balance this off, though, with roughly the same increase in distance covered due to the greater speed of the laminar section, and you can readily see that you have to make a decision more on the basis of the air conditions than you do on the airfoil shape.

Next, I made comparison tests between the 385 and the Cirrus section. Here, the difference in descent time was even less, although the 385 did consistently stay up slightly longer – five to ten seconds. As in the case of the laminar section, the Cirrus section covered more ground – but not as much more as did the laminar.

The test comparisons between the laminar section and the Cirrus section brought out some very interesting items. Right off, it was apparent that the Cirrus section would go up on tow at a steeper angle than the laminar section without stalling. This meant that the plane with the Cirrus section would get higher on tow, and thus take longer to come down, even if the sink rate was the same. To check it, at least as closely as I could, I controlled the two planes (or rather, one plane but with different wings) on tow so they would wind up at the same release height. When I did that, the difference in descent time was, for all practical purposes, a big fat zero. And the speed was very nearly the same also.

However, the fact that the Cirrus section could consistently go up steeper, and thus get higher, gave it a measurable advantage in quiet air. This advantage would disappear when the wind was strong enough to take them both to the maximum height, right above the anchor point of the high start.

While I was in the midst of these tests, I was idly checking over the top curvature of the laminar section and comparing it with the 385. Except for the leading edge, they were virtually identical. Certainly within the usual limitations of most modeling construction techniques that would be true, anyway. The difference at the leading edge was distinctly noticeable and measurable. That gave me an idea. The Davis type laminar section was practically flat bottomed; wonder what would happen if I shaved the leading edge to the sharper curve of the 385 right at the nose, but with the slightly more gentle transition to the upper curvature just aft of the leading edge. In other words, make it a "flat bottomed 385."

The wing that I was using is built in three sections; the center section is five feet long, with 7° dihedral. The tips are two and a half feet long and removable, with steel pins holding them in place, and the pins can be bent to vary the tip dihedral so that it can be either a continuation of the 7° or swept up to give some polyhedral. I was using about 4° of polyhedral, principally because that was what I had found best for circling in thermals.

So, just to get an idea of the effect, if any, I first shaved the leading edge of the left wingtip panel until it matched the 385 section. Then I recovered it, this time with checkered MonoKote so I would be visibly reminded during the tests.

The results were so noticeable as to almost be called dramatic – that is, while on the towhook. As I would feed in more up elevator, the right wing stalled out every time. So, then I modified that wingtip to the 385 leading edge curve, covered it with the checkered MonoKote to match the left tip, and went back to the tests.

Now, with the wingtips modified to the 385, and the center section still at the laminar leading edge curve, I could pull full up on tow, and the model wouldn't stall on either tip. The center section would start to mush instead. With this combination, the model would go up just as steep as the Cirrus section, and the difference between the flat bottomed 385 and the undercambered section was only about five percent in descent time. But the penetration of the flat bottomed section was noticeably better.

I got a laugh out of these last tests. I was out at the field, checking out the

wing with the checkerboard leading edges on the tips. Bob Andris came out, watched the tow tests, and asked, "Whatcha doin'?"

"Modified the wingtips to eliminate tipstall. Did the left one first, put on the checkerboard covering so I wouldn't forget which, found it didn't stall, so modified the right one, covered it the same way for appearance."

"Seems obvious to me," observed Bob, "if you want to get rid of wingtip stall, use checkerboard MonoKote!"

That ruined the rest of the time for testing, so we went hunting for thermals instead.

And that's as far as I've gone in this test series. There's lots more, and as time goes on I hope to check out additional sections. Like, for instance, the 2412. At the Reynolds number used in the NACA tests (around 3 million) it looks very good compared to other sections. But we are flying our sailplanes at a Reynolds number around 80,000 to 100,000, and things are quite a bit different. There's very little data available in this regime – and what there is is highly suspect. So, although the experiments I'm making are far from precise, they are being made in the environment in which we fly every day, so, even if they're not quantitative, they are qualitatively comparable. And, if you don't agree, then you are free to make your own tests.

So here's a summary. First, it seems obvious that on a warm, quiet day, a lightly loaded glider with a 385 airfoil will give you an advantage, although it is only about 5% to 10% at the most.

Close behind the 385, and perhaps slightly better if the wind starts to come up, is the "flat bottomed 385." And this gets better as the wind gets stronger.

Next comes the Cirrus section – but you have to remember that it varies from root to tip, so it isn't really one airfoil.

Last on the list is the so-called laminar section. Whether it's really laminar in this size and speed is open to debate. In fact, I expect to hear from some of you that the Eppler sections are "laminar." Maybe so.

And then there are some general observations which apply to all of the section.

Consider, for example, the rate of sink. All of the wing sections were within a few seconds of each other if the release altitude was maintained at about 300 feet – and the number of seconds was generally around 150 – perhaps slightly more. But this would seem to indicate that the rate of sink is around 2 feet per second. Does that agree with what you thought it was?

Next, if the rate of sink is around 2 feet per second, and the forward speed of our gliders is around 20 miles per hour, then the glide ratio (20 mph works out to about 30 ft./sec.) turns out to be about 15:1. Does that sound right? I don't know; maybe the models are flying slower or faster. I never measured the speed. But if you got 1000 feet high, then you should be able to cover 15,000 feet horizontally – almost three miles – without any help from thermals. Somehow, though, when it comes time to make that goal and return flight for LSF qualification, even a two and half mile flight (round trip) seems like a coast to coast trip.

So, think it over, take your choice of wing sections, build your contest job, and go to it. And remember, you can't lose.

Unless somebody else stays up longer and lands closer.

More next month. □

FEEDBACK

From Page 12

Topeka, Kansas. To those of you who are thinking that such a display involves a lot of work and expense, guess again. Our club contains only 26 members of which 22 displayed 45 planes, 3 boats, and 2 cars. Less than $30.00 was spent on the display. A club half the size of ours could have put on just as good a display. So, you see, it's not all that expensive or complicated and you don't need a large club to do it. But what about the time involved? Not much, really. Three or four evenings will set you up with a fairly elaborate exhibition.

In our first meeting with the management of the White Lakes Shopping Center, ideas of grandeur of another "Toledo Exposition" were soon forgotten and the realistic capabilities of the club began to emerge. It was decided to hang half of the planes from the ceiling and set the remainder on tables inside a fenced off area where club members would be available to watch over the models and answer questions. With the use of 12 30" x 36" poster board material, some old RCM magazines and other magazines, whose identity could not be determined, and 3 evenings work, we soon had 12 very respectable posters covering 7 different pictorial subjects which had been cut from the magazines. For the subjects we chose aerobatics, pylon racing, power and sail boats, strange and unusual aircraft, R/C scale, mishaps, and a special poster aimed toward people showing an interest in getting started. Believe it or not, the posters turned out to be the most work. The rest was as easy as going out to the flying field.

One member wrote a pamphlet which dealt with typical questions asked by spectators, followed with a section covering the benefits of joining an R/C club (and not just any old club either) and an invitation to watch us fly at the local flying site. This pamphlet later turned out to be an invaluable "ice-breaker". Others contributed over 100 slides of R/C scale at the 1968 NATS and a ½ hour length film of the clubs flying activities (which even included some successful flights).

The main exhibition was held on Saturday, while during the preceding week 26 airplanes were hung from the ceiling of the mall to advertise the coming event. The management of the mall provided for news releases in the local newspaper and radio. On Saturday the work of setting up the fence, 8 tables, display screens, and projection booth had been taken care of by the mall personnel. All that was left for us to do was to show up. Another 19 airplanes, 3 boats, and 2 cars were brought in to be displayed on the tables inside the fenced area.

If possible it is a good idea to have a dynamic display. One member brought down a Testors R/C single channel Mustang. It was a tremendous attention getter and the rest of the members stood in line for their turn to

Close-up shot of the planes set up for exhibit on the main floor of the mall.

drive it up and down the mall chasing after all the pretty girls.

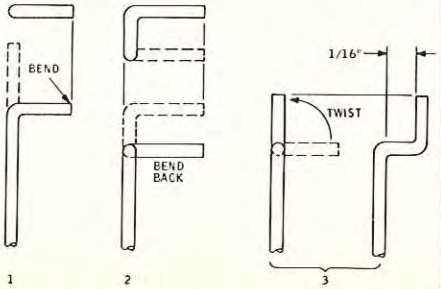
It is an easy, simple exhibition to put on yet it can be tremendously successful with only a little extra effort. The mall has asked us to repeat our exhibition next year and extravagant plans for next years show already include a R/C tank and a R/C derigible for dynamic displays.

Well, that's about it. It doesn't cost much, even a small club can put it on, it won't keep you away from the flying field, and in the three months following the display, our club has grown from 26 to 47 members as a result of the mall display and other publicity.

If you have decided that it's time to publicize R/C and your club in your town, don't overlook the possibility of flying demonstrations and static displays at airport open houses and civic gatherings. The newspapers and television stations are also usually eager to receive "news releases" on any club contests or other activities sponsored by your club. Just be sure not to ask for free publicity from them, but offer a news release on your activity. A phone call will usually be sufficient. Above all, a display in a shopping center mall will offer maximum exposure for a small amount of effort and expense. All that has to be done is contact the local shopping center and set a date and decide what kind of displays you want. But afterwards save any posters that you have made for other public displays, such as local airport open houses and airshows, or to hang on the walls of your workshop, your den, your living room, your bedroom, your kid's bedroom or even your monther-in-law's bedroom.

AN OLD TRICK FOR A NEW BUILDER

Bill Patterson, writing in the "Hear Ye," newsletter of the Valley Forge Signal Seekers, Inc., has been having difficulty in making those "Z" shaped bends on the ends of music wire that show up on so many sets of plans.



Even the tip of needle nosed pliers is too wide to get about 1/16" of straight wire between the two bends. Bill mentions that he was fortunate in having learned the trick shown in the sketch from Dick Francis during a visit to his hobby shop when he had asked him how to make this type of bend. With this, he disappeared into one of the dark corners of the shop and, after a short time, returned with a piece of .045 music wire and, using a pair of heavy pliers he started bending, using the method shown. Quite simple, once you've seen it done.

QUARTER MIDGETS

California: On Sunday, December 6th, the Northrop Modelers of El Segundo, hosted the Orange Coast RC Club at Mile Square, drawing 15 quarter midgets between the two clubs. When it was over Carl Meyl had won the flyoff in 1:58 flying a Fox .15 powered Spirit of St. Louis that weighed 2.55 pounds. The wing and basic dimensions were taken from Fred Reese's Cassutt Special plans published in RCM. Second place went to Don Grove of the Orange Coast Club, flying an O.S. .15 powered Cassutt Special, also from RCM plans. Third was George Alvedo flying a Super Tigre powered Francis P-51. There were 4 Francis P.51's, 2 Cassutts, and 2 others with Cassutt wings, one Minnow and the rest original designs. In the next quarter midget contest, the group intends to go to a 3 pylon course and fly from the center as in Formula I. All contestants use K & B 500 fuel which was provided by K & B Manufacturing, 12152 Woodruff Ave., Downey, California.

The flight line at Mile Square, Dec. 6. 15 quarter midgets competed.

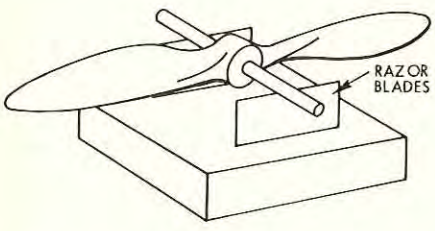
FUEL SOAKED BALSA VERSUS GLUE

If you have a bird that is basically a good machine that you would like to keep around for awhile, but you've had a bad time keeping glue sticking due to oil soaked wood, this hint from Bob Talley of the Oily Boids "Squawk Sheet," of Port Arthur Texas, may be your answer, A product sold in any supermarket called K2R Spot Lifter, a product sold to lift grease spots out of cloth, will also work with balsa wood. This product comes in either spray cans or in a paste form, and Bob found that the spray seems to work the best for balsa although either would be satisfactory. You merely spray or spread the material on the oil soaked wood, let it dry, and in a few minutes a white powder will appear on the surface. Brush this off and repeat as many times as is needed. On balsa that has absorbed a lot of oil, do this until the surfaces become dry. Then wait overnight and the oil will re-appear from the bottom pores out to the surfaces again and you can have another shot at it. A test by Bob on an oil soaked tail that epoxy would no longer hold on was given this treatment and, after about 15 flights, it was still holding perfectly.

THE SUBJECT IS PROPELLERS

Propellers, that's the thing you bolt to the front of the engine. There is an old saying that the hand is faster than the eye. It turns out that the propeller is faster than both the hand and the eye as demonstrated by the number of modelers doing a jig while shaking their hand in the air.

After buying a new engine, how many of us take the time to read the instructions, especially as to the recommended prop to use. Really fellows, the manufacturer does know what is the best size prop to start with. Many times a new flyer (old gray haired ones, also) will use any old prop



they happen to have or one they have used on another size engine. Maybe I should tell what diameter and pitch are: diameter is self-explanatory. Pitch is the distance forward that a prop will move in one revolution in a solid mass if there were no slippage or losses. A low pitch prop (4-5) gives a lot of power with relatively slow aircraft speed. When starting with a new engine a good policy is to buy the manufacturers recommended size and one pitch higher and lower. Break the engine in on the recommended prop and also use it for the first flight. After you know the characteristics of your plane try the other props and then use the size that works best with your aircraft. If you put the engine in a different aircraft, follow the above procedure to select the best prop for that airplane.

Two items that must be stressed are **never** use a nylon prop on engines larger than a .35 (preferably never use nylon props). If you insist on using nylon props, boil them for 1 hour to relieve the stresses developed during molding and if you are nuts enough to fly in cold weather (below 40-50 degrees) always use a wood prop. *(Clarence Lee uses nylon props – to stir paint, etc. – Ed.)*

The second item is: all props should be balanced, both nylon and wood. The worst thing you can do to your radio equipment (other than crashes or throwing) is to use unbalanced props. They generate high vibration levels. A simple balancer can be made with two razor blades and a ¼" rod. To balance a prop, level the razor blades and place prop on rod across edge of blades. Determine the heavy side and sand the entire blade area until it is slightly light (by sanding the entire blade area there is a minimum change to the airfoil shape). Now dope the sanded blade to bring the prop into balance. Do not cut off the tip or change the shape of the blade as you will change its dynamic balance and could end up with more vibration than you would have had you never touched it. Now is a good time to get a supply of props all balanced and ready to go for Spring. From Jack Finn, Cedar Rapids Sky Hawks 'Log Book.'

DID YOU KNOW THAT:

Unless you wash your hands carefully after using epoxy, you could cause a swollen face or puffy eyes should you rub your face too soon after using. This is not true in every case, but could cause irritation in those people sensitive to allergies. The tip is from Paul Harvey in a recent radio broadcast and printed in the Palm Beach Aeronauts "News." If Paul Harvey's face appears swollen or blotchy in current TV programs, it is because of working over an RC model in his basement workshop!

Another excellent idea from the Aeronauts is that if you should have trouble with warped hardwood spars in a kit, or obtaining same for an original design, consider substitution with a built-up box spar. These are light, easy to make, warp free, and extremely strong. Basically the box spar would consist of two strength members connected by two outside webs. For example, two ¼" square strips boxed in by 1/16" x 3/4" sheet sides would make a spar 3/8" x 3/4" that would be surprisingly strong and true. By the way, making a tapered spar is a cinch by this method as well.

CUMBERLAND FLYERS

If you are in the Fort Campbell, Kentucky or Clarksville, Tennessee area, the Cumberland Flyers meet on the first Tuesday of each month at 7:30 p.m., at the Northern Bank of Tennessee, New Providence Branch, 656 Providence Blvd., Clarksville, Tennessee 37040, according to James Smallwood, president of the Cumberland Flyers. Although a small club with only 15 members, the Cumber-

land group were extremely active as Sunday flyers until they held their 1st Class A Pattern contest in 1971. A very successful event, 7 club members entered and attracted approximately 300 spectators. The contest was quite smooth and experienced no difficulties or problems while safety was enforced and everyone had a pleasant day and were pleased with the results. According to James Smallwood, competition is a good way to generate interest in an RC club. The Cumberland group was exceptionally fortunate in securing the cooperation of the Fort Campbell Special Services Department who secured an RC field for them as part of their recreation program for the military who like to fly and the Cumberland Flyers fly there as guests of the military club members. If you are a newcomer to RC, or a Sunday flyer looking for a local club and you live in the Fort Campbell, Kentucky, or Clarksville, Tennessee area, contact Jim Smallwood and plan to attend the next meeting of the Cumberland Flyers.

MESQUITE MODELERS

Major Merrell S. Beebe, 125 Mason St., Fort Huachuca, Arizona 85613, is the secretary-treasurer of the newly formed Mesquite Modelers of Sierra Vista. Although new, and still growing in membership, the Mesquite Modelers have already had a full page write-up in the Sierra Vista Herald Dispatch during December 1971. This was an extremely favorable write-up and mentioned many of the activities of the Mesquite Modelers as well as presenting a full page of photographs of various members of the club engaging in their flying activities. Our congratulations to the Mesquite Modelers and their president Donald Mulligan for this "good press" which is so sorely needed in the sport and hobby of radio control. Mesquite Modelers also invite flyers in their area to contact them with regard to joining their club.

Part of the membership of the newly formed Mesquite Modelers of Sierra Vista.

just because the weather is cold. Many fliers start their engines in below-zero weather all the time without them. If you are going to use a starter, then the starting technique remains exactly the same as for hand starting. Except when it comes to the flipping of the propeller you use the starter, i.e. choke the engine two or three times, give it a small exhaust prime and flip the prop by hand a couple of times, connect the starting battery, and hit it with the starter. I think that if you follow this technique you will suddenly find your starting problems no longer exist.

As for any detrimental effects caused by starters, there are none as long as you apply a reasonable amount of pressure. The bearings used in model engines are designed to take thrust loads from either direction. I realize that there are some ham handed clowns who will try to push the engine out the back of the airplane but with just enough pressure to keep the starter from slipping on the spinner you will do no harm to the engine. However, always be sure to flip the engine a couple of times by hand first, especially if an inverted installation. It is almost impossible to get a hydraulic lock with an upright engine but it is quite possible with an inverted one; i.e. the combustion chamber full of fuel so that the engine cannot turn over. If you should happen to have a hydraulic lock and hit the engine with an electric starter, bad things are going to happen, such as bent rods, broken wrist pins, etc.

Regarding a starter survey, we will take it into consideration. Possibly a future column. Of the three brands presently available, all three do an excellent job.

Dear Mr. Lee,

As you probably know there are many problems in installing a retractable nose gear and cowling the engine at the same time. As a possible way around the problem I would like to mount a Max .60 G.P.R.V. inverted (ala Chipmunk) and rotate the carb and back plate 180 degrees to up-right position. This would allow the tank to be raised enough to clear the nose gear mechanism without flooding the engine.

My question is will this rotation of the rear rotor back plate have any bad effects on the top end or will it even run in this position? As I see it, as long as the tank is ½" below the needle valve no flood out should occur.

Thank You
Ed Vollmer
St. Joseph, Mo.

Ed, I don't have a rear rotor O.S.

.60 handy to check the back plate to see if this can be done. However, you can easily do it yourself. In order to rotate the back plate 180 degrees, and have the engine run, there is going to have to be a crankshaft drive pin hole 180 degrees to the regular one. If such a hole exists then you can rotate the back plate and the engine will run as well as in the standard configuration. Many models of your Super Tigre are this way but I am not sure about the O.S. If the extra drive hole is not there then you cannot rotate the back plate unless you make a new rotor valve unit. Frankly, I do not recommend the inverted installation due to the idle problems it will induce.

Dear Mr. Lee,

I am using a new McCoy 40/RC Series 21 with a Perry carburetor and find that I cannot get the engine to 4-cycle with either a 10-6 or 11-4 prop. Once the needle valve is opened enough to keep the engine running full chat, I can keep opening the valve with no apparent effect on the engine until the valve practically falls out. This makes it impossible to 'listen' for proper engine operation. On one flight, the engine quit cold in the air and simply by opening the valve another 2 full turns, again with no discernable engine performance change, I had no more trouble. Summarizing, I have yet to hear this engine 4-cycle from a rich mixture. However, when the valve is way open, the idle does seem to get a little erratic and 'juicy'. Incidently, I am using Fox Duke's Fuel with 10% Nitro.

Yours Truly,
Dick Swartmont
Penn Laird, Va.

Evidently something is obstructing the flow of fuel somewhere in your fuel system, Dick. Start with your tank and make sure there are no obstructions or leaks in the pick-up tube. If, by chance, you are using one of the sintered bronze clunk filters, get rid of it. These have a tendency to plug up and restrict fuel flow. Make sure your tank is positioned correctly and not too low. Also, be sure there is no excess distance between the tank and the engine. An engine can only pull the fuel so far and, if your tank is low and farther from the engine than necessary, the engine will not be able to get enough fuel. If all is okay to this point and the problem persists then the trouble must be in the carburetor. Remove the small aluminum fuel nipple from the carburetor body and make sure there are no obstructions here. Disassemble the carburetor and check for any foreign matter, burrs, etc., around the slot in the idle mixture adjusting disc and square hole in the brass spray bar tube. Next to the narrow slit in the idle mixture adjusting disc there should be a small

hole. Make sure that in the high speed position this lines up with the square hole in the spray bar tube. This hole governs fuel flow at high speed. If the holes are misaligned, egg shape the hole in the aluminum idle disc so that they do match up. By checking out the above mentioned things, I am sure you will find the obstruction.

Mr. Lee:

In the Spring of this year I purchased a Webra .61, hoping to get the necessary rpm's for competitive flying.

I notice some of the top competitors, such as Martin, Kraft, Chidgey, Page, Edwards and so on, use this engine, and they seem to really turn on. How do they do it?

I have tried everything I can think of, such as home brew to commercial fuels. I even tried the mix that is on the instructions for the Webra, which is 17% oil, 5% Nitro, 78% Alcohol. In the prop department, I have tried 11-7, 11-8¼. I have tried different glow plugs with different fuels, and props. The props were balanced, tried and checked again for balance. With and without a spinner. With and without a Silence-Aire muffler. Also, with a Kavan carb. Have also checked fuel tank location and fuel line routing for leaks in the fuel line.

I just can't seem to tweek any more than 10,500 from the engine. The tach used was borrowed from the Combat Electronics Division of the Philadelphia Ship Yard, and reads direct divided by 2.

Now I have a few other questions which I'll make brief.

Does Nitro give rpm's?

Does a higher Nitro content help in cold weather? Say from 10% to 15%?

You have probably guessed that finances are of some concern, otherwise I would just go out and buy a H.P. .61 and forget about my Webra.

Thank You
Bruce

Fellows such as Kraft, Chidgey, Doc Edwards, etc., have been in this R/C game a long time and have learned how to get the utmost out of their engines. They start out with the correct fuel, correct prop and glow plug, break the engine in properly, and run it correctly thereafter. It is hard for me to say exactly what your trouble may be without ever having seen your engine or how you have run it. Evidently somewhere during the break-in period you have unknowingly done something wrong: Run the engine on a dirt field, run it too lean, used fuel that did not have enough lubrication, etc. Along that line, although Webra's fuel formula calls for 17% oil, this is not near enough and may be part of your trouble. You can get away with 17% if you always fly on the rich side and never really work the engine. However, load it down with a little too much prop (such as the 11-8¼), run it a little on the lean side, and you can expect damage to the engine with only 17% oil. You should never run less

R.C.R.C. 12TH ANNUAL RC CONTEST

DATE: May 6 – 7 1972
SITE: Old Huntsville Airport
TIME: 8:00 AM – 6:00 PM Saturday
8:00 AM – 2:00 PM Sunday
HEADQUARTERS: Ken Bar Inn Motel - located on So. Parkway
ACCOMODATIONS: Two motels within walking distance
on site camping also permitted
EVENTS: R.C. Pattern (class A, B, D novice, D expert), RC Scale (AMA)
For further information please contact: "Red"Scholefield, C.D. or Gary Martin, Pres. RCRC, 3412 Hutchens Ave., Huntsville, Alabama 35801

than 20% and 22% is a much more desirable figure. And this for a broken-in engine. During the break-in you want at least 25%. If, during the break-in, you got in a few lean runs with a low oil content fuel, the damage was done. No amount of additional running with more oil, at a richer setting, etc., is going to undo the damage already done. Once the sleeve or ring is scored, the rod galled, etc., they stay that way. If you are only getting 10,500 out of the engine, something is seriously wrong. Most of your competition fliers are using Cox blue can fuel and the Fox glow plug. Prop sizes vary from 11-7 to 11-8. Try running your engine with the Cox fuel, Fox glow plug, and an 11-8 maple Power Prop. The engine should turn close to 12,000. If it still only turns 10,500 the only thing to do is return it to MRC for service.

Regarding your other questions, a heavy spinner isn't going to hurt the performance of the engine in any way other than if it is out of balance it is sure going to cause severe vibration. Also a heavy spinner is going to have a strong gyroscopic effect. Any quick change of direction of the airplane will have a twisting action on the engine which, in turn, could break loose the mounts or firewall, if radially mounted. Nitro-methane does increase the rpm of an engine. However, after the first 5%, it takes a lot of nitro for a small gain. The difference between 5% and 15% nitro content fuel being maybe only 400-500 rpm. Higher nitro content fuels will help in cold weather simply because they will run hotter and the addition of nitro does aid the starting. However, do not use more than 15% nitro in your R/C stunt fuel.

Dear Mr. Lee,

I have an Enya .15 RC which I broke in on nitro X stunt formula and have been flying it on it for some time but the engine still kept tightening up. I switched to Indy No. 1 fuel 15% nitro. The engine didn't tighten up, but it's throwing out a lot of black gunk from around the prop drive hub. Why? Will it hurt the engine? Back in my ignition days if the engine started spitting out black gunk, we had to change fuels.

Thank You
Wm. G. Mitch
Merrillville, Ind.

Any time you detect black residue coming from an engine it means you have metal-to-metal contact and the cause should be determined immediately. I would guess in your case, Bill, that during the initial break-in some of that tightening up you experienced was due to a tight fitting crankshaft. The crankshaft was probably scored

and now it keeps grinding away at the bearing. It would be best to disassemble the engine and check it out. If the crank is scored you can probably clean it up with some 360 grit emery paper. If the bearing is scored, wrap some 360 emery paper around a dowel and clean it up. Just be careful not to remove any more material than just necessary – just the high spots caused by the scoring.

Dear Mr. Lee:

I was given a new (in the box) Red Head McCoy .60 engine which I converted to RC use by installing a Kavan carburetor. My problem is this: 1) The shaft diameter is 5/16" over which a 7/16" sleeve screws on and becomes the base shaft for the propeller. Since this engine is rated by the manufacturer to deliver 17,000 rpm I'm afraid to drill out my prop holes to 1/2" for fear of weakening them or drilling the holes off center and causing excess vibration. I have a 1/4" electric drill and before I try I wanted to ask you if you thought the procedure was safe. 2) Also, I was contemplating the elimination of the propeller spacer and mounting a Veco spinner on the engine. I know I'll have to slot the back plate of the spinner to receive the shaft key and also the prop hole, but that 5/16" crank shaft is still a problem. Does Veco or anyone else sell a spinner nut threaded for this size shaft or is there a better way of doing it?

I have enjoyed your column in RCM very much, finding them both useful and informative to some extent each month. However, you are to be particularly praised for the style in which you write – it's clear and to the point. Even a guy like me thinks he understands and that's the mark of a good teacher.

Keep up the good work.

Sincerely
Ted Szalinski
Elmhurst, Illinois

You don't have any real problem, Ted. Thousands of guys have been using the Mac .60 in U-control speed for years with that set-up with no problem. And your racing props have much smaller hubs than the R/C props we use now. The only thing that puzzles me is why you would have to drill the prop out to 1/2" when the sleeve nut is 7/16". Actually the nut is a hair under 7/16" in order to fit a 7/16" hole. There is a better way, however. Veco makes an adapter nut the same as the McCoy which will fit a 5/16" shaft but is only 3/8" in diameter. The end of the nut is, in turn, threaded for a Veco spinner stud. This is the same set-up the fellows use that are running spinners on their Veco engines which also have 5/16" shafts.

I wouldn't recommend running the engine without the drive spool. The McCoy .60 is very close coupled and, without the extension spool, your prop would be very close to the engine fins. Also, there would not be enough support for the drive key and it would

tear right out of a thin back plate.

Don't misinterpret that 17,000 rpm figure. That is the rpm at which the engine develops its maximum power. However, this is with a much smaller prop than you will be using. With an 11-8 prop the engine will turn right around 11,000.

If you want to spend a few dollars and drill out your propellers accurately, there is a tool called a counterbore that is available from any machinist supply. Although intended for boring holes in metal it will do the same thing as a drill and has a pilot. You would want a 3/8" counterbore with a 1/4" pilot. With this you always drill your props out dead accurate and it is well worth the investment – usually $5.00 or $6.00. It is the only way to drill out props.

Dear Mr. Lee:

Would you tell me what is considered proper operating temperature, cylinder head temperature measured at the rear, for the various common engines? Looking at old columns of yours, I gather that 350 degrees is about right, and I assume this is in Farenheit. Does this 350 degree figure apply to Veco only, or all makes, or even all sizes?

Sincerely
Will D. Mitchell
Beale AFB, California

The cylinder head temperature of most all of your engines from .29 displacement through the .60's runs between 350 and 380 degrees Farenheit. Anything over 380 degrees being too hot. This is with a normal setting. The engine can easily exceed 400 degrees with a lean setting. Your smaller size engines run slightly cooler. □

VIEWPOINT

From Page 6

pattern and attempt one "touch and go", (optional, but points will be awarded if successful). Additional bonus points will be awarded if the engine is still running after the final landing. Each flyer will fly three rounds. NOTE: If the engine quits prior to takeoff and a prop change is not required the watch will be reset and another takeoff attempt may be made.

Musical pylon event day will be a continuation of the takeoff, left turn and land program. One pylon will be set up along side the downwind end of the runway and another will be set 500 feet upwind. Flyers will be called to fly in groups of four. (Three for limited participation, if you have less than three entered, forget it!) At the

starters direction the flyers will start their engines and, when started, the flyer will stand behind his airplane (helper will be holding it). The starter will flag the start one at a time with about 3-5 seconds (insure plenty of separation) between starts until all have started. The flyers will commence to fly a course around the two pylons using left turns and will clear the runway. The "judge" will insure the runway is clear then turn his back to the planes and at some random time he will sound the compressed air horn (or bell or what have you). When the horn sounds each flyer will attempt a "touch and go" on the runway. He must do so from downwind to upwind and must not "cut" the pylons! If his engine stops or he breaks a prop, or what have you, he is out of that round. If there are no "accidents", the last person to "touch" may not "go" but must stay down. When the judge is sure the runway is clear he will repeat the procedure and do so until only one is left. That one is the winner of that heat and will receive 4 points, the next to last out will get 3 points, and so forth. There will be as many rounds flown as possible and points will be totaled at the end of all rounds. Place ribbons will be awarded for this event as well.

The final event of the Falcon Tournament will be a pylon race. It still requires only takeoffs, left turns and landings and by now all should be very proficient. The course will be set up as prescribed in AMA/NMPRA specifications. Starting order will be determined by Beauty Contest points (most points starts first, least last, and so on). The racing will be conducted exactly as outlined in Formula I and points will be awarded on the basis of 4 for 1st, etc., etc. As many rounds will be flown as possible and at the end of this day all points earned in the tournament will be totaled and trophies awarded accordingly. Special tournament awards will also be presented. For maximum benefit this event should be held on the 4th of July and a picnic should follow the awards presentation. (Labor Day or other suitable days will do).

Special Points to Consider

The beauty contest should be held during a known bad weather month just preceeding the start of the flying season and it should be a "family affair", complete with snacks, cake and coffee or what have you. The judges panel for the Beauty Contest may be 3 or 5 wives of modelers who

are not entered.

The Falcon must be built to kit specifications without "wild" modifications. In other words if it doesn't show on the plans, don't do it!

The engines must demonstrate an idle capability to prevent any "wild" rework jobs. With the exception of the last event it would be of no avail anyway, so why bother?

The control operation required prior to weigh-in is to insure all equipment is installed and operational. This phase should be accomplished by the instructors who can make quick safety checks and give tips.

Each entrant is encouraged to post his colors (one main and one trim) at the Tournament Headquarters (local hobby shop). He may use other colors for trim but by posting colors, individuality is assured. In the event that two or more choose the same colors they should coordinate to insure no "look alikes". All spare parts/planes belonging to each entrant must be identical in color to insure interchangeability, while maintaining individuality.

An overall score board should be posted at Tournament Headquarters and be updated by the conductors or custodian (hobby dealer). A sample is included.

LETTERS

From Page 5

United States operating FM equipment between 52 and 53 MHz, the most prevalent frequency being 52.525 followed by 52.76, 52.78 and 52.72 – far removed from typical R/C operation in the 53 MHz region.

There are, however, six nets operating in the 53 MHz region and they are as follows: Diamond Head, Hawaii, 53.52 MHz; Princeton, Mass., 53.54 MHz; State of Nevada, 53.175 MHz; Dallas, Oregon, 53.46 MHz; Fort Worth, Texas, 53.05 + 53.15 MHz; Seattle, Washington, 53.525 MHz.

Except possibly for the Nevada net all of the above are far enough removed from standard RC frequencies to be troublesome.

Also, most of the six meter nets are being disbanded and being moved to the VHF and UHF regions due to greater availability of commercially made equipment requiring no conversion from surplus equipment. In addition, the net directory has been alerted to advise net managers to avoid operating in the area of R/C fre-

quencies.

I think most flyers on six will agree the chances of being shot down on six are substantially less than on 27 or 72 where the majority of interference is generated by fellow RC'ers.

Sincerely,
Edward F. Eggert WIEGM
Rockville, Conn.

FROM A BEGINNER

Gentlemen:

First, I would like to thank you people for publishing your truly fine magazine. For if I had never begun reading your magazine I would not now belong to that great group and thrilling sport, the RC fraternity and RC flying.

I had been a modeler for years and in casting about for another hobby settled on RC. After reading your review on both a radio and a plane, I purchased both with my summer earnings and proceeded to construct my first plane. Following a good thirty hours of building (and frustration) it was finished.

All of this time I had been thinking and believing, somewhat naively, that I would find someone to fly the plane for me. Fortunately I heard of a club near my home and appeared there one Sunday and after talking with one of the members, he invited me as his guest and agreed to fly my ship. Well for all that could have gone wrong, nothing did. (Well, almost nothing. I managed to hook up the ailerons backward, but the rest, which was correct, was only that way because of what I managed to glean from your magazine.)

I know now that I will probably stay with this hobby for the rest of my life and again I thank you for helping to bring me this complete and utter satisfaction.

Will Swenson
Pomona, New York

CAN YOU HELP?

Don:

I am a modeler, aviation buff, and a lover of films. I am combining these interests by doing research on the history of aviation motion pictures. I wondered if any of your readers would be kind enough to write to me if they know where any information of this type can be obtained.

Very truly yours,
Stephen Pendo
91 Tremont Street
Barre, Vermont 05641