

MODEL BUILDER



volume 7, number 70

\$1.50

OCTOBER 1977



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New Look . . . New Technology . . . New Price Range: Our engineers were given the latitude to take a fresh approach to designing a 4-channel sport flier's radio. They were told not to cut corners and create an economy 5-channel like others have. This one was to be built from scratch. The result: MRC's 774 with features that make it strikingly different and more advanced than any system in its price range.

Fresh Appearance: To begin with the 774 looks different. Its unique size is just right to the touch . . . with contoured side plates for your palms. A ribbed bottom and finger-grip back make for a balanced feel and sure grasp. Modern yet functional.

Sound Engineering. Less evident, but just as new, are the smooth and responsive semi-open gimbal sticks . . . a novelty for the sport flier, long an essential in more expensive sets. The sticks also have external tension

adjustments to let you set the response to match your preferences. And there's a voltage regulator for ease of operation on 9.6 volt nickel cadmiums or 12 volt dry cells. Advanced servos have a Signetic NE544 IC and two output transistors to amplify power. Even the receiver is state of the art, including C-Mos circuit decoder for low current drain and added reliability. You'll find the 774 compatible with all MRC servos. Unlike some others on the market, this 4-channel lets you interchange servos as the need arises. In short, our engineers have created what may well be the prototype for every new sport radio to come . . . including an amazingly low-key price range. Available with 2 servos and battery holder for dry cells or complete with 4 servos, nickel cadmium battery and charger. Send \$1.00 for MCR's 1977 Color Model Aircraft Products Catalog.



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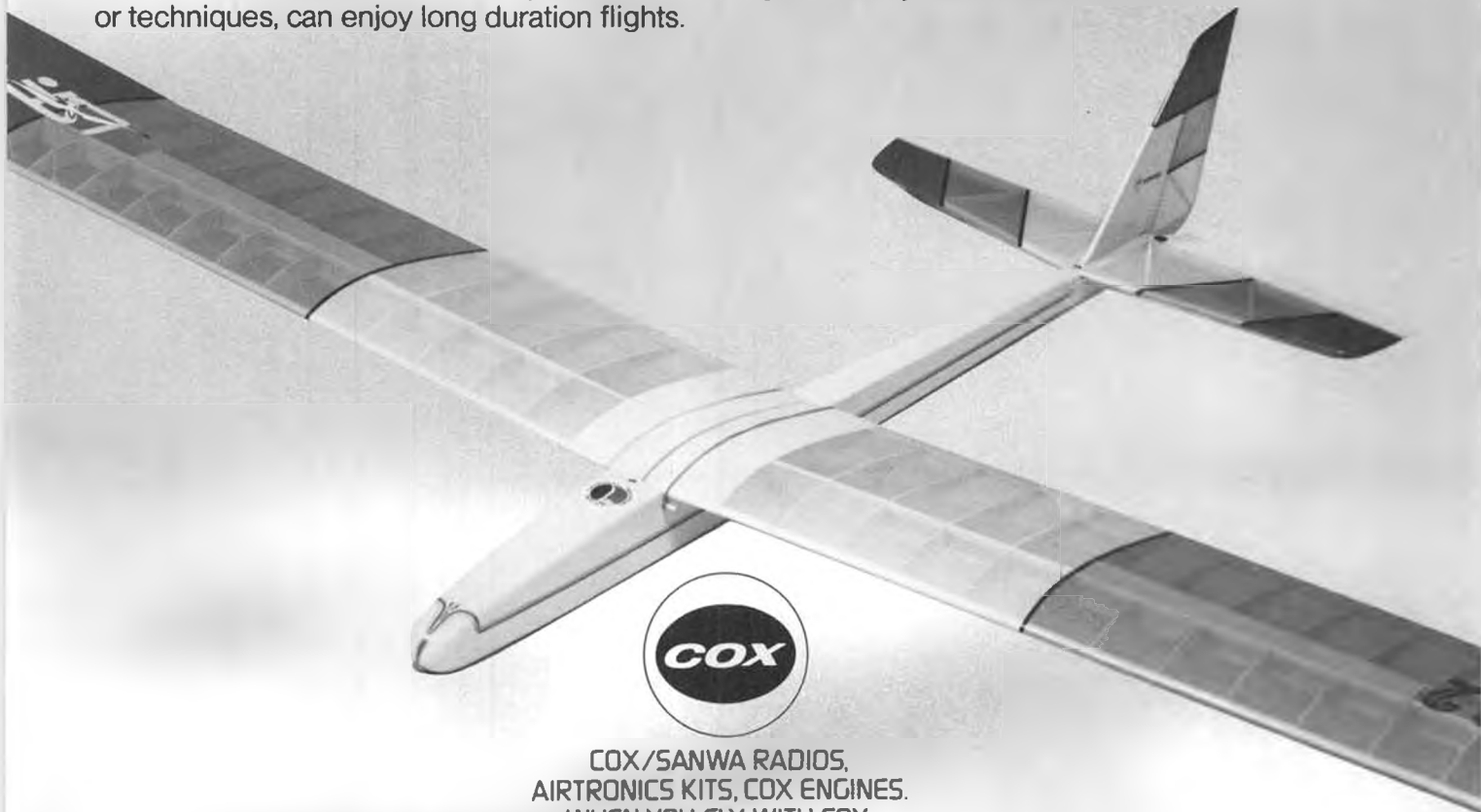


R/C Olympic II Sailplane. Perfect for a first plane or a first place.

In 1977 the Olympic II has already won a number of major contests including the Sno-Fly and Canadian Nationals. At the '77 North-South meet an Olympic II placed second overall behind the winning Aquila. In 1976 the ship placed first and second at the AMA Soaring Nationals.

The same kind of functional design that makes the Olympic II a great trainer for the R/C novice has made it a real competition threat! It's quick and easy to build and the large wing area (928 sq. in.) and flat bottom airfoil contribute to a slow, floating glide. In this way, the ruggedly built Olympic II makes the best use of weak or marginal lift conditions. Even the novice, with no special skills or techniques, can enjoy long duration flights.

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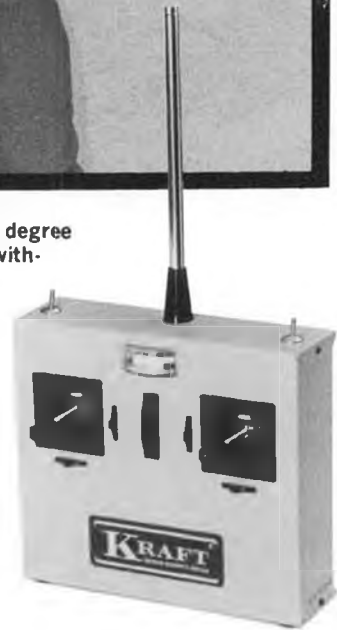
Recently Don wrote us about his new records: "I have found an even more severe test for my Kraft system than when I was running my straightaway record boats back in 1972.

I am now involved in competition oval records. This involves accelerating the boats to speeds in excess of 70 MPH down the straightaways, then putting the boats through a violent high speed turn. The turns have to be precise and instantaneous. This puts an unbelievable strain on the entire system and especially the 15H servos used in the boats.

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Roy Cogburn has put his Kraft to an even more strenuous test in his big seventeen pound twin OPS .60 powered Thundergator. Roy currently holds both the straightaway record at 74.750 MPH and the oval record with an average speed of 41.841 MPH.

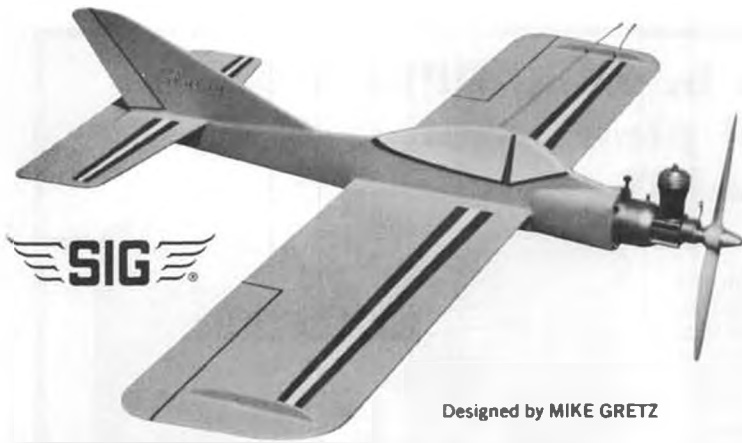
From my past experience, I am convinced when better radios are built, Kraft Systems will build them."



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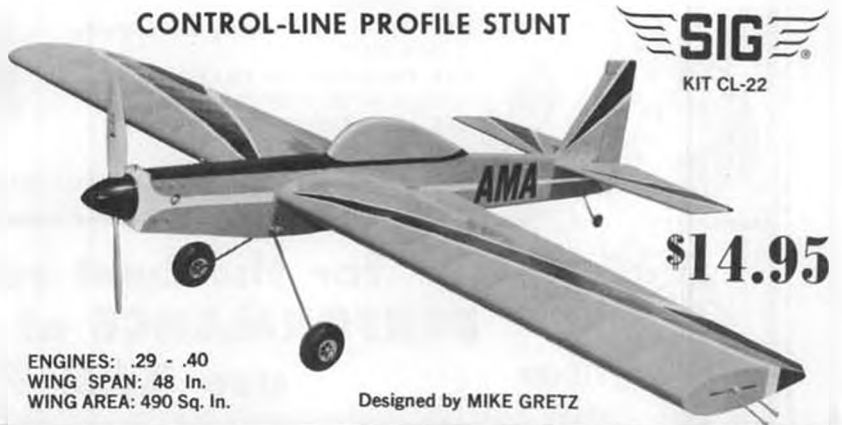
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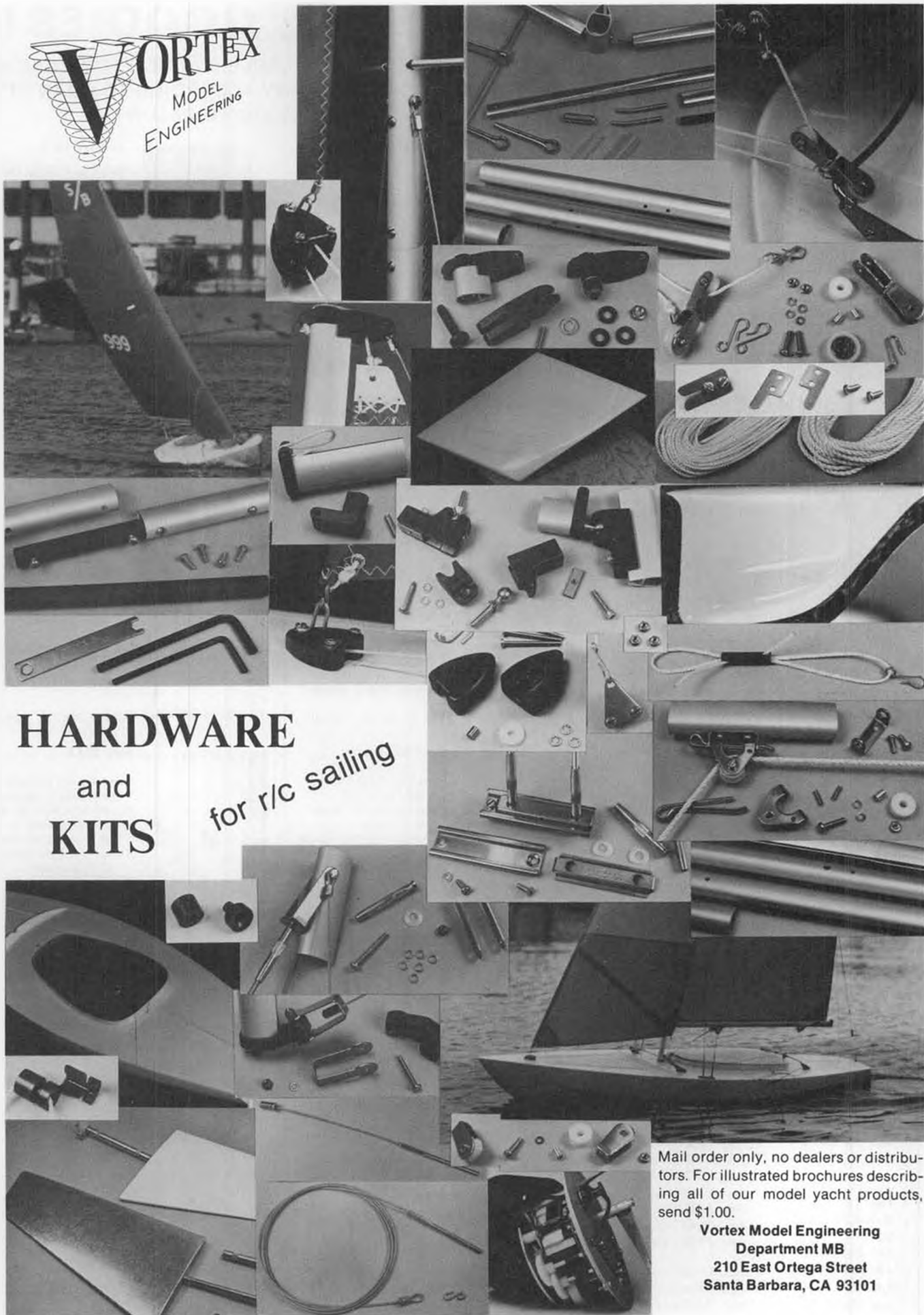
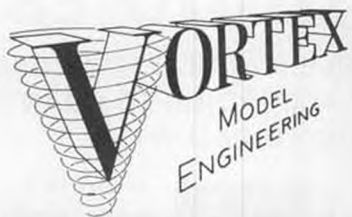
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ts, also big one.
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MODEL BUILDER

OCTOBER

1977

volume 7, number 70

621 West Nineteenth St., Costa Mesa, California 92627

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CONTENTS

FEATURES

WORKBENCH, Bill Northrop	6
OVER THE COUNTER, Eloy Marez	7
SCENE AT THE NATS, Bill Northrop	10
1977 NATS PATTERN AND SCALE, Bill Northrop	12
FIRST WORLD R/C CAR CHAMPIONSHIPS, Chuck Hallum	16
CHOPPER CHATTER, John Tucker	24
PLUG SPARKS, John Pond	26
R/C PYLON, Jim Gager	32
R/C SOARING, Dr. Larry Fogel	34
R/C POWER BOATS, Bob Preusse	38
STRICTLY SAIL, Rod Carr	40
F/F SCALE, Fernando Ramos	48
HANNAN'S HANGAR, Bill Hannan	50
FREE FLIGHT, Bob Stalick	54
MODEL BUILDER'S CLASSROOM, Frank Zaic	58
CONTROL LINE, Dan Rutherford	62
THE HALF-A SCENE, Larry Renger	64

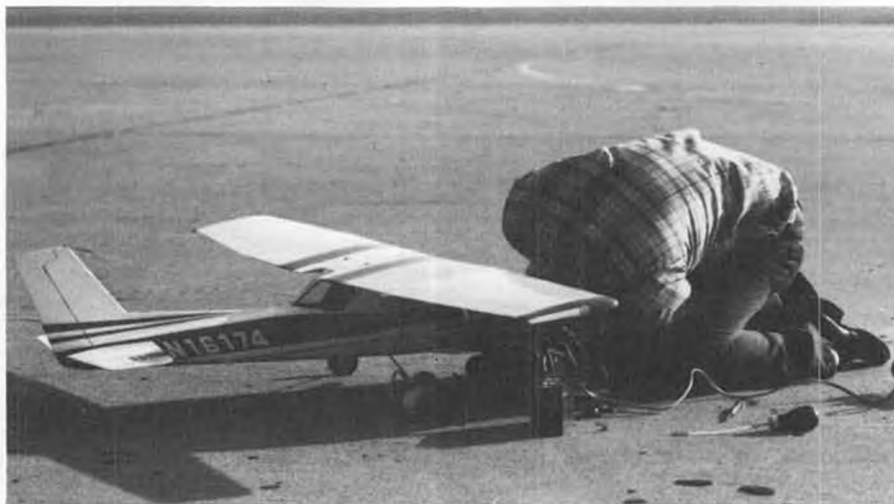
SCALE VIEWS

SPARMANN P-1 (Part I), Peter Westburg	37
CURTIS A-3 FALCON, Nick Karstens	66

CONSTRUCTION

HAROLD KRIER'S KRIER KRAFT, Ray Nugen	18
ED LIDGARD'S "EUGENE II" O.T., Bob Oslan	31
ELECTRIC MOTOR SPEED CONTROL, John Karasz	42
"YELOISE," A MANHATTAN, Ron Williams	45
PEANUT LOIRE 46, Don Butman	51
VOLKSPLANE, Vern Schroeder	60

Cover: There is something hypnotisingly attractive about a completely assembled, yet uncovered model airplane framework, particularly one of the all-stick type, such as the Manhattan class indoor model built and photographed by Ron Williams . . . who also just happens to live in Manhattan. To further enhance its attractiveness, the framework has been carefully dyed yellow, which seems to make it light up against the dark background. Construction article begins on page 45.



"That's funny, I'm sure it had an engine in it this morning!" Bruce Tharpe checks out a problem in his R/C Sport Scale Cessna 150 on the flight line at the 1977 Riverside AMA Nats, March AFB.

from Bill Northrop's workbench . . .

LOST?

On the last day of the 1977 Nats, August 14, our spring-top briefcase somehow came up among the missing. Although its contents did not include wallet-type items . . . money, credit cards, license, etc. . . . it did have quite a few memos and important papers. In particular, all of the notes and/or business cards with scribbled messages pertaining to **Model Builder** business . . . subscriptions and orders for radial engines . . . which had been gathered throughout the previous week, were lost. If you talked to us at the Nats, and left any specific requests regarding **Model Builder**, or R/C Contest Board matters, please contact us. We particularly need the names of the those who gave us specific orders for the radial engines, as these will be delivered in accordance with our priority listing, and we don't want you to lose your place.

IMPORTANT CORRECTION

In the sub-heading to the article about the fabulous World War II "Scramble", beginning on page 10 of our August 1977 issue, we mentioned that over 8,000 spectators paid to attend this meet. The figure was correct, but "paid" was completely wrong!

The head-count was carefully compiled by the Boy Scouts, who handled automobile parking at the beautiful Morgan Hill flying site. However, all of these spectators enjoyed the two-day spectacle at no charge.

AT LAST . . .

MAN-POWERED SUCCESS

The long-sought after goal, and the \$85,000 purse for achieving same, appears finally to have been accomplished. Although we don't have too many details, and the Asso-

ciated Press story in the paper contained the usual inaccuracies, "It was built mostly of a super-strength plastic, called Mylar," it would appear that all conditions required by the prize donor, the London Royal Aeronautic Society, have been met.

As you might suspect, the designer/builder of the 97 foot spanned, canard pusher, 70 pound aircraft, is an accomplished model builder by the name of Paul McCready. Structural engineer on the project was Vern Oldershaw, another modeler. Bill Hannan, in a recent "Hannan's Hangar", and also, we believe, Dr. Larry Fogel, in our "R/C Soaring" column, mentioned attending a lecture by McCready, so we'll probably hear more on the subject from both of these **Model Builder** editors.

All due credit must also be given to the "motive power", 24-year-old cyclist Bryan Allen, who powered and piloted the aircraft through the prescribed 1.4 mile course, which includes a Figure 8, all to be done at not less than 10 feet off the ground. Bryan pedaled furiously for over seven minutes to complete the flight. An average individual would only be able to keep up the pace for about 2 minutes, so his excellent endurance meant even more than his fine physical condition.

The aircraft, called the "Gossamer Falcon", is primarily a flying wing, with a huge pusher prop which is chain driven, through a great deal of reduction, by the pedaling pilot. A small leading stabilizer of the full "flying" type, is used for pitch and directional control, being tilted, as in free flight stabs, from tip-to-tip, to induce turn.

AIRCRAFT AND SPACECRAFT CATALOGS

The National Air and Space

Museum has published two volumes that are now available for sale, *Aircraft of the National Air and Space Museum and Rockets, Missiles, and Spacecraft of the National Air and Space Museum*. They are comprehensive catalogues of the Museum's aeronautical and astronautical collections.

The aircraft catalogue contains historical information and three-view drawings for all the planes on display in the Museum and lists, with locations, all the remaining aircraft. There are 225 black-and-white photographs in this 128-page soft-cover book. There are also 12 color photographs on the covers. The spacecraft catalogue contains descriptions of the Museum's astronautical collection. There are 91 black-and-white photographs in this 68-page soft-cover book, with 16 color photographs on the covers.

Both volumes measure 8-1/2 by 11 inches. The volume on aircraft sells for \$2.00 and the volume on spacecraft sells for \$1.50. In addition, there is a 75¢ handling charge, per book, sent within the continental United States. Checks or money orders should be made payable to Smithsonian Institution. Please do not send cash.

Send order forms to: National Air and Space Museum Publications, Smithsonian Institution, Washington, D.C. 20560.

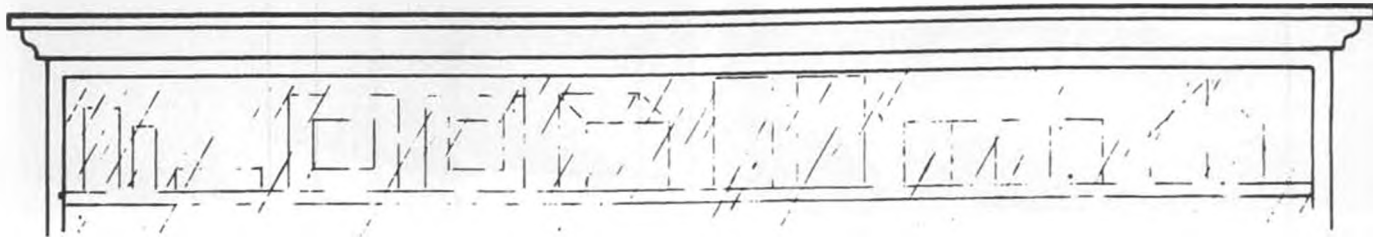
FIRST SIERRA CUP

On Saturday and Sunday, October 22 and 23, 1977, the Sierra Eagles MAC will conduct an FAI Free Flight competition at the Eagles' flying site near Sacramento, California.

A starting line and starting poles will be used. Groups of 4 to 6 competitors will be organized and

Continued on page 102

OVER THE COUNTER



• Those of you who miss the "Good Ole Days", when we sat around the day after a night's building and chewed the glue off our fingers, will welcome the appearance of "Super Model Cement" from Du-Bro Products.

Though the cyanoacrylates, epoxies, contact, or aliphatic adhesives are great to have around and use, there are times in modeling when you are not concerned with 150 plus MPH airspeeds or holding down engines at 25,000 RPM. That type of modeling calls for this type of a cement, intended as an exceptional balsa wood glue. It also makes perfect bonds on ABS and acrylic plastics, such as found in many A.R.F.'s and canopies. It dries clear, strong, quickly, and fuel proof. Get yourself a 60¢, 1-3/4 ounce tube, you'll find it handy for many of your building needs, on everything from Peanuts to Mammoth Classic Scale.

* * *

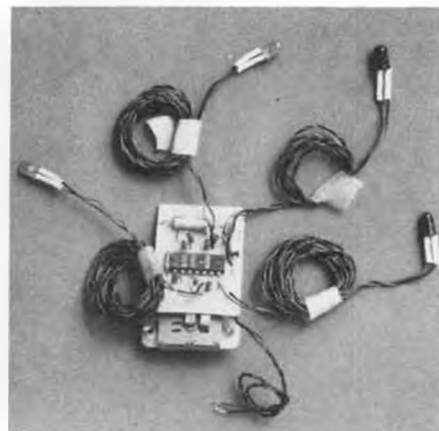
Have you seen the Williams Bros. plastic "solid" Gee Bee? Neat, huh? One of the many features that makes it so is the scale Pratt & Whitney "Wasp" engine sitting inside that big cowl; a touch which you can now add to your own radial engine scale designs, in 3/8 inch-to-the-foot size. The "Wasp" was among the most popular engines back in the days now called the "Golden Age" of Aviation, and this size should fit



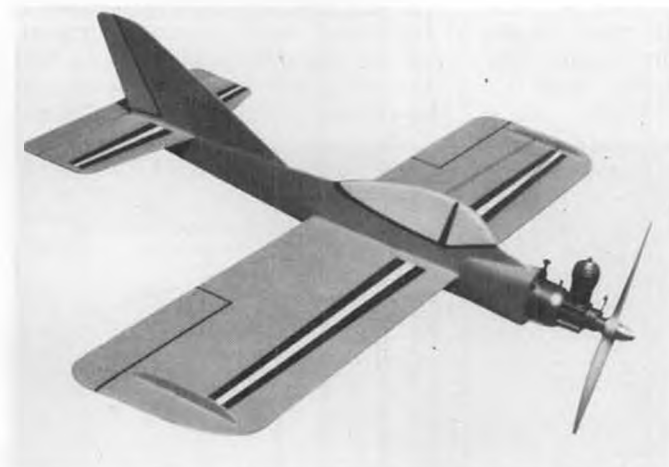
Sterling Models' F4U Corsair for 1/2A to .10 engines and R/C.



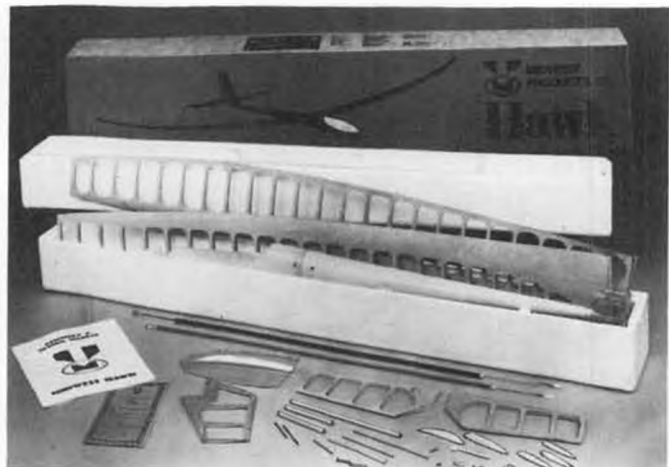
Special Model Boats issue by M.A.P.



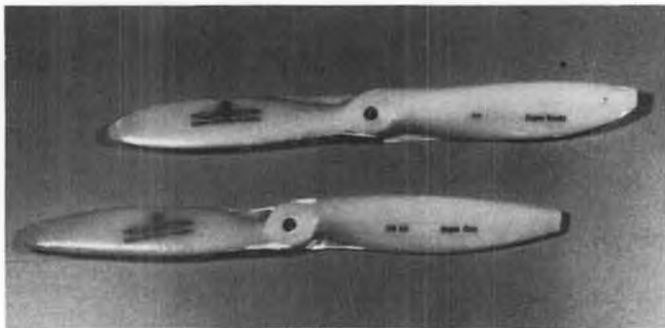
Flashing light system, by Vern Zundel.



The "Skyray" is a 1/2A stunt control line model by Sig Mfg. Co.



The Ho . . . er, Midwest Hawk, now available from Midwest Products.



World-famous Bartels fibreglas props, available from Exportations.



Ducted fans from Midwest Products.



Micro-X moves outdoors, with the "Exeter".



Midwest Products now offers walnut and mahogany with its modeling lumber line.



Portalign's Precision Drill Guide.

right into many scale rubber and some 1/2A engine models.

This plastic kit contains 23 pieces, including crankcase, cylinders, and exhaust stacks. It comes complete with a detailed assembly sheet which includes color information. It is priced at \$1.49, and will be available shortly in all hobby shops that stock Williams Bros. products. If you can't wait, order direct at 181 Pawnee St., San Marcos, CA 92069.

* * *

For a long time, the F4U Corsair was admitted to be an airplane that you sat back and admired, but did not model, certainly not in R/C, though a few hardy individuals tried. But now, possibly because of the advent of more precise radios, better

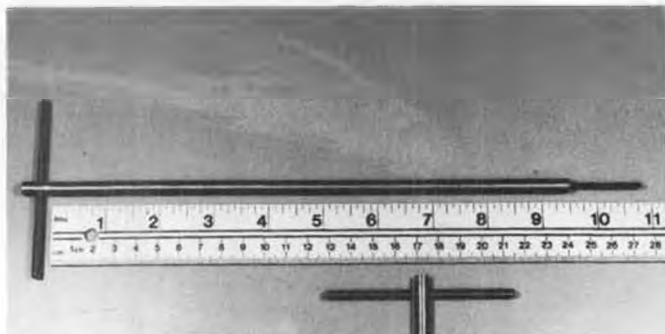
engines, or possibly just better techniques and flyers, it too has joined many a model air force.

And the latest to enlist the F4U in its kit line is Sterling Models, which recently announced its 36 inch span model for 2- to 4-channel R/C and .049 Tee Dee to .10 engines. Diesel conversion of the Tee Dee, available from Davis Diesel, is recommended. The kit includes die-cut balsa and plywood parts, hardware, full size plans, and decals for "Pappy" Boyington's "Lulubelle," as seen in the "Baa Baa Black Sheep" TV series.

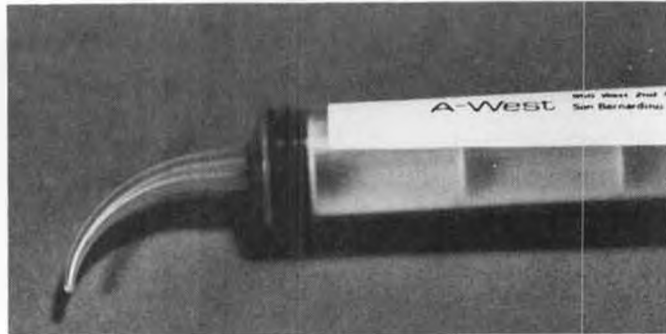
Available in late September, and priced at \$29.95 at most hobby shops. If not available locally, contact Sterling Models, Inc., 3620 "G" St., Philadelphia, PA 19134.

* * *
In our September column, we brought you news and a photo of Top Flite's new "Freshman" Trainer, which many of you might have seen in the flesh during the R/C Aerobatic World Championships and Riverside NATS. We have just received word from Top Flite that one of those checked and rechecked, impossible-to-happen-mistakes has indeed happened; the nose gear shipped with the first batch of kits is a half-inch too short. It is 2-1/2 inches long, instead of the required 3 inches.

If you have recently purchased a "Freshman" with a short nose gear, you are urged to drop a line to Top Flite, who will promptly send you the correct part. You dealers might



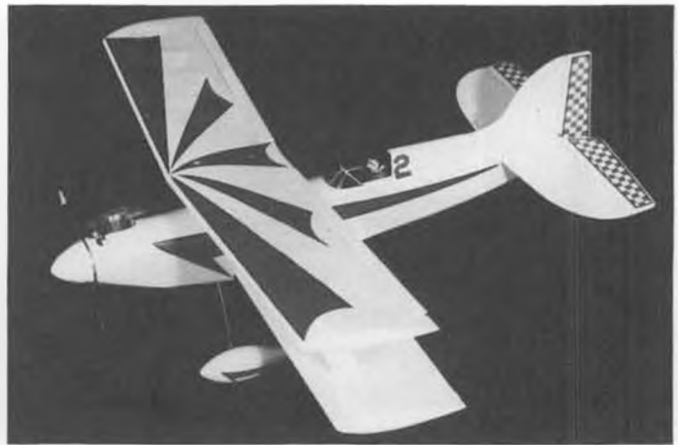
Harry's Handy Hex Keys, by Harry B. Higley and Sons.



The G-Gun, by A-West.



Rear exhaust muffler for .29 to .40 engines, by Tatone Products.



The "Stinger II" by Master Kit.

also check kits in stock, and notify Top Flite if you need replacement nose gears. Top Flite's Sid Axelrod also advises that the plans also incorrectly call for the wrong size wheels. All 3 should be 2-1/4 inch diameter, instead of the sizes indicated.

Personally, we can understand and live with mistakes being made, but being lied to or ignored always sends us to some other product or company, forever. On the other hand, we are always impressed by evidence of good customer service, and keep that in mind when shopping for models and supplies. In this case we are happy to recommend Sid Axelrod, and his gang at Top Flite, as people who obviously care about us, the customer. Top Flite's address is 1901 N. Narragansett Ave., Chicago, IL 60639.

* * *

For Control Line flyers, the latest from Montezuma, Iowa is the "Sky-ray", a 1/2A stunt model, easy to build and of outstanding flight performance.

This 23-3/4 inch wingspan model features a profile balsa fuselage, sheet balsa wing and tail, die-cut plywood parts, all hardware, and illustrated instructions.

Available in October, only \$4.95,

from Sig Manufacturing Co., Montezuma, IA 50171, or its many dealers.

* * *

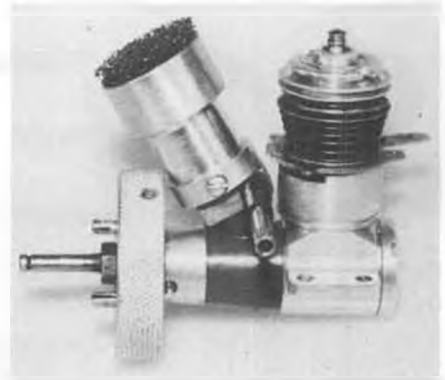
You don't have to be an AMA Master class flyer to enjoy the new "Exeter" from Micro-X Products, though this airplane is perfectly capable of all the maneuvers in that class of aerobatic flying; even knife edge, and hesitation rolls, all on a .23 to .35 engine. Sporting a 45 inch wing with a total of 317 square inches, the all-up weight is from 3 to 4 pounds, depending on engine and type of finish. The remarkable maneuverability is supposedly due to a new airfoil that changes shape progressively toward the wing tips, efficient at any speed.

Machined contest balsa parts of correct grain and density, including matched body sides, make this kit a "builder's delight".

Only \$43.95 from your local shop or direct from Micro-X Products, P.O. Box 1063-E, Lorain, OH 44055.

* * *

The "Hawk" is back! The foam, plastic, and plywood ARF kit for this well-known soarer is now available from Midwest Products Co., needing only covering, painting, and radio installation. A combination of the toughest materials available make this an almost indestructible glider,

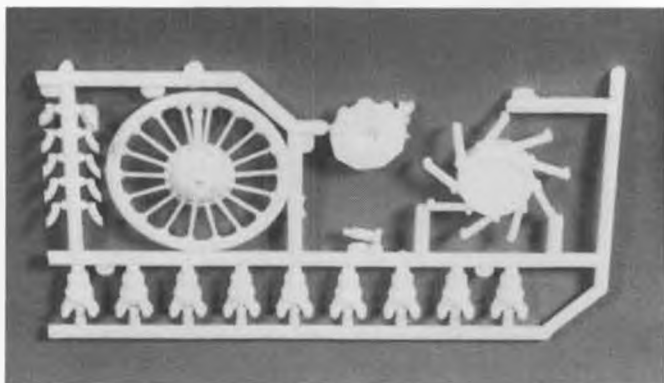


Air Intake Filter, by Thunder Road division of Tatone Products.

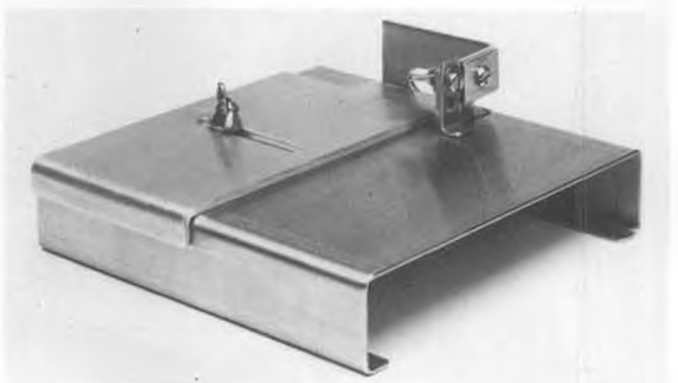
yet it is still competitive for both thermal and slope competition. Each "Hawk" is shipped in its own molded foam case that can be used later for transportation to the flying field. Replacement parts are readily available.

Other new products from this Hobart, Indiana company are Axiflo Ducted Fan Kits, designed for the sport flyer, featuring lightweight and molded parts for ease of assembly. First of the line is a unit for .40 size engines, soon to be followed by an .049 version. Throttle capability is determined by the engine used, which can be operated with or without tank pressure. A clever feature

Continued on page 97



Wasp radial engine in 3/8 scale, for Williams Bros. Gee Bee plastic static model, now available separately.



Saflex Balsa Wood Slitter.



Paula Bauer, Chicago, Ill, with her C/L Scale Bristol M-1C.



"My first maneuver will be Proto Taxi!" One of the SAC B-52's based at March AFB trundles by on its way to a far off parking ramp. Full scale activity was practically non-existent.

SCENE AT THE NATS

By BILL NORTHROP . . . A brief photo review of the 1977 Nats, March AFB, Riverside, California, as seen by the cameras of Bill Northrop and Eloy Marez.



Ed Hotelling, Formula 1 winner, uses special technique for dismantling his engine for inspection as wife looks on. A well-deserved win.



Gene Sidwell, of the Air Force Association, congratulates George Rose on receiving the Association's award for best AF scale model.



USPJA judge Frank Broach's children, Tony and Melinda, from St. Louis, build Delta Darts, helped by Linda Bourns, Riverside, Cal.



Repla-Tech's Bob Morrison and Australian all 'round modeler, Tom Prosser, watch the Sunday Air Show from special grandstand.



Bob Gieseke, in the process of winning 2nd place in Open C/L Stunt.



Jerry Murphy launches Pearl Livingston in Class C gas free flight.



Gordon "Chip" Hyde, age 5 (five) flying .60 powered Ugly Stik during Air Show. No fake!



Unidentified Delta Dart fliers getting in some test hops. A great promotional idea.



The very first, Number One engine ever built by Irwin Ohlsson.



The very first Ohlsson engine, being held by the one and only Irwin Ohlsson.



USPJA judges handled all flight judging in Pattern and Scale at the 1977 AMA Nats, for a first in Nats history. Every judge was given a USPJA shirt for working the Nats, by the organization.



No caption necessary!



Bill Hannan releases Farman during Outdoor F/F Rubber Scale event. Takeoff boards reminiscent of old-time Nationals.



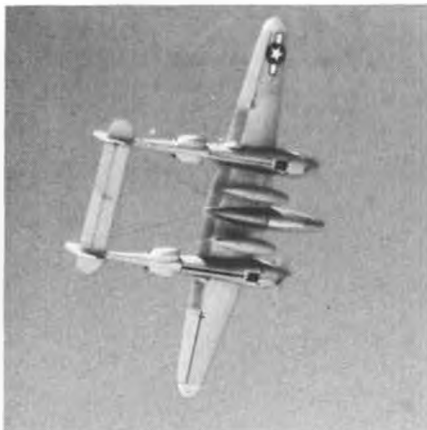
See no evil, hear no evil, speak no evil and smell . . . oh well, you can't win 'em all. Danny Nichols, Riverside, takes a nap.



Don Sull's unusual Sport Scale Dornier 23. Placed third.



Steve Sauger's Fairchild 24 was 2nd in AMA Scale, putting him on the U.S. Team. Radio antenna is only give-away.



Art Johnson's 5th place Sport Scale P-38 passes overhead. Smooth flyer.



George Rose's P-6E flew very well. Placed 5th in AMA Scale. Won AF Assoc. award.



Bob Frey's P-47N "Jug" about to pancake with collapsed gear. Realistic action!

1977 NATS R/C Pattern & Scale

Report and photos by BILL NORTHROP

• With our regular columnists covering other R/C events at the 1977 Nats ... Jim Gager on Pylon and Larry Fogel on Soaring ... it is only necessary for us to report on Pattern and Scale.

Larry's report will probably appear next month, but Jim's will be de-

played a month. On Sunday morning, as he and his driving companions prepared for the return trip to Ft. Wayne, Jim's back suddenly hit him with the kind of pain that only those who have suffered disc problems will understand. Although he was able to help a little with the driving, the continuous sitting and jolting forced them to stop at a hospital in St. Louis, where Jim was given a shot of morphine to kill the extreme pain. When they arrived in Ft. Wayne, Jim immediately went to the hospital, and was still there, two weeks later, when he called to tell us what had happened.

Before getting into the special reports, a few general comments would seem to be in order. The question most asked by all contestants present, not only in R/C, was, "Where in hell is everybody?"

Actually, this question has come up after previous California Nats, and still remains a puzzler. One statistic is obvious ... more West Coasters seem to be willing to travel East for Nats competition than vice versa. This was also apparent last year for the NSRCA Championships. Eastern Pattern fliers had a fair ex-

cuse this year, however. The Master's Tournament and World Championships, being run back-to-back in Springfield, Ohio, pretty much drained both the financial and vacation wells of many contestants.

Pylon is another story. At the



Dr. Wayne Owens preps his Martin B-26.



Carol Perkins, wife of FAA inspector Larry, with his niece "Perky Turkey", flown in Novice Pattern. Inexpensive kits available. Write MB.



Curt Oberg placed 5th in Expert Pattern. Curare.



Don Thomey gives Bill Simpson a hand with his Dirty Birdi. These BIRDS members placed 9th and 10th respectively, in Expert.

annual Bakersfield Form I races, 118 fliers competed. The Nats only drew 55, and some of these were Easterners. Some said Standard fliers didn't enter because they wouldn't stand a chance. So, should we pick 20 who will be guaranteed a trophy and let everyone else stay home?

Of course, the 1976 Dayton Nats was a tough act to follow. After two years in Lake Charles, where the site was OK, but the weather was unpleasant, Dayton came on like gangbusters, producing the largest Nats ever. Riverside was bound to look small after that.

Another factor is population density and drawing area. Dayton is surrounded in all directions by active modelers within a day's drive. It draws from all points of the compass. On the other hand, Riverside, being about 60 to 80 miles from the Pacific Coast, draws from a little



Bob Underwood and his Wittman "Bonzo" again made the FAI Scale Team. Congrats!

over half as much area . . . and much of this is thinly populated desert.

One last reason also applies to local contests, where lack of attendance has been a serious consideration recently in Southern California.

Every weekend, there is some kind of a contest within reach of every kind of modeler . . . all year 'round. Believe it or not, this can get to be a drag, and the Nats simply fails to be any more than just another contest . . . oh well . . . on to Pattern and Scale . . . at the first Nats in 10 years without a drop of rain!

Pattern was contested by 110 fliers, divided as follows: Novice 45, Advanced 20, Expert 21, and Master 24. A total of 24 judges, all USPJA members, and operating in 8 teams of 3 each, scored all flights during qualifying. For the finals, six judges were used at each of 4 flight lines, providing complete, man-to-man, equal exposure.

The judges, as teamed for the qualifying were: Dick Burkhalter, Chuck Beardsley, and Jess Hogan; Rene Grebe, Dorothy Speights, and Ivan Tarbert; Jim Bune, Gary Har-



Marc Graham holds on as Jack Stafford preps his Twin Comanche. One of Stafford's latest kits.



Dick Hager's C-47 was beautiful on the ground as well as in the air. Suffered hard landing which appeared to cause severe damage.



Tony Bonetti and Emily make last-minute check before going up for a finals flight. Tony placed second in the Master class.



Novice Rod Barnes preps his Phoenix, as Dave Brown assists. Rod finished Nats with Dave's '75 W/C Phoenix after a mid-air.



Joe Tschirgi's Brandenburg about to go plop. He could actually taxi on the concrete!



Close-up of the engine mounting in Tschirgi's (say "Shirgi") plane. That's the flying prop!



Dolly and Bob Wischer, standard equipment at every Nats. Bob 1st in AMA Scale.



Col. Bob Thacker flew this military version of the famous Beechcraft "Staggerwing".



Bob Guilfoyle's Lockheed "Sirius" on takeoff run. Very smooth flier.

kins, and Bill Semler; Chic Young, Evan Jenkins and Lee Taylor; Bob Palmer, Jim Steele, Jr., and Frank Broach; Noel Allison, Don Butman, and John Byrne; Al Tuttle, Larry Sartor, and Bill Coopersmith; Eric Clapp, Ralph DePalma, and Bill Eich.

In the sense that rank amateur golfers and tennis players use the

same sporting equipment as the top-seeded professional, so it is with the Novice and Master Pattern fliers . . . and anyone in between. "Pattern airplanes" is a good name, as with the exception of a lone Ugly Stik, and another shoulder-wing, trike, fixed-gear model that we only saw from a distance, all of the ships were of one pattern . . . the typical glass-and-foam low wing, piped super .60 powered, retracted trike-gear, possibly droopy-stabbed, FAI aerobatic machine.

As an example, Rod Barnes, a traveling companion of Dave Brown's, and a Novice pattern flier, lost his Phoenix 7 in the only mid-air to occur during Pattern. Because he didn't have a back-up airplane, Dave Brown loaned him his No. 3 back-up Phoenix, with appropriate official permission and hasty AMA license number change. So Novice flier Barnes finished in third place, with the airplane that placed third in the 1975 World R/C Aerobatics Championships in Switzerland! Coincidentally, Dave's other traveling companion Tony Frackowiak, placed third in Advanced Pattern at the Nats.

The Master class was notably short of prominent names, mostly from Eastern and Southeastern states. Rhett Miller III was not present to try to extend his string of four wins, nor was fellow FAI team member, Mark Radcliff. Still, two



Granger Williams and his stubby Gee Bee 2 Sport Scale entry.

Easterners came out on top, and the missing competition took nothing away from their superior flying.

Dave Brown was the big winner, and after his top placing on the U.S. team in the 1977 World Championships, and his 2nd place individual triumph, it is a safe bet that he would have been on top no matter who in the U.S.A. was present at the Nats!

Tony Bonetti was second, and the way he has sharpened his presentation in the last year or so speaks for itself in his scores. We've been watching and judging Tony in competition since the early 1960's, and he's better now than ever.

In third spot, only 90 points out



It takes 3 to handle a Tigercat! Joe Bridi and Marty Wittenberg hold on while Jerry Ortega tach's the engines on his F-7F.



"I'm sorry, but that left rear molar has to go!" Ron Dickson's P-40E looks very fierce, even on its back to get the inverted engine perking.



Scale Squadron member, Don Lien, with his Sport Scale 2nd place winning FW-190. Same combo took first at WW II Scramble.



Don Srull preps his Dornier 23 which was 3rd in Sport Scale. Odd combination of squares and curves. Nice flier.



Art Johnson and his remarkable P-38. Built entirely of balsa and hardwoods, it is scheduled to be a future Model Builder construction article. Very realistic in the air; scale speed and sound.



Granger Williams holds for Bob Wisniewski. Ship is a Super Stearman.



Earl Thompson and his beautiful Corsair that was on our August cover. Lack of scale ruler could have cost him spot on team.



Frank Capan flew this Proctor Nieuport 11, being held by Larry Williams. Profi .75 engine turned big prop without any trouble.

of 25,000 below Tony, was Bill Sal-kowski, followed closely by Jim Kimbro, Jim Oddino, Joe Bridi, Phil Kraft, Wayne Abernathy, Don Weitz, and Dick Mattie. Tom Prosser, from Australia, who had remained in the States and Canada after flying at the World Champs, joined in the fun and placed 15th.

In the Expert class, Charles Dan-ley, with the highest single finals flight in the third round, was first, followed by Earl Haury, Harold Roberts, Rusty Van Baren, Curt Oberg, Mike Middleton, Geoff Nel-son, Ken Hirose, Don Thomey, and Bill Simpson.

Advanced Pattern was won by young Californian Marty Wittenberg, and very close behind were Michael Johncock, Tony Frackowiak, Ken Jackson, Ralph DePalma, Phil Sibille, John Lockwood, Craig Millet, Bill Woolard, and Larry Bennington.

The top ten in Novice Pattern were so bunched that there were only 167 points between first and tenth. Dave Wilson led the way, with a highest single score of 607, followed by Jay Jolley, Rod Barnes, Tom Purkiss, Tiny Westberg, Troy Allen, Larry Perkins, Dick Anderson, Mark Peters, and Mike Balog.

The ten fliers listed in each skill class were the top qualifiers, putting them in the finals on Friday and

Continued on page 101



Butch Kroell's No. 13 car gets the checkered flag from Joe Tentslert as it crosses the finish line in the final World Championship Race of the first R/C World Auto Championships. The next car, behind Joe, was actually over a lap down from the winner.

The First WORLD R/C CAR CHAMPIONSHIPS

By CHUCK HALLUM . . . Our "R/C Auto" columnist gives a detailed report of the driving action at this inaugural event, held at Thorp Raceway, Pomona, California, on July 4th weekend.

• Well, race fans, the First World R/C Car Championships is now history. Butch Kroells is the first World Champion, the winner of the first race with true, world representation.

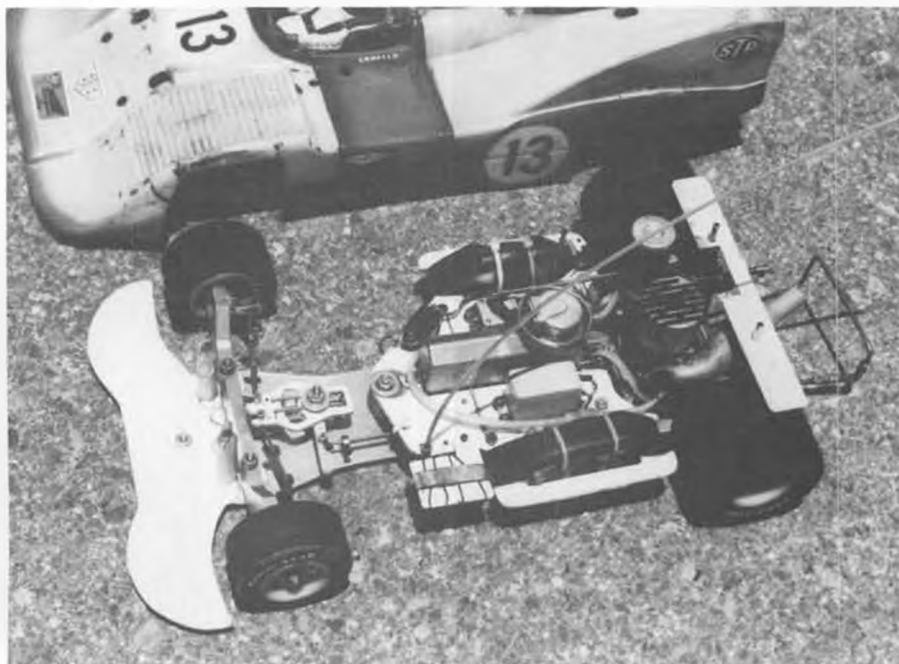
Butch ran a terrific race with a well-prepared car, stayed out of trouble, and took the short way around the track, beating all comers by over two laps. We'll get back to his race shortly.

The First World R/C Car Championship (WR/CCC), was held at Thorp Raceway in Pomona, CA on July 4, 1977, with qualifying on July 2 and 3. Racers began arriving for the

WR/CCC about 2-1/2 weeks early, with the South Africans being the first. Then about one week ahead came the teams from Sweden, Italy, Switzerland, and Holland. Racers from the Eastern U.S. were also arriving. By Thursday, June 30, practically everyone was there. Entries totaled 111, with 45 from overseas. The foreign turnout almost doubled our early expectations for the race.



The first World R/C Auto Champion, Butch Kroells, is dwarfed by the huge winner's cup.



Here is the champion's car. It's an Associated RC-100, with several extra goodies, as explained in the text, plus a super-strong engine.



Butch Kroells is awarded the special checkered flag that was used for the First World R/C Car Championship final race.



Chuck Hallum qualified for the C Main, but was hit by equipment problems.



Antonio Della Zoppa, Switzerland, was excellent interpreter, announced races bi-lingually.

Racers also came from Japan, Germany, and England, as well as all corners of the U.S. and Hawaii. A terrific representation for this the First World R/C Car Championships.

By Friday, July 1, almost everyone had their cars working pretty well. Bill Jianas had his car going the quickest, getting lap times down in the low 17's. Art Carbonell was just a touch slower, but seemed to have adapted to the track and had his car working well. Behind these two, there were gobs of racers in the high 17's and low 18's. The English drivers were doing quite well and had the fastest cars with the "Quiet Mufflers". The Italian team was still struggling to get its cars competitive . . . only Franco Sabattini seemed to be doing well, but was down on horsepower.

The European drivers (except English) were a little unhappy with the track. The tracks in Europe are a little larger, and have more sweeping type corners of intermediate radius rather than the sharper corners and short straights at Thorp Raceway. Also, the traction was so good that their gear ratios and tires were not appropriate. These facts led to a disappearance of any advantage that EFRA cars might have because of the smaller tires and larger wings that were hoped to compensate for the decreased power caused by the quiet mufflers.

Friday evening there was a drivers' meeting, to go over some of the rules. First, Mike Reedy, the race director, would explain a certain point, then Antonio Della Zoppa, from Switzerland, would translate the explanation in several languages for the foreign racers. It was really quite something! I don't know what we would have done without Antonio. The drivers' meeting took quite a bit more time than expected. Then we

got back to controlled practice 'til the track closed at 7 p.m.

Saturday morning at 7 a.m., the track site was opened and the timing equipment, etc., was set up. The sun was out and warm already. So far, every day had been sunny, with temperatures above 90°F, and it would continue that way through the meet, with only a slight cooling on Monday. After the practice round, there was about an hour's break before the qualifying heats began. Some people were thrashing and some were visiting and having lunch.

When qualifying started, it was apparent that the heats were set up about right, because in the first few heats, only about one car might get 30 laps in the time limit (to keep the program moving), then in the middle heats, several would easily beat the limit, and practically everyone would in the latter races. In one of the middle races, Rich Lee turned in a time of 561 seconds for 30 laps, and was the first to really look fast. But he put a few guys into the wall doing it and was lucky not to get black-flagged. Then in the last race,

Continued on page 67



D.O.M. Hallum delivers special award (?) to Debbie Preston, England, 3rd in B Main.



Mike Reedy, Race Director, with volunteer lap counters, lap count marshals, and recorder.



KING KONG KRIER KRAFT

By RAY NUGEN . . . We've known about, and waited for this model for over ten years. It fits our Mammoth Classic Scale concept to a "T"; it's large, it's light for its size, and it flies in a realistic manner.

• The Krier Kraft was originally designed (or compiled) and constructed by Harold Krier, one of our late and great aerobatic champions. According to Krier, the aircraft was a combination of an old Great Lakes fuselage and Bucker Jungmeister 131 wings and tail surfaces. The modified

radial cowling was enlarged to accommodate a heftier engine.

Being a biplane man, I fell in love with the airplane after seeing it at the 1963 Armed Forces May Day Program at Patterson Field, near Dayton, Ohio. Our club, the W.O.R.K.S., was flying in the pro-

gram's opening spot.

We immediately collared Harold Krier after our show and asked him about a set of plans. At this point, we learned from Harold that no plans had ever existed . . . Bang! So where do you go from here?

Since Harold seemed reluctant to let me get near his airplane, I took the direct approach, inviting him over to the model flight line and letting him fly my Sperry Messenger. That did it . . . permission granted! Still going strong, I attacked his plane with camera, tape, and gusto.

After many photographs, miles of measurements, one year of drawing; sawing, painting, and workshop sessions with Don Lowe, we arrived at Wright Field Runway 21 for the moment all modelers await . . . the moment of truth . . . flight number one!

What a flight it was. Starting with an Enya 60, and swinging a 12 x 6 nylon prop, I fired her off and started a taxi run. After about 80 feet, she lifted gently off the runway, and with Don Lowe standing behind me, talking ("Don't stall her!"), she flew beautifully. Don then took over, putting her through the basic maneuvers, and brought her in for the first landing.

No trim was used on that first flight. However, back in the workshop, we decided that 3 degrees of



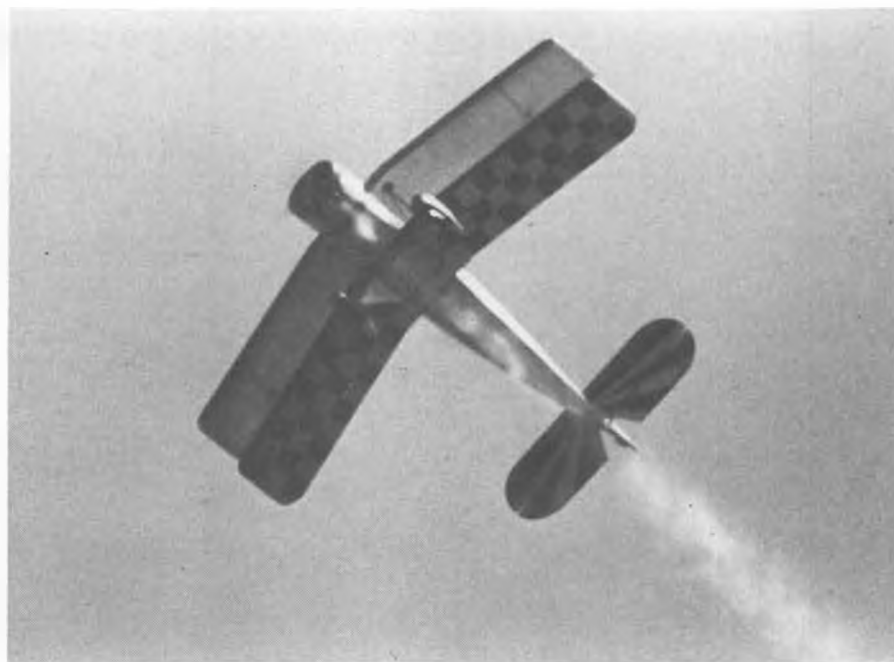
Ray Nugen snugs down the nylon wing bolts. Photo gives an idea of the size of this biggie. If you don't fly from a grass field, you better make a rack to hold fuselage during assembly.

positive incidence in the top wing was too much. I reduced it to 2 degrees. This was just right, smoothing out the glide and making the landing flare less abrupt.

The airplane came off the board weighing 10 lbs., 4 ozs., carrying 12 oz. of fuel, four controls and .60 power. While in the shop, we changed to an O.S. 80, swinging a 14 x 6 wood prop, added a smoke machine (with its own 12 oz. fuel tank), and increased the engine's fuel capacity to 20 oz., which gave us approximately a 22 minute flight range.

A little more about the smoke machine . . . it is run off of crankcase pressure, and requires a back check valve between the engine and the smoke fuel tank (I use Casite for smoke liquid). The metering needle valve is mounted in the exhaust stack, as close as possible to the exhaust port. To complete the circuit, run a feed line from the smoke tank to the needle valve, with a servo-operated cut-off somewhere between. Flattening the end of the metering needle will help produce a fine spray into the hot exhaust, which improves the smoke volume.

The smoke fuel tank is mounted beside the engine under the cowling. The exhaust stack extension was made by shaping a piece of aluminum tubing to fit the side-mounted engine exhaust, porting straight down. The cowling was made from a 10 inch aluminum sauce pan. The handles were ground off, the rim cut off, and



With smoke machine turned on, the Krier Kraft passes overhead. As with any large and lightly loaded model, this ship is extremely realistic in flight, moving at scale speed in all maneuvers.

the bottom cut out.

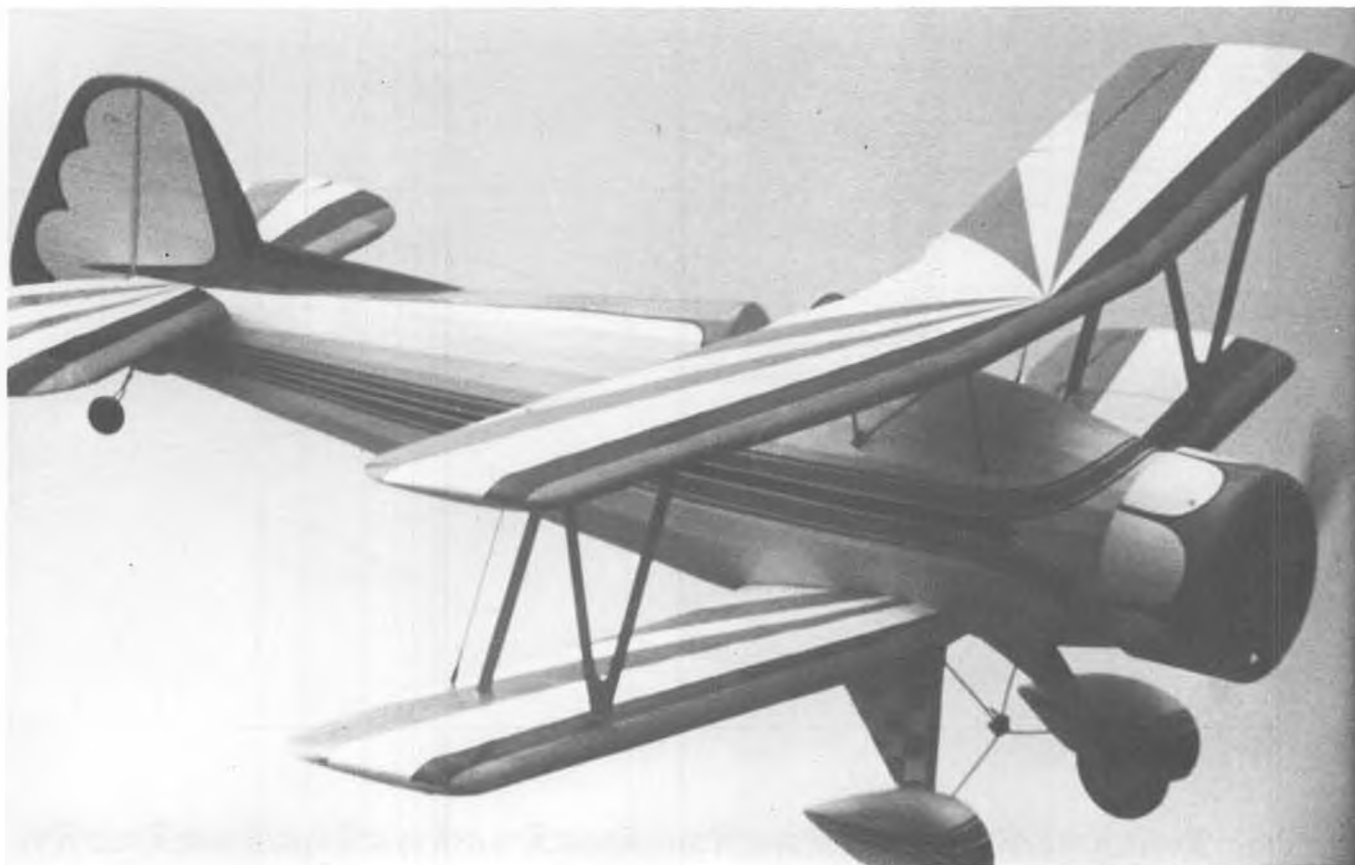
The original model was covered with parachute nylon, and copies exactly Harold Krier's color scheme.

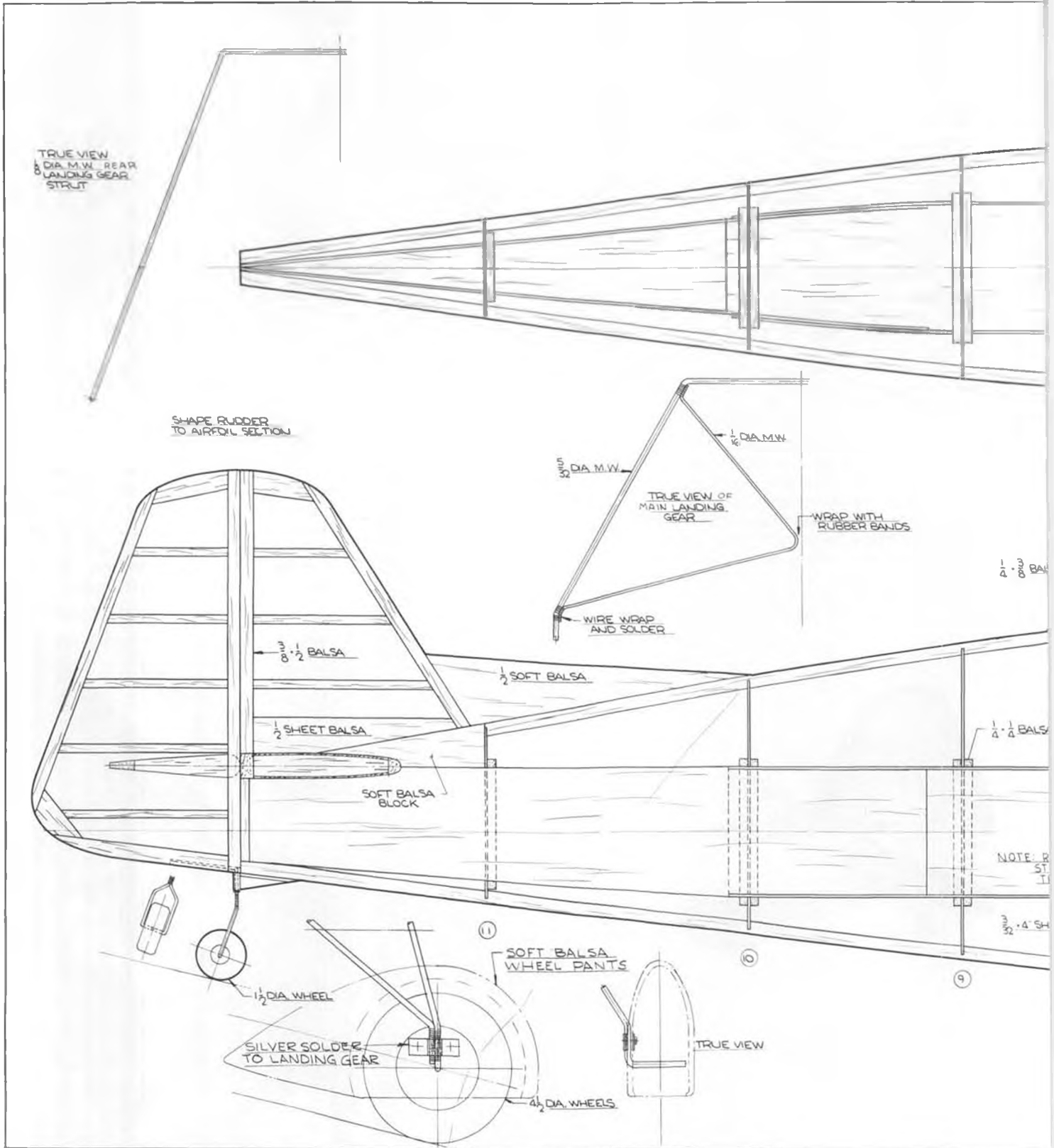
The aircraft is basic white, with a dark blue stripe behind orange leading edges. All orange stripes, and the orange and white checkerboard on the underside of the bottom wing are trimmed in dark blue. The center fuselage stripe is dark blue, and 1/8

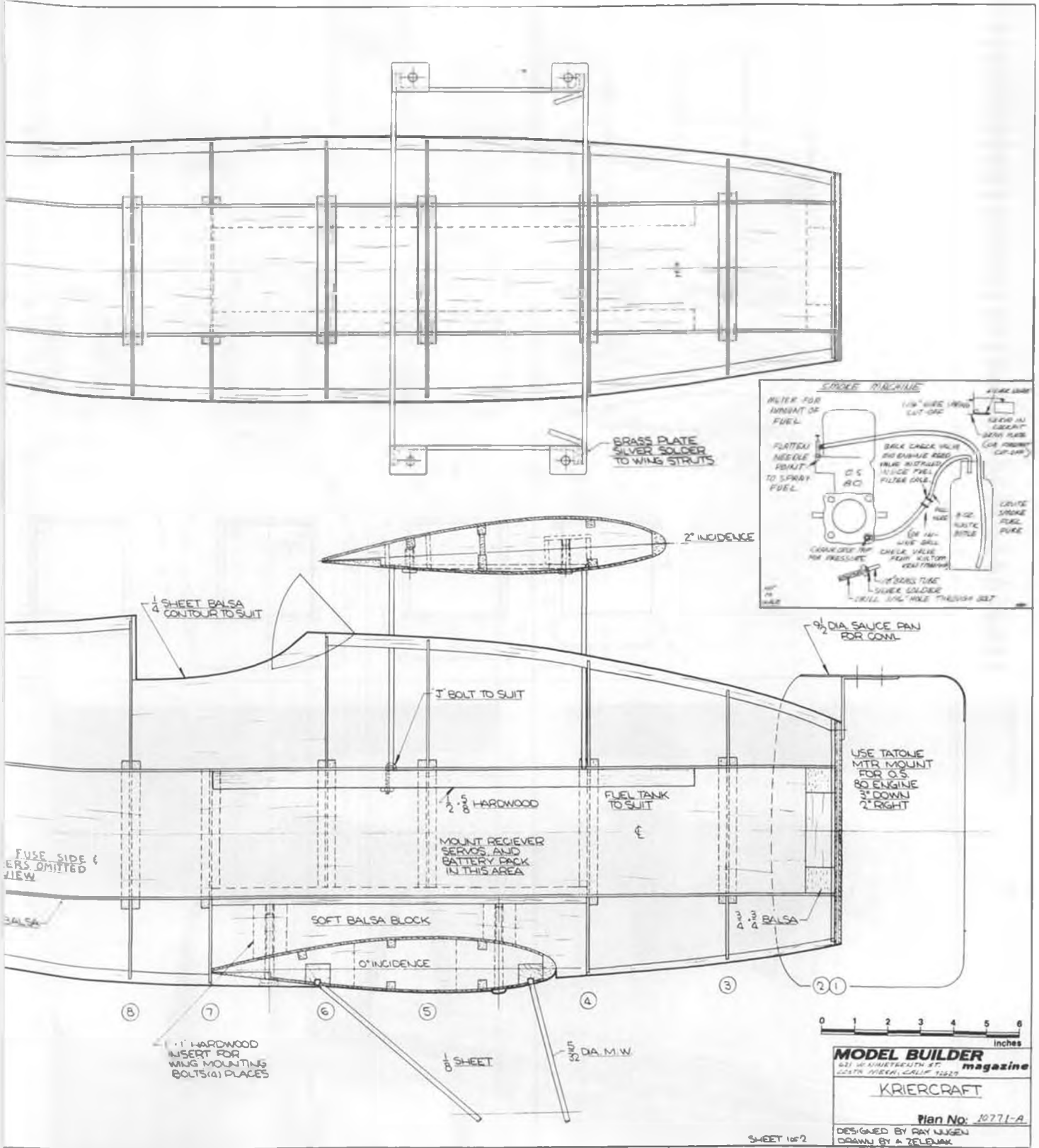
masking was used to separate orange pin stripes.

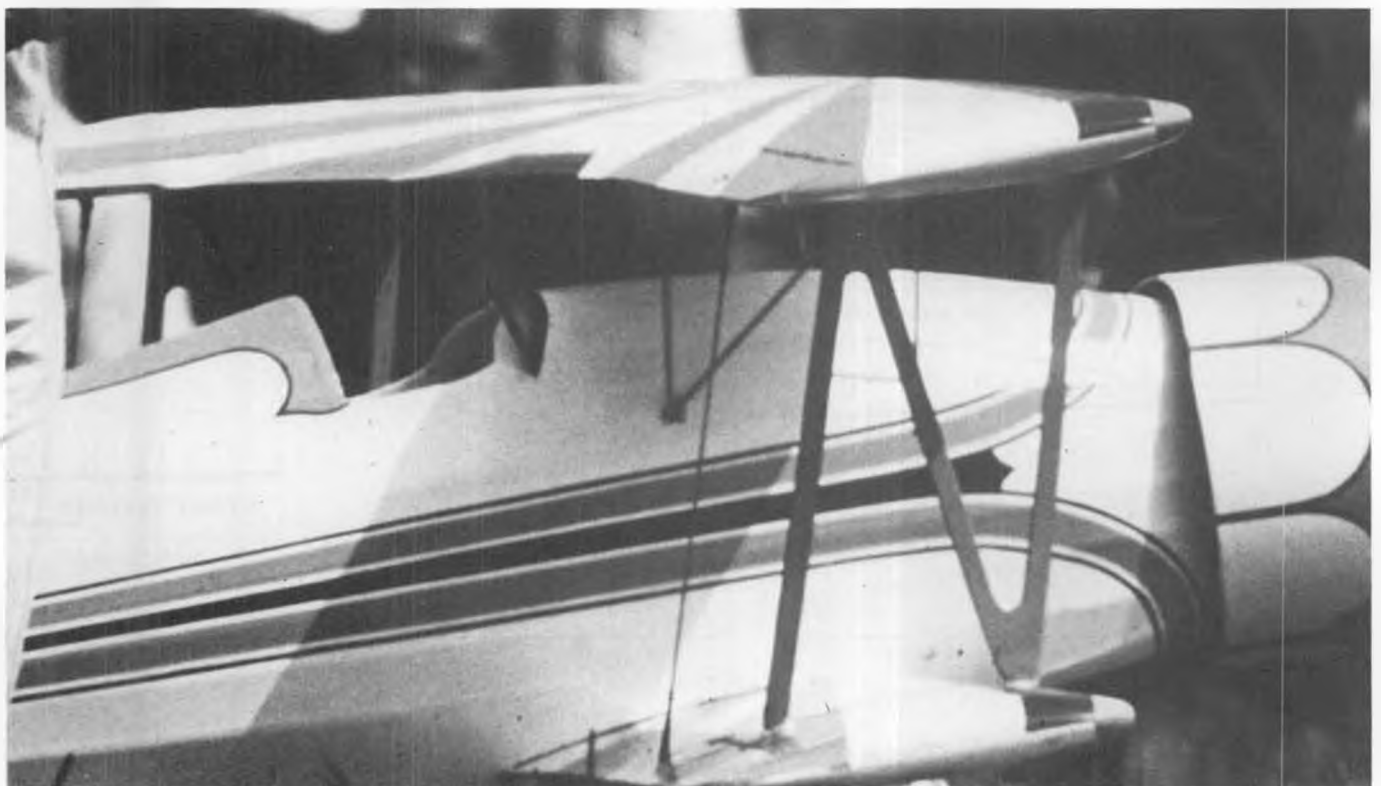
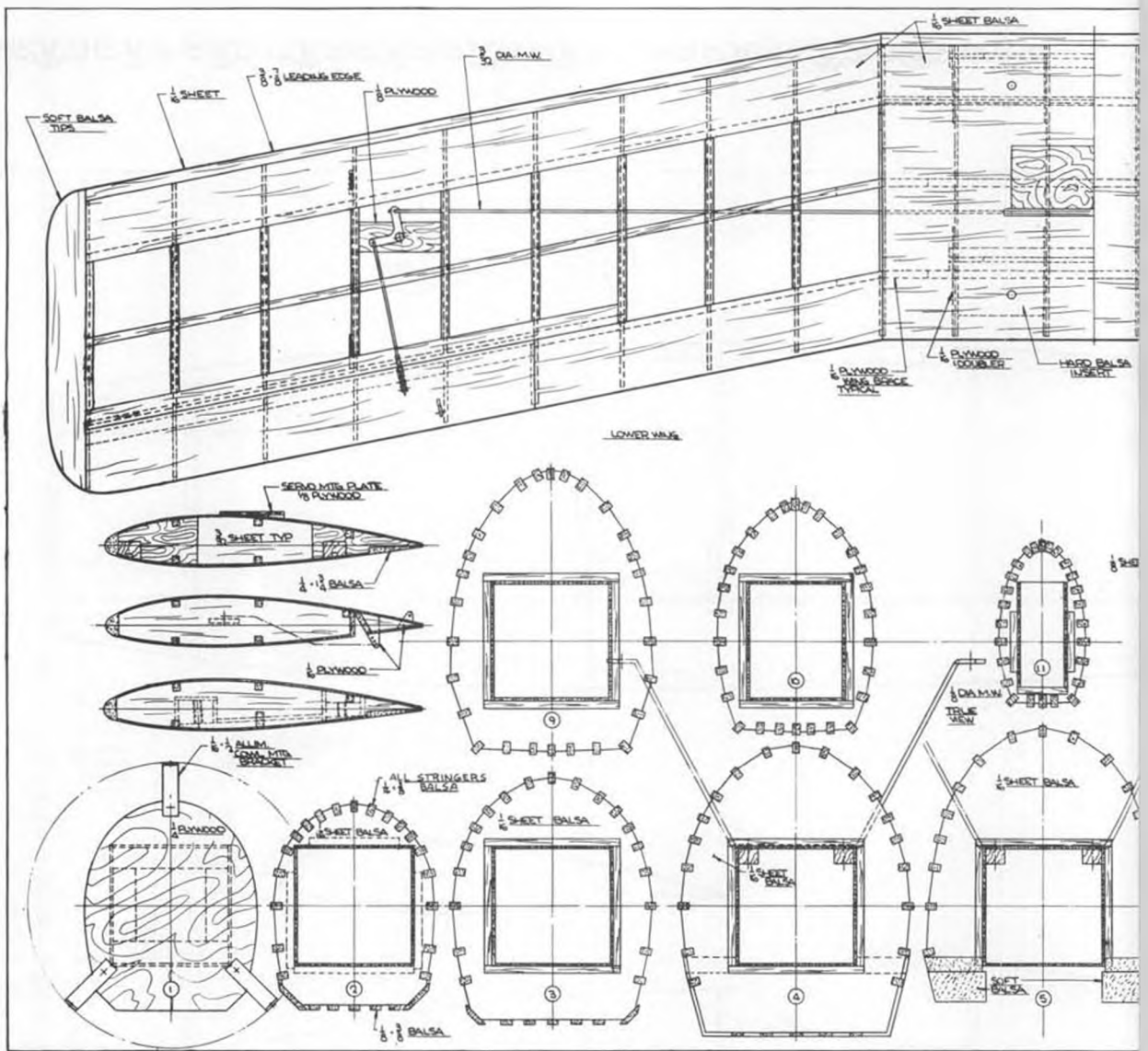
Although a beginning R/C modeler could probably fly it, the model is not for a beginner to build. As it was completed about 13 years ago, there have been quite a few changes in structural materials and adhesives, but the basic construction design still provides the best means of

Continued on page 87











Charley Gilbert's "Baby Ranger". Glass body, vacuum-formed windows. Adapts to Heli-Baby, Revolution, or Alouette mechanics.

CHOPPER CHATTER

By JOHN TUCKER



PHOTOS BY AUTHOR UNLESS NOTED

ROTOR MOTOR

When liquid 90% hydrogen peroxide (H_2O_2) is passed through a silver-plated screen catalyst bed contained in the rocket, an exothermic chemical reaction occurs which decomposes the peroxide into water (H_2O) and free oxygen (O_2) at 1340°F. It does not burn. Superheated steam is released through a small nozzle in a rearward direction as a supersonic driving jet. There is no need for carburetion, ignition or starting systems, batteries, plugs or wires. There is no tip flame, no air pollution, the only sound it makes is the soft pffft-pffft-pffft of steam exhausting at the rotor blade tips. There is no plop-plop-plop of the blades to be heard, because the usual tip vortex noise generation is prevented by the rockets jet blast. The reduction of

tip vortex loss also increases lifting efficiency.

Does this sound like something out of the future? Well, not really, if technological research by Aerospace General Co., of Odessa, Texas, has anything to say about it! They have developed a one-man mini-copter which can literally be strapped onto the pilot's back after unfolding it from its 21 inch diameter x 60 inch case . . . and the entire operation requires only 2 minutes (with no tools needed). The key to this remarkable chopper is the simplicity and high performance derived from a miniature, 8 ounce rocket "rotor-motor", which is faired into each blade tip. Measuring only .7 inch in thickness and about as long as a pack of king-size cigarettes, the rockets pack a driving thrust of over

45 pounds each. They deliver more power than a 100 h.p. aircraft engine, and either rocket will sustain flight if the other one fails.

The rocket rotor-motors are fully throttleable, and with blade tip power, there is no torque to overcome, either power-on or power-off. According to the designers, a rocket power system can be made in any size to fit the requirements. Completely bypassing the gear box, drive shafts, clutch and cooling devices, the power is added at the tips of the blades where the leverage is. Man, what a beautiful way to power our R/C model choppers. Can you imagine a 60 inch diameter rotor on the chopper of your choice, and weighing less than 4 or 5 lbs.? (A guess.) With that kind of weight and no rotor torque to worry about, I can imagine all sorts of new things to do! Now, don't rush out to place your order yet . . . there are other things to consider, such as availability and costs of the rather exotic fuel, along with fantastic fuel burn-rates.

A quick calculation from the data supplied on the above rockets showed a burn-rate of a 1/2 gallon per minute for each engine. Of course, we're talking about larger engines (50 h.p.) than would be required for our models . . . by the time they were scaled down to R/C model dimensions, they would probably be about the size of a glow plug, and consume no more fuel than a glow engine! I'm also sure that



Charley, at his main workbench, working on his adjustable pitch, three-bladed aluminum prop.



Charlie at the console of his Logan lathe. Belt sander/grinder is the latest thing for sharpening tools, etc., better than grinding wheel.



Gilbert at his drawing table . . . at least it was until it became a work-bench. His Hughes 500 glass body was designed for the "big" engines.

much research needs to be done before such scale-down is possible. At any rate, perhaps the above will spark the imagination of our more ambitious technicians, and we'll have such a powerplant in the near future! My personal thanks and gratitude to Mr. Gilbert Magill, President of Aerospace General Co. for his fine work in the development of rotormotors and the technical data supplied for this article.

THE STING

I've just finished reading the August '77 issue of *MB*, and made a special note of the incident(s) where our "Over the Counter" editor was bee-stung under each armpit last summer! Thought you'd like to know, Eloy, that you don't have an exclusive on that one, according to a letter received from Mike Miller, of Vancouver, Washington! He sez, "After about 2 minutes of flying my Revolution, something landed in my hair. A quick swipe with my left hand found nothing. I didn't know it then, but my head was being used as the Beecraft carrier, U.S.S. Wasp. In the

next few seconds, I was hit in the face by 4 mad bees! All of this time, the Revolution is still flying. I managed to keep cool and the "Rev" under control for the first 2 stings. On the third hit, I decided to move out, and fast. My fourth hit was the real stinger . . . all I could think of was to pull back on the throttle stick and hope for my life. While running backwards at full speed, I fell. The transmitter also fell, and when it hit the ground, the throttle went to full-bore. Before I could recover, the Revolution was about 100 feet high and upside down! The rest, you can figure out. Upon looking at the remains, I discovered it could have been worse. The boom is bent, the frame is bent, the tail rotor shaft is broken, the tank is split, flybar bent, all blades destroyed, and last of all, the canopy is smashed."

Did he say, "It could have been worse?" Well Mike, I really feel for you and Eloy's predicament . . . can't imagine anything worse to have happen during flight. Perhaps you should do what Eloy did, and change deodorant to K&B 500 to eliminate further problems!

METRIC TAPS AND DIES

In spite of the simplicity of the metric system, many of the R/C chopper builders have difficulty in understanding the numbers on taps and dies used with the German helicopter kits. Probably the most used tools in my shop are those taps and dies, to thread push-rods and metric-sized machine screws. They are rapidly becoming more and more available in the better hardware and tool supply stores, but you still must know what to order since there are so many sizes available. A set of 4 should see you through any helicopter problems that might come up, and I recommend that you pick them up as you find them. The taps and dies are designated with two sets of numbers, separated by an "x",

such as (4 x .70) or (2.6 x .45), etc. The first number is the diameter of the thread in millimeters, while the second number is the distance between threads in millimeters. The system is similar to the American Standard, where the first number denotes an arbitrary diameter size and the second is the number of threads per inch. A metric 4 x .70 screw would be 4 millimeters in diameter and seven-tenths of a millimeter between threads. An American 6-32 screw would be a No. 6 diameter and 32 threads per inch.

To keep them straight and to avoid confusion, I have 4 little plastic boxes, each of which contains a tap, die, sample machine screw and nut, tap drill, and clearance hole drill. The sizes are shown below for your information:

Tap/Die	Tap Drill No.	Clearance Drill No.
2 x 40	53	48
2.6 x 45	45	39
3 x 50	40	32
4 x .70	30	22

Continued on page 70



Demonstrating new aluminum brazing rod, for home shop use. Low heat required. See text.



Charley operates his vertical milling machine. Power hacksaw barely visible at left.



Slow revving Forster 99 allows prop to be seen in this shot of Sal Taibi's Powerhouse as it starts climb for altitude at Las Vegas SAM Champs.



Delightful, delectable, delicious, Miss SAM Champs 1977, Tricia Webster, Tenn. U.



PLUG SPARKS

By JOHN POND

• Boy, was it hot! All sorts of heat records were set at Las Vegas during the Eleventh Annual Society of Antique Modelers (SAM) Old Timer Championships. When the columnist left Northern California, Las Vegas had just registered the high of the nation that day.

The weatherman predicted the high pressure area would move south and did it ever! Temperatures were never under 110, and ranged up to 117 in Las Vegas. The predicted temperatures of 90 to 100 based on local forecasting never materialized.

However, before one gets the idea this was an inferno, all flying started at 6 a.m. At that time, and up to 11 a.m., conditions were just beautiful for flying. The drift was extreme-

ly slight, and the only models that were lost were easily recovered the next day. Quite a few models were going out of sight straight overhead, drifting perhaps a 1000 feet, and then descending. This was the case for Barnet Kernoff, as his Smith Mulvihill Tractor went out of sight overhead as the dethermalizer stuck. The model was recovered later by Larry Boyer a short distance away, where no one saw it come down.

Two areas, as before, were set up for free flight and radio control flying. Noted on the first day of free flight was the number of mid-air collisions and near misses. As stated before, in the last report on a Las Vegas contest, with the drift practically negligible, the biggest hazard was

the model itself as it would land almost in the same spot from which it took off!

Rise-off-ground flights were a real pleasure in this dry lake area, as the hard sun-baked ground provided an excellent surface with a minimal of dust. As pointed out in the Las Vegas contest review, there wasn't a blade of grass to trip over. In short, it was a great area for flying and retrieving of models.

Most gas engines were susceptible to the heat, particularly the glow engines. Generally speaking, a reduction in the amounts of nitro in the glow fuel helped reduce overheating and pre-ignition. Most ignition engines ran well on three-to-one, but the exotic fuels of six or eight-to-one did have problems.

Rubber motors had to be kept cool, as the air temperatures had a tendency to slowly parboil the rubber. Surprisingly, only a few rubber motors were broken in the winding process, as the experts recognized how to handle their rubber in the heat. As Barnet put it, "I like my rubber medium well, not overdone."



The secret of winning. Cover your Playboy like this, and it tries to go O.O.S. to hide. Won Class C for Ray Chalker. It's draped, not covered!



Mark Fehner, with his more conventionally covered Super Cyke Playboy, was nosed out of first place by one second! Johnson photo.



Al Schwankert releases Woody Woodman's McCoy 60 ignition powered (oof!) Playboy. It placed third in R/C with only one flight.



"M a m m y. The sun shines east, the sun shines west . . . and in Vegas, it shines too much!" Danny Sheelds, with a *darlin'* hat.

A total of 150 contestants registered for the Las Vegas Champs. This was the largest, out-stripped only by the Wright Patterson 1976 Champs, which featured 191 registrants. Regardless, the SAM Champs show a tremendous growth every year in the particular area they are staged. Most gratifying to this columnist was the huge contingent of flyers from the East Coast, notably New Jersey. Surprisingly, in view of the activity of the Aeronuts, Pelicans, and other O/T clubs, the Chicago area was poorly represented.

In the flying of free flights, what can you say about Bruce and Leslie Norman? They simply tore the contest apart, winning twelve places and two special award trophies. Their table at the Awards Banquet simply groaned with the weight of the trophies.

Old pros, such as Sal Taibi, liked the early morning air, and proceeded to show the others how it was done. This year, Taibi picked on an event that was strange to him, flying scale, and promptly proceeded to win same. Of course, he had to demonstrate he hadn't lost his touch with his Powerhouse, winning the Antique Event easily (so it seems!).

As usual, the biggest entry was in the .020 Replica Event (and we have



Slick SCIF builder, Phil McCary, and his "gussied" up Comet Clipper. Note gravity trim tab on left wing trailing edge. Streamlines during power burst, then drags wing in glide.

voted out glow engines in the other events!) which proves the popularity of old-timers using the simpler glow engines. Jerry Vernon, that perpetual bridesmaid, finally broke the jinx and won over a field of 67 entrants. No mean feat!

In spite of the cries of those who think the converted ignition glow engines were going to win everything, it is interesting to note that only 16 of 45 places were taken by glow conversions. Then, when you take off the nine places taken by the

Normans (who could win with egg-beaters!) you have only 7! Don't know what all the furor was about.

No question about it, the glow conversions will come into use more and more as the original ignition engines vanish. Regardless of anyone's statement, ignition engines are getting harder to find all the time. As the scarcity increases, so does the price of the dwindling supply. Hopefully, the gap will be filled by those love-of-labor manufacturers who produce engines of that vintage.



After all these years, the Comet Clipper is still one of the most popular free flight gas jobs. The latest trend seems to be toward adding that often dismissed engine cowling. On the left, it's Bob Petro, Couer d'Alene, Idaho, and on the right, the SCAMPS own Bob Oslan (Mr. Cal Aero Models).



Cliff Silva patiently broils in the Las Vegas sun with his Super Cyke powered Playboy Cabin.



An unusual one, by Bruno Markiewicz, Detroit. It's a Bommerang, by Frank Ehling.



Hope Alfred Hitchcock doesn't see this. He'd probably come up with a sequel to "The Birds!" Larry Boyer and his Clipper, which met an immovable object. Same RV was attacked twice!

The free flight events were ably run by Gene Wallock. Everyone agreed that he did an outstanding job of organization in running the meet from 6 a.m. to 4 p.m. Of course, the only ones around in that afternoon heat were those tough Texans, the Normans.

Over on the radio side of things, where Tom Bristol was C.D. (with an excellent assist from wifey, Pat), activity was as good as ever. Only a few radio sets suffered from the

heat, notably Ted Kafer (SAM 21 Secty) whose Lanzo Stick model suddenly dived in from several hundred feet for no apparent interference or reason.

The New Jersey boys are still shaking their heads over the "loss" of their event, Class C R/C Assist. This year, Don Bekin's son, Larry, won over all the hotshots, using a Playboy Sr. he had built only in the last month. Give those kids an inch and they'll take an arm!



O/T R/C Headquarters on the Vegas flying site. No one could say there was a shortage of flying space! Smart contestants flew early, and headed for town by noon!

Among some of the "new" designs seen in the Texaco Event was Nicholas Sanford's "Ehling 4 hr. flyer", Al Schwankert's "Goldberg Gas Bird" and the much heralded "Gua-neiri MG" as flown in four sizes by Jim Clark.

Anyway, we are getting ahead of our story, so let's start at the beginning, where the contestants were registering at the Stardust, on the "Strip." A slight amount of fouling occurred when some of the contestants reported to the main desk instead of the Tony Perch Tour Reservation desk (as spelled out in the contest directions). This was only a minor flap, as the rooms were excellent for the price (\$18.00/day) as compared with the standard asking price of \$30.00 per diem being asked on the "Strip."

Once everyone was ensconced, the "Bean Feed" held Monday night was, in actuality, a smorgasbord dinner with plenty of group tables and chairs being available. During this pleasant get-together, some of the late changes in contest procedures were announced. The six o'clock starting time proved to be a wise move in light of subsequent weather developments. Also discussed were the special ignition events for R/C and the new .020 R/C rules as developed by SAM 21.

Tuesday night was about the only free night the contestants had, as it seemed there was always something cooking. One couldn't complain about places to go in view of the fact that most modelers quit flying around 1 o'clock in the afternoon. Those who brought their wives were delighted to find that this time, the wives actually enjoyed a contest site. If it is any indication, the columnist only saw his wife twice a day, once in the morning and, if lucky, once in the evening!

ANNUAL SAM BUSINESS MEETING

Wednesday evening was the date for the Annual SAM Business Meet-



SAM 21 winners at Vegas. Front row (l to r); Don Bekins, Karl Tulp, Larry Bekins. Front row (l to r); Bob Von Kinsky, Nick Sanford, Ted Kafer, and W. Squires.



Young Larry Bekins set the eastern boys on their ears by winning Class C R/C. C.D. Tom Bristol presents trophy.

ing, as presided over by Joe Beshar, President. After a few opening remarks, he brought up the subject of the SAM Constitution as updated and rewritten by Beshar, Pond, and Banaszak. After a reading and short discussion, the SAM Constitution was adopted and plans made to add this paper to the SAM Rule Book for 1978.

The location of the 1978 SAM Champs was announced by President Beshar as Westover AFB, to be run by SAM 7. Of course, this was tentative, based on the SAM 7 membership approval to run the Champs. However, there was no doubt about 1979, as Mark Fechner, of Salt Lake City, announced the SLAM Club was requesting and expecting to stage the SAM Champs.

Tim Banaszak reported there are now 1629 paid SAM members (we're getting bigger all the time!). He also initiated action on a SAM Life Membership for \$75.00. This motion was unanimously adopted. The SAM Treasury is in great shape, with over \$3000 in the kitty with all trophies paid for!



Former SAM Director Bud McNorgan is real active again. This is his Brown Jr. powered Dallaire Sportster. Johnson photo.

At this point, Charlie Banks, representing National Airlines, spoke on the idea of a National Airlines Museum, to be located at St. Petersburg, to reflect the early transport airplanes used by N.A.L., such as Stinson T, Stinson U, Lockheed Electra, etc. Banks is looking for help in this direction and indicated that a mutual reciprocity agreement could be worked out. Never know when S.A.M. is liable to get itself a first

class sponsor.

Following a short welcoming speech by the Western VP, John Pond, the floor was deferred to Al Hellman to discuss the problem of the new ignition engines now being manufactured. After a rather lengthy discussion, the Wahl-Brown Jr. Custom, Spielmaker 60, and Remco 29 engines were approved as pre-1950 type ignition engines.

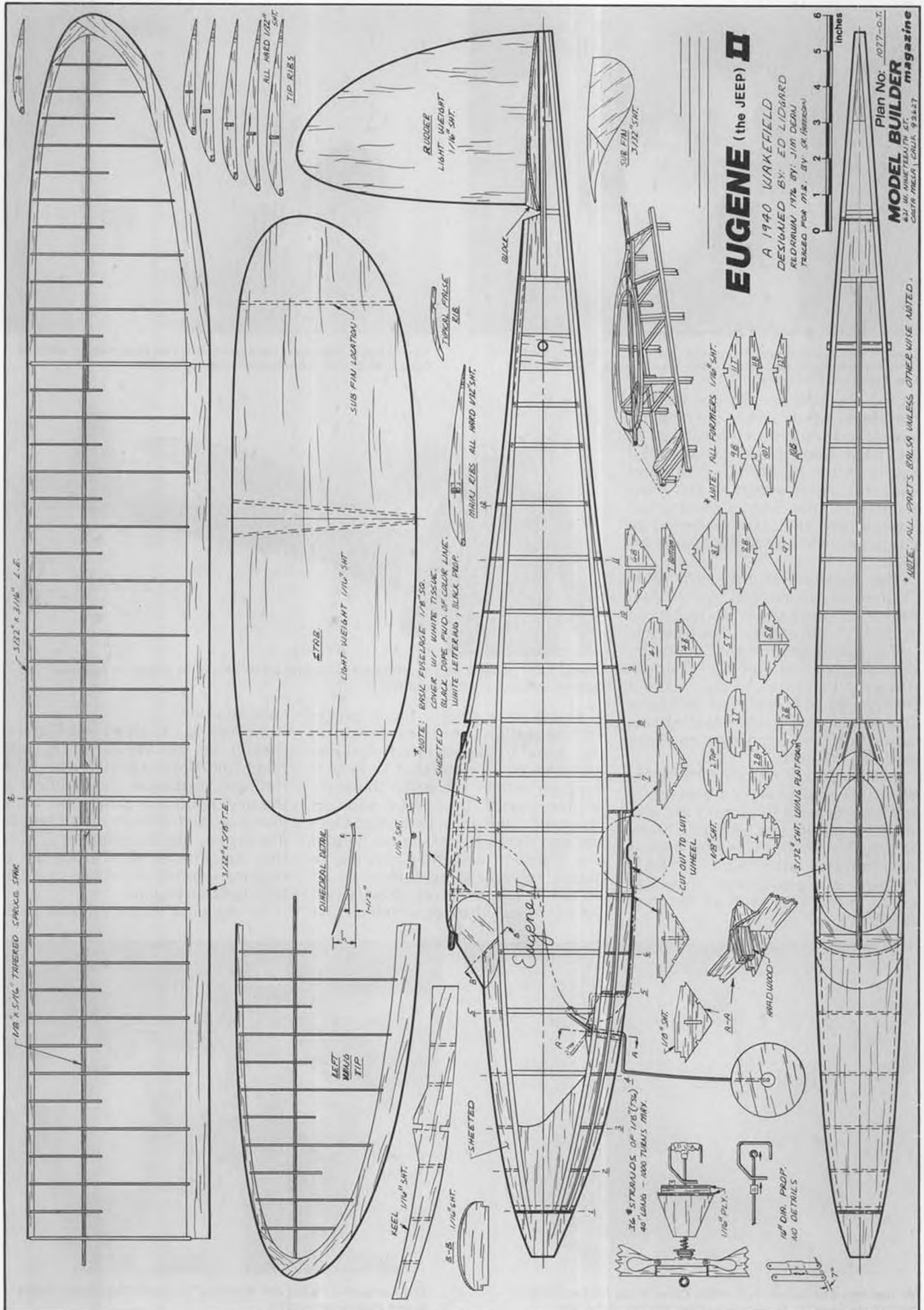
To evaluate future engines to be

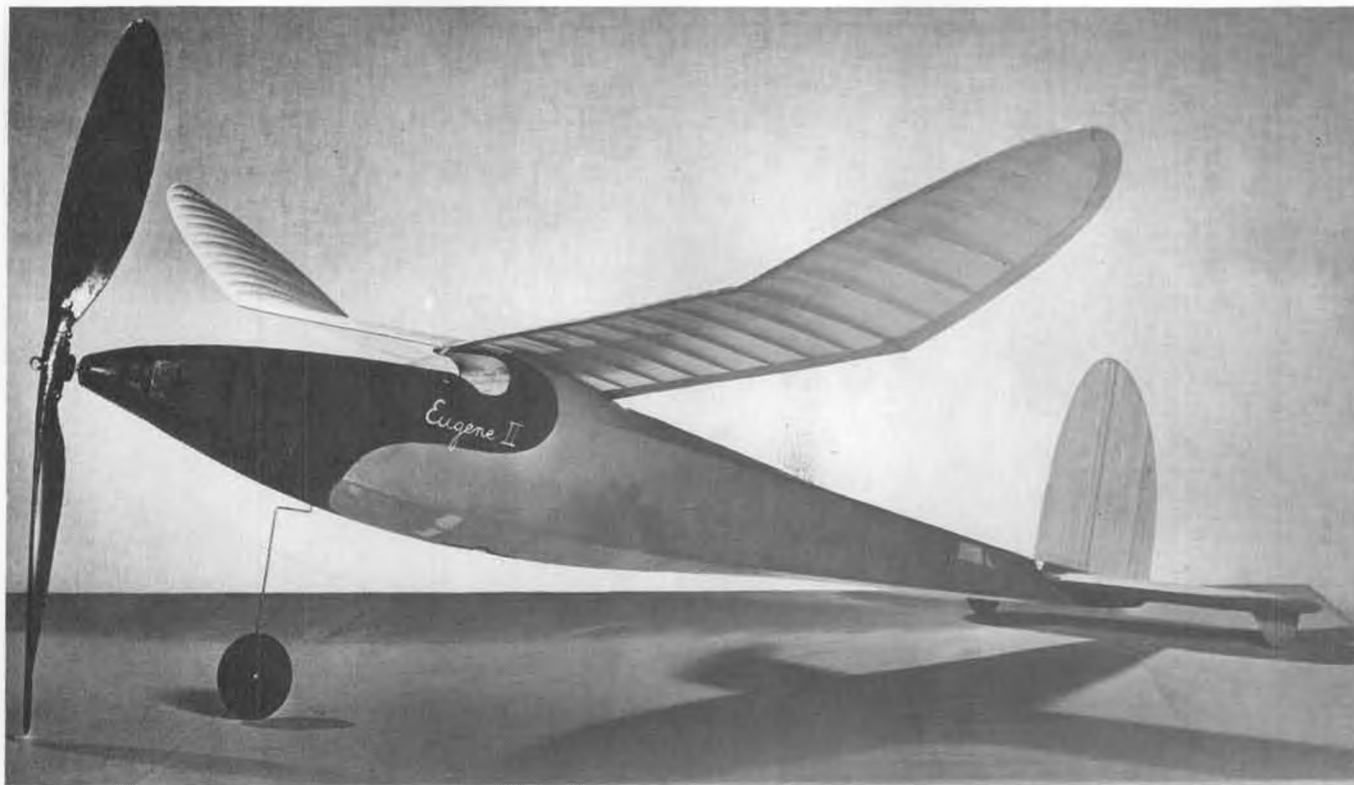


Mr. and Mrs. Abe Gallas, with Abe's Cloud King. Modern electric starters are great for those old ignition engines, right Abe?



The Kansas City boys; Jim Root and son, with Marv Mayo, ready to test their Interceptors.





ED LIDGARD'S "EUGENE II"

OLD TIMER Model of the Month

Designed by: Ed Lidgard

Text by: Bob Oslan

• Eugene II is the work of Ed Lidgard, one of the best rubber modelers to ever crank 1400 turns into a motor. He's best known for his Sparky, which has been kitted by Comet for about 35 years and will probably go on forever. Hi-Ho is another Lidgard design that was published in *Air Trails* around 1941. This was a slick rubber ship that could be flown in either the "fuselage" or "stick" class by virtue of a removable streamlined cabin. Eugene II is a typical example of the Lidgard family of designs ... streamlined, retractable gear, and innovative.

Ed designed and built the ship shortly before going into the Army in WW II. Consequently, it doesn't have a contest pedigree. However, it's easy to see that Eugene II has real high performance potential,

and its sleek looks make it too tempting not to build.

The plan presented here was redrawn by Jim Dean (then traced by Al Patterson) from the original, which Ed gave me during a visit to my home prior to the 1976 U.S. Free Flight Championships. Jim has done his customary fine job, and the information on the plan should be sufficient for any competent builder. The only change was the elimination of the Austin dethermalizer timer which was used on the original. You can use your own favorite fuse arrangement on your ship.

Unfortunately, the original plans didn't have any propeller information on them. The 16 inch prop diameter was calculated by use of the photo of Ed's model. He sometimes did unusual little things with prop design, and you might just drop him a line via **M.B.** for his thoughts on the subject.

I was talking to John Pond about Ed, and learned that he would have

won even more meets than he did if it wasn't for the exceptional performance of his models. The problem, it seems, was that his ships climbed so high and so fast that they went O.O.S. much sooner than the competition that started lower in the lift. That's really not so far-fetched when you consider that in those days there were no maxes; whoever stayed up or in sight the longest was the winner.

Ed's ability to wind a rubber motor is legendary. He was even accused of cheating during the Wakefield competition because one of the English flyers couldn't believe the number of turns Ed put into rubber. He is one of those people with the "touch", and can stop winding one turn short of the miseries.

And so, with this thumbnail sketch of one of the outstanding rubber flyers of the period we love so well, I'll turn you loose to do your thing with one of his designs. Enjoy. •

manufactured, a three-man committee was appointed to test and recommend which engines meet the intent and requirements of SAM engine regulations.

Woody Woodman, the official Chapter Record Keeper, announced that SAM now has 32 chapters, with

the latest addition of the Northern California AMPS joining the fold and becoming SAM 32.

In other business, the "SAM?" publicity pamphlet was to be updated. At the same time, the new Old-Timer Static "Scale" judging rules (as originated by Tom Barnes)

were to be incorporated in this P.R. piece. At present, the rules are being reviewed by the SAM Executive Officers. Hopefully, the new publicity pamphlet will be out before the Trade Shows start in 1978.

Al Hellman also used this time to

Continued on page 72



The winners and their trophies, at the NMPRA-QM EASTERN STATES CHAMPIONSHIPS, put on by the Valley Forge Signal Seekers

PYLON

"GO FAST AND Turn Left!"

By JIM GAGER

PHOTOS BY AUTHOR UNLESS NOTED

• As this is being written, it's only a week away from time to head out West to Riverside for the Nats, and we've two brand new airplanes to get sorted out before we leave, so we're going to draw a lot of this column from some current newsletters we've

received.

The first we'll draw from is Prather Products' "Product News," which is a small informational letter put out by Terry Prather, covering the best use of the products put out by his company, contest news, and racing

tips. (By the way, it's almost worth the price of a Prather kit to get on this mailing list. Application forms are provided in the Form. I and Q-M kits.)

DOES FORMULA I NEED A CHANGE?

In the past couple of years, here in California, the average entry per contest has dropped by nearly 50%. Overall N.M.P.R.A. membership is down. Why? I feel there are several reasons for this drop of activity in Formula I:

1. There are several other racing events now, 1/2A, Quarter Midget, Quickie 500 which attracts the beginner. These flyers have not decided to move to Formula I.

2. Many fellows drop out because of expense, lack of availability of competitive engines, or they feel they can no longer handle the speeds of the Formula I ships of today.



Top 3 NMPRA-QM contestants, prior to fly-off for 1st (l to r): Gail Jacobson, Paul Zink (the winner), and Bobby Blouch (3rd place).



C.D. Joe McDermott congratulates Len Weiderhoft, NMPRA-QM President, winner of special event fly-off. George Zink at right.



Dave Latsha with his super van and new Prather Toni. Look closely, that's a pylon racing scene painted on the side of Dave's van!

WHAT'S THE SOLUTION?

I feel we need to do something to encourage new people to enter Formula I and stop the drop-out rate. At a contest this past weekend, Bob Smith, Ed Hotelling and I ran a heat using 15% nitro in our Formula I racers. No changes were made in the engine, prop or airplane. The times were 1:25.6, 1:26.7 and 1:29 respectively. Frankly, we were all surprised the times were so fast since the engines dropped 2,000 rpm.

What effects would 15% nitro have on Formula I.

A. Using 15% nitro in our engines should cut the expense tremendously. Not only would we reduce the wear and tear, but lean runs wouldn't cause near as much damage to our engines as with 60% nitro. Fuel costs and plug costs would be cut drastically.

B. The reduction of wear and tear would make the K&B engines more competitive. This would make more engines available for those who want to fly Formula I. My Terry Tigre X-40's have been back-ordered several months since I started making them.

C. The reduction of the times by 7-10 seconds may encourage "old-timers" to give Formula I another try.

D. Running 15% nitro (like Q.M. and Quickie 500) is less frightening to the beginner who doesn't normally mix or use 60% nitro.

E. Most important of all is safety. I feel those few extra seconds will give the pilots a little more time to prevent crashes.

I think we should experiment and hold a couple of races in various parts of the country to find out if 15% nitro will work. Naturally, the fuel will have to be supplied by the contest management.

I've talked to many top flyers

throughout the country, and most feel 15% nitro may help our event. If you feel this way, try it out. Let me know what you think.

This and similar ideas have been batted around in the past, so by itself, it really wouldn't be newsworthy. This is the first time, however, that we've seen such highly respected fliers attempt to actually find out what restricting the nitro content would do under actual racing conditions.

Now let's examine Terry's statements about the reasons that guys are supposedly dropping away and newcomers aren't rushing to fill their ranks.

First is expense (we'll use our figures).

Airplanes: A Formula I completely built, lacking only radio and engine, costs in the neighborhood of \$150.00 to \$200.00, assuming you build it yourself and pay list prices for all materials including the kit. If you have it built for you complete with paint and details, you can expect to



Gail Jacobson flew his Prather Toni to second place in the championships.

shell out another \$150.00 to \$200.00.

Engines: A competitive Formula I engine is going to cost at least \$75.00 in stock form. If you have it reworked to increase its reliability or to improve its power output, you can tack on another \$85.00.

Radio: Radios can range all the way from the \$200.00 cheapie up to the \$500.00 sets. From what I've seen in use, it appears that the somewhat more expensive units predominate, and for safety's sake, it's probably a good thing.

So, even before you've run your first race, you could have anywhere from \$425.00 to \$1060.00 invested in just one competitive airplane. This doesn't even begin to touch on the ground-support equipment you'll soon find you need to acquire on your way to stardom.

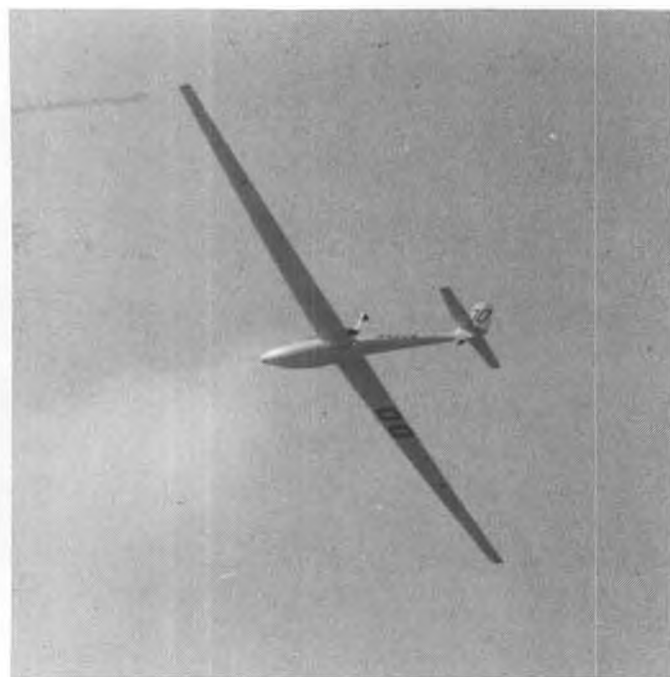
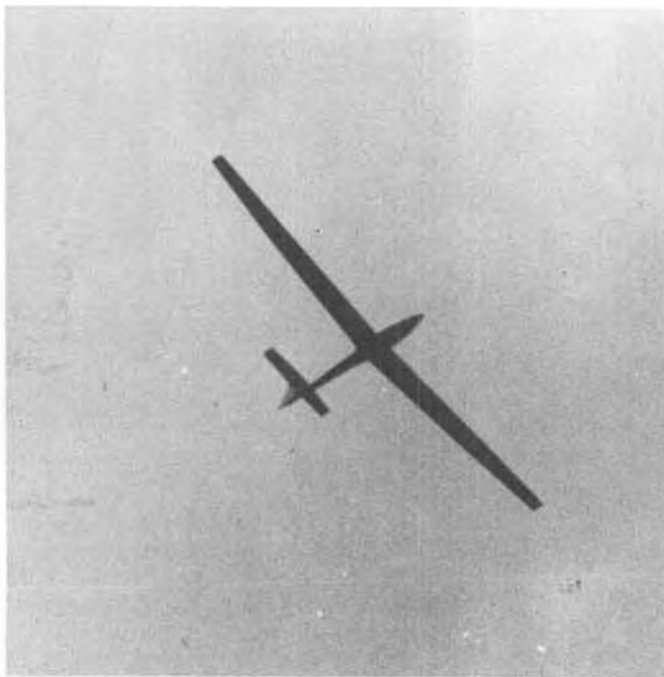
We'll not touch on what it takes to keep your healthy body and lighting reflexes in shape, and getting to and from the contests, as all competitors face the same costs and problems. We will take a look at what it takes to feed that speedster of yours.

That Powerbelching 40 you're using eats at least eight ounces of fuel per flight, and it probably runs its

Continued on page 76



First place winner, Paul Zink, is flanked by C.D. Joe McDermott (left) and contest originator Al Grove. All NMPRA-QM Champ photos by Austin Gutman, an MB Editor's eastern O.F.B.



Which aircraft is a model, and which one is a full-scale sailplane; both in flight over Torrey Pines. One is a Kestrel 17, and the other is a Libelle. Read the text carefully, and you'll find out . . . that is if you can't tell from the photographs.

R/C SOARING

by Dr. LARRY FOGEL.

PHOTOS BY AUTHOR

IN MEMORIUM

The Raven . . . a beautiful flying wing that demonstrated its ability to thermal with the best of them.

Last Saturday morning, after a 20-minute flight, the Raven was at about 500 feet in the near range when suddenly a radio failure caused a hard down command which put the aircraft into a terminal dive, ending on the pavement.

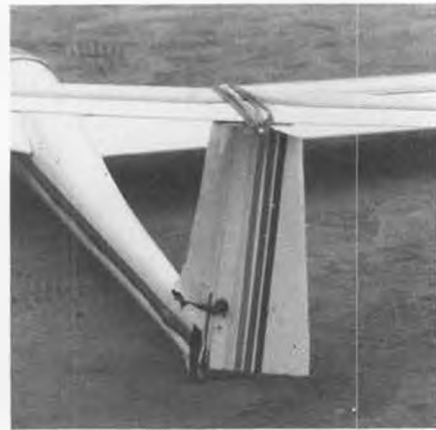
I guess we must face the fact that all good things come to an end. After a preliminary autopsy it was clear that there was nothing left but an entire rebirth . . . back to the building board. Here is a case of a short but enjoyable life, in contrast to so many sailplanes that become older and heavier as each scrape and scratch is repaired. Perhaps it was better this

way.

Ben Watson has recently returned from a stay in Great Britain. There, he was active in both slope and thermal R/C soaring. He brought back with him the Ivory Gull, a kit offered by Keilkraft. The outward appearance is strictly conventional T-tail, but wait 'til you see how these control surfaces operate! The entire tail rotates about a horizontal axis for elevator control, while the rudder is separately coupled through a ball-joint placed so as to minimize the cross coupling between rudder and elevator. I didn't believe it would work until I saw it in action. This sailplane is fast and quite aerobatic for its size and configuration. It looks good, flies well, and provides Ben with a lot of pleasure. Perhaps we

should look overseas more often for bright ideas.

I've long been interested in the problem of preventing dorking in contests. You know, the pilot makes a kamakaze landing for the sake of winning points almost without regard for the resulting condition of his sailplane. Why not require that each contestant install an inexpensive shock indicator in his fuselage; as for example the Shock-Fuse as produced by Impacto-Graph? This small device is an inertial threshold monitor designed to ensure the safety of delicate products during their shipment. It weighs only two grams, can easily fit under the canopy, and provides a go/no-go indication of any shock load in excess of the preset amount of g's (for example 5g, 10g,



The tail on this Keil Kraft Ivory Gull, built by Ben Watson, has a horizontal pivot for pitch control . . . the whole thing moves as a unit . . . fin, rudder, stab, and all. The rudder is turned by a ball-joint, and there is no interaction between the two. Just one question . . . What's the advantage?



Simple answer to avoiding mid-air . . . keep blue sky in between at all times.

or up to 150g in 10g increments). The device responds only to shocks which last more than nine milliseconds, and this is almost always the case in a sailplane crash. It comes with self-adhesive backing for ease of mounting, and can be read by the Timer (with the Contest Director being the final authority). In this way, it's clear whether that particular landing was or was not acceptable.

These devices can be reset for reuse and are quite expensive in small quantity (but the cost comes down to a matter of cents when they're purchased en masse). Perhaps similar devices produced by other firms might even be more suitable for our purpose. Please let me know if you've come across such an item. I'm convinced that this approach is worth our serious consideration to improve flying standards in our contests. It's bound to save many hours needlessly spent on repair. (How about nature's "Shock-Fuse," the chicken egg? The Rocketeers have an event called Egg Lofting, in which a flier's score is zilched if he does likewise to the egg upon parachute recovery . . . y'ain't allowed to catch it! Perhaps the penalty of having to remove the scrambled egg is sufficient incentive for proper landings without having to scratch the flight. wcn.)

L.B. Cotter sponsors the Sunset Fliers R/C Glider Club at Granada Hills High School, Encino, California. His students now fly Windrifiers well enough to start on the contest circuit. He challenges other high school teachers to establish a similar club and meet his pilots man-on-man (I mean youngster-on-youngster). Here's a way to involve young folks in a hobby/sport that really deserves their attention . . . a way to get them started without unnecessary aggravation and cost. It's a way to tie in physics, meteorology,



Just a beautiful scene at Torrey Pines, a few miles north of San Diego.



The glider "tug", or tow plane, pulls a glider from the take-off strip just a few hundred feet back from the cliff at Torrey Pines.



A converted C/L Nobler 350 ft. over the ocean. If you'd told Aldrich 15 years ago . . .

and even art, with an enjoyable leisure time activity. I applaud Mr. Cotter for his innovative action. Here's hoping that other schools can take up his challenge. By the way, Frank Zaic recently attended a luncheon held by the Sunset Fliers. He presented the "Lindberg Trophy" to their top pilot and briefed them on the history of R/C soaring. Couldn't ask for a better speaker on that subject.

The other day I had the chance to watch Russell Owens fly off Torrey Pines in his full-scale Libelle. The immediate purpose was taking photographs for advertisement purposes. Note the camera mounted over the canopy. I couldn't help but wonder about this profile as compared with that of the quarter-scale



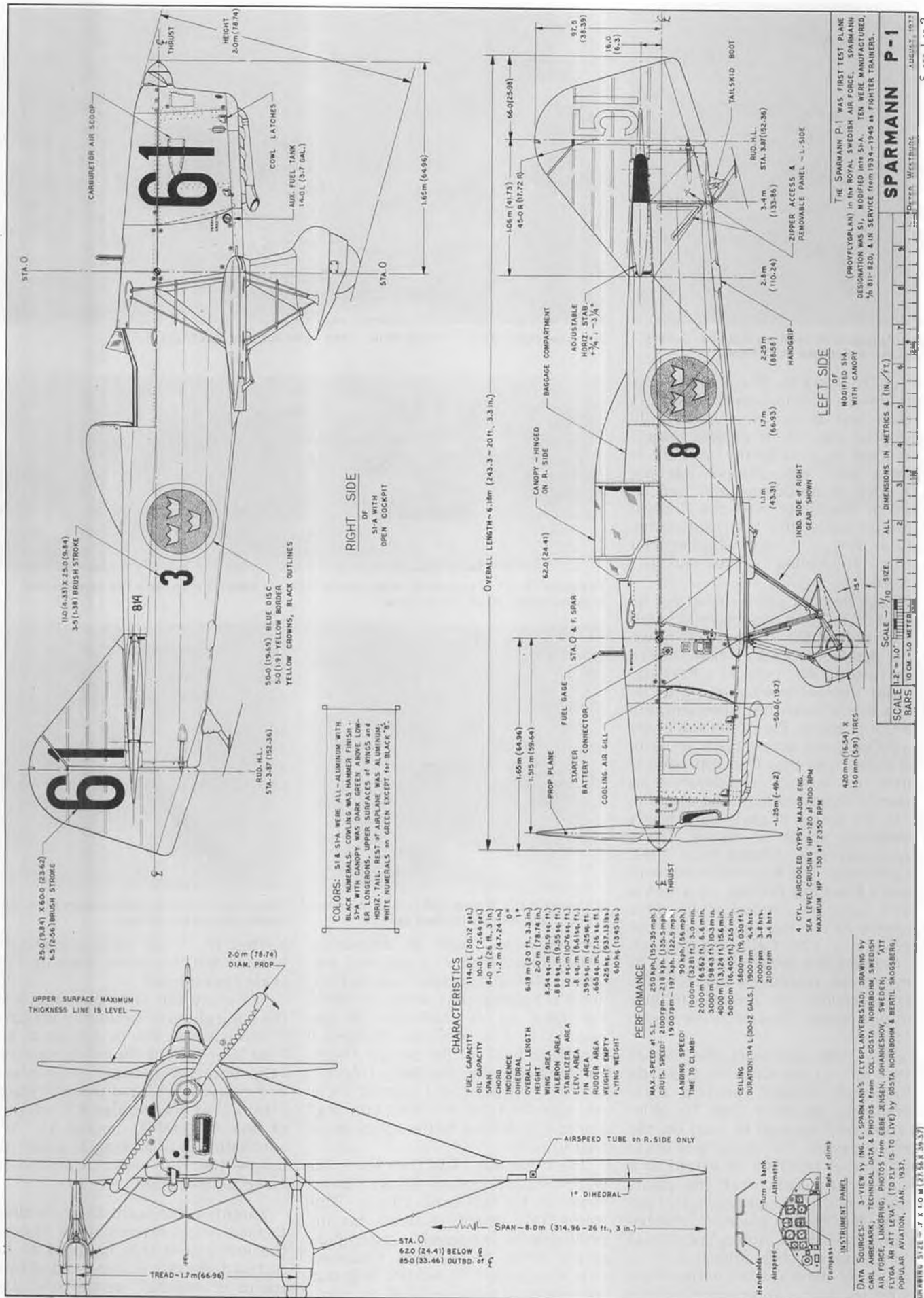
The author's ill-fated Raven enjoys a last fling before becoming a statistic.

Kestrel 17 . . . you have to admit it's hard to tell this plane from its full-scale counterpart.

We share the same airspace with the hang gliders. Sometimes it's hard to tell whether you're in front or behind. Our rule of thumb is, "always keep blue sky between your plane and everything else in the air." Hank Stekel flies the Nobler R/C version of the original U-control kit. It's aerobic, thus making it easier to follow the rule when it's time to make the decision.

Parents often want their children to take music lessons. They choose the instrument that happens to be on hand, the one recommended by a friend or teacher, or the one dad

Continued on page 78



Full size prints available direct from Pete Westburg. See ad on page 94.



The original P-1 had a civil registration and was called the S1. It had rounded wingtips, and no headrest. Before this photo was taken, the rudder outline had been changed from a lozenge shape (rounded). Finish on aluminum work was damscened to hide hammer marks.

by PETER WESTBURG

PART ONE

• No, this is not a Ryan ST in disguise . . . it is an honest-to-goodness airplane that probably very few modelers are aware ever existed. Always on the lookout for appealing aircraft to model, I found the Sparmann P-1 in an excellent history of the Swedish Air Force, by Col. Gosta Norrbohm and Bertil Skogsberg.

Shortly after World War I, Edmund Sparmann, an Austrian aircraft engineer, journeyed to Sweden . . . the aviation industry in Germany and Austria having come to a grinding halt . . . where he was instrumental in selling the Phonix 122 fighter to the newly created Royal Swedish Air Force. Some years later, he designed and constructed, at his own expense, the Sparmann S1, a low-powered fighter trainer which he hoped would be accepted by the Air Force as an alternative to expensive first line fighters. Unfortunately, Swedish Air Force policy did not coincide with Edmund Sparmann's

Continued on page 93

The Sparmann P1



Cockpit shot reveals two handholds below windshield, slides for map board just below instrument panel, standard instruments. Cylindrical object ahead of windshield is fuel gauge.



Photo of the only still-existing P-1, which, unfortunately, has no wheel pants. Original fairing consisted of a sprung portion which telescoped into the fixed upper streamlines.



Kraft KP-3C transmitter, with 120V. charger in front, the G&M waterproof radio box with Kraft receiver, servos, and battery pack inside, and the Kraft KBC-A charger, for use with a 12-volt car system through the cigarette lighter socket.

PHOTOS BY AUTHOR

R/C POWER BOATS

By BOB PREUSSE

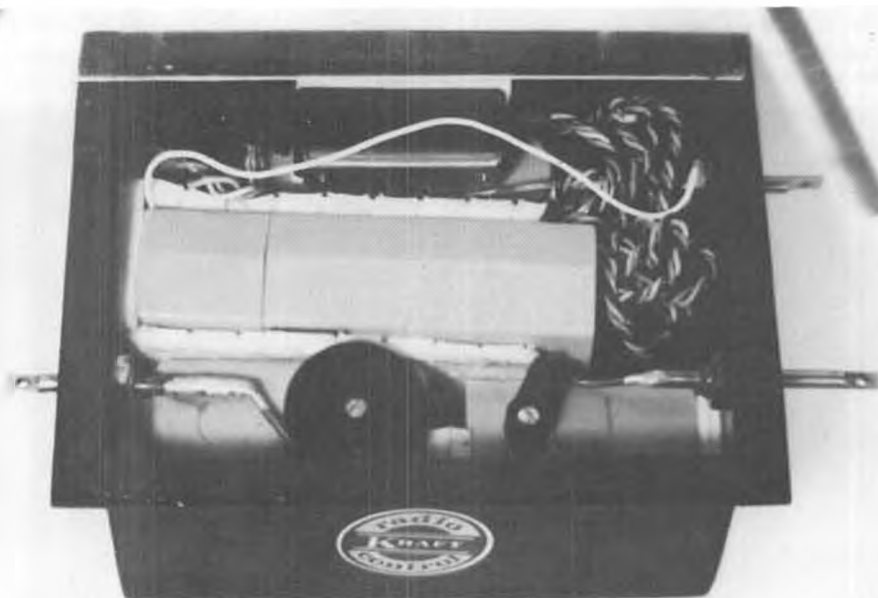


Remember that famous boating cliché "reliability is the secret to winning races"? Speed is, of course, important, but if you can't finish all your heats, you will not be a consistent winner. In past articles, we have

discussed various hardware installations, building suggestions, kit reviews, engine reviews, etc. In this article, we will discuss the Kraft Radio System and the G & M Models radio box installation.

Kraft Systems, Inc., 450 West California Avenue, P.O. Box 1268, Vista, California 92083, has been in the R/C equipment business since 1959, and is the leader in producing a reliable, lightweight, and accurate proportional system. Now Kraft has given R/C boating what it always needed: a fast and easy way to change frequencies right at the pond, with the new plug-in frequency R.F. modules, which permit not only changing frequency in the same band, but switching to all frequencies in other bands as well!

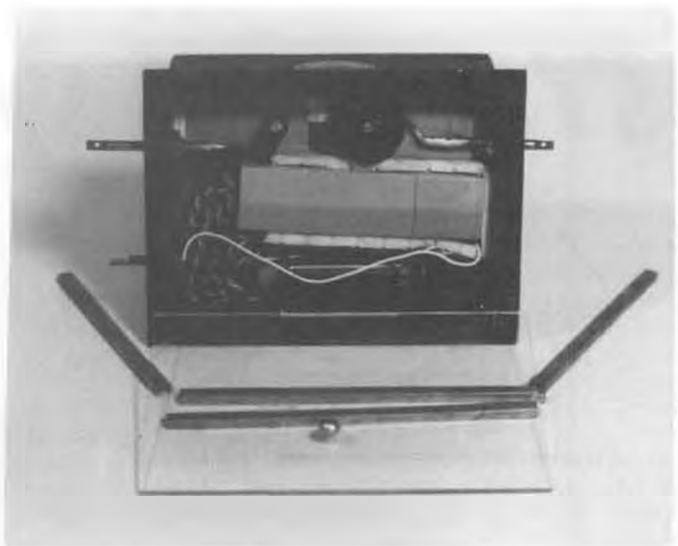
All components for the Kraft system can be bought individually, which is ideal for boaters, because you can buy the system that readily suits your needs. I really didn't need the 5-channel transmitter, so I selected the 3-channel transmitter (KP-3C), which also allows for the plug-in frequency R.F. modules by simply removing the back of the case. The 3-channel transmitter is primarily intended for use with the 3-channel "brick" receiver. However, since the brick will not have the servo power to handle a .60 size hydro, you will want to buy the components separately. I recommend



All shipboard radio components are fitted inside of this G&M watertight box. Controls are linked to the stainless steel pushrods which pass through watertight fittings. Box is pressure tested.



Kit for the G&M watertight radio box. Four different sizes are available. Assembly is with epoxy glues.



Although 3-channel brick could be used, stronger servos are necessary. The 7-channel unit fits fine, and allows frequency module change.

the KPS-15H servo for rudder control. This is a higher powered version of the KPS-15, and is also recommended by Kraft for R/C boats. It uses a 6 ohm motor in place of the standard 10 ohm. It also has the speed you'll need for those tight fast turns, as the rotary travel of 100° is .4 seconds; all the power you should need in a compact size (1.76 long x .92 wide x 1.49 inches high). However, if you should need more power, Kraft has a super servo which is made on special request. It has a KPS-16 gear train on top of a 15H electronics, and produces 35 lbs. of thrust! Its 100° transit time is .9 seconds.

For throttle control, I recommend the KPS-12 servo, which is currently Kraft's smallest available digital proportional servo. It still features full travel and good power. You could use the 15H for throttle also, but it really is not necessary, and the KPS-12 will save space in your radio box.

The 7-channel receiver (KPR-7C) was used because it does accept the plug-in RF modules. What is amazing is that the 7-channel receiver is no larger than many 3-channel receivers. All connectors snap into the receiver base, very securely, for good reliability.

The boater can select either the 450 MAH KB-4M or KB-4S battery packs, which must be used with the high-power servos. The KB-4S is square, while the KB-4M is narrow and long. I found the KB-4M to fit best in my installation.

G & M Models, P.O. Box 342, Broadview, Illinois 60153, offers waterproof radio box materials and kits. The box is constructed of phenell fiber pre-cut pieces that are epoxied together. Also included in the kit are waterproof push rod seals, stainless

steel push rod ends, plexiglass top, pressure fitting and screw, brass channel, foam tape, and instructions.

The radio boxes come in 4 sizes: No. 234 — 2 x 3 x 4, No. 235 — 2 x 3 x 5, No. 235P — 2-1/4 x 3 x 5 and No. 235M — 1-3/4 x 3 x 5, all dimensions in inches. I selected No. 234, which provides a neat, compact installation as the photos show. There was even enough room to add a Servo Sentry, which is a must with the possibilities of interference from other transmitters on the same frequency, CB interference, or weak batteries.

By connecting a Servo Sentry between the throttle servo and the receiver, you can have your engine go to low throttle whenever your transmitter signal is lost or interrupted.

Why do I need a radio box? No boat has a watertight radio compartment. I make this statement without any reservations. We have seen many

a fancy hatch cover and cowling, containing as many as 24 screws, which the owner would claim was watertight. However, careful inspection of the wire leads would show corrosion. And try to seal a compartment with a contoured cowling! Properly constructed, the G & M Models radio box will not leak. The push rod seals are guaranteed not to wear out. Thus your Kraft radio is well protected from moisture that will damage the best equipment.

Be sure all components are shock mounted with either 2-sided foam tape or Dr. Scholl's foot pad material (for wrapping the receiver). See photos for a suggested installation.

Let's list a few additional points that make your Kraft Radio/G & M Models radio box a reliable system:

1. The radio box method allows the boater to easily switch one radio

Continued on page 95



Quick frequency . . . even band change, makes the Kraft unit very handy at races where mixing of boats in various heats can result in frequency conflicts.

STRICTLY SAIL

By ROD CARR



• The crush of the competition season has delayed our outfitting of the East Coast 12-meter that we promised to start. However, David Mainwaring, guiding force of Heritage Marine, P.O. Box 554, Needham, Mass. 02192, has been kind enough to release an excellent write-up on the construction and outfitting of fiberglass hulls. His research and experience in all things polyester is summed up for the benefit of all of us who have worked with the pungent, itchy stuff. Dave is a **Model Builder** advertiser and should be contacted directly for further information on his line of scale and competition models. For now, he dons his cap as guest columnist.

THE FIBERGLASS MODEL YACHT BUILDER'S GUIDE,
BY David L. Mainwaring

This is a guide to assist the model builder in building model sailing boats from kits with fiberglass hulls and associated components.

FIBERGLASS

Fiberglass is the common name for glass reinforced plastics, GRP. The strands are produced in a non-woven cloth called matt and in a woven cloth called fiberglass cloth, boat cloth, tooling cloth and woven roving. After the cloth has been saturated with resin and the resin cured (hardened) we have fiberglass. Fiberglass matt and cloth are sold by the yard in small lots by retailers, and by the pound by wholesale suppliers. Matt and cloth are designated in thickness by referring to their weights. Matt is weighed by the square foot, with 3/4 to 3 oz. matt being most common. Cloth is also weighed, but unlike matt, it is weighed by the yard. Thus, a 9 oz. cloth has the same glass content as 1 oz. matt. Matt and cloth have different handling characteristics and different conformability, as well as different impact and strength factors. Working with matt using brush-on resin requires skill and experience to avoid developing one big mess of glass fibers and resin. You will find, with a little practice, that matt conforms well when worked with a resin-covered surface with a constantly wet brush. A matt called surfacing matt can be used to work the regular matt in place and squeeze out air bubbles and excess resin. This matt is hard to obtain, other than from wholesalers. A layer of cloth

works well for surfacing if you can stand the added weight. Fiberglass cloth put up in tape form is widely available. It is a convenient way of getting high quality cloth in small quantities. It is important for the glass resin combination to have as high a glass content as possible for strength. Fiberglass cloths used in boat building must have a special treatment called Chroming to make the glass compatible with the resin. *Do not use industrial or auto grade fiberglass cloth unless it is treated.*

Fiberglass (GRP) laminates will absorb water through the capillary action of the glass fibers. The problem of water absorption and surface abrasion is overcome in the molding stage by adding a specially formulated resin known as gel-coat. Although gel-coat is available clear, it is usually pigmented to give the surface resin a molded-in color. Polyesters and lay-up resins can be pigmented, giving the part a solid color throughout. This is an inexpensive way of molding color in, but it presents two problems... hidden air bubbles within the laminate, and exposing glass strands.

RESINS

Polyester resins are formulated in many make-ups. To change the liquid resin to a solid you must add a hardener to catalyze the mixture. Whenever resin is referred to in this manual it is intended that it be properly catalyzed before use. The resin you choose for your model should be preaccelerated. This resin will commonly have a purplish hue in the liquid stage and may change color to indicate states of cure. Resins should be at room temperature (60°-90°F.) for curing. Among the polyester resins available are the air inhibited types. Lay-up, spray, and gel-coat resins are formulated so their surfaces will not cure readily while exposed to air. This is advantageous if several layers of glass are to be laminated over a period of time. However, it may present a problem to the unsuspecting who finds the surface of his resin "forever tacky". Sometimes, applying a layer of hard bowling alley wax will solve this problem. Gel-coats, therefore, are not used as a finish coating on completed boats because they are air-inhibited.

Finishing resins or hand lay-up resin is commonly a waxed resin. When

special waxes are formulated in the resin, they will move to the surface as the resin cures. This is an advantage if this is the outer surface. If you want to bond to this surface, you must first sand it thoroughly and then prepare the surface with acetone or polyester solvent.

Polyester resins may be thinned with acetone and styrene. The common polyester hardener is methyl ethyl ketone peroxide (MEK60). Resin and hardener must be handled most carefully and in strict accordance with the manufacturers' instructions. The amount of hardener or activator in conjunction with the room or ambient temperature determines the gel time and the cure rate of the resin. The gel time is the period that the resin remains liquid until it turns to a jelly just before curing hard.

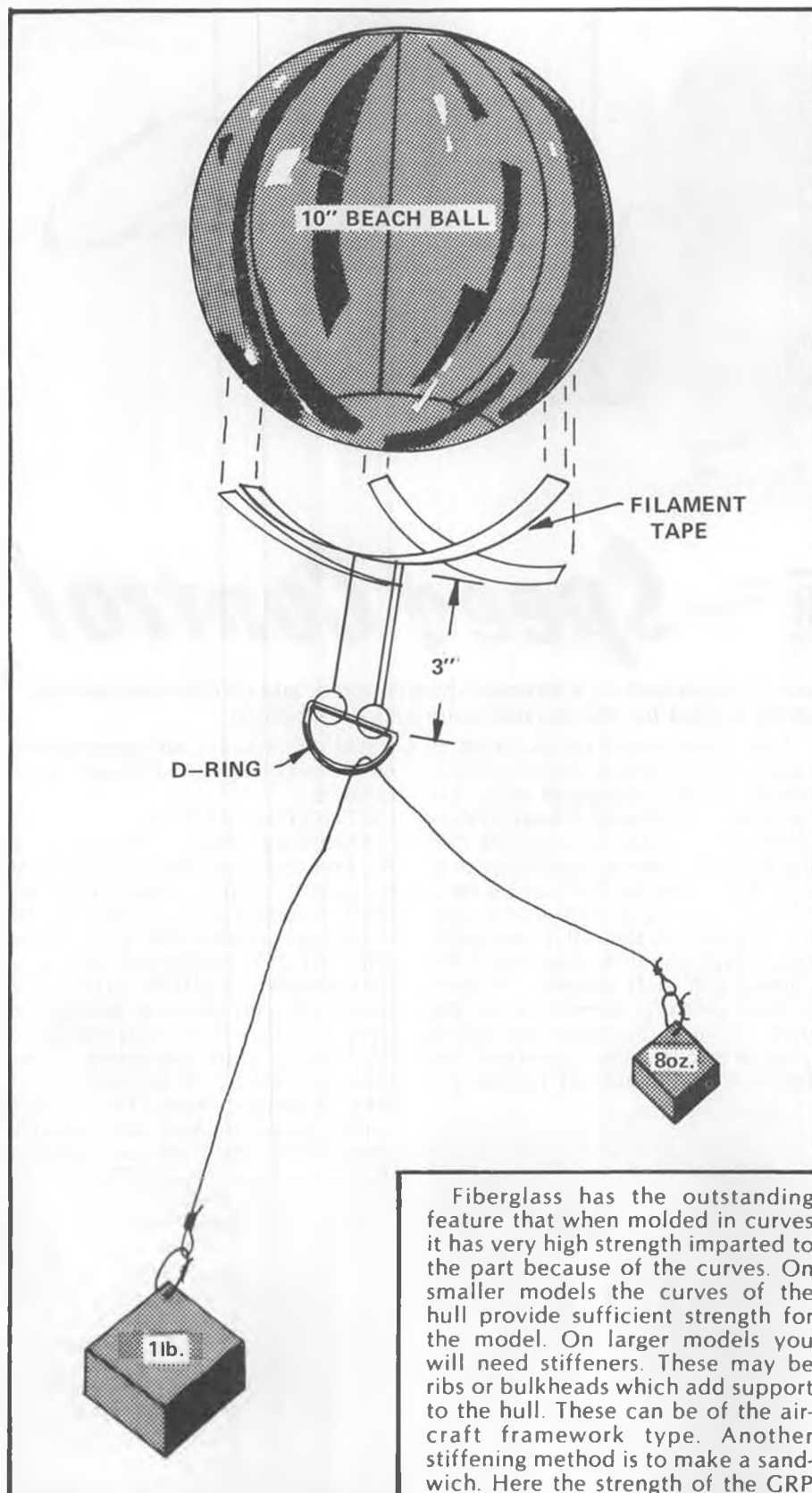
Resin has a "pot life" and is only workable for the time before it jels; this may vary from seconds to several minutes. **CAUTION . . . DO NOT** use too much hardener. Styrene will thin the resin and become chemically part of the cured resin. Acetone will thin the resin but will evaporate during cure. Acetone will change the characteristics of the cured resin and may result in brittleness and other unwanted characteristics.

Polyesters may be filled with a number of components from sawdust to pecan shells. Most common fillers are Cabosil and micro-balloons and macro-balloons. This filling may make the resin thixotropic, and filled resin may vary from a slurry to a heavy paste. Macro-balloons and micro-balloons are used to make a foam-like putty which will work as a flotation foam.

Polyester will bond nicely to polyester. We stress that surfaces must always be cleaned and prepared for bonding. The bond between two fiberglass parts, such as keel and shell or hull and deck, will be enhanced if the interface between bonded surfaces is filled with a layer of saturated matt, cloth, or filled resin. Polyester resin is frequently used to bond to wood as a glue. However, among wood glues, polyester rates poor. The initial bond to wood may look all right, but it has a history of delaminating. We will not rule out its use for model building. However, there are better wood glues, and the best of the water-proof glues are the many epoxies.

Fiberglass is not at its best under tension. Spread or distribute any tension load over a wide area. The same goes for compression loads which should be spread out also. This fiberglass found in models will tear if pulled on, so always spread the load . . . more on this later.

You must remove all waxes in



Fiberglass has the outstanding feature that when molded in curves it has very high strength imparted to the part because of the curves. On smaller models the curves of the hull provide sufficient strength for the model. On larger models you will need stiffeners. These may be ribs or bulkheads which add support to the hull. These can be of the aircraft framework type. Another stiffening method is to make a sandwich. Here the strength of the GRP is achieved by laminating a light-weight core between two layers of fiberglass.

G.R.P. LOAD SPREADING

Flat surfaces or slightly curved surfaces, such as the bottom of a Star 45 model, have only moderate fiberglass strength unless sandwich construction or several layers of glass are used. To avoid this added

weight, load spreaders are used to distribute loads over a wide area of the flat surface. A sectional shape, called a Tee or Top Hat, will greatly strengthen a flat glass panel. This works on the same idea that an I-beam works in steel construction. A piece of cardboard, plywood, spruce, or another fiberglass component is used to form a right angle to the flat surface. A piece of glass tape or matt is placed so as to form a right angle with the flat surface being the top of the letter T. When molded in place with some activated resin, the finished Tee section acts as a solid brace equal to the height of the Tee. The cardboard former or plywood may be removed if it was waxed before the resin was applied. For still additional strength, form what is called a Top Hat, which is a double-Tee section with a cap between the tees. Cut in half, it would look like a top hat. The former used to build the Top Hat can not be removed. Using Tees and Top Hats can strengthen a hull or component without using up significant hull space. You may use bulkheads of polyurethane foam to make tee sections and leave the foam in for flotation. Do not use styrofoam or any styrene-based foam; it will dissolve away in resin. Once again, remember that surfaces must be prepared for gluing or bonding to them.

TOOLS

The average kit builder will need few special tools. When working on hardened fiberglass parts, we recommend the Dremel Motor Tool. With this you can sand, carve, cut, trim, grind, and much more. It takes the cussing out of trimming fiberglass and cutting holes in hulls. Other than that, the usual assortment of clothespins of the spring variety, sharp modelers knives, rubber bands, a few coarse bastard files and a couple of mill files, and a supply of 3M-ite wet-or-dry sandpaper; Nos. 220, 320 and 600 will be adequate.

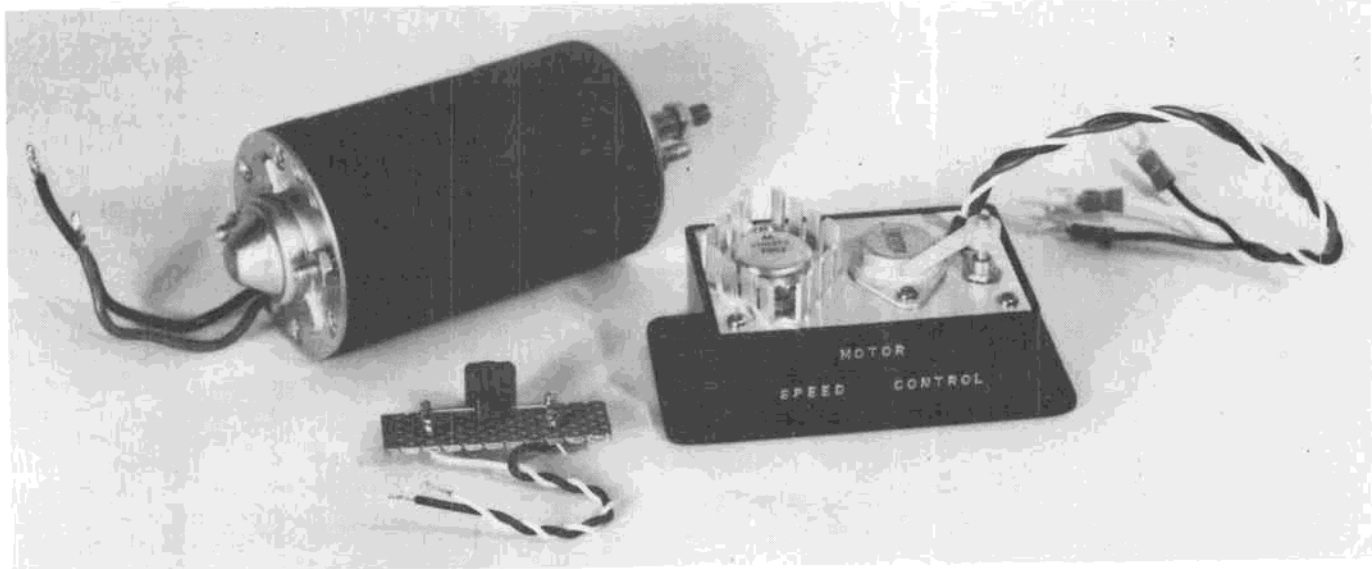
SAFETY

Always work in a well ventilated area. Resins, hardeners, and solvents are flammable and toxic. MEK60 is impact sensitive. Some people are especially sensitive to any and all components. Avoid excessive skin contact. Avoid inhaling concentrated fumes. Wash well and keep skin clean from these chemicals.

Always follow manufacturers instructions. DO NOT SMOKE or have open flame around when working with fiberglass chemicals. Select an appropriate work area. Protect furniture, floors and other surfaces from

Continued on page 95

order to bond to fiberglass and you can reverse this and coat surfaces with hard floor waxes during building to protect surfaces from accidental spills. Also remember to use only resin-resistant tape, such as Scotch brand Cellophane tape which is inert to resins; regular masking tape may be used, if not in contact with resin or solvents.



ELECTRIC MOTOR *Speed Control*

By JOHN KARASZ . . . This speed control is operated by a separate throttle servo, and can be used in boats, cars, and even some aircraft. An interesting project for the electronically-minded modeler.

• The motor speed controller as described herein has been in use by the author for the past 1-1/2 years. It is a pulse-switching unit that can handle up to 20 amps. Though it has only been used in boats, it is equally adaptable to electric powered cars, and with some extra care taken to cut down the weight, in airplanes. This is easily done by using a plywood box instead of the heavier plastic one, or by mounting it without a box. Be sure to allow for cooling of the large switching transistor.

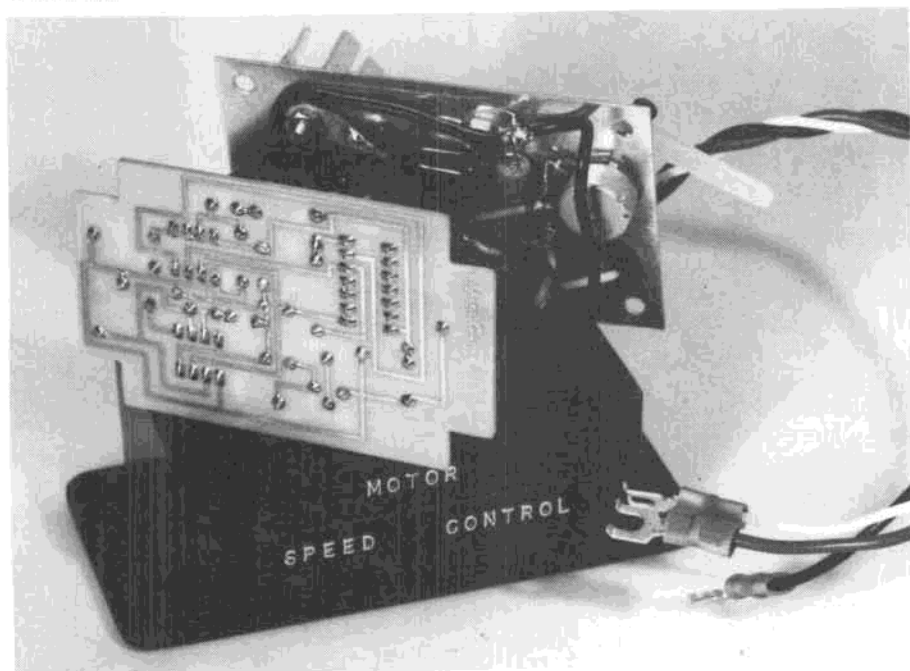
The circuit could be modified to switch greater currents, but approximately 10 amps margin of safety has been left. Most model boat motors draw considerably less current during normal running conditions anyway. Also, with the 10K pot set for a 4.7 volt reading as stated, the controller produces the full motor speed range over about 90 degrees of the control pot shaft rotation. A servo is mechanically connected to this shaft. However, by varying the setting (plus or minus .15 to .2 volts) of the 10K pot, the amount of control pot

travel required for full motor speed range can be either increased or decreased.

CIRCUIT DESCRIPTION

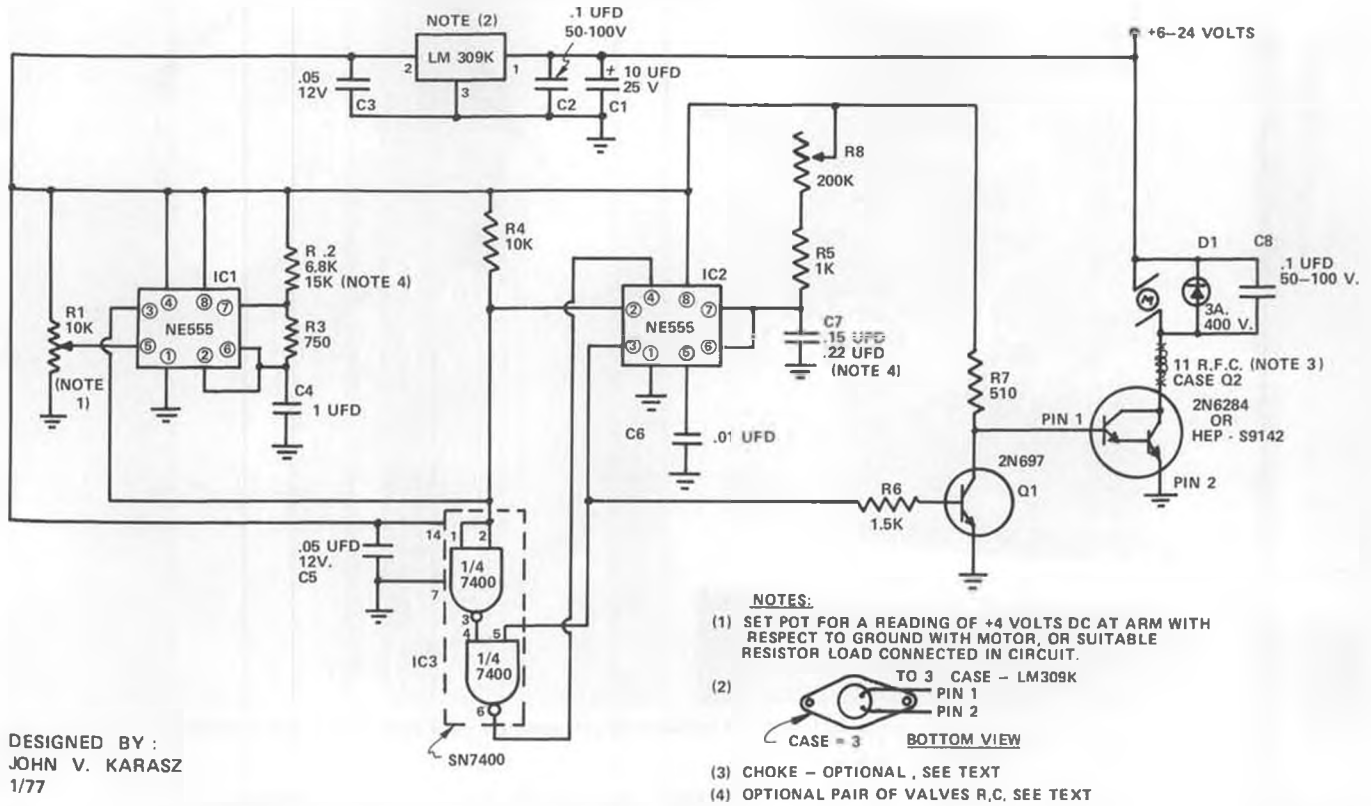
Examining IC-1, a NE555, it is hooked up to operate as a constant frequency "clock", which provides short negative-going (+Vcc to no volt) trigger pulses to IC-2. IC-2 is another NE-555, connected now as a mono-stable multivibrator. This mono-stable (or one-shot) is triggered by IC-1 and is width controlled by an RC time constant consisting of the servo-operated 200K pot and the .15 mfd capacitor. Now, the variable width pulse train is successively amplified by the 2N697 and 2N6284 devices. This "chopped DC" is the voltage used, then, to drive the motor. The motor sees a time-averaged level and runs accordingly.

A short explanation of the 7400 IC is in order. This IC contains several nand gates, whose function it is to deliver reset pulses to the one-shot under certain conditions. With a system like this one, where the one-shot is synchronized to the clock, it is possible for the one-shot to miss its trigger pulse when the RC time constant gets large enough to occupy the entire time period between trigger pulses. This can result in an annoying effect: the motor can be slowed down, virtually to a halt, then speed up again, suddenly, as the 200K pot is rotated a little further. To avoid this, the 7400 IC resets the one-shot with a pulse into pin 4 at the same time (give or take a few nanoseconds) that it receives a trig-



All components are mounted on the PC board, or on the underside of the top plate. Pot arm is moved by throttle servo for variable speeds. Text explains how to get reversing.

ELECTRONIC MOTOR SPEED CONTROL

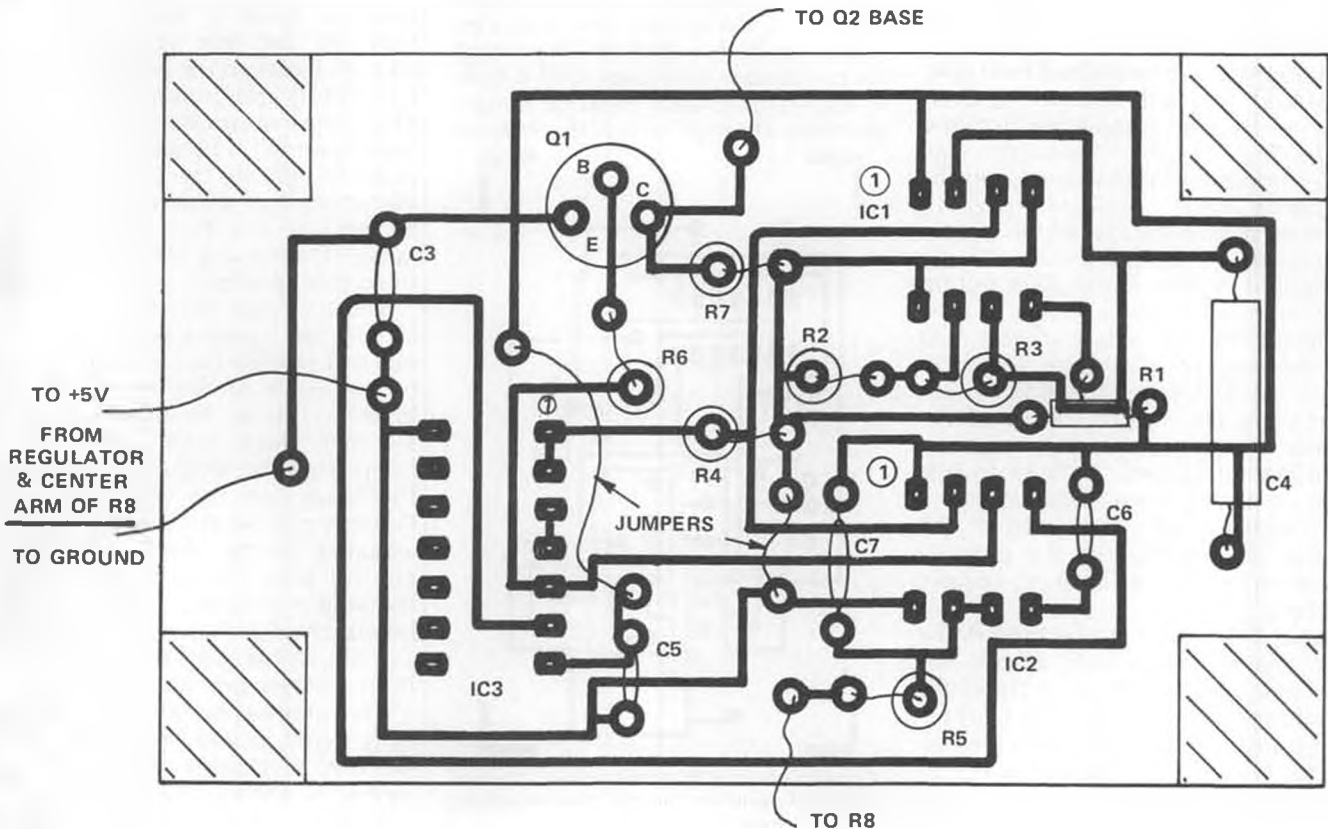


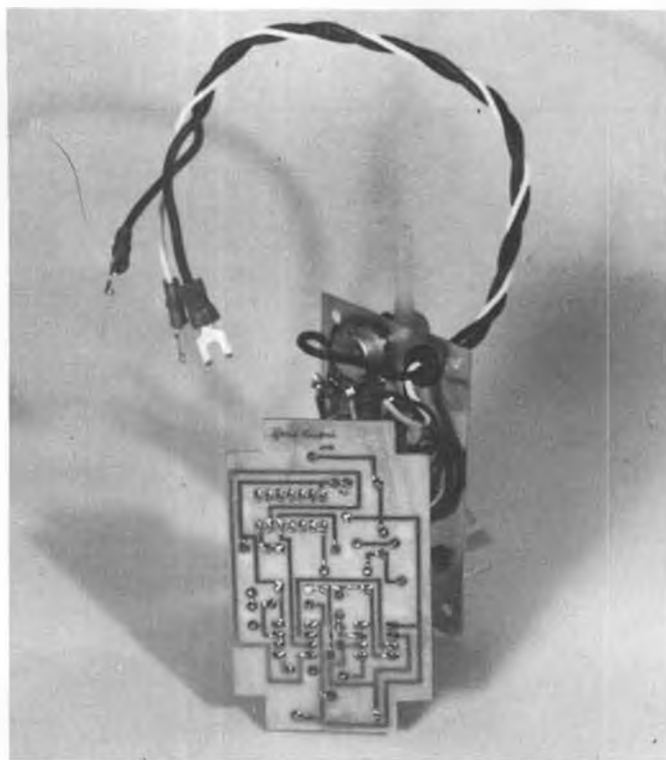
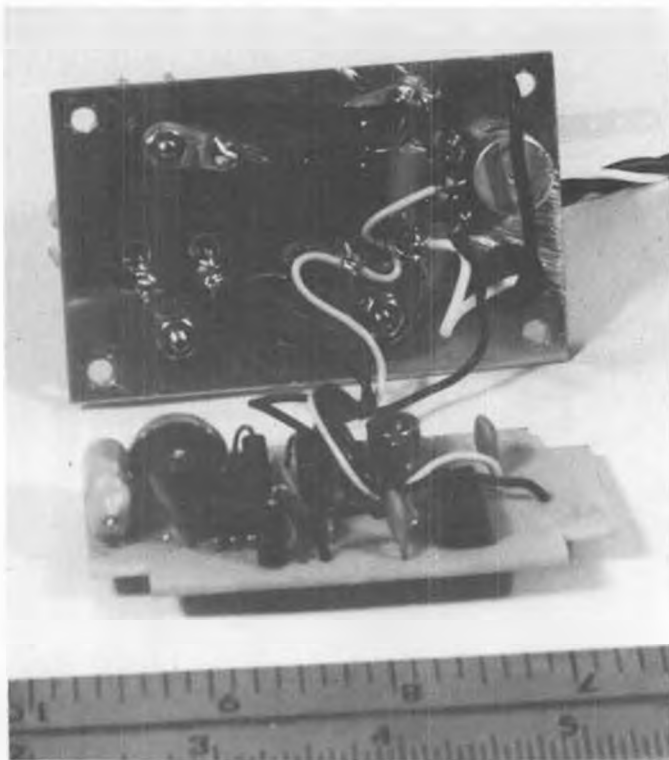
ger pulse, but only when the RC time constant is in that critical region. This causes the one-shot to start timing again. Since inversion occurs through the 2N697, the output is a low ... just what is desired for, in this case ... about 200 degrees of

useless 200K pot rotation. The 10K pot is used for voltage controlling the frequency of the clock. Although fixed resistors could be used here, the use of a potentiometer is a nice feature. By varying the clock frequency over a small range, it is pos-

sible to change the amount of 200K pot travel (hence servo throw) necessary to vary the motor speed through its full range.

An output transistor diode-capacitor protection network, to be inserted in parallel with the motor,





Use these photos of the components in relation to the PC board and top plate as you assemble your unit. Range of pot control can be varied to accommodate the travel of your particular radio servo.

has been included. This is not located on the PC board; it should be mounted on a small auxiliary board close to the motor terminals.

CONSTRUCTION

If a utility box is going to be used, such as the one shown (GC Electronics), it is necessary to notch the four corners of the board to allow for the clearance between the board and the corner posts molded into the box. Component mounting on the board is accomplished next, and is straightforward. Follow the overlay, as shown. Remember that the foil side of the board is facing you; the components are mounted on the opposite side.

Next, mount the Darlington output transistor (2N6284), the voltage regulator (LM-309K) and the 200K pot on the aluminum cover. Also drill a hole for the 3/8 inch grommet next to the pot, to allow the 3 No. 16 wires to exit from the box. These wires are (1) +6 to 24 volts, for motor supply, (2) ground, negative terminal of battery, (3) lead to one side of motor, from collector (case) of 2N6284. (The other side of the motor is connected to the positive terminal of the motor supply battery.)

Use 4-40 hardware to mount the components mentioned above. Remember, you MUST use a transistor insulating kit to mount the Darlington transistor (2N6284) since the collector (case) of this device is not at ground potential. There are several connections to be made between

the board and the components on the cover plate. For this purpose, it is convenient to use any of the commercially available "ribbon cable" of +20 to 24 gauge stranded wire. Though not as neat, single conductor wires of the same size can be used.

For ease in mounting the speed controller in a model, a base can be made of plexiglass and glued to the bottom of the plastic box. Use any of the plastic cements recommended for plexiglass. As shown, drill a hole in each corner and install a rubber grommet through which the mount-

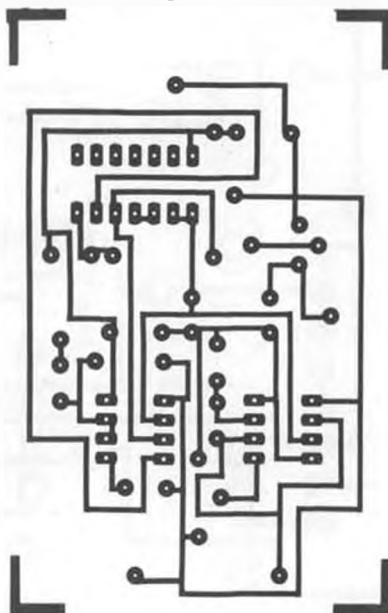
ing screw will go.

After the PC board and top cover are completely wired, power can be applied and the unit aligned. Use a 12-volt motorcycle or gelled electrolyte battery if available, and use a 10 amp fuse in series with the battery to prevent serious damage in case something shorts out.

The only initial adjustment that need be made is that of the 10K trim pot. Set this pot so that the voltage between the pot arm (center connector) and ground, is 4.7 volts. The total amount of variation recommended is between 4.6 and 4.8 volts. Increasing the voltage causes the amount of 200K control pot to be greater for full motor speed range. Decreasing this voltage has the opposite effect.

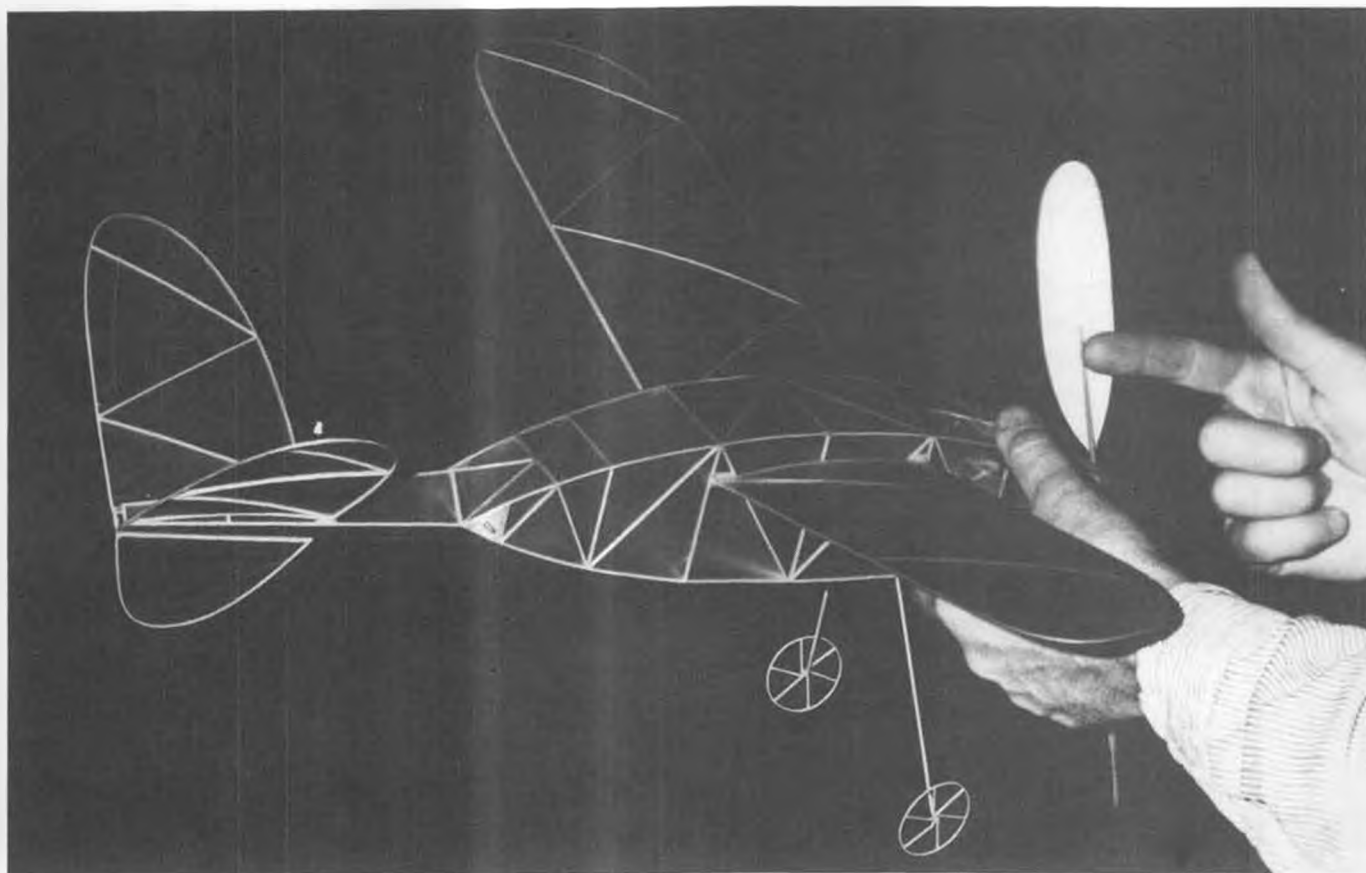
The unit can now be assembled into its box, using a couple of strips of vinyl seating tape on the bottom of the inside of the box for the PC board to rest on. Then put a piece of 1/4 inch thick foam over the PC board so as to sandwich it between the foam and the vinyl tape. The Goldberg nylon steering arm can be attached to the shaft of the 200K control pot. Connectors, either of the solder or crimp variety, should be attached to the ends of the wires, as compatible with the battery and motor installation to be made.

This unit has been tested successfully with several types of small motors; a Dumas Pittman 6-volt motor, a Dumas 12-volt motor, a



Exact size print of PC board pattern. Use this for making your own boards. Various copying processes are available.

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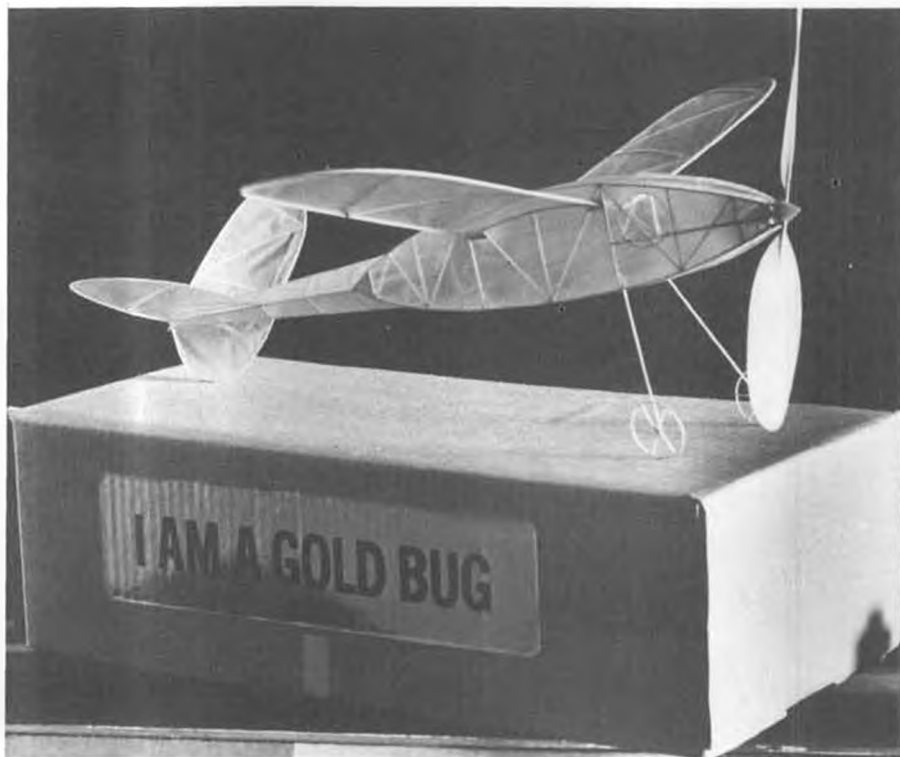


"YELOISE" ... a Manhattan

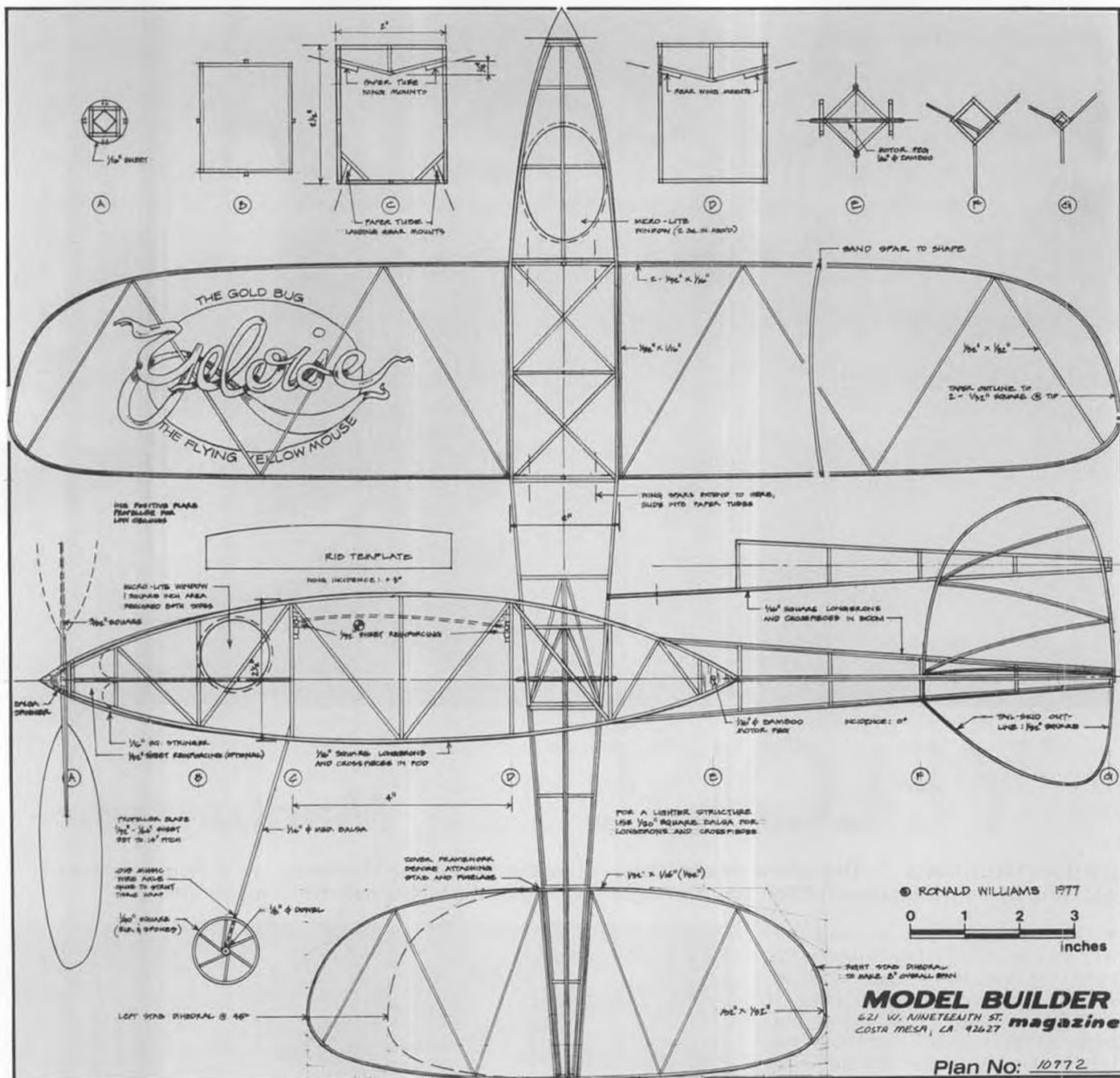
By RON WILLIAMS . . . One of the newest classes of indoor model, the Manhattan is a curious mixture of old time stick-n-tissue construction and the fragile delicacy of the highly scientific "microflimsey".

• The first time I saw a Manhattan was at Columbia's Low Library Rotunda. It was Ed Whitten's "Riversider", and it seemed gigantic. I couldn't help but think of it as, perhaps, an "Old-timer", and found myself looking up into the dome to reappraise the space in terms of this great clunk of a plane. Richard, Ed's son, wound, as Ed held the plane . . . the rubber seemed enormous . . . and I wondered. It took off quite gracefully and began a dignified climb toward the high arched windows in the streaming sunlight.

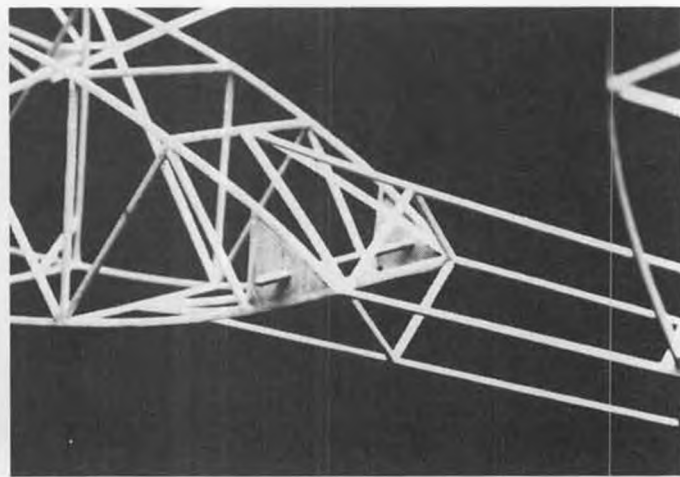
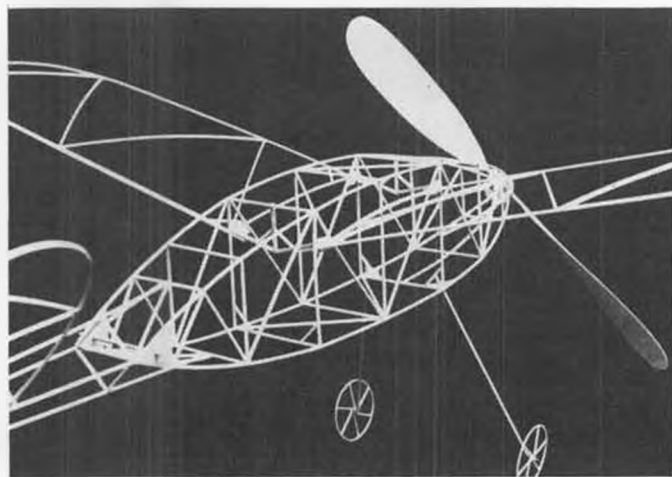
I was distracted momentarily by another flyer, and then turned to Richard to ask where the plane came down. His reply, that it was still flying, astounded me. I was used to anything resembling the Manhattan, such as a large indoor scale job, returning to the floor after at most, a minute's flight. This flight lasted more than two minutes, and that to me was really something. Indoor had previously meant planes that were hardly there or planes that were hardly up. But the Riversider, at more than 10 grams and what

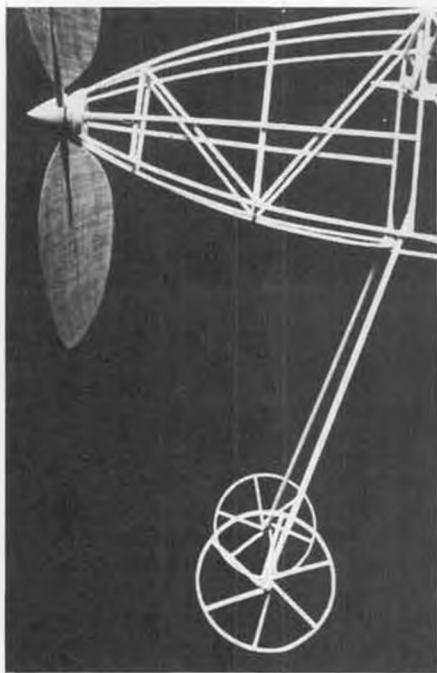


A Manhattan on the Box!! Note the author/designer's sneaky answer to the window requirement, his live comment on an otherwise perfect set of rules.

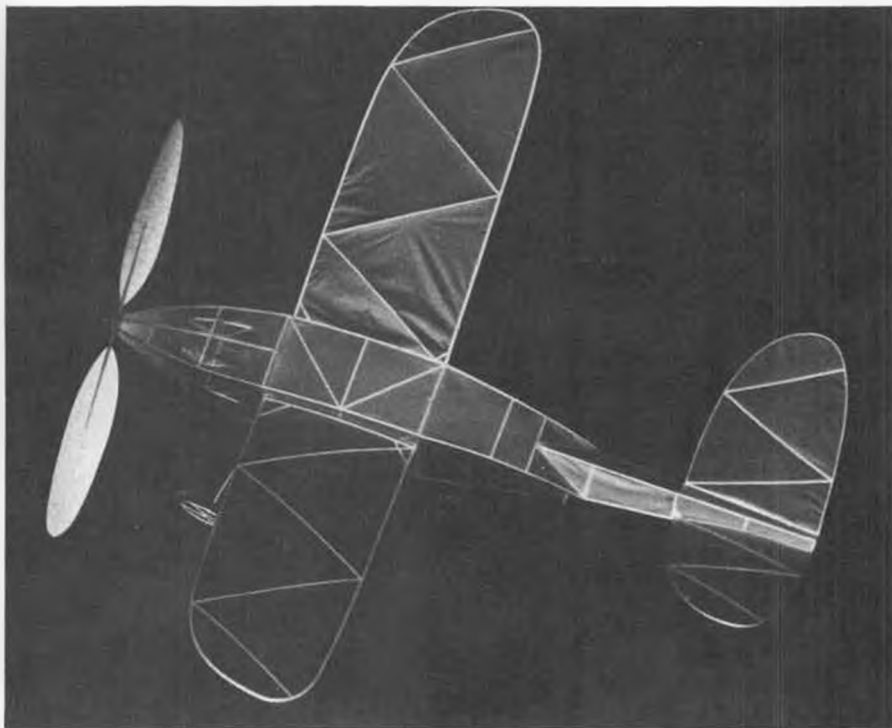


FULL SIZE PLANS AVAILABLE — SEE PAGE 104





Dig those racy "wire spoke" wheels! Prop designed to flare forward for low ceiling flying.



"Yeloise" on her way for another quiet investigation of the upper structure of an indoor site.

seemed great bulk, was something else.

I immediately promised myself I'd build a Manhattan, but one thing led away from another until some time had passed and a few other flyers built them and enthusiasm mounted, and . . . well, I began sketching, trying to come up with an idea worth following. The bulk of the required fuselage "container" and the other limits for the class gave a very definite shape to a conventional format. I looked at what photos and layouts I'd found of other Manhattans and remembered John Triolo's "Skyscraper" with its pink, merthiolate-dyed frame and tissue.

From some corner of the woodwork came the notion of a plane with the appearance of being alive, like an insect or an animal. The

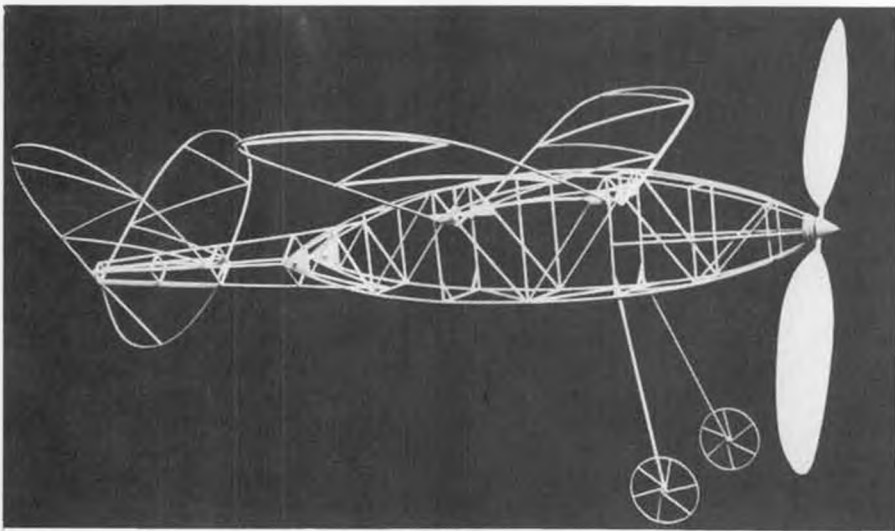
sketches began to look like a cross between a bug and a mouse. I called it "Yeloise," after Eloise of the Plaza, a children's book character, my daughter called it "The Flying Yellow Mouse", and Ed Whitten saw it as the "Gold Bug". As I worked some structure into the scheme, it began to look possible and so the lines became harder and harder until I could start laying up the balsa.

The fuselage was built in two sections, the pod (thorax?) and the boom or tail cone. The construction was conventional, with two sides being built simultaneously and then cut apart on removing from the building board. The longerons were cut very slightly at the outside corners at the front and back of the

center "required" box, after the box was framed. This allowed the sides to be pulled together toward the nose and tail without distorting the center box. The longerons were laid up wet and wet again when framing the nose. The cracks were glued when everything was framed with two or three thin coats of Titebond. (Titebond was used throughout, with the exception of the rolled paper tubes, but more about those later).

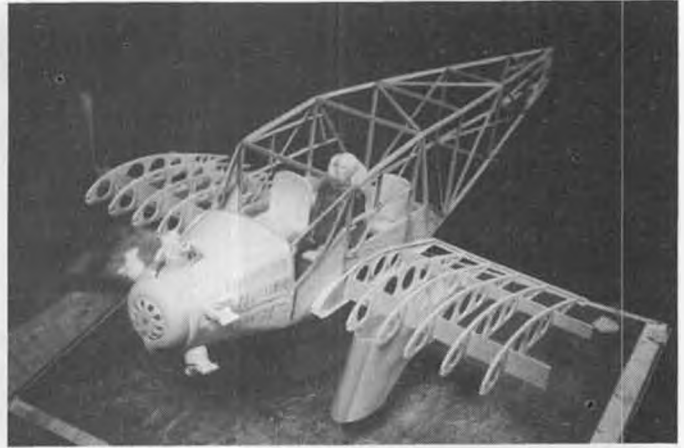
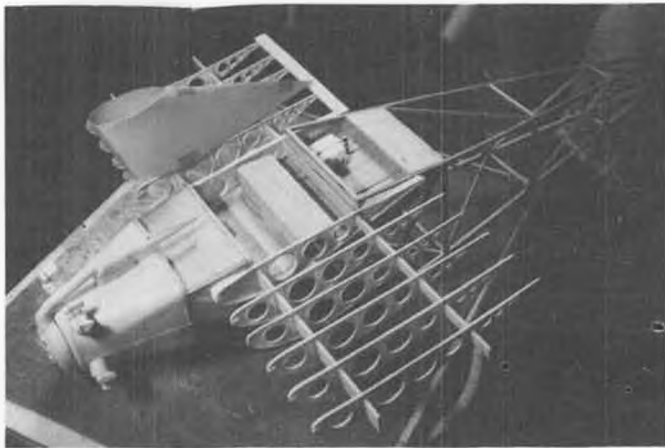
The tail cone was framed and glued to the main fuselage with a minimum of fuss, but slowly and carefully. Diagonals between pod and boom were soaked, bent, cut to fit, and installed, using tweezers to locate them. The horizontal (top and bottom) diagonals were then installed and everything double-checked for alignment over the plans.

The wings and tail surfaces were made by bending soaked wood around cardboard forms. I'm too lazy to make a trip to the water tap to soak a little piece of wood, so I run it back and forth through my mouth, working up a good gob of saliva to wet it down. Works fine (ugh!). A thin stream of Titebond was used to laminate the wing outlines. They were held to the cardboard forms by paper-lined strips of 1/4 inch wide masking tape (I make a whole bunch of tapes by laying a strip of bond paper or heavy tissue 1/2 to 3/4 inches wide on a linoleum surface, then laying 2 inch lengths of tape across this strip about 1/8 apart and



Side view of the complete uncovered structure. Beginners can go with 1/16 sq. construction in the fuselage, and heavier spars, until they get the "feel" for indoor building.

Continued on page 90



Alexander Bullet, to 1-1/2 inch scale, by Gene Thomas. To be a future kit, the 54 inch span model will have vacuum formed ribs, to keep down cost. They are also quite functional and light. Kits expected in September or October.

FREE FLIGHT SCALE

• Even though the Nats are just around the corner as this is being written, I can't seem to get myself in some kind of gear. Ever since school let out for summer recess, I've been working ten to twelve hours a day on finishing my full-size "model". This has left me with no time for modeling. Add to this that my wife has decided to start remodeling the house with wallpapering, painting, new carpets, et al. You all know this all-too-familiar route! Talking about short days. One wonders where all the time goes.

The frustrating part of all this, is that there are so many ideas I want to try out and pass along. These will have to wait until summer is over. I truly thought this was the time to get all kinds of things accomplished, but nay, this is not to be. However, I did manage one neat thing so far. Tom Laurie and I joined forces and drove into Las Vegas for the SAM Champs earlier this month. Between the two of us, we had eight old-time models. Two of these were Texaco

R/C, and a couple of the F/F gasies were almost as big. These were loaded into my VW van. To say that this vehicle was loaded with models and equipment would be an understatement.

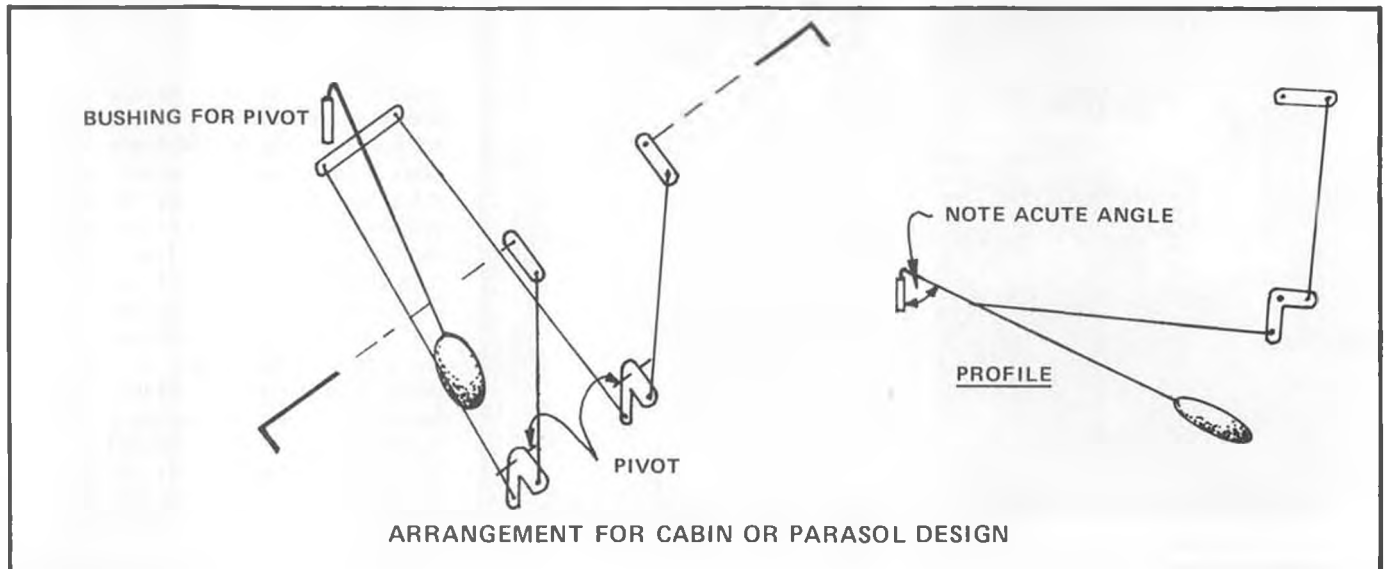
By now, most of you have heard that the weather was always above 115° in downtown Vegas. The contest itself was situated some 26 miles out of town in a dry lake bed, and we knew it was much hotter out there. We would have to get up at 4:30 a.m. in order to be out at the site near the 6:00 a.m. starting time. By noon, it seemed as though it were at least six in the evening. One lesson I learned I want to pass along. It is one that is quite common to F/f. Of the five models I took, only one was a newly built model. As it turned out, this was the only one I had trouble with. The VW van, with all of its windows, really causes the "greenhouse" effect, and by the time we got into the California desert, the heat inside was really getting up there. By the time we

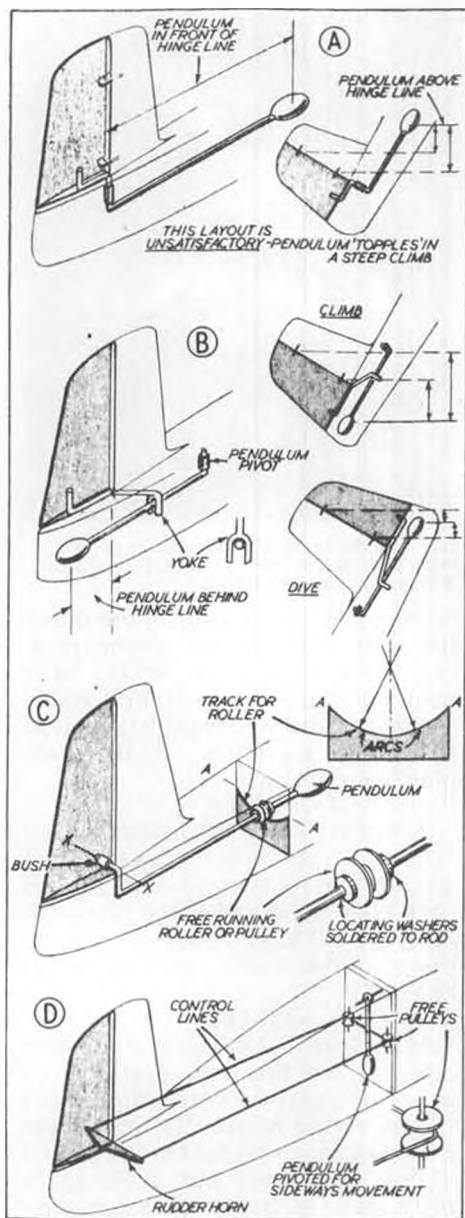
By FERNANDO RAMOS

reached Vegas and unloaded our models, my new model's wing looked like a corkscrew. The rest of the models looked just fine.

After a fine banquet the very first night, Jim Adams brought over a steaming device and we worked over the warps in the wing. It didn't look bad. Unfortunately, the next day it was warped again. Tom and I drove all over Vegas until we found some styrofoam. This was used to anchor the wings. It looked as though it would work quite nicely, and I didn't have to fly it until the end of the week.

The last day of the contest saw the mercury reach a sizzling 120° plus. Needless to say that this didn't help the condition of my wings. Add to this that I was signed up for three events that particular day. That meant that the model had to stay put in all that heat until I was ready to fly it. All that heat just made it impossible to make the model fly the way it should have. The moral to all this: Pin down all flying surfaces

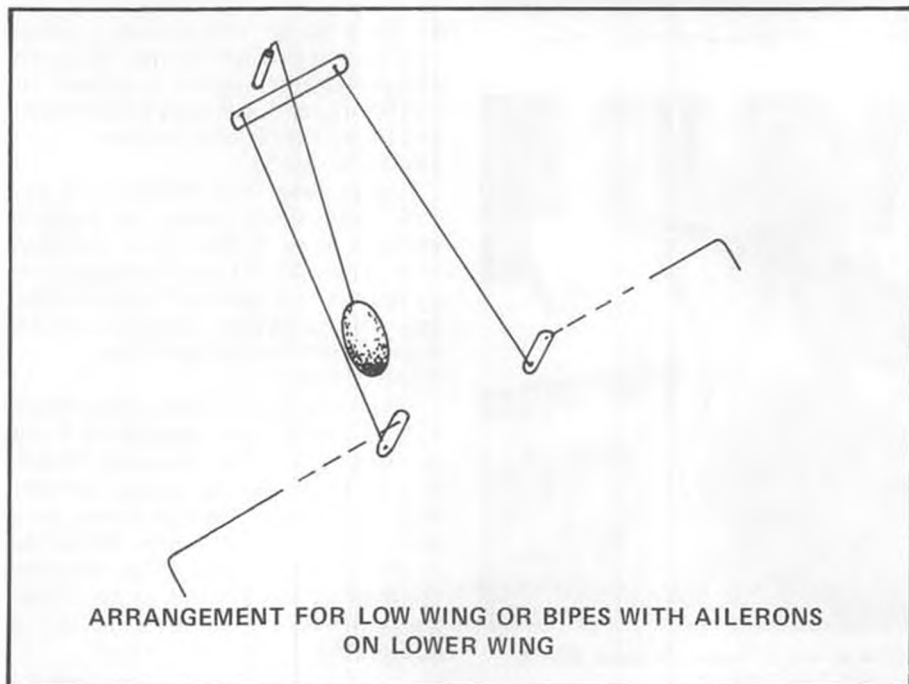
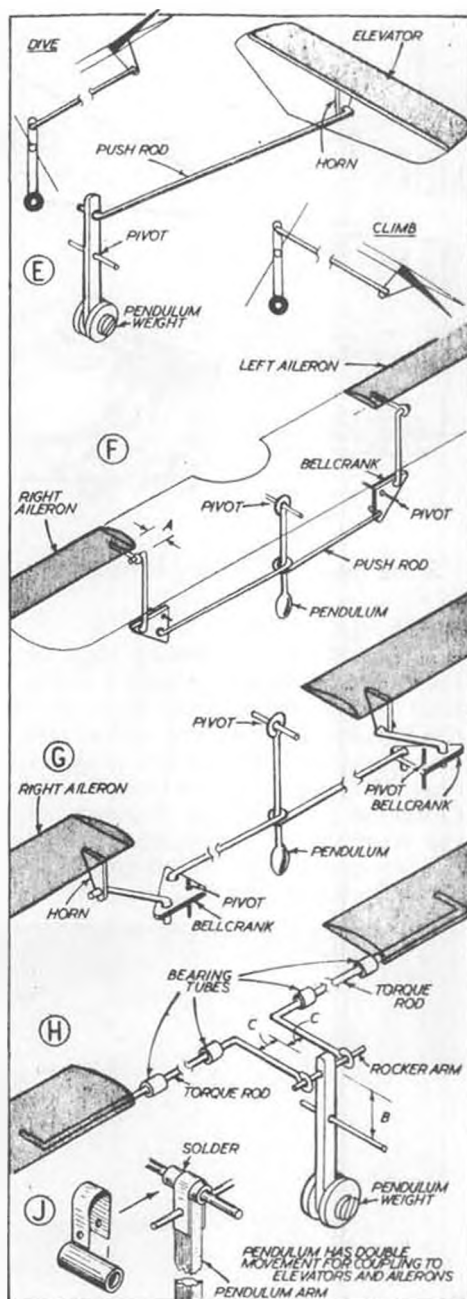




for several weeks before attempting to make that initial flight. Believe me, models that were winning were not new models. My other models are several years old, and all the heat they took, both in the van and the desert, had no effect on the way they performed. So from now on, I am planning to pin down all my flying surfaces before they ever take to the air. Incidentally, I took one of my scale models, which is diesel powered (what else?). One thing for sure, diesels do not like hot weather. The engine would run, but it had absolutely no thrust whatsoever. In spite of all the heat, it was great fun!

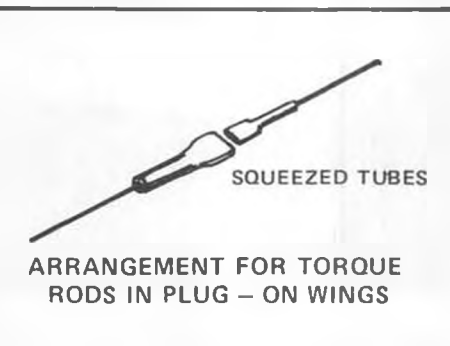
My Marquart Charger homebuilt continues to overwhelm me with one detail after the other. I had every hope of flying that bird by the end of summer. Well, my family has decided that we will be taking a vacation after the Nats, so that takes care of that neat idea. At least the end is in sight!

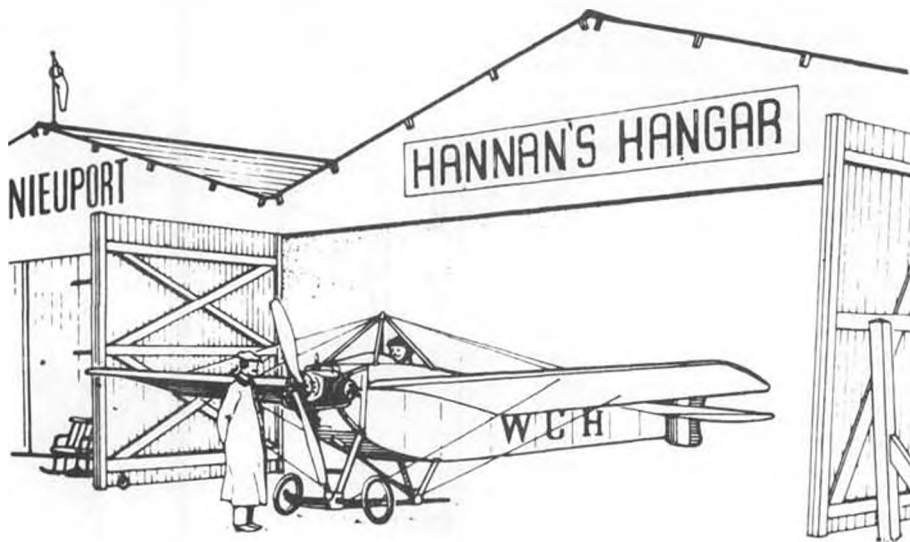
I think there's an interesting parallel between modelers (not necessarily scale modelers) and homebuilders. Oshkosh is to the homebuilder as the U.S. FF Champs at Taft, SAM Champs, or Nationals are to the modelers. I have a close relationship with several homebuilders who have been working frantically for months trying to complete their aircraft in time to make that long but thrilling flight to Mecca. How many times have you burned the midnight oil preparing for the next contest? I think the only real difference is the magnitude. Believe me, haste on the big ones causes the same results. I'm not talking about taking shortcuts which will weaken the aircraft in some way, and make it unsafe. I mean



things like hurrying the paint job, and having runs, rough edges, not enough sanding, etc.; all the same basic things we go through when we finish our models. One thing I hope I have learned, and that is not to hurry at this stage of the game. People will be looking at how neat the exterior of your airplane is, and it

Continued on page 81





"Scale model accuracy is in the eye of the beholder."

HUGE HUGHES HAPPENINGS

Latest in the continuing saga of the "Spruce Goose" wooden flying boat, is the strong possibility that the long-hidden machine will at last be exposed to public view, possibly near the Queen Mary, in Long Beach. Obtained by "The Air Museum of the West" for an undisclosed "Summa" money (pun intended, probably no cash changed hands), the scheme

certainly has merit, and is a far superior plan to the totally asinine proposal once advanced, to slice the craft into pieces for display in various aviation museums. Perhaps we will have a chance to see this engineering masterpiece soon, and our guess is that it will draw longer waiting lines than "Star Wars".

B-1 BEING MASS-PRODUCED!

In spite of the presidential cur-



Carl Lindstrum, son of "Wandering Dave", with EZP-30, designed for John Oldenkamp's popular new contest event.

tailment, B-1's are still rolling down the production lines in ever-increasing quantities. Nearly 50,000 have been purchased in the United States alone. Oh, did we forget to mention that these are Entex 1/144th scale plastic model kits?

PASSENGER POWER

A Boeing 747 pilot recently tried "Daring" Goehring's man-powered aircraft on for size. As he looked back over his shoulder, the comment rang out: "O.K. you 400 people back there in the tourist section, pedal like hell!"

NEW CO₂ CAPSULES

It appears that cameras and lenses may not be the only products of superior quality emanating from Japan. Nittan brand CO₂ cartridges are now being marketed in the United States, and from our preliminary tests seem outstanding in performance. Featuring welded construction, they are said to be completely free of the leakage and pressure variations found in other brands. We plan additional tests under a variety of conditions, and will report the results and locations of sales outlets.

BROKEN JAWS?

Just in case your SHARK CO₂ engine may need parts or repairs, Vintage Aero, 1 the Glen, Tenafly, New Jersey 07670, is offering a complete overhaul service. Additionally, they offer a 90 day warranty of such engines purchased from them.

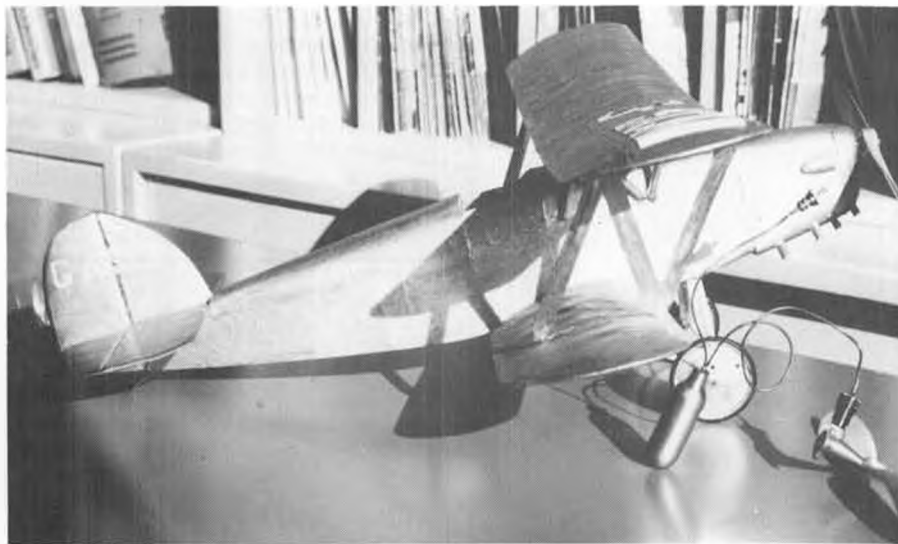
HANDY HINTS

Phil Koopman passes along these tips: "There's been mention of using marking pens for coloring tissue. We've been having great success with 'Letraset' Pantone marking pens. There are 96 colors available in the wide tip, and 45 in the fine tip. Really a dye, so there's no shrinking or dissolving of the tissue during application. No fumes either!"

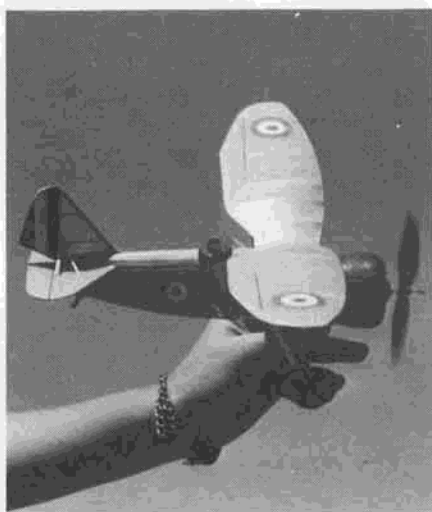
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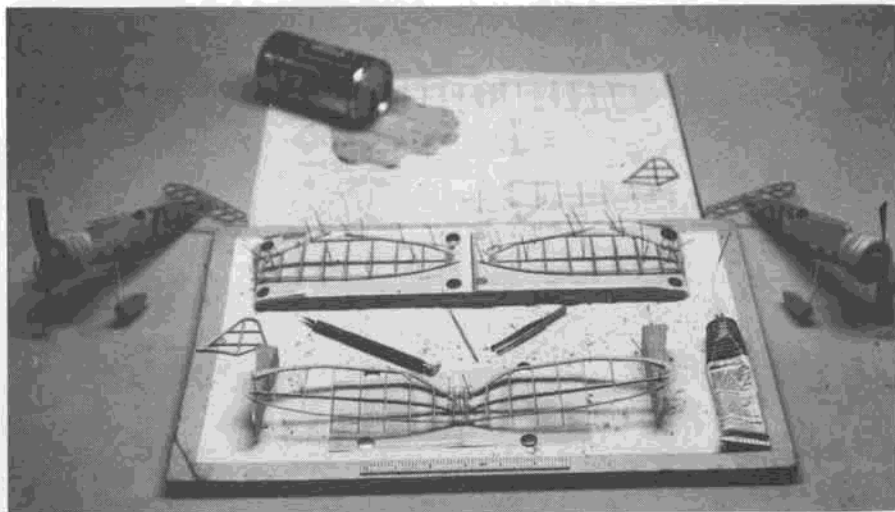
Fred Hall's Fleet Canuck, 16 inch span indoor model, does over 80 seconds R.O.G. Placed second in M.I.T. contest.



Fine Isaacs Fury, spanning 40 cm, constructed by Ebbe Jensen, of Sweden, is powered by a Brown CO₂ engine. Photo sent by a friend of scale-viewer Pete Westburg.



Even French airplanes are curvacious! The Loire 46 is a departure from normal.



The Loire Peanut Factory. Note contoured wing boards. Can of spilled liquid at top of photo contains "Cold Stuff". It doesn't glue anything at all, but it sure makes the plans lie flat!

LOIRE 46



By DON BUTMAN . . . "Cacahuete" is not a variety of sneeze, as you may have thought. It is the French word for "Peanut", and therefore very appropriate as part of the title for this month's subject.

- The graceful gull-wing presented here is the Loire 46, one of the last open cockpit pursuit planes used by the French Air Force. Its slick appearance is due both to the gull-wing design and to the gracefully rounded flying surfaces and fuselage. Just think of a 3/4 or full size (38 foot wingspan) home built of this plane!!

Construction differs a bit from the usual in that a "keel" type fuselage is employed. The use of 1/64 plywood for most of the fuselage formers makes stringer notch cutting easy. However, as indicated on the plan, the "inbetween" notches may be cut after fuselage assembly. A Dremel or similar tool with a 1/32 thick cutting disk works very well.

The keel pieces are inserted into the former openings and then aligned

over the plan. Three or four 1 inch thick pieces of balsa are used under the keel to raise the formers off the plan. Glue the formers in place, along with the temporary keel support.

The rear motor hook is glued to F-7 at this time. Glue the main stringers in place, notch formers and add the secondary stringers. Note that the top keel piece "hangs out in the breeze" to provide an opening for

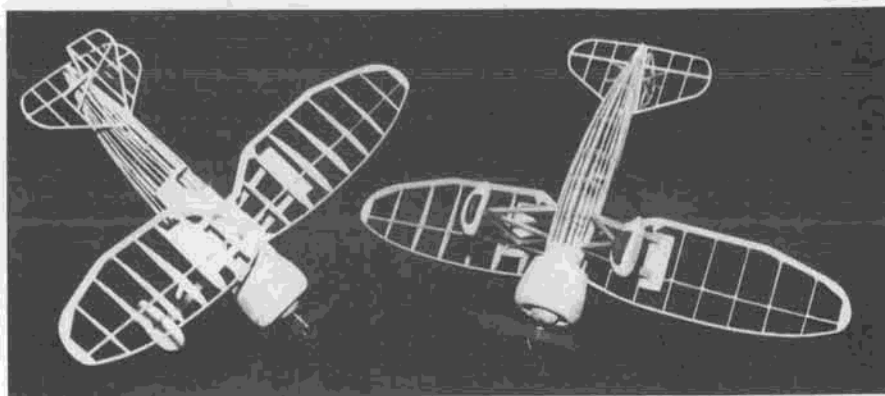
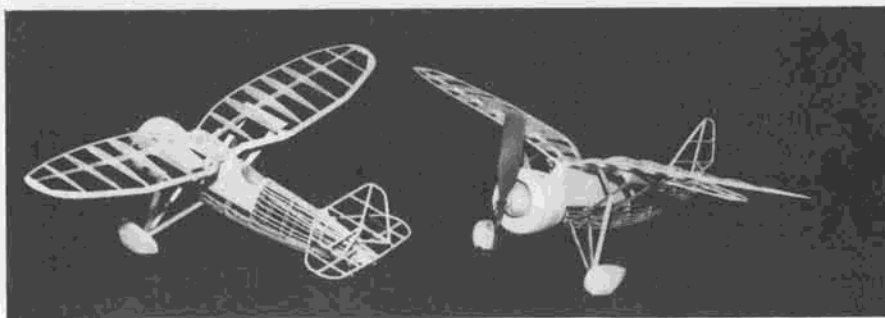
the stab. Add the tail cone, forward 1/32 sheet, and shape the 1/4 inch nose sheet to the fuselage outline. Form the landing gear wires and epoxy in place.

The cowl is shaped from six balsa rings and one plywood ring, glued together. It may be lightened more than shown, but with a balsa thrust button and "Skeeter" prop, the CG

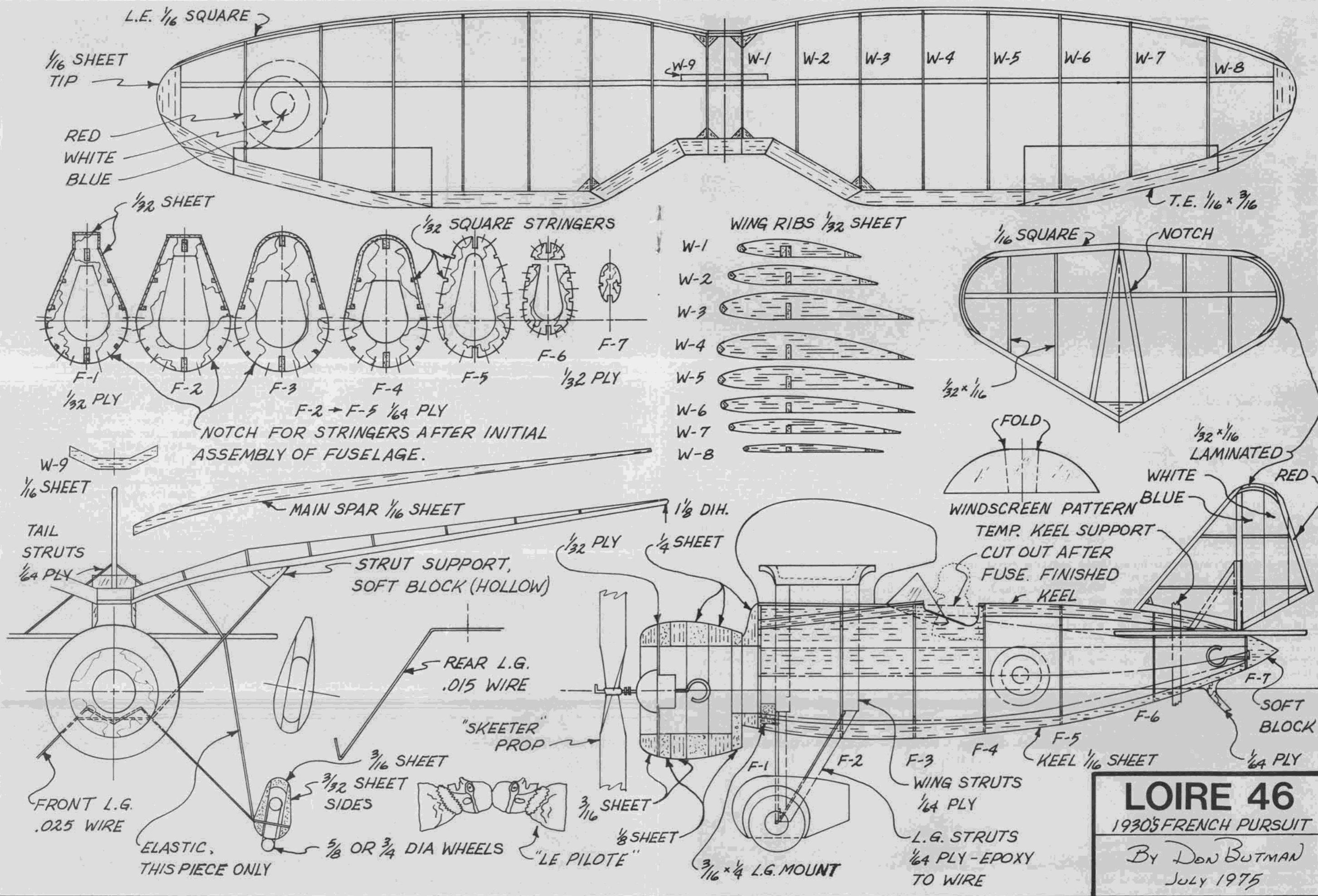
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This should make a dandy scale subject in any size. Plenty of color, and unusual configuration.



These photos of the Loire framework should help you during construction. The author's structure is on the rugged side. Considerable weight could be saved in various areas.





Tom Koster, of Denmark, winner in FAI Power at the World F/F Championships. His model is "Speed Cream", an unflapped version of a design he has been developing for at least the last five years. It was reported to be the highest climbing model at the contest.

FREE FLIGHT

By BOB STALICK

• There seems to be a common strand that flows through the efforts of those who are successful in competitive endeavors. That strand is planning. Those who plan ahead and work to prepare themselves to meet the challenges facing them will normally have a larger percentage of that little, but important, thing called luck. In looking over the results of the recent FAI F.F. World Championships held in Denmark, another factor seems to hold true. Experience is as important as is the planning and preparation factor.

Our top placing flier in each event had been to the World Championships before. Willard Smitz, who at the last minute was asked to stand in for Phedon Tsiknopoulos in Wakefield, was on our team in 1975. Willard placed 19th and led our Wakefield team to 8th place in the competition. Jim Walters, who flies A/2 almost as a passion, repeated as a team member from the last program and topped our team efforts in that event with 15th place, helping the A/2 team to an overall seventh. Tom McLaughlan also repeated and

placed 20th. Our Power team was the highest placing of all of our efforts in 1977, with an overall 6th place.

I think we have come to expect that the Americans should place first in International Competition, but we are constantly disappointed lately because we have not done so. It is easy to point the finger at this or that, and numerous writers of letters have expounded upon their pet theories as to why. One of the favorite scapegoats is the FAI F.F. Committee. It has replaced the AMA



Jim Walters designed and is producing a kit for his E Z Bird A/2 Nordic. A beginner's type kit, but highly competitive model.

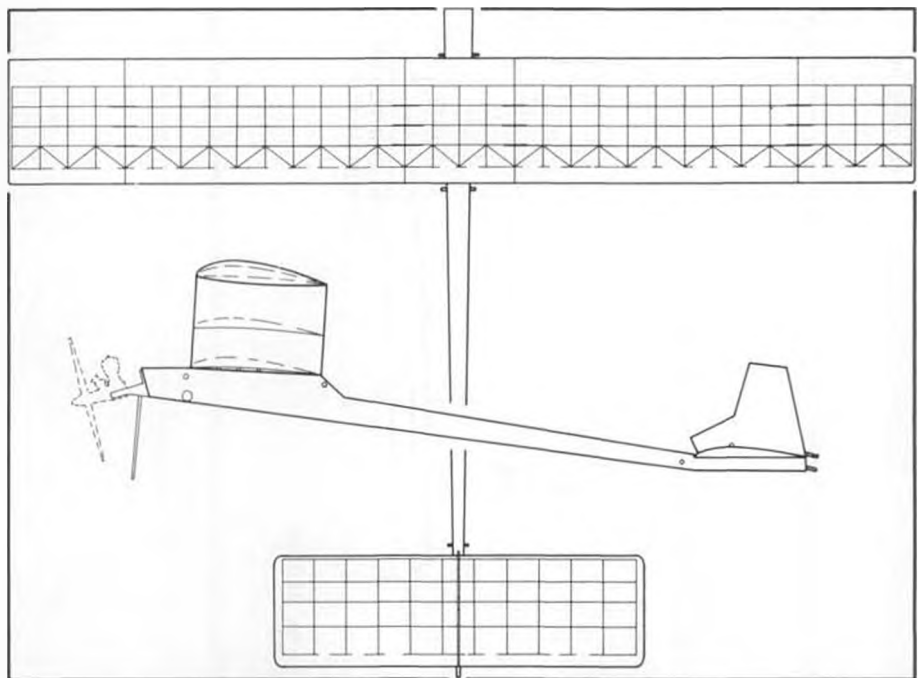


Jim Crocket Replicas' FAI F/F Team T-Shirt, modeled by Tom Stalick. Available from Crocket. See ad for mailing address.

as the target of the day. As ex-committee chairman, I believe that the committee, operating as it does as a voluntary and democratic organization, has come a long way from its early days in 1974. With almost no help from the FAI competitors outside of its own membership, it has finally developed a rationale for selecting finals sites based upon objective criteria. These specifications will be used in selecting a finals site for the concluding finals of the 1979 program (it is interesting to note that the A/2 team, which was not selected until a month before the World Championships, amidst controversy which continued to the bitter end, did comparatively well in Denmark).

The committee, armed with information from Bill Bogart, who was team manager in 1975, and with new information from John Lenderman, 1977 team manager, is developing a handbook for future teams. The purpose of this handbook, as well as those now developed for Semi-Finals and Finals Contest Directors, is to collect the experiences and expertise of those who have worked at making the program go, and put them into an organized and prepared set of information so that future teams have a better than even chance of doing well at the World Championships. In the past, it has always been the passing of information by word of mouth.

This system may have been successful in the past, but the current level of competition does not allow the luxury of sloppiness any longer. So the current committee, under the direction of new chairman, Rol Anderson, seeks ways of improving its efforts to the end of democratically choosing the best team from the U.S.A. to compete at the World Championships. As it does so, it needs and solicits your assistance. When you abstain from helping, you do as much to hinder our teams' efforts as if you were refusing to fly in the program because of your committee member's color of eyes. Constructive criticism has its place always, but it must be constructive. We can all put our efforts at assisting



OCTOBER'S MYSTERY MODEL

the committee, the team and the team manager toward its goal, or we can sit on the sidelines and take potshots. Some of the potshot-takers have threatened to get out of the program. That's an excellent suggestion, and I hope they decide to follow their threats. Others have been critical and have followed their criticism with well thought-out ideas for improvement. I commend them for their assistance. Because of their ideas, several poorly constructed sections of the 1979 program have been improved. There is no doubt in my mind that the U.S.A. has the ability to field a very competitive team for the World Championships. We have proved that we can do it. The preparation and organization phases have been needing tightening up. That is the committee's job and that is what the committee is doing. The year 1979 will be a better in that regard.

DARNED GOOD AIRFOIL — B-6557b

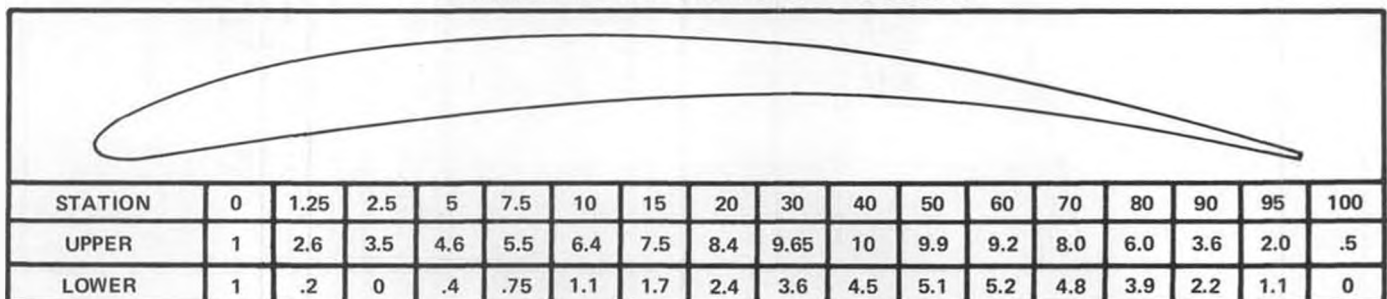
This section was developed primarily as a contender in the calm air Nordic series of wing sections, but has found itself used often as a stab airfoil for rearward c.g., small

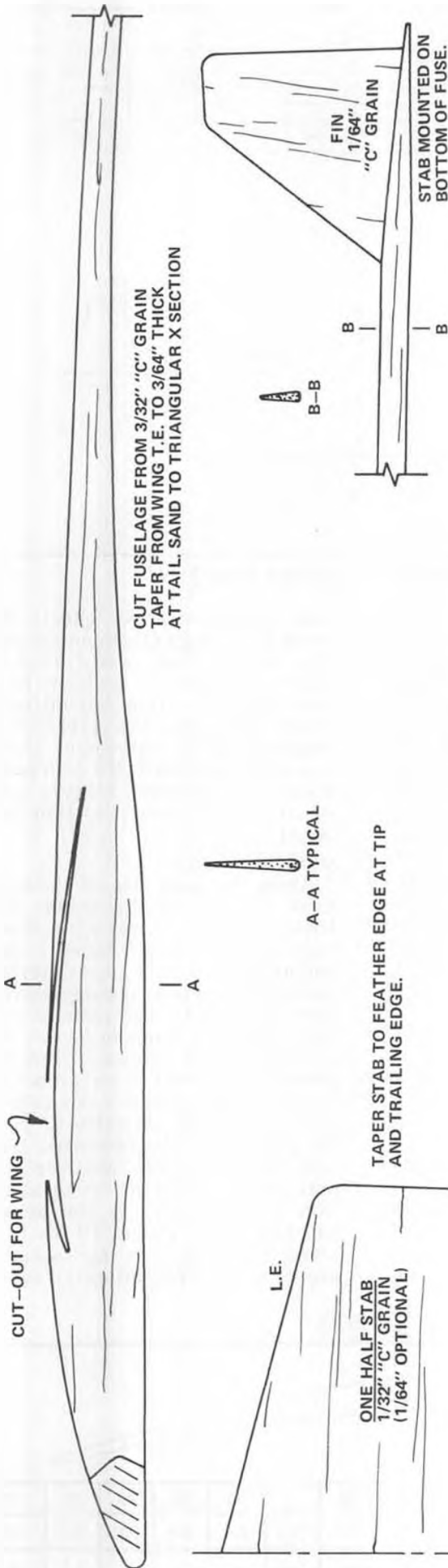
area stabilizers on A/2 gliders. Because of its high undercamber and thin rear portion, warp-free construction could be a problem, however, use of a wide trailing edge could overcome this problem if weight is kept to a minimum. Thickness of the section at the high point is adequate for spars. It bears looking at for both wing and stab sections for gliders.

MORE AIRFOILS

Along the same line of thinking, Kevin Collins, writing in the Bat Sheet, has put together a list of airfoils in common use today in A/2 gliders. Kevin is an engineer with the Boeing Company in Seattle, and has been an avid A/2 contestant for at least the last 4 program cycles. His comments bear reading: "With the present FAI format of early morning and late evening rounds, one cannot expect booming thermals to push his glider over the 180 mark. Getting away from the 'anything will max in lift' syndrome, more attention is being paid to the actual sink-rate of our gliders. Of the variables affecting sink-rate: weight, aspect ratio (A/B), and airfoil selec-

DARNED GOOD AIRFOIL — B-6557-b





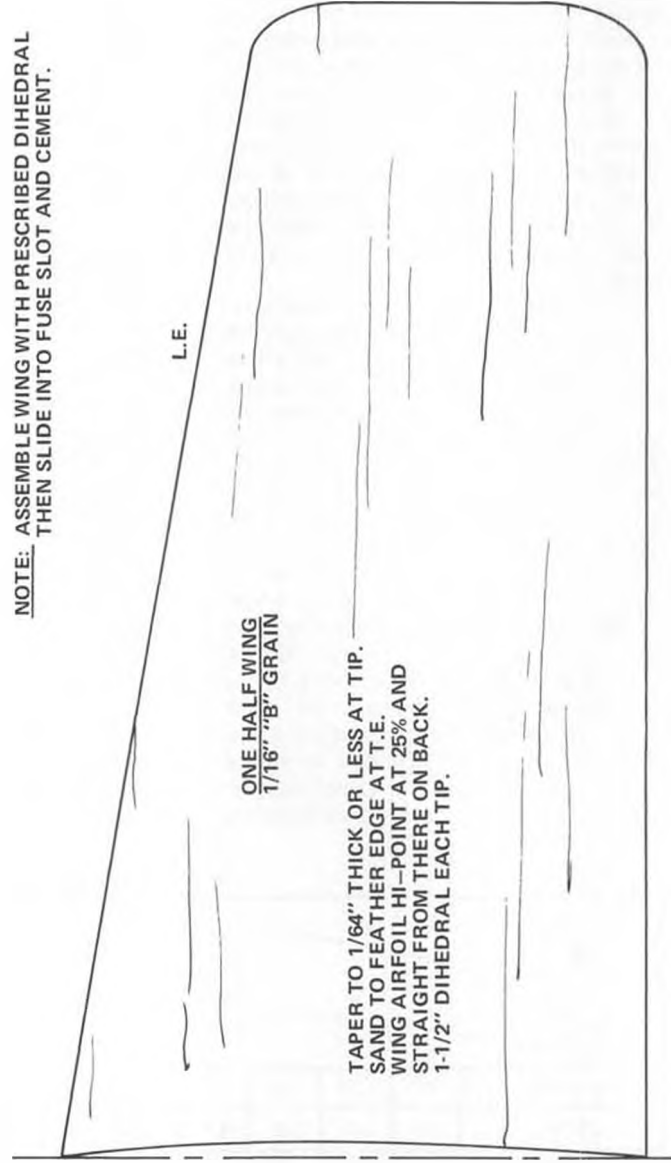
CUT FUSELAGE FROM 3/32" "C" GRAIN
TAPER FROM WING T.E. TO 3/64" THICK
AT TAIL. SAND TO TRIANGULAR X SECTION

A-A TYPICAL

TAPER STAB TO FEATHER EDGE AT TIP
AND TRAILING EDGE.

NOTE: USE EXTREMELY LIGHT Balsa (4-5 lbs. STOCK)
ALL-UP WEIGHT SHOULD BE 3 GRAMS.

⊕



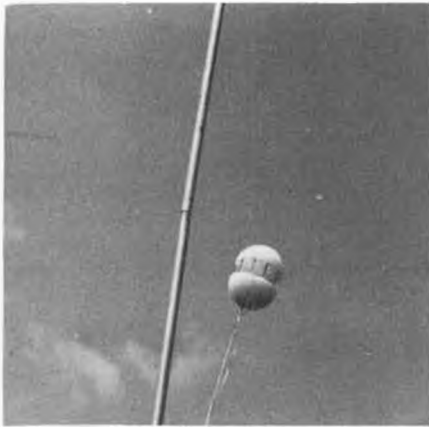
ONE HALF WING
1/16" "B" GRAIN

TAPER TO 1/64" THICK OR LESS AT TIP.
SAND TO FEATHER EDGE AT T.E.
WING AIRFOIL HI-POINT AT 25% AND
STRAIGHT FROM THERE ON BACK.
1-1/2" DIHEDRAL EACH TIP.

NOTE: ASSEMBLE WING WITH PRESCRIBED DIHEDRAL
THEN SLIDE INTO FUSE SLOT AND CEMENT.

I.T.C.C.C. FORMULA GLIDER
DESIGNED BY: BOB DUFFIELD
SWIPE FROM AN OLD BAT-SHEET BY: BOB STALICK

SA

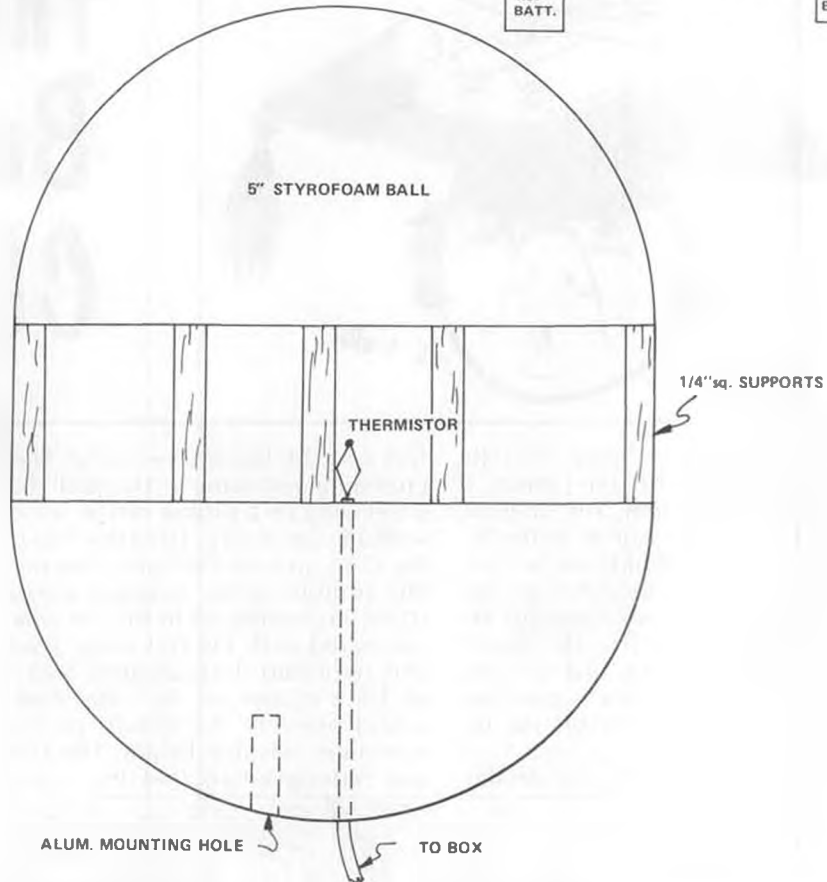
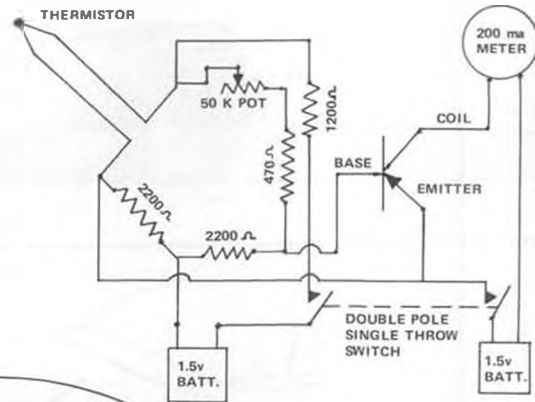


Photos of Jon Fink's thermal detector at top of pole, and meter box at the bottom.

tion are probably the most common. Assuming everybody builds to minimum weight and 'to each his own aspect ratio,' the only alternative left is airfoil selection.

"There are many airfoils currently being used on A/2 Nordics with varying degrees of success. In order to get some comparative sink-rates of airfoils without building a whole fleet of 'identical' Nordics with different airfoils, an attempt has been made to calculate sink-rates. The Allnutt-Kaczanowski report, 'A Relationship Between Basic Airfoil Parameters/Aspect Ratios and Rate of Sink in Nordic A/2 Gliders,' (1970 NFFS Symposium Report) was used to calculate sink-rates. They (Alnutt and Kaczanowski) performed tests on actual A/2 Nordics, leading to their conclusions that sink-rate correlates closely to airfoil thickness, aspect ratio, and camber factor. In order to give an accurate comparison of each airfoil the A/R has been held constant. The accompanying table shows sink-rates for 23 airfoils calculated with a 14:1 A/R. When reading the table, remember that as the A/R changes, so does the sink-rate. As the A/R goes up, sink-rate decreases and vice versa." Numerous airfoils detailed in the chart have appeared over the last 3 years as features of this column's "Darned Good Airfoil."

- PARTS LIST**
 THERMISTOR FENWAL G832J2
 2200 ohm RESISTOR
 1200 ohm RESISTOR
 50 K POTENTIOMETER
 470 ohm RESISTOR
 2N43 TRANSISTOR
 200 DC MICRO AMP METER
 PENLIGHT BATTERIES(AAA)



Jon Fink's thermistor thermal detector. Thermistor is mounted in foam ball at top of pole. Remainder of circuitry is in meter box at base of pole. See text for more information.

OCTOBER MYSTERY MODEL

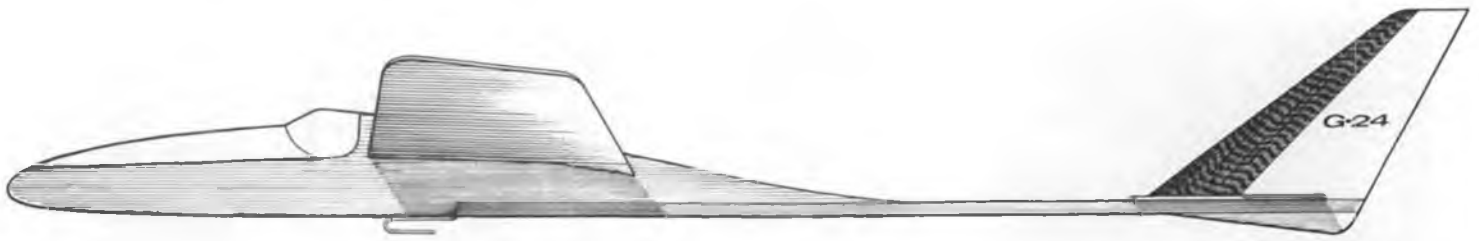
This model design is not old as far as previous mystery models go. In fact, it appeared in a magazine less than 15 years ago. What is curious about this design is that it was part of a two-part article which was purported to be a "flying system." The other part of the article was a thermal sniffer which was designed to be used with this model.

Although I never built this model, there was a fellow in our area who did. There was no doubt that it was out-of-the-rut in appearance, with 17 degrees downthrust, shoulder wing, T.D. 15 powered, sloped fuselage with no pylon, all contributing to the design's uniqueness. It was intended to be flown as an FAI Power Model. I'm sure that some other examples

were built, by other than the designer. Maybe you built one. Maybe you took a picture of it. If so, send the pix in for the column. Send the name of the model to Bill Northrop and he will reward the earliest post-marked, correct answer with a free subscription to **Model Builder**.
 THREE VIEW OF THE MONTH —
 Duffield's Glider

Bob Duffield was one of those unusual competitors. He was friendly, fiercely loyal, inventive, and a hell of a nice guy. The impact he made on the scene in the Northwest during the short time he was to be there, was great. He was an excellent Wakefield flier. Bob was a young man when he was killed in a freak accident involving some tests with a

Continued on page 87



the Model Builder's Classroom

by FRANK ZAIC

• While I was developing the HI-START G-24 glider for the juniors, I had a bit of a problem. The original G-24 just would not ride over the hi-start post as it should, no matter how much power I used for the hi-start. After several unsuccessful attempts, I realized that the G-24, which had a flat wing, just did not have enough lift to carry it over the hi-start post and so drop-off the hi-start line.

How to get more lift out of flat

1/16 x 4 x 24, balsa sheet wing? Then I remembered using a "flapped" flat sheet wing on a rubber model which worked very nicely. Tried the flap on the G-24, just on the center section. The addition of the flap was a good 100% improvement in the lift when compared with the flat wing. I was able to hi-start the G-24 on 10 feet of 1/8th rubber so that the model would override the hi-start post at maximum possible height. The G-24 was redesigned so that the young-

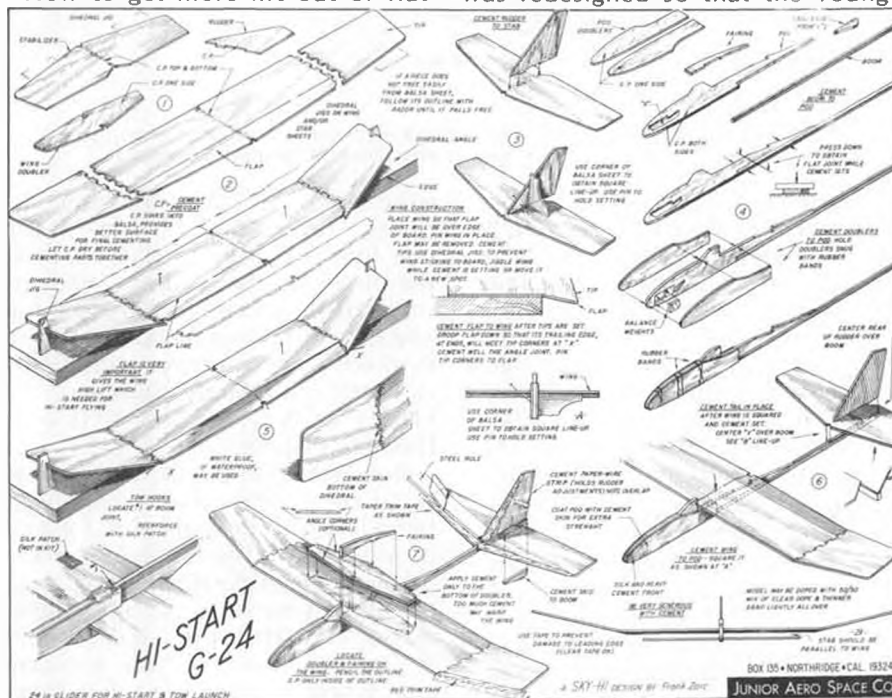
sters were able to incorporate the flap during the assembly without trouble. . . . But I still wondered just how much better was the "flap" over the flat sheet in actual numbers.

During correspondence with Ferdie Gale (who you met in our July, 1975 MB article) I mentioned the effectiveness of the flapped flat sheet and wondered how it really compared with a flat surface. I also mentioned that it would be interesting to know how the flapped wing would check if it were tested like a triangular airfoil with the narrow flap being the leading edge instead of the trailing edge, and also if the triangular section was solid. As you can see, I asked for windtunnel tests as though I was writing to Santa Claus.

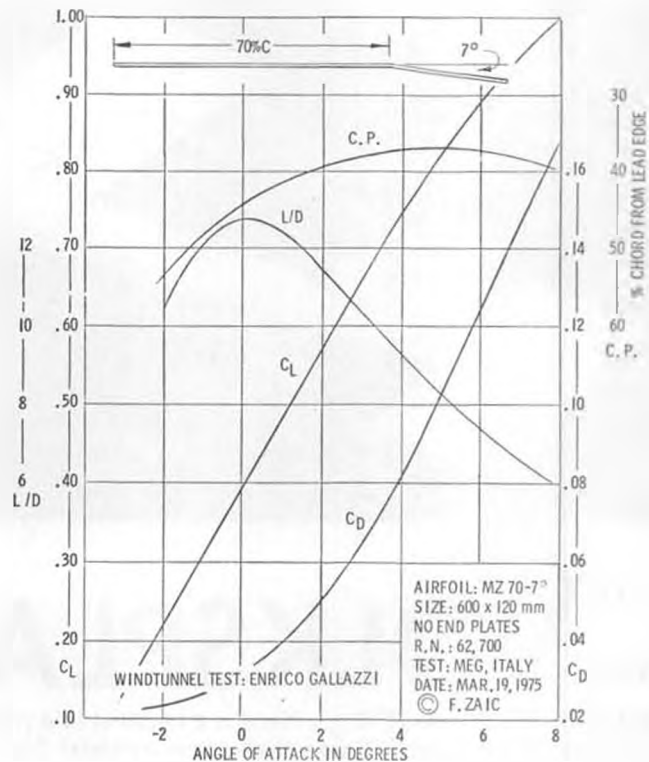
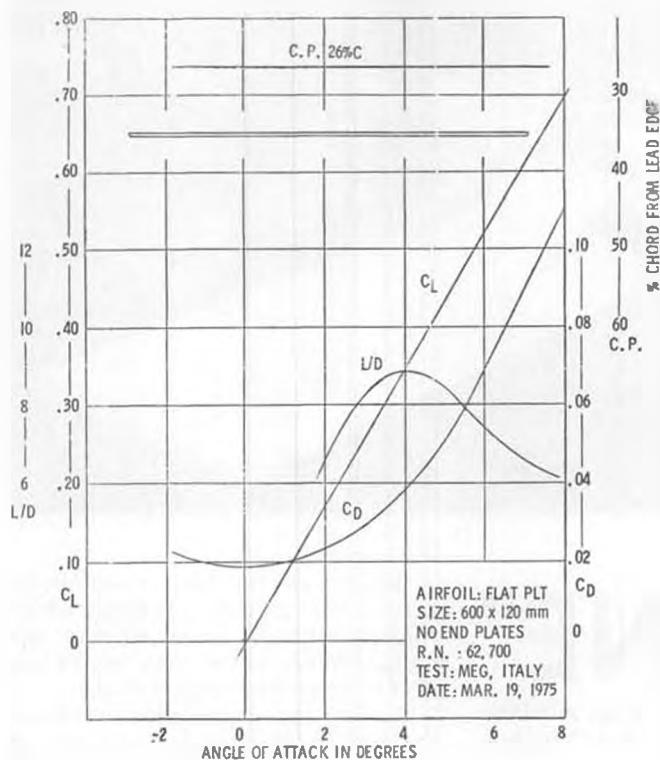
A few months later I received a surprise package from Ferdie. His friend, Enrico Gallazzi, made the windtunnel tests of all the variations I asked for, plus that of a flat plate so that it could be used for comparison. Their test data was in their terms, which I converted to the familiar NACA charts as shown.

We could write pages and pages talking and comparing the various values of the different sections, but this sort of comparison is usually best done by the individual who knows for what he is looking and can make the final decision. But I would like to point out the basic difference between the flapped and flat wings.

We should realize that we should not compare the airfoil values be-



Typically thorough assembly drawing by Frank Zaic, of his HI-START G-24 glider. Back of this drawing contains instructions and sketches on how to adjust and fly glider from a hi-start rig.



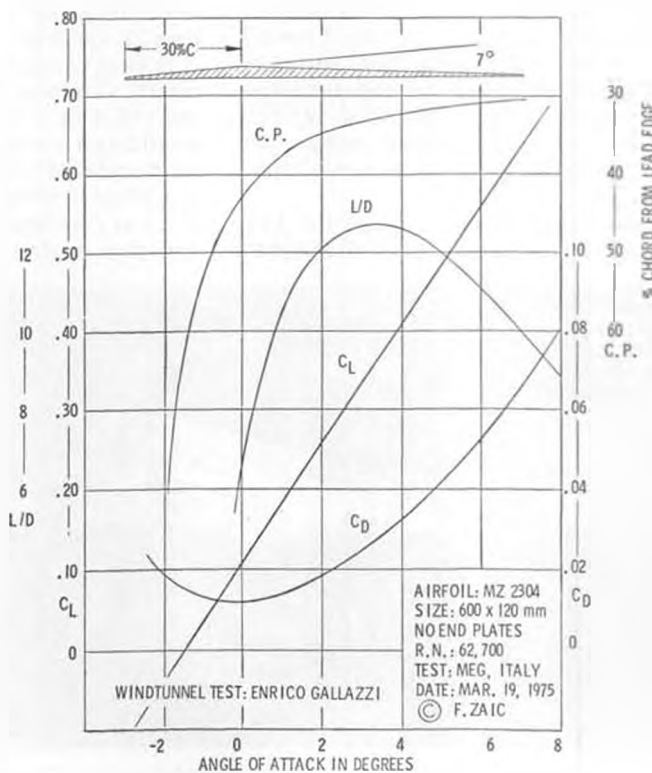
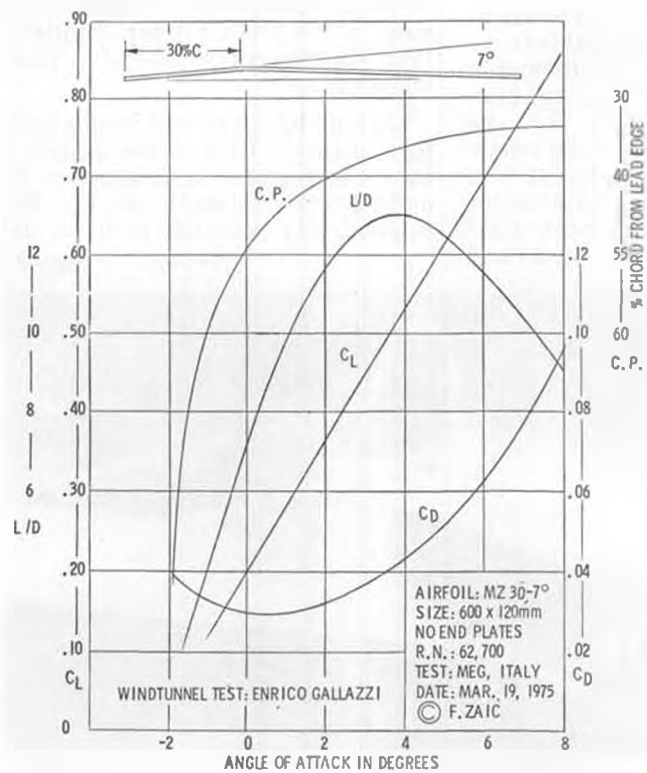
yond 5 to 6 degrees angle of attack, as most models do not glide at higher angles. The angle of attack, under powered flight conditions, will be determined by the power used. Low powered models may fly close to 5°, while high powered models may actually fly below the zero angles. These angles, of course, are assumed by the design under power.

Back to flap/flat wings. See the charts. At zero angle of attack, the flap wing has as much lift as the flat one has at 5°, while the drag value of the flap wing is much less than that of the flat one. So, right here, you can see the advantage of using a flapped wing instead of a flat one. At 5°, we have just about reached the maximum values for the flat

type, while we can go still higher for the flapped one. Of course, as you go into higher angles with the "flap," the drag also goes up a bit faster than the regular Clark Y. However, we are not comparing them at this time.

We will not make any comments at this time about the other two sec-

Continued on page 79





the "VOLKSPLANE"

By VERN SCHROEDER . . . Here is a control line model of an airplane that is easier to build full size than some models! Scaled at 1-1/2 inches to the foot, it could be converted to R/C.

• Designed by W.E. Evans, an aircraft design specialist at Convair, the "Incredible Volksplane," as it is sometimes called, is itself hardly more than a huge overgrown model. Its nearly all wood construction follows quite closely that of most model aircraft; and we might add, is much simpler than some.

Evans' basic design objectives were to keep it simple, low cost and light. Using a Volkswagen engine, which requires only minor modification and bolts directly to the firewall, one-piece full-flying tail surfaces, plywood sheeting on the fuselage, one-piece bent aluminum landing gear and strut braced wings, are all methods used to achieve these goals.

Although simplicity was the keynote of its design, the Volksplane's

flight performance is still quite impressive. A 40 horsepower VW engine, combined with a flying weight of only 650 pounds, gives it plenty of zip. It takes off in 450 feet and lands in about 200, putting it in the STOL (short takeoff and landing) class. Top speed in level flight is about 85 mph, cruise about 75 mph, stall is a mild 46 mph, and the dive speed limit is 120 mph. Rate of climb is about 450 fpm. The airframe has been designed to withstand loads to 6.6 G's. Ceiling is about 9000 feet.

A year of spare time would enable nearly anyone to complete construction of a Volksplane. The cost would run somewhere in the neighborhood of \$1200 (1969 prices). This could be broken down into \$600 for the basic airframe and another \$600 for the engine, prop, wheels and

instruments.

Best of all, the fuel consumption is only two gallons per hour; which figures out to be about 40 miles per gallon! What better way could you find to beat the energy crisis?

During its ten year plus existence, the Volksplane has become one of the most popular of homebuilts. Each homebuilt fly-in held will produce at least one, and often several will make the scene. We know of at least one high school shop class, with an aviation oriented instructor, who built the VP as a class project. More recently, a two-place version has been designed and called the VP-2, which has slightly larger dimensions all around.

Flight tests on the original full sized aircraft (which we have modeled here) were performed by none other than **Model Builder's** "Prolific Peanut Producer", Walt Mooney.

Our model presented here is built to a scale of 1-1/2 inches equals 1 foot, which gives it a wingspan of 36 inches, and a length of 27. The original was powered with an old

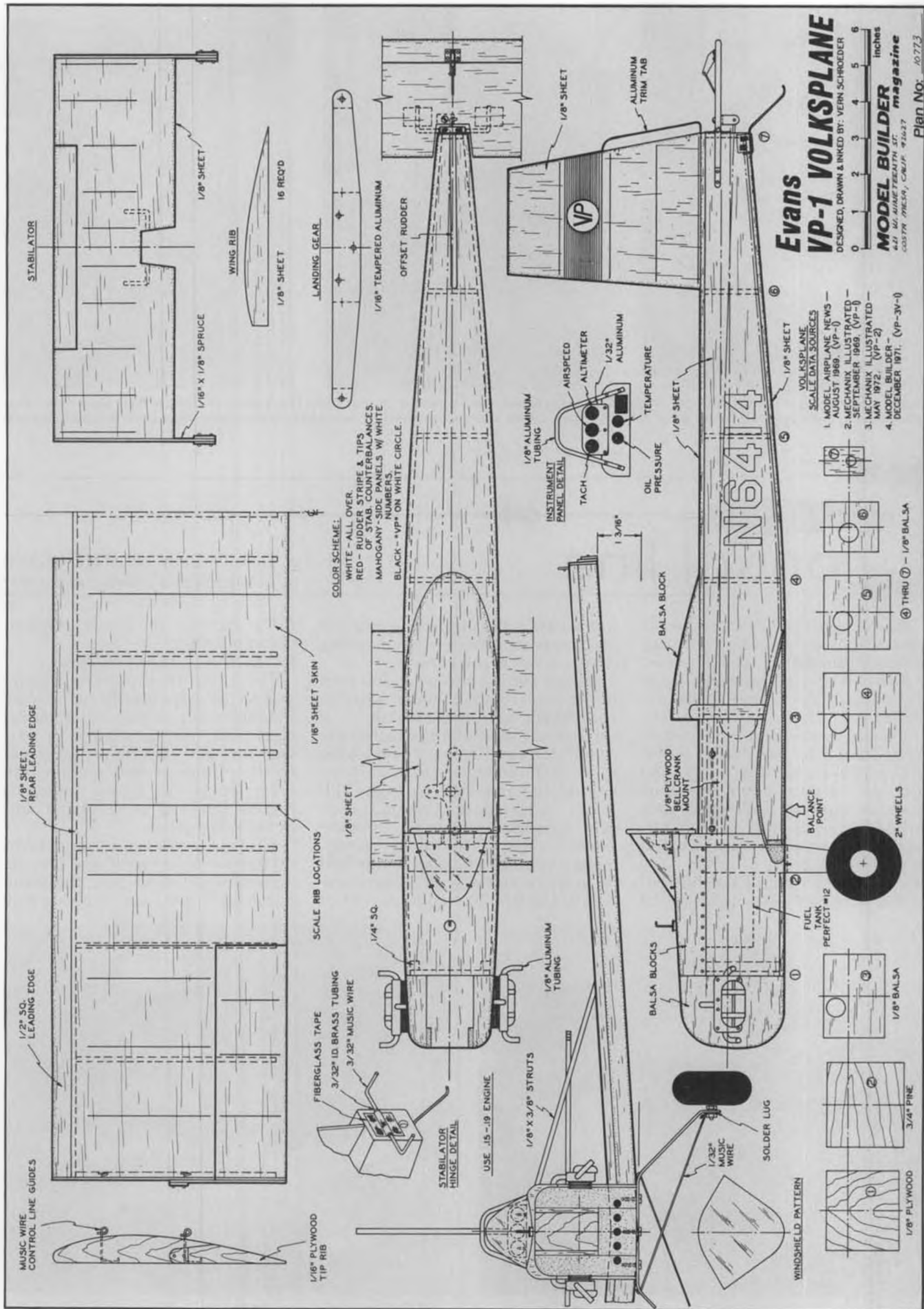
Continued on page 79



Ancient Cub .14 was used in original model. Though a modern .09 or .10 would do, a .15 would give livelier performance.



Contact shelf paper simulates natural finished plywood sides. Seal edges with epoxy. Plans could be used for R/C version, as is or larger.





Here is our FAI Combat team (l to r): No. 3 man, George Cleveland, most consistent flier at trials; No. 1 man, and MACA Pres., Gary Frost. Note stretched nylon blade on Rossi-turned prop; and No. 2 man, Chuck Rudner, a surgeon (!), who risks his profession every time he hand-flips a prop.

Control line

By "DIRTY DAN" RUTHERFORD
PHOTOS BY AUTHOR UNLESS NOTED

• This is tough. I've just spent a week and a half at the R/C Car Nationals and have been getting really pumped on R/C cars. Now to sit down and talk about C/L takes some adjustment.

To make matters worse, I am in no way prepared for the NATS (AMA-style) which is only days away, and WCN has foisted a new deadline schedule on us poor under-paid, over-worked, ego-tripping columnists. The deadline was two days ago and it is now 1:00 at night.

I'd ask myself why I do this, but I'm afraid the answers might not be

to my liking. Best to have a more or less clear conscience when doing these columns, you know.

Before getting into what you read this column for (by the way, what do you expect from this column... it surely can't be anything worthwhile, can it?) the Jive Combat Team wishes to publicly announce that we have invited that primo R/C car racer, Bill Jianas, to be a part of the JCT, if he ever decides to take up Combat. Jianas is one of the most beserko people you can imagine, and would fit in quite nicely with other members of the JCT. (Read about some of

Bill's exploits in Chuck Hallum's column. wcn)

FAI COMBAT TEAM TRIALS

Until just recently, FAI Combat was not an event qualifying for World Championship status; an incredible oversight on someone's part, wouldn't you say? Due in large part to the efforts of MACA, with Gary Frost the prime driving force, the FAI has finally given Combat a place in the W/C's game.

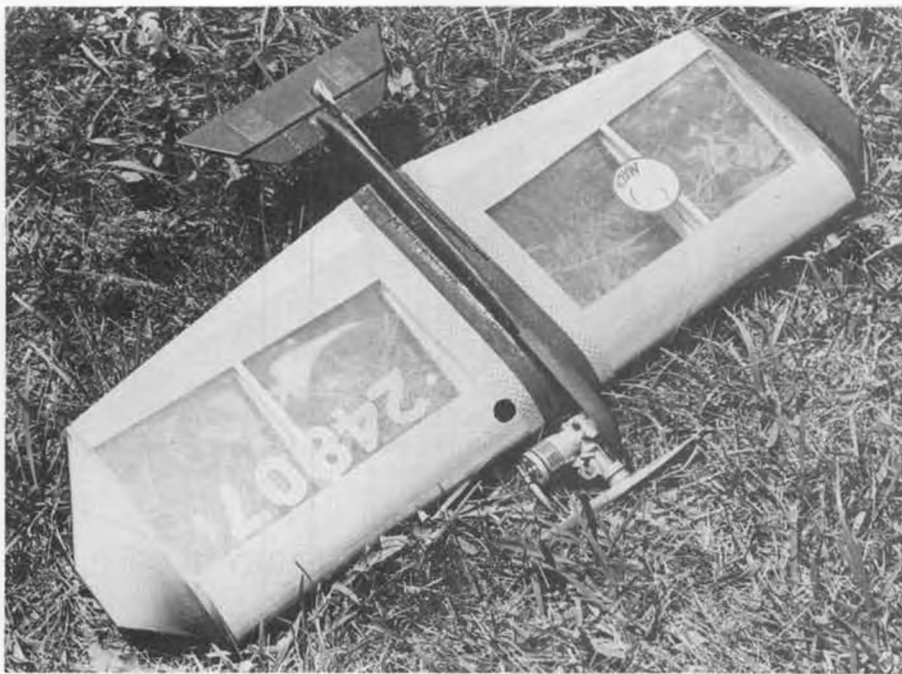
Give U.S. modelers a shot at taking on the rest of the world and they flat go for it. In MACA's case, this meant holding a Team Trials to pick a team



Watch what you're doing, Paul! Paul Smith refuels, with Debi Imhoff's assistance... or distraction.



Kit Gerhart, with one of Howard Rush's planes, is getting ready for a start. All Combat Trials photos courtesy of Charlie Johnson.



Dick Imhoff sets a new world record for low aspect ratio combat planes. Photog Johnson says it flew fine, and you can probably make two out of one Guillotine!

Front end of Howard Rush's long-nosed plane. Pipe gets exhaust clear of wing. Bartels prop.

of three of our best FAI Combat fliers, something that has been in the planning stages for quite some time.

Held over the 4th of July weekend in St. Louis, everybody I have talked to regarded this first Combat Team Trials as a huge success. The competition was really super, with top-notch Combat fliers from all over doing their best to make the team.

I personally regard this as a bit of a surprise. Let's face it, FAI Combat is still regarded as a bit of a joke with the majority of U.S. Combat fliers. The engine size (puny 15's), strange rules, little FAI experience, even less in the way of FAI contests, all adds up to a sideways glance at FAI while preparing for "real" Combat with AMA Combat planes.

But the factor that made the difference seems to be MACA. The Miniature Aircraft Combat Association has done really good things for Combat, and did a super job in getting interest up for this Team Trials. Without MACA, the whole thing would have been pretty much a joke, as far as I'm concerned.

However, with MACA putting on the show, some of the best Combat flying ever took place early July in St. Louis. Several people I talked to said that it was probably the most competitive Combat they had ever been involved in. Charlie "Yawnson" even went so far as to say that it was better than the flying in Holland last year, which was a sort of unofficial world championship of Combat held the weekend before the regular '76 C/L World Champs.

I would imagine that one of the other magazines will feature a full report on the Combat Team Trials,

so I'll pass on a complete rundown, especially considering the fact that I wasn't even there. To wrap it up, here is our first FAI Combat Team: Gary Frost, George Cleveland, and Chuck Rudner. They are all proven Combat fliers, no turkeys here. I look for them to do a number on the boys over in England.

POLITICS REARS IT HEAD ONCE AGAIN, OR, AMA, AMA, WHERE WERE YOU?

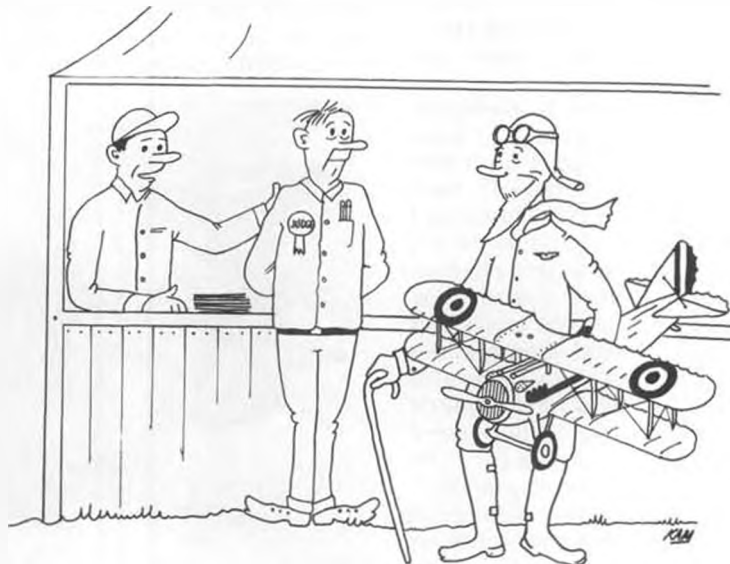
Despite the fact that Gary Frost wrote to the AMA specifically inviting John Worth, Johnny Clemens, etc., to attend the FAI Combat Trials, the only AMA official there was Ron Malcom, a Canadian and CD for the Trials! The very first Combat Trials

and "our" AMA ignores it.

It is quite obvious that there were more political Brownie Points to be gathered by AMA officers and employees in attending the R/C Masters Tournament held the same weekend (*Wrong! The World Champs was on July Fourth weekend. The Masters, to select our team, was the weekend before. wcn*). Combat fliers take Combat just as seriously as Pattern fliers take Pattern, and I see no reason why the FAI Combat Team Trials shouldn't be equally as important as the Masters.

If nothing else, possibly the lack of AMA officials at the Combat Trials proves that the AMA knows

Continued on page 93



HE SAYS HIS NAME IS EDDIE AND HE WANTS TO ENTER SCALE COMBAT!



Bill Sestito with his House of Balsa Nomad II. Cannon 2-channel, QRC .049 for power.



Steve Whittman built this GMC "Miss Norway" for the author. Did a nice job. See review in text.

The 1/2-A SCENE

By LARRY RENGER

• Over the past month I flight tested a couple of new models. The first one is the "Free Spirit" Flying Wing, kitted by Allied Hobbies. A friend of mine, Bill Sestito, did the construction and decor. His building is excellent, even though he has only just recently joined the ranks of modelers.

The Free Spirit took considerably longer to build than the 2 hours noted on the box labels, but those figures are invariably pure fiction. Anyway, construction is simple and straight forward. The only hairy area is the problem of joining wings to fuselage in correct alignment. The model I have was aligned almost perfectly, so all it takes is a mite of care.

This copy of the kit was built with a QRC engine for power, and a semi-cowl was added to make it look really slick. Decor matches the white/metallic red shown on the box label, except that blue trim stripe was added.

Radio for the model is a very interesting set of equipment. As I mentioned a few issues ago, I built one of Royal's new "Dorffler" two-channel micro receivers. This time I used another copy of the same kit, except with the extra two-channel modification so I have a really tiny four channel unit. Servos are a pair of Ace's new Digital Commander micro units. These servos were also built from kits. Battery pack is made from 100 mah cells which were swiped from some wrecked "Cox Electrocharger" electric airplanes.

Just to round out the picture on this conglomeration, I tuned the receiver to my Cox/Sanwa 4-channel transmitter. It is a real tribute to the radio control industry that this assortment of miscellaneous manu-

facturer's components all work perfectly together. Standardized signal form, from company-to-company, is a real blessing to consumers.

The real nitty-gritty of any project is how it performs in the air. My Free Spirit weighs 17 ounces. Total wing area is 300 square inches. This makes it a very lightly loaded model, although not unusually so for a flying wing. The QRC provides ample power when using only one head-gasket, Cox Racing Fuel, and a 5 x 3 Cox Competition Prop.

This total combination climbs out well and has ample power to loop or roll from level flight.

One very interesting feature of the Free Spirit is the very fat airfoil. There are several advantages which are immediately evident when you fly. The model responds very smoothly, and does so without being twitchy. Second, speed is quite constant; climbs, dives, and maneuvers

have little effect on the flying speed. Final effect is that the airplane remains maneuverable in power-off glide down to very low speeds.

My only negative comment on this kit is that the firewall, as provided, is hopelessly inadequate. Substitute a 1-1/2 inch square of 3/16 aircraft plywood, and you have a really neat model.

Second model for the month was built for me by Steve Whittman. Steve is the 12-year old son of Ron Whittman. The two of them have made it a habit of knocking off various Free Flight national records for years. Ron also markets a variety of trim tape and decor items. Steve did a very nice job on a GMC "Little Miss Norway" kit. Finished in Pale Blue Flite-kote, the model is incredibly light.

ACE radio is the brains of the outfit this time. I have an ACE 5-channel transmitter with Dunham open gim-



Model Merchant's newest, the P-40. Construction is similar to the Rickey Rat, and also features retract, which fold and rotate, just like the real ones.

bals, the Digital commander 1-8 receiver, and two Bantan servos. All of these units were built from kits. I screwed up the receiver assembly in a couple of areas, so I returned the entire system to ACE to be "cured". Turn-around time was a total of three weeks; total charge, including parts, shipping, insurance was \$17. The radio now works flawlessly. In my own defense, I must say that my 2-year old "helped" me build the receiver (*that's what you get for using child labor! wcn*).

Power for this model is interesting, as it is a custom engine I built. I wanted to fly at my local school yard and Mile Square, both of which require mufflers. On the other hand, this is a "the more power the better" model, so I needed something special up front. The combination I ended up with is a Tee Dee 049 crankshaft and case, Medallion .049 carburetor, and a QRC piston, cylinder and muffler. The carburetor has been drilled out to .177 inch diameter (don't forget, this is a spray bar type carb), and the crankshaft pressure tap opened up with a .025 diameter drill. The engine will turn a 6 x 3 Cox Competition prop at 17,000 RPM on Racing Fuel.

First flights on Cox racing fuel showed promise, but I couldn't get a consistent run through a whole tank. Bruce Tunberg (project engineer on the Conquest .15's) suggested that my engine was overheating. The cure he suggested was addition of the heat sink from our ready-to-run cars. Hey gang! It works! That son-of-a-gun sounds like a very fast sewing machine from start to running out of fuel. It seems that the heat retained in a muffler on a hot engine is just more than the fins are sized to get rid of. The Heat Sink (part 8477, \$1.75 plus shipping) adds enough extra convection area right where you need it so that your engine stays cool. One final added advantage is that it also keeps the glowhead on tight!

Flying the Miss Norway is, to say the least, exciting! The first flight left me with my hands shaking in pure fright. The model was smooth, and not too far out of trim, but it is so incredibly fast that I was scared silly. Speed was very close to that of a pylon racer and much faster than anything I had flown before. I thought my 1/2A Chaos was quick and maneuverable, but Miss Norway is a very fast lady!

After a dozen flights, the model is still a thrill to fly, but at least I don't risk leaving puddles on the ground any more. Controls are responsive with remarkably small throws. A bit of nose weight has smoothed out elevator response for me, and I would



Midwest Products' P-39 Airacobra. It flies OK with a Baby Bee, but really gets sporty with a Black Widow.

probably shorten the ailerons another couple of inches from the tip on the next one, while increasing the throw somewhat.

I certainly recommend this model to advanced flyers who get their jollies from burning up the sky.

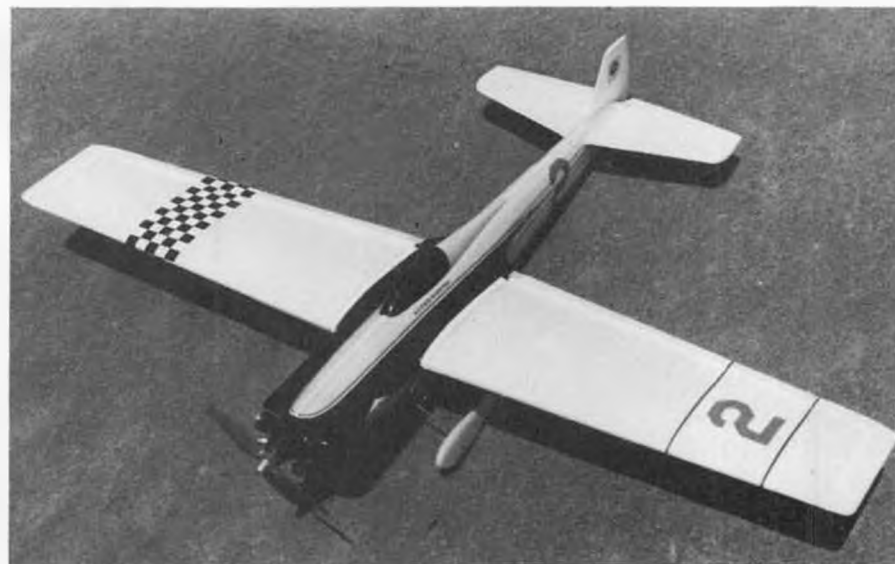
An interesting sidelight to my flying the above models occurred as I was putting some flights in on the Miss Norway at a local school yard. A gentleman came over from a house across the street. Oh-Oh, here we go with a noise complaint, I thought. Fortunately I was wrong; he was an R/C flyer who was astounded that you could fly in a school yard. He flies '60's and the concept had never occurred to him! After a pleasant discussion and showing off my model he left, having decided to put a QRC power pod on a Questor kit he just bought. He was really pleased to find a "new" flying site, since he normally flies at Mile Square and has a long wait for flying time.

The moral here is to take your 1/2A's with you to your regular "big ship" field and talk up their benefits. The more people buy 1/2A models, the niftier the equipment that will be made available by kit, engine, and radio manufacturers.

"WHAT THE (1/2A) WORLD NEEDS" DEPARTMENT

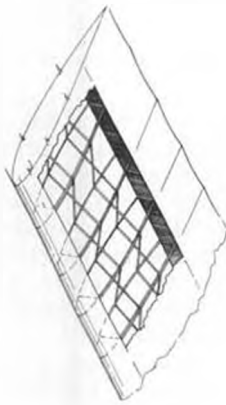
1. Smaller linkages, clevises, etc.
2. A really good, throttled, muffled, 1/2A engine.
3. A wider variety of 1/2A props, such as a 5-1/2 x 2, 5 x 3 narrow racing, 6 x 3 narrow blade stunt, and 7 x 2 scale and F/F.
4. One, 1-1/2, and 2-ounce clunk tanks which are lightweight, the current units have construction identical to the 8, 10 and 12 ounce units!
5. Lightweight wheels. Actually, Joe Klaus has brought back the beautiful foam rubber K & B racing wheels, but more sizes are needed.
6. Lightweight, but full size U/C

Continued on page 67

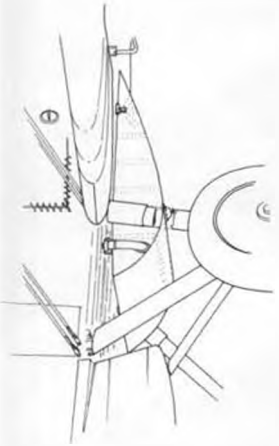


Model Merchant's new 1/2A Rickey Rat. An ARF kit, it uses a plastic fuselage, and sheet foam wings. Light and fast!

- COLOR SCHEME -
 STANDARD CORPS OLIVE DRAB - FUSELAGE, STRUTS &
 LANDING GEAR
 CROCKI YELLOW - WINGS, HORIZONTAL TAIL SURFACES & FIN
 WHITE LETTERING ON OLIVE DRAB
 BLACK LETTERING ON YELLOW



SIMPLIFIED VIEW SHOWN TYPICAL WING RIB STABILIZING TAPES
 (OMITTED FROM VIEW BELOW FOR CLARITY)



INSTALLATION OF 26 GAL. DROPABLE, RIVETED &
 SOLDERED BRASS AUXILIARY FUEL TANK.

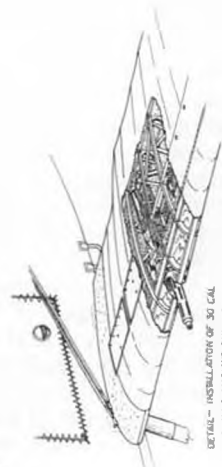
1 TWO 30 GAL. BROWNING'S FORMER FORWARDED
 1 TWO 30 GAL. TUBES - FWD COCKPIT
 C-3 SUBMOUNT-

TWO 30 GAL. LENS RINGS ON
 SCAFF RING - REAR COCKPIT

CONVENTIONAL CURTISS WING STRUCTURE - HOLLOW BOX SHAPED WITH SPRUCE
 FLAMES & 2 PLY SPRUCE WEBS - TRUSS TYPE RIBS WITH SPRUCE MEMBERS
 & BIRCH PLYWOOD WEBS - LEADING EDGE IS STIFFENED WITH SHEET DURAL
 ALUMINUM BACK TO FRONT SPAN - WINGS ARE COVERED WITH GRADE 4
 COTTON CLOTH - AIRFOIL SECTIONS ARE CLARK 'Y'

AVIGATION LIGHTS -
 WHITE - TOP RATT FUSELAGE
 BROWN - RIGHT UPPER WING TIP
 RED - LEFT UPPER WING TIP

HORIZ. & VERT. TAIL SURFACE
 STRUCTURES ARE DURALUMIN
 EXCEPT FIBRE STAR FRONT
 BEAM IS DUAL STEEL TUBES
 COVERING SAME AS WING.
 FIBRE STAR AUGMENTED BY
 CHAIN DRIVE MECHANISM
 FROM FRONT COCKPIT



DETAIL - INSTALLATION OF 30 CAL.
 BROWNING MACHINE GUN - EACH
 LOWER WING

FUSELAGE FRAME - DURAL TUBES
 & RIVETED JOINTS.

AIRWAY FLARES &
 DIRT DEFLECTORS

13 GAL. ALUMINUM
 MAIN FUEL TANK

22 X 6 TIRES & SAUZEODE
 ON BENCH WHEELS & BRAKES

14 GAL. ALUMINUM
 OIL TANK. PRELUBRICATION
 STARTER WAXOILS STORED
 ON OUTER WHEEL.

8 0" DIA. CURTISS-ROEDER TYPE No. 21, 3000 W.P. SINGLE PRICE,
 FORCED ALUMINUM PROPELLER, DRIVEN BY A 430 HP
 CURTISS D-12 V-1100 ENGINE

AIRSAVED PIVOT TUBE

PERSPECTIVE CUTAWAY
CURTISS A-3 FALCON
 NICHOLAS MARSTENS
 JANUARY 1937

DATA SOURCE - SET OF A-3 PLANS PLUS PHOTOS
 & TECHNICAL DATA FROM PETER WESTBURG

ORIGINAL DRAWING SIZE 28 X 40

bellcranks. The geometry should be the same as for .35 and up models, but structure can be immensely lighter. I save 3/8 ounce on my flap horn *alone* when I made a custom unit for the Scamp!

7. A four-channel Micro Brick: on 1/2A models you don't need a separate wing, so why separate mounting for servos? Radio reliability is no longer a really good reason for having separate components.

8. A variety of lightweight cowls and canopies for the scratch builders.

9. More 1/2A fliers, all of whom subscribe to **Model Builder** and read this column. (I can dream, can't I?) . . . (We mean "can't we." wcn.) ●

R/C Auto Continued from page 17

Bill Jianas flamed out with some idling problems, and did not get back on the track. But Chuck Phelps and Arturo Carbonell were motoring right along and were lucky to have a couple of more racers drop out. With no traffic, Chuck posted fast time of the day with a 556.9 second run, and Art got a 571.8 second run.

The only problem we had Saturday was being a little ahead of schedule . . . and the use of the white flag. In Europe, time schedules are adhered to quite strictly. So when we got ahead of schedule, some racers were not ready and one was not even there . . . until just before his scheduled race time. The white flag problem affected several racers . . . when they got the white flag they pulled into the pits, shut off their engines, and retired. It seems that in Europe there is no white flag, just the checker, and when you get that, the race is over. So several European racers' times had to be adjusted because they believed the race was over. (It's amazing what seemingly obvious details can be overlooked in the briefings. wcn)

But other than that, the race was going pretty well. Only a few complaints, and the same guys were always griping. However, it was pretty nice when a couple of people came by after controlled practice, etc. on Wednesday, Thursday, Friday, and racing Saturday, and said they thought we were doing great.

Sunday was the last qualifying day, so lots of guys were going to have to let it all hang out as they didn't get a time the day before. Since Bill Jianas didn't get a time Saturday, he was in one of the slower races, but he bulleted around everyone to get a run of 542.6 seconds, which held up for Top Qualifier. I think he had an advantage today,

RACE-WINGS



**6 RUBBER SCALE PLANS
COMPLETE PLANS SHOW ALL PARTS,
BOTH WINGS, FULL STAB, PROP BLANK,
SCALE SOURCE REFERENCES**

20' Folkerts SK-2. 20' Crosby CR-4.
13' Chambermaid. 13' Folkerts SK-2.
13' Floyd Bean. 15' Smirnoff Bearcat

Set \$500 Postpaid Foreign add \$150
order from **CLOUDBUSTER VENTURE**
P.O. Box 2921
Livonia, Michigan 48150
DEALERS INQUIRIES INVITED

being in a slightly slower race, 'cause nobody gave him trouble. But Phelps and Carbonell had the advantage yesterday. Georgia Campbell ran as fast as her race leaders, but had missed the start (trying to start the car on a dry fuel tank), and was down about one lap at the start. Georgia got about a 612 second run, so just missed the mains because of the goof up. Debbie Preston, the 14 year old whiz girl from England, showed her stuff by running a 590.0 second heat, to be the fastest foreign qualifier . . . she is really a great driver. Matt Azzara led his heat most of the way, looking as if he might cut Jianas' time, but a few encounters with corner markers near the end of the race dropped him to a 562 second run. The only other drivers I noticed on Sunday who were fast and smooth, were Jeff Rold and Gene Husting.

So that was it for qualifying. The top 30 drivers then got some time, about 1-1/2 hours, to practice before going home and preparing for the big day. The qualifying order is listed elsewhere.

Monday morning, July 4, started off overcast, but clearing by 9 a.m., so the day was a little cooler. Competition concours judging was first, and Al Chuck won with a neat Armor All Porsche. Gary Buriani was second with another Armor All Porsche. All 30 qualifiers for the mains then got two 10-minute practice sessions to get final needle settings and wear in new tires. But as usual, there were lots of last-minute changes and thrashing. There was about an hour's break before the mains started, for announcements, b.s., and lunch, if you had time.

The "C" Main drivers were then called for the first 100-lap race. During the warm-up, I broke a clutch nut shaft and missed the start. Roger Curtis was in the lead when I finally got into the fray. Only 5 seconds separated all of these cars in qualifying, so there was lots of close rac-

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ing going on. But Roger Curtis seemed to be the only one who didn't have problems, and went on to win. Besides my first problem, I also had a pinion come off the clutch bill. Johan Pretorius had gear problems, Jay Kimbrough had clutch bearing and wheel problems, and Bob Titterington had an ill handling car because of a board blast.

In the 110-lap "B" Main, a battle between Phil Booth and Gary Grossenbacher developed quite early, as they moved out from the pack. John Thorp and Rick Davis had their own thing going a little farther back, but Debbie Preston and Bill Campbell weren't far behind the leaders. It looked like Grossenbacher was faster than Booth, but Gary had to pit quite often ... about every 15 laps ... and Phil would get the lead. About midway through the race, Campbell pitted and had a battery change, so Debbie Preston moved into a solid third place. Thorp's car was handling badly because of some shunts ... probably with Rick Davis ... and dropped out. A short time later, Davis went out too. It was still a see-saw battle between Booth and Grossenbacher until Gary flamed out on the back straight. I had seen

earlier what looked like fuel coming out the back of the car on the sweeper going into the back straight. So Phil Booth got a lap on Gary and held this lead to the end, and Debbie Preston took third, running as fast as the leaders at the end.

Well, now it was time for the World Championship race of 120 laps. Everybody was out for the warm-ups, and then the cars were called to the line. What a noise they made with all of the throttles blipping! Then the flag came down ... and when it went up, Butch Kroell's car shot into the first corner, ahead of the pack.

What a mix-up! Butch had about a 30-foot lead going into the back straight, ahead of Matt Azzara, Gene Husting, and Bill Jianas. But back on turn 3, Chuck Phelps spun a gear loose. A frantic stop had Chuck back on the track in about 5 or 6 laps time, but he was out of it from there on. Butch led by the same 30 to 50 foot margin, while Jianas passed Husting and started closing the gap on Kroells. As both gradually pulled away from the pack, Bill passed Butch on the back straight. But Butch got the lead right back, and then, when Bill pitted the first time,

his engine flamed out as he came back on the track. A race to the starter and back to the track left Jianas over a lap down.

Meanwhile, Butch had a comfortable lead ... but everyone else was still on the same lap, with quite a battle for second between Azzara, Husting, and Rowland. When these guys pitted, Mike Rowland lost time due to a slow pit stop. A little later, Butch Kroells came in for his pit stop, but didn't lose the lead. It looked like Butch was getting better mileage, about 25 laps compared to 20 for the rest of the field. Jianas was running very hard, but then he flamed out again on his second pit stop when the engine or glow plug cooled. So now, at around 40 laps, Jianas was down about 3 laps. Art Carbonell had a crankshaft let go here, and had to retire from the race.

Up to 60 laps, about four cars were on the same lap with the leader. But then, with pit stops and shunts that other cars had, Kroells put a lap on the field. Butch was driving the best race I've seen him run; keeping close to the line and not overshooting corners. Jianas, on the other hand, was pressing hard, using up all the track, overshooting corners, and spinning out ... really blasting around other cars but probably going slower than Butch.

Gene Husting always seemed to move out of Bill's way when they were close, 'cause Gene didn't want to tangle. By lap 80, Jianas was back on the same lap as Husting, Rowland, Azzara, and Lee. But Butch had over 2 laps on Bill. With about 20 laps to go, Jianas passed Husting to take second place, but unless Kroells had a problem, there was no hope. And that's the way it ended. Kroells, the winner, with more than 2 laps over Jianas in second and Gene Husting in third, with Mike Rowland in fourth, about one second behind Gene. Butch was awarded the special First World R/C Car Championship checkered flag used for that race.

Kroells said he didn't know whether he was going to make those last couple of laps because he was so nervous. You could tell he was choked up during all the picture taking. Butch still couldn't say much even by banquet time ... he just couldn't believe that he was World Champion.

After a couple of days, Butch, a local Southern Californian, was almost back to normal, and I had a chat with him. Here are some of Butch Kroells' "secrets". His Associated RC-100 has the aluminum front end, which he appears to lower some and shims to align the car;

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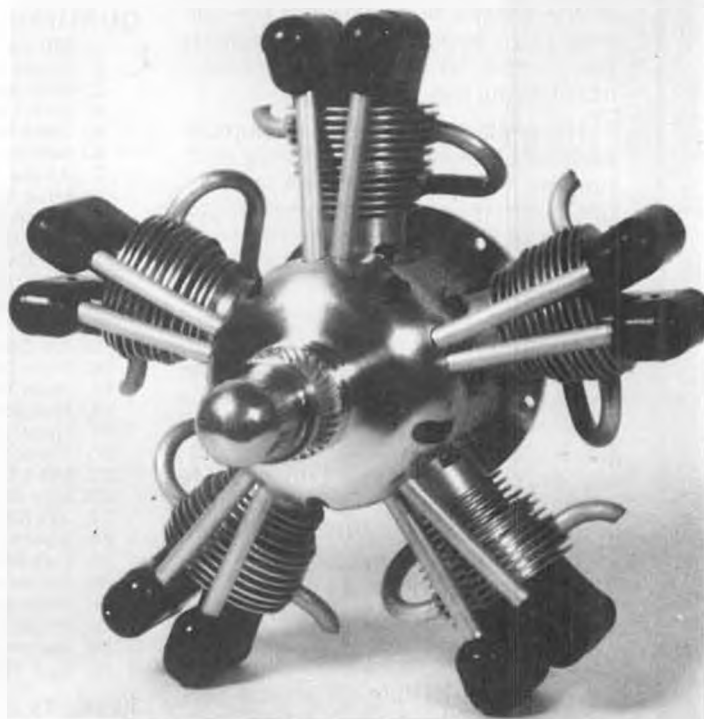
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the new disc brake; 65:11 gears; 5/16 D rear axle; he rounds the front of the chassis plate to keep the corners from bending; and he mounts the bumper so it is under the body, not sticking out.

The engine uses a Perry 61 pumper carb and McCoy head and mag muffler. No info on the engine innards, but Butch is known to have changed timing in the past. For the main, he started with 3-1/4 D rear tires, a soft molded left front larger than the foam right front. Also, he cleaned and tore down the car each night to check things over to be sure everything was O.K. In the car, he used a 5-cell receiver pack, but tried a 4-cell pack to smooth out his driving during practice, but didn't like it. He also tried a 12-tooth pinion, but didn't like it either. Butch did use a new handmade front steering override (prototype) to help him get through the sweepers better. Butch hasn't driven much this year, but being an Associated team member, he is kept up-to-date on what works, etc., and besides that, Earl Campbell has driven Butch's car to a couple of wins when Butch didn't race, so he has kept up to date that way. Looks as though we all know about what Butch's secrets are ... but he just did the S.O.P. (Standard Operating Procedure) things better

than the rest of us.

QUALIFYING

1. Bill Jianas, Assoc., 542.6
2. Chuck Phelps, Assoc., 556.9
3. Matt Azzara, Assoc., 561.8
4. Rich Lee, Assoc., 561.8
5. Gene Husting, Assoc., 569.0
6. Jeff Rold, Magnum, 569.7
7. Arturo Carbonell, Delta, 571.8
8. Mike Rowland, Assoc., 575.5
9. Butch Kroells, Assoc., 576.1
10. Gary Buriani, Assoc., 580.0
11. Bill Campbell, Delta, 589.4
12. Rick Davis, Marker, 590.5
13. Debbie Preston, PB, 590.9
14. Reiner Dosch, Assoc., 592.0
15. Bill Coalson, Delta, 592.0
16. Dave Dawson, I.M.R., 592.8
17. John Thorp, Thorp, 593.0
18. Phil Booth, PB, 596.6
19. Gary Grossenbacher, Assoc., 598.0
20. Franco Sabattini, SG, 601.0
21. Mike Queller, Delta, 601.3
22. Don Steward, J-CAR, 602.2
23. Jay Kimbrough, Assoc., 603.5
24. Johan Pretorius, Assoc., 603.5
25. Bob Welch, MRP, 603.7
26. Chuck Hallum, HRE, 604.6
27. Ted Longshaw, PB, 605.2
28. Roger Curtis, Assoc., 605.5
29. Gary Kyes, MRP, 606.1
30. Bob Titterington, Titan, 606.9

RESULTS

THE WORLD CHAMPIONSHIP RACE:

1. Butch Kroells, 120 laps
2. Bill Jianas, 118
3. Gene Husting, 117
4. Mike Rowland
5. Rich Lee
6. Matt Azzara
7. Chuck Phelps
8. Jeff Rold

9. Gary Buriani
10. Art Carbonell

"B" MAIN:

1. Phil Booth, 110 laps
2. Gary Grossenbacher, 109
3. Debbie Preston, 106
4. Bill Campbell
5. Dave Dawson
6. Reiner Dosch
7. Bill Coalson
8. Franco Sabattini
9. Rick Davis
10. John Thorp

"C" MAIN:

1. Roger Curtis, 100 laps
2. Bob Titterington, 89
3. Ted Longshaw, 87
4. Mike Queller
5. Bob Welch
6. Johan Pretorius
7. Chuck Hallum
8. Jay Kimbrough
9. Don Steward
10. Gary Kyes

All in all, I thought the race went pretty well. There were all the typical bitches and gripes, plus a couple of requests for special late entrants (which were turned down). I hope the majority of the racers were satisfied. ●

Choppers . . . Continued from page 25

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WORKSHOP OF THE MONTH

While we're talking tools, etc., it seems only fitting to include that master machinist's workshop ... Charlie Gilbert's. Right after I took the photos of his shop, he called me and said he had cleaned it up, added cabinets, painted benches, and all that good stuff, so could I come back and take more pics. Since I was leaving for my annual vacation (and still on it) I didn't get back, so will show you what it used to look like, ha!

The backbone of his shop is his Hedwick vertical milling machine, which is equipped with a variable speed drive and back gears. Of course, he has a million cutting tools, such as end mills, angular cutters, and keyway cutters of all sizes. If it can be done on a mill, Charlie can do it! Another very important item is the 13 inch swing, Logan lathe, also equipped with variable speed drive, back gears and quick-change gears

for thread cutting. Being a true machinist, his collection of precision tools, micrometers, gauges, etc. leaves little to be desired. Also included in the list of equipment is a heavy-duty air compressor, welding set-up, power hack-saw, vertical belt and disc sanders, grinders and hand tools, in addition to the vacuum forming machine described in an earlier issue, and a band saw.

As far as the man goes, Charlie is the Director of Engineering and Manufacturing for Techcon Systems, Inc., of Gardena, Calif. The firm specializes in engineered systems for metering, mixing, dispensing and packaging of various industrial chemicals, such as plastics, silicones, cyanoacrylates, cements, epoxies, etc. Charlie designs and builds their machines ... always a new project on the board.

Charlie was born and raised in Florida and moved to California in 1953, where he met and married Lorraine, his wife of 19 years. Incidentally, Lorraine is no slouch when it comes to handicrafts ... their home is filled with exquisite examples of her artistic talents, and she also shares a high degree of interest in Charlie's activities (model activities, that is).

In 1932 he discovered model building and has been active ever

since ... from solid scale to free flight gas to fixed wing R/C to helicopters! During his early days, he served as a copilot for Pan American Airways for 14 years, then did a hitch with the Coast Guard Search and Rescue. In 1942, he took an ICS course in engineering, passed his FAA exams for aircraft and engine mechanic's rating, and served as an engineering representative. How's that for a varied career, fellas?

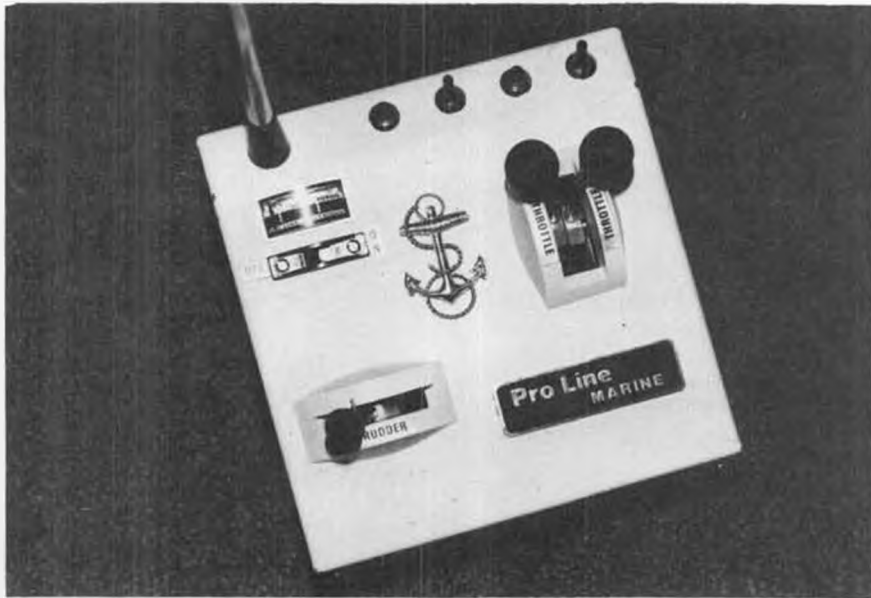
FINAL APPROACH

In closing, I'd like to pass on a few "goodies" which Charlie passed on to me ... he's always whetting my appetite for new shop ideas!

(1) For your R/C helicopter starting belts, try any bearing supply house and ask for urethane round belting with a shore hardness of 70 to 80. It's available in colors, from 1/16 to 1/2 inch diameters (use 3/16 for most starter belts). It's also very inexpensive ... one dollar will buy enough to last a large club membership, a lifetime.

(2) A fantastic new space-age structural adhesive called EA-9309 is available from the Hysol Division, The Dexter Corp., Pittsburg, Calif. 94565. It will cement anything to anything else as though it were welded. The adhesive itself is mixed with a catalyst, by weight, has a 40 minute pot life and cures in 24 hours.

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I would recommend that you contact Charlie directly for small quantities in kit form, since it is difficult to measure and weigh from the larger cans available from the corporation.

(3) Another item available through Charlie is aluminum brazing rod and flux. I couldn't believe that aluminum could be brazed as easily as soldering two wires together, but it really works... I did it myself. Now I'm going to make my own mufflers, pipes, etc., with my little torch! Charlie will send you a 1/4 ounce jar of flux plus 3 rods of 3/32 x 18 and instructions for \$5.00 plus postage. Only low temperature required, very easy to work, professional results!

(4) Last but not least, he can supply 1 ounce bottles of cyanoacrylate at industrial prices and also spray cans of "instant cure" for those cements. Contact him directly (213/532-9601) for prices and details on all the above. Gotta save the rest for another time so will close, and BCNU next month.

Plug Sparks . . . Continued from page 31

announce that he has been successful in getting Woody Woodman to assign the new Los Angeles (now being formed) Chapter the designation of SAM 49 (the Forty-Niners). Those L.A. boys are stealing San Francis-

co's thunder again!

Guests introduced were Bill Rounds, of New Zealand, and Dave Pascoe, of Canada. The meeting broke up thereafter for some good old-fashioned bull sessions.

BLUES IN THE NIGHT

As a follow-on to the SAM Business Meeting, directly after the conclusion of the SAM Champs, the columnist received a second letter from Tom Lucas of SAM 7 in Connecticut, stating that SAM 7 was no longer interested in running the 1978 SAM Championships.

Initially, SAM 7 was quite enthusiastic about staging the 1978 SAM Champs at Westover AFB, but since the new rules become effective in 1978, quite a few of the members (mostly Juniors) find their glow engines are now outlawed. Naturally, the fathers who run the meet take a very dim view of staging a contest where there is no place for their youngsters.

It is ironic that glow engines for old-timer models should have been outlawed as it seems everyone has forgotten how the O/T movement got started. If one reviews the early Stockton O/T Contest photos in the 1962, 1963, etc. issues, you will find over 70% used glow to get started. As the columnist has repeatedly

stated, "you gotta crawl before you can walk."

Let's hope that President Joe Beshar can get Lakehurst NAS again!
THE ELECTRIC EVENTS

Probably the best contested special events were the free flight .020 Electric and the R/C Electric events as staged and run by Bob Boucher, of Astro-Flite. Bob put up all the trophies, did most of the timing, and in general, was an actual event director under the contest directors.

The free flight event, restricted to Astro .020 motors only, was held on Wednesday. The columnist and Prexy Beshar competed, with the latter using a Baby Bombshell for free flight and radio control. Much to the columnists chagrin, Joe beat him in both events. The free flight event was won by Mike Bernhardt, utilizing a Wallock Ranger.

The radio event was won by Bob Boucher, using a Super Buccaneer (yeah, the big one!). The columnist had a good flying Turner Special, but unfortunately, the batteries blew up on the third flight. Beshar, on the other hand, hooked a good thermal to come in second. Bruce McAviney (Hobby Shack) used a gear arrangement and was actually able to fly an eight foot Ehling contest model using only an Astro 10 motor! The new gearing system as developed by Boucher (and Phil Bernhardt) is really the answer to flying the big models.

Battery troubles for most developed around 12 o'clock, as the air temperature was reaching 115°F. What are you going to do when the directions say to keep the batteries from going above 115 when charging? This was one drawback of the electric models in the heat.

Regardless, the new form of old-timer may be just what the doctor ordered when it comes to noise abatement. Ya gotta admit, there isn't much noise emanating from the hum of an electric motor.

Boucher has stated he will continue to plug and promote electric contests to spur further interest. Even the Riverside AFB Nationals will be featured with free flight and radio control events for electric power. We'll report that later on!

TOUGH LUCK STORY

Herb Wahl, that dedicated Brown Jr. manufacturer, probably qualifies as "top banana" on the hard luck stories of the 1977 SAM Champs.

Herb was so pleased with his Piper Comanche, he decided to fly to the SAM Champs at Las Vegas (all kinds of room to land!). Poor Herb! The oil line in the Comanche blew out. Do you know how long an aircraft engine runs without oil? Herb says he was lucky to stretch the glide into

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When an aircraft engine seizes because of lack of oil, you don't repair it. It is simply junk! Herb was able to rent a car and finish his trip to Vegas.

However, on the way back, he had to leave all engines, parts, models, etc., at Prescott. Ironically, he has had to purchase new booster batteries to check the engines at the plant.

Latest news is that the wounded bird will leave Herb \$6000.00 poorer! Boy! that's an awful lot of Brown Jr. motors! Hope this doesn't flatten Herb financially.

VICTORY BANQUET

The SAM Champs are always fittingly wrapped up by the Victory Banquet. Don't know how many attended, but all seats were sold!

Joe Beshar still tells the old joke about how good he and his wife get along. He never looks at another broad because his wife will step on his models!

Presentations of the trophies were made by Tom Bristol and Gene Wallock, R/C and F/F respectively. The trophies were so big, the fifth place trophies could pass for first place any day. Tom Sutor (trophy provider) gave out plaques to honor the hard work of the SAM Champs managers and officers. Real neat!

Food was real great. Al Hellman

came in for another round of applause for a job well done as did the two contest directors. Gene Walloch and Jack DeFond were able to award six trophies before someone found out the wrong events were being awarded! Many of the modelers and their wives took in the Parisienne show after the banquet. Great time had by all!

FIELD PICKUPS

Among the more interesting models on the field was Danny Sheelds' twin pusher. Danny jumped the gun on the columnist in announcing that a special event and trophy would be given for the best flying twin pusher. Naturally, he was all alone and won the trophy unopposed. However, Danny did show the twin pusher was no idle threat, as he placed fifth in the rubber stick event.

On the other end of the spectrum, Dick Johnson, of Dallas, showed up with a Comet Flying Phantom R.O.G. and entered the stick event. That's doing it the hard way! It was just too much handicap to win but Dick had a ball anyway; the name of the game: FUN!

The "Norman Dynamic Duo" staying out on the field until 4 p.m. Whew! Even Bruce, a veteran Texan, had to admit the heat got to him a little. What stamina! Most fellows

quit around twelve and headed back to the Casino for a tall cool one.

Sal Taibi building and flying a scale model for the first time at a SAM Champs. Flew his Corben Ace (powered by a Cox Black Widow) at 6:30 a.m. and won the event with the first flight.

Tim Banaszak all alone again with a Compressed air model (Hughes Hobart). Last year at Wright-Patterson AFB, there were three contestants. Hopefully, interest will pick up when the event is staged on the East Coast.

Irwin Ohlsson and a gang of fellows came to the SAM Champs and MECA Collectogether. Many fellows got a big kick out of talking to Irv about their Ohlsson engines and model experiences. Irwin is just as affable as ever, after all these years, and it was a real pleasure to see him at the Champs.

Comet Clippers and Zippers still as popular as they were in 1939 and 1940. Check the results if you don't believe! Bruce Norman also commented on this and noted there are many other competitive designs, but none seem as popular as the Goldberg creations.

Bruce Norman quietly remarking about those heroes who got up at 6 a.m. to fly. He sez if he gets up before noon he figures he belongs to

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the "hero" group.

Some fellows are now flying on both sides of the contest. Noted at both the free flight and radio control centers were Jack Jella, Bruce Norman, Lee Webster, Joe Beshar, Nick Sanford, Jim Robinson, Fernando Ramos, Barnett Kernoff, and a flock of others whose names escape me. The main idea here is *HAVE FUN!*

Larry Boyer "harpooned" his Clipper in the aluminum siding of a motor home. This, after someone else had stuck the other side! The owner must have thought his vehicle was target zero.

The "roach coach" sold out all lemonade and similar drinks by

twelve o'clock. Almost would have paid to carry your own canteen... desert style! Weather was beautiful from 7 to 11 (lucky numbers!), and if you got your flights in by then, in most cases, you were a winner!

Well, we have yakked enough about the 11th Annual SAM Championships, so let's take a look at who won and what they used to win.

1977 SAM Championships Results OLD TIMER R/C ASSIST CLASS C GLOW

1. L. Bekins (Playboy/OS35)	827
2. Al Peterse (Playboy/ST35)	819
3. Jim Clark (M.G./ST40)	797
4. Al Schwankert (Sailplane/KB40)	784
5. Lee Webster (Playboy/ST35)	775

CLASS A GLOW

1. Mark Patroliia (Sailplane/Veco 19)	891
2. Al Schwankert (Sailplane/K&B 19)	858
3. L. Fair (Playboy/ST19)	814
4. Joe Beshar (Playboy/ST19)	727
5. Don Bekins (Zipper/Cox 15)	672

.020 REPLICA

1. Don Bekins (Playboy)	636
2. Al Peterse (Playboy)	564
3. Ted Kofer (Bombshell)	487
4. W. Squires (Playboy)	450
5. John LeSeur (Playboy)	395

CLASS B GLOW

1. Al Peterse (Stratostreak/OPS 29)	900
2. Vince Bonema (Clipper/ST29)	899
3. Joe Beshar (Fox/ST29)	898
4. Al Schwankert (Zipper K&B 21)	857
5. Ted Patroliia (Sailplane/OPS29)	840

ANTIQUE CLASS

1. Al Schwankert (Gas Bird/K&B 40)	898
2. Nick Nicholas (Buccaneer/Merco 61)	880
3. Howard Carmen (Powerhouse/Fox 45)	872
4. Jim Clark (MG/ST 40)	844
5. Lee Webster (Powerhouse/ST 40)	750

TEXACO (1/8 OZ/LB)

1. Karl Tulp (Dallaire/OS60)	16:57
2. Don Bekins (Lanzo/Spitfire)	15:41
3. Otto Bernhardt (Lanzo/Taipan)	11:54
4. John LeSeur (Lanzo/Merco)	11:43
5. R. Von Kinsky (Lanzo/Webra)	10:55

CLASS AB IGNITION

1. Don Bekins (Playboy/OS30)	705
2. John LeSeur (Clipper/OS30)	282
3. Joe Beshar (Dodger/Forster 29)	236

CLASS C IGNITION

1. John LeSeur (Lanzo/Merco 60)	567
2. Don Bekins (Playboy/OS35)	412
3. W. Woodman (Playboy/McCoy 60)	298
4. N. Sanford (Scram/Spitfire)	248
5. R. Von Kinsky (Powerhouse/Spitfire)	115

R/C ELECTRIC

1. R. Boucher (Buccaneer/10)	802
2. Joe Beshar (Bombshell/020)	647
3. John Pond (Turner Sp./25)	511
4. B. McAviney (Ehling/10)	425

FREE FLIGHT O/T

CLASS A CABIN

1. Ray Chalker (Dodger/OS 15)	15:00
2. Leslie Norman (So Long/OS 15)	11:31
3. Bruce Norman (So Long/Ohlsson 19)	11:04
4. Jim Robinson (So Long/Bantam)	7:35
5. Larry Boyer (Rocketeer/OS 15)	7:32

CLASS B PYLON (50 entries)

1. Jim Adams (Zipper/Forster 29)	16:58
2. Leslie Norman (Zipper/OS 30)	16:45
3. Bruno Markiewicz (Alert/OS 25)	14:25
4. Larry Clark (Foo-2-U/OS 25)	13:47
5. Walt Parker (Zipper/K&B 29)	12:57

.020 REPLICA (67 entries)

1. Jerry Vernon (Interceptor)	11:24
2. Sal Taibi (Playboy)	9:45
3. Bob Oslan (Strato Streak)	9:00
4. Bob Cowles (So Long)	7:49
5. Mark Nordlund (Playboy)	7:48

STICK RUBBER (19 entries)

1. Steve Joseph (Gollywock)	10:09
2. Barnett Kernoff (Smith)	10:00
3. Fernando Ramos (Altimeter)	9:48
4. Roger Gudahl (Climber)	8:38
5. Danny Sheelds (Burnham)	8:26

30 SECOND ANTIQUE

1. Sal Taibi (Powerhouse/Forster 99)	14:35
2. Bruce Norman (Clipper/Cyke)	12:05
3. Leslie Norman (Clipper/Cyke)	11:58
4. Larry Boyer (Clipper/Bunch)	10:51
5. Bob Bissett (Rambler/Ohl. 60)	9:43

CLASS A PYLON

1. F.L. Swaney (Interceptor/Arden)	17:53
2. Wayne Cain (Playboy Jr./Arden)	12:15

- | | |
|---------------------------------|-------|
| 3. Bob Dittmer (Ranger/Arden) | 12:03 |
| 4. Leslie Norman (Zipper/OS 20) | 11:52 |
| 5. Jim Persson (Zipper/OS 20) | 11:25 |

- CABIN RUBBER (21 entries)**
- | | |
|---------------------------------|-------|
| 1. Bob Oslan (Flying Cloud) | 11:26 |
| 2. Bob Bissett (Johnson) | 10:12 |
| 3. Dick Williamson (Sensatherm) | 6:01 |
| 4. Greg Richardson (Sparky) | 4:13 |
| 5. Tim Banaszak (Korda) | 3:55 |

- CLASS C CABIN (54 entries)**
- | | |
|------------------------------------|-------|
| 1. Bruce Norman (Clipper/OS 35) | 15:00 |
| 2. Larry Boyer (Clipper/Bunch) | 12:09 |
| 3. Terry O'Mera (Clipper/Madewell) | 11:27 |
| 4. Walt Johnson (Clipper/Madewell) | 11:04 |
| 5. Leslie Norman (Clipper/OS 35) | 8:30 |

- CLASS B CABIN (36 entries)**
- | | |
|----------------------------------|-------|
| 1. Jim Robinson (Dodger/OR 23) | 16:06 |
| 2. Bruce Norman (Clipper/OS 30) | 11:21 |
| 3. Leslie Norman (Clipper/OS 30) | 10:57 |
| 4. Larry Boyer (Clipper/Enya 29) | 9:23 |
| 5. Don Wertz (Clipper/OS 30) | 9:19 |

- CLASS C PYLON (44 entries)**
- | | |
|-------------------------------------|-------|
| 1. Bruce Norman (Zipper/OS 35) | 13:40 |
| 2. Mark Fechner (Playboy/Cyke) | 13:39 |
| 3. Leslie Norman (Zipper/OS 35) | 12:31 |
| 4. Al Heinrich (Sailplane/McCoy 60) | 12:11 |
| 5. Bob Findlay (Playboy/Cyke) | 12:03 |

- FUEL ALLOTMENT ANTIQUE (31 entries)**
- | | |
|------------------------------------|-------|
| 1. Terry O'Mera (Scram/Bunch) | 25:06 |
| 2. Larry Boyer (Clipper/Bunch) | 19:54 |
| 3. Cliff Silva (Roll/Baby Cyke) | 16:44 |
| 4. Don Nordlund (Ehling/Spitfire) | 12:20 |
| 5. Al Hellman (Clipper/Forster 29) | 10:44 |

- SCALE (22 entries)**
- | | |
|--|-------|
| 1. Sal Taibi
(Corben Ace/Black Widow) | 16:51 |
| 2. Nick Sanford
(Corben Ace/Spitfire) | 14:00 |
| 3. Phil McCary (Cub Coupe/O&R 60) | 8:07 |
| 4. Cliff Silva (Corben Ace/Bunch) | 6:21 |
| 5. Carl Cogar (Interstate/TD 020) | 4:31 |

- SPECIAL EVENTS**
- | | |
|----------------------|----------------|
| COMPRESSED AIR | Tim Banaszak |
| TWIN PUSHER | Danny Shields |
| .020 ELECTRIC | Mike Bernhardt |
| PERPETUAL TROPHIES | |
| Pond Perpetual: | Terry O'Mera |
| Shallor Memorial: | Jim Adams |
| White Memorial: | Bruce Norman |
| Spcl Hi-Time Delong: | Bob Schafer |
| Sweepstakes: | Bruce Norman |

Gene Walloch, C.D., along with his faithful recorder, Jack DeFond, report there were 469 entries in all the free flight events. Tom Bristol did not have a count of all the entries, but does report that 115 actually registered official flights, indicating a much higher entry list. Pat Bristol is to be commended for the help she rendered at the R/C area.

THE WRAPUP

Regardless of what anyone says about the contest not being the greatest, this is not true. Hellman reports 150 contestants participated at the Las Vegas Champs. This is the highest ever with the exception of last year's shindig at Wright-Patterson AFB. The organizing and running of these meets is now becoming a big time project, and no one person or club should dismiss any effort lightly (CIA please copy!).

In that respect, the Contest Manager, Al Hellman, and his lovely wife, Lois, should be highly com-



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mended. Lois, of course, for her work at the Hospitality Room, and Al for all his untiring work on behalf of SAM. Like Al sez, "I wouldn't take a million dollars for the experience, but wouldn't give a dime to go through it again."

Al Hellman, in conjunction with the VAMPS gang, Chambers, Vance, Cavallaro, and West (if we overlooked anybody, it wasn't intentional!) managed to put on one of the smoothest run contests to date. As noted at the Business Meeting, the SAM Champs had been moved up a month to allow for lower temperatures. This was not meant as a precedent and hopefully the next SAM Champs will be held one week before the AMA Nationals to allow contestants to attend both functions.

Last but not least, the columnist has nothing but praise for our much maligned President, Joe Beshar. Again, this year, Joe singlehandedly promoted donations from three major magazines (Flying Models, RCM, **Model Builder**) at \$250.00 a clip. This made for an extremely successful contest from a financial standpoint. The contest netted over \$700.00, together with the \$750 contribution, easily paid for \$1000.00 worth of trophies. Hellman reports

after all expenses we were still in the black!

Joe has not only been an excellent promoter of SAM, but has found time to enjoy the hobby as he sees it ... FUN! On that note, we are going to close off, only to warn you we'll be right back with a report on the Old-Timer Events at the Nationals in the next issue. More darn fun coming up!

R/C Pylon ... *Continued from page 33*
best on at least 60% nitro, but we just recently saw some 50% nitro advertised at \$27.50 per gallon. Breaking that down, it comes out to \$1.72 per tankful. Assuming an average contest runs at least five rounds, that's \$8.60 for eats. More than it costs to feed two kids for a day. Oops, forgot all those practice flights you put in every week too, better add those up separately.

When you're running at peak RPM's, the glowplugs don't always hold up so well either; if you're lucky, and are willing to chance a used plug going bad and costing you a contest, you may get more than one flight from one. Most guys won't chance it though, so chalk up from 69¢ up to \$2.00 each, depending on your plug choice.

Props cost from \$1.25 to \$2.50 each, and depending upon the flying site and your ability to land, a prop could last for one flight or up to many dozen flights (we've flown from fields where most everyone broke a prop on every flight).

So, assuming the worst, each flight could cost from \$3.66 to \$5.22. Now multiply that by the number of heats you'll fly in a contest, and you'll see why a lot of people say it's expensive. Going to 15% nitro won't decrease the fixed costs of the engines, airplanes and radios. What it will do, however, is bring down the running costs, and probably eliminate the cost of reworking engines and those huge repair bills to repair ruined engines; ruined more than likely by the use of high-nitro fuels.

Terry's second point concerns lack of competitive engines. It is his opinion that there's only one engine that's really doing well at present, and that's reworked Supertigre X-40. The rear intake 6.5 Sr II by K&B hasn't shown the necessary reliability to be competitive on a continuing basis, hence we suspect, the arrival of the new front intake 6.5 engine. At this point in time, it's too early to tell whether this new one will stand up to the rigors of 60% nitro.

So at this point, the only way to be among the frontrunners is to have several reworked engines ... Supertigres at this time ... so as to have at least two good engines to see you through a contest, and to have at least one more back-up engine in case you blow one and have to send it away for repairs.

The point of all the foregoing is that with 15% nitro fuel being used, it's possible that other engines, such as the O.S. 40 racing design or the OPS racing 40 would be competitive and not require expensive reworking.

Terry's third point is that many of the guys, current and potential racers, are afraid they can't handle the speeds that we're going now. Pilots we've talked with, when assured that they wouldn't be quoted in print or by name, have expressed concern that even the slightest slip or lapse in concentration could result in a major accident. Besides, we're flying against other planes and pilots, so what difference does it make if low times are in the mid-twenties instead of the low to mid-teens.

Anyway, it's our opinion that there are very, very few of us who couldn't use that extra margin of safety those few seconds would give us.

We'd like to hear your personal opinions on this, letters can be sent direct to me at: 3727 Shepherd Lane,

Fort Wayne, Indiana 46815 (also send a copy to the AMA R/C Contest Board Chrm., c/o this magazine. wcn).

Now we'll turn to the next newsletter, from the Metropolitan Air Racing Association, which is composed of several racing oriented clubs in the Eastern United States. We'll just add a few items and then turn it over to the newsletter editor, George Zink.

The MARA contest has to be termed a success, even though, at first glance, the 25 entrants doesn't seem very impressive. What you must consider is that at the MARA contest, only NMPRA members were allowed and, due to an unavoidable scheduling conflict, there was another major contest in the area, which drew other contestants away.

NMPRA-QM EASTERN STATES CHAMPIONSHIPS, by George Zink

Paul Zink set the North East QM record with a sizzling 1:29.7 in the NMPRA-QM Eastern States Championships, on his way to winning that event. The time was established in a flyoff with Gail Jacobson and Bobby Blouch.

Paul's time is the lowest QM time for the standard 2-mile course that we have heard of to date. The Valley Forge Signal Seekers, host club for the meet, rechecked all aspects of the aircraft and assured compliance with the rules. They rechecked the course length and found that it was 6 feet, 11 inches too long! When the course was laid out, we used marks on the telephone cables and it seems the cable has stretched a bit since the marks were put on some 4 years ago.

Paul flew a year-old Rickey Rat from D&S. It weighed in at 2 lbs., 10 oz. The Rossi up front turned a 7x6 Rev-Up prop modified down to a 7x5 (55 Series). Although the 1/4 inch slot rule was waived for the event, Paul still used the slot.

Arthur Talisman did the calling and put Pat right on pylon 1 for every lap. Congratulations to Paul and Arthur for a great effort.

The 2-day meet as mentioned before, was hosted by the Valley Forge Signal Seekers. They did a truly great job throughout both days in every aspect of the race, and the meet was worthy of the title "Championships." Every racer we talked with had high praise for the VFSS, and we understand that a few members of the VFSS are now going to give racing a try. The format of a 2-day meet was a change of pace for most of our fliers, but they found it very enjoyable, and most look forward to having another 2-day meet some time in the future.

A total of 8 rounds were flown,

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5 Saturday and 3 Sunday. The U.S. Navy (Johnsville NAS? wcn) limits flying on Sunday until after noon on Sunday. Most of the racers were thankful for the extra time to sleep and prepare their aircraft.

A free flight event was being held upwind of us Sunday, and every so often a glider would be spotted dropping in near the triangle. I suppose Steve Nielsen wanted to get into the act a bit himself, because he turned his QM into a free flight at the end of the race. The radio quit in his P-39 and was last seen looping up into the clouds. Steve hunted for it the rest of the day with nothing to show for it except the view of some Pennsylvania wildlife. The next evening, he received a call from the local police informing him that the plane was retrieved by a young boy and that it was in fair shape. Steve had stayed up almost all Saturday night, resurrecting the Cobra before it went OOS, and I have a feeling we haven't seen the last of the P-39.

Several of our regulars turned in their best times at the meet, and a few really outdid themselves. Joe Sera moved himself up into the expert class with a fine 1:48. Joe has been flying QM for about a year

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now, and now that he has a quick aircraft, Joe looks like a real threat in Expert.

Warren Batson is another new Expert Flier. This was Warren's second race as an Expert, and he turned a fine 1:49.

In fact, when you take a look at the average of everyone's best it comes up to be 1:51.7, and that ain't too bad.

The 8 rounds of championship racing all boiled down to a flyoff between Bobby Blouch, Gail Jacobson and Paul Zink. All three had perfect scores, with idles checked on landing. A race-horse start was used throughout the race, as in the flyoff. Bobby and Paul diced a bit in the early laps, with Jake trailing them by about a 1/4 lap. Bobby took a cut on No. 1 and the finishing order was established, although Paul got mighty close down at No. 1 a few more times on his way to that 1:29.7.

But the racing wasn't over yet. Rube Tyson and Lew Hipkins still had to fly off for 5th and 6th, and a Grudge Race still had to be run for 2 new ST 15's. The top 12 finishers, frequencies permitting, would fly a 3-heat race with the winners and the man with the best 2nd place time go-

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ing once again for the engines.

The lineup included the first thirteen finishers, as Lew Hipkins declared himself out with a cracked motor mount. Entries in the final heat were Len Wiederhoeft, Bobby Blouch, Paul Zink and Dick Berner. Bobby Blouch got off to a good start this time, and was in the lead by 100 feet about lap 3. Dicing each other were Dick Berner and Paul Zink, with Len Wiederhoeft close behind. Paul took a cut at No. 1 and then took another cut, and right after that Dick Berner took 2 cuts down at No. 1. Bobby Blouch took the first engine

and NMPRA-QM President Len Wiederhoeft took the other. It was a good close hard fought race, but cuts told the tale.

Five Cox 15's were offered as prizes to the men turning the best times. As the results show, all 5 times were under 1:40. We don't have the results from the first 5 rounds, so I can't say how many times the 1:40 barrier was broken, but it did happen several more times.

Winners of the Cox 15's were Paul Zink (1:31.4), Bobby Blouch (1:35.3), Gail Jacobson (1:36.9), Ron Bressler (1:37.9), and Dave Latsha (1:39.8). •

TROPHY WINNERS

Place	Name	Plane	Engine	Best Time
1	Paul Zink	Rickey Rat	Rossi	129.7
2	Gail Jacobson	Prather Toni	Rossi	136.9
3	Bobby Blouch	Own P-51	Rossi	135.3
4	Dave Latsha	Prather Toni	Rossi	139.8
5	Robe Ryson	Rickey Rat	Rossi	143.5
6	Lew Hipkens	Weesner Tony	Cox	145.6
7	Dick Berner	Cosmic Wind	Cox	142.8
8	Dave Hidden	Own Design	Rossi	142.2
9	Mark Frieberg	LR1A	Cox	144.2
10	Len Wiederhoeft	Own Design	Rossi	146.0
11	Dick Beltz	Cosmic Wind	Cox	153.8
12	G. Milliken	R.J.	Rossi	158.0
13	Joe Sera	P-51	Rossi	148.5
14	Al Grove	Cosmic Wind	Cox	145.7
15	Steve Nielsen	Rickey Rat	Rossi	146.5

Soaring Continued from page 35

played in high school so many years ago. But each musical instrument has a personality of its own, and it's important to match these to the personality of the youngster if the learning is to take root and become a long-term investment in his future enjoyment.

What's this got to do with RC soaring? Well, each type of model sailplane has a personality of its own. There are those which fit the lazy sky . . . planes that orbit well with a gull or hawk. Then there are those aerobatic craft, impatient to perform each next maneuver. You want to keep them close-in in order to enjoy each nook and cranny of their behavior. And there's the scale sailplane that provides a vicarious enjoyment of full-scale flight . . . with far greater convenience, safety, and less expense.

In fact, the personality of the aircraft should mate that of the pilot and the conditions under which he flies. Here we see finer differences between aircraft within the same type. How near to neutral stability should you fly? Clearly, the high-altitude thermal-seeking machine should be positively stable so it can care for itself when reaching the limit of visibility. In contrast, the aerobatic craft should be marginally stable to allow wild maneuvers . . . limited only by the ability of the pilot to anticipate the aircraft (and turbulence). But how near to neutral stable is comfortable? Moving the c.g. an eighth of an inch can make the difference of 25 feet in the neutral stick pull-out from a 45-degree dive. The experienced pilot plays the game of trimming even to his crossing the "t" when he terms the plane "perfect."

But the novice must suppress his personality for the sake of his learning. He should choose a sailplane that's easy to handle and well behaved. You don't put the beginner on a bronco, yet it's all too common to find new pilots flying aircraft well beyond their capability. I know that we must stretch in order to learn, but the "too sensitive" aircraft can only lead to unnecessary crashes and unhappiness.

Returning to the analogy, parents often rent or buy the cheapest available musical instrument for their offspring. "After all, we don't know if he'll really take to it." As a result, the beginner may have to cope with some serious inadequacies of the instrument . . . this in addition to his own inexperience in playing music. What could be worse?

In terms of RC soaring, it's of

paramount importance that the beginner fly a plane that's flyable. Let an "old hand" check the location of the c.g. that the wing incidence is the same on both sides, that only the proper warp is in place, that there is sufficient but not excessive control surface deflection, that the radio installation is clean and unlikely to produce glitches, that the antenna hasn't been shortened to fit the fuselage, and so forth. I guess the moral of the story is, it's best to learn from others' mistakes. Get all the benefit you can from those who know how to fly your plane better than you do. And this is true all the way through the learning process. The expert pilot can still learn a trick or two from another expert.

There are those who take RC soaring in a most casual manner, "It's just fun to fly." "I'm not competitive." I can't help but think that these individuals would enjoy flying far more if they accepted the challenge of nature as the competitor, making their sailplanes as clean, sleek and fully capable in terms of performance.

By the time you read this, the 77 NATS will be history, but at the moment I find all my friends too busy practicing to hold a casual conversation with me. Maybe I ought to be out there practicing too!

Zaic Continued from page 59

tions, the triangular single surface and solid, but I am sure that many of the technical boys will have a good long look at their charts. They are a valuable addition to the basic airfoil information.

I had a bit of trouble in providing the names or numbers for the sections. MZ 2304 presented no problem as it is "solid"; but the other two are peculiar since they are single surfaced. Finally, decided to locate the position of the angle break by percentage of chord and the degree of the angle change. Hence MZ 30-7° and MZ 70-7°.

I think that we all owe a debt of thanks to Ferdy and Enrico for helping us with such basic information as they have with the above wind-tunnel tests.

Volksplane . . . Continued from page 60

OK Cub .14 liberated from our junk box; but we recommend a more modern .15-19, which should improve performance considerably. The nose may have to be modified slightly for the type of engine used and the appearance could probably be improved by using an inverted or horizontal mount.

We have listed scale data sources for all models of the Volksplane

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even though our plan is for the VP-1. The VP-3V-1 appears to be identical to the VP-1 except for a two inch wider fuselage and the elimination of the rudder trim tab. The VP-2 of course, is the two place version and has larger overall dimensions.

Let's begin construction with the: **FUSELAGE:** Unlike many builders who dislike building wings, this writer finds the fuselage more of a chore; so we usually try to build it first and leave the more pleasant tasks 'til later.

Cut two fuselage sides from 1/8 medium sheet balsa and the fuselage bulkheads from the materials called out on the plan. Mark off the bulkhead locations on the inner surface of the two sides.

At this point it will be necessary to determine the type of engine and the method of mounting which is going to be used. The firewall location shown on the plan will work with most .15 engines, but will probably have to be moved farther back for a .19. A radial mount will simplify the installation considerably; but if beam mounting is used, it will be necessary to notch the firewall and install hard maple mounts. Extend the mounts back to bulkhead No. 2 and epoxy securely in place.

Once the firewall location has been determined, the two fuselage sides can be joined. The sequence is not important, but we usually start at the nose and work toward the tail. Next, install the engine bearers or drill the holes for the motor mount and install blind mounting nuts behind the firewall. The fuel tank also should be installed at this time. We used a Perfect No. 12, 2-1/3 ounce rectank.

The 1/8 top and bottom sheeting can now be added, along with the cowl blocks, backrest and 1/8 plywood bellcrank mount.

Finally, the cowl blocks can be



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shaped and the entire fuselage given a final sanding with 220 grit sandpaper.

WING: Cut the ribs and rear leading edge from medium 1/8 sheet balsa and the wing skins from medium 1/16 sheet. Mark off the rib locations on the inside surface of the skins and bevel the inside of the trailing edges to a thickness of 1/32, as shown on the side view, to keep the thickness of the trailing edge down to 1/16.

Now pin the two bottom skins down on a flat surface. Cement the rear leading edge and ribs in place. Be sure to cement the two center ribs in place so when the two wing halves are joined, they will form the proper dihedral angle. Next cement the upper wing skins in place. The 1/2 inch square leading edges are added next, followed by the 1/16 plywood tips. Shape the leading edges and give the wings a thorough sanding.

Finally, join the two wing panels using epoxy cement. For additional strength, the center joint can be covered with a strip of fiberglass tape epoxied in place.



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as shown on the fuselage top view. Groove out the lower surface of the stabilator so the 3/32 wire hinge will fit flush with the under surface when assembled.

Epoxy the hinge in place and reinforce with two pieces of fiberglass tape as shown. Next epoxy the brass tubing pivot to the rear of the fuselage, using a strip of fiberglass tape for reinforcement. Check alignment carefully while the cement is setting.

The tailskid is bent from 1/16 music wire and epoxied in place, again using a strip of fiberglass tape for reinforcement.

FINISH: Although there are many finishing methods available today, this writer being a bit old-fashioned by nature, still prefers the old dope finish, at least over balsa surfaces. Use your own method, but ours goes like this:

First, sand the entire model with 400 grit sandpaper and apply two coats of clear dope and repeat the sanding process.

To simulate the full-scale ribs, apply 1/32 wide strips of tape at the locations shown on the plan. Now cover the entire plane with lightweight silkspan. This helps to cover the grain in the balsa wood and reduces the amount of filler needed. Apply another coat of clear dope, followed by two coats of an 80% clear dope and 20% cornstarch or talc mixture. Sand thoroughly and then give the ship one last coat of clear dope.

Next apply at least three coats of white dope, preferably sprayed on. The red tail stripe and stabilator counterbalance tips are painted red.

The wood-grained side panels are cut from either mahogany or walnut contact paper, which is available at most hardware, department, dime stores, or supermarkets. The lettering and numbers are cut from white or black decal or Monokote trim sheets as required.

FLYING: Balance the model at the point shown on the plans and add weight, if necessary, to the nose or

tail. Under no circumstances try to fly a tail heavy ship!

The Volksplane's full-flying stabilator makes the ship extremely sensitive to control movements. Place the pushrod in the inner hole of the bellcrank and the outer hole on the elevator horn and use some means of limiting the amount of stabilator movement to about 3/16 up and 1/8 down.

Follow these simple instructions and your Volksplane should provide you with many hours of enjoyment, either as a sport model or in scale competition. ●

Speed Control . Continued from page 44

Sullivan "Hi-Tork" starter motor (12 volts), and a series wound automobile window cranking motor. The Sullivan starter was run extensively, and draws currents of from 6 to 8 amps under load at full voltage. It is not recommended that over 6 to 8 amps be drawn for really extended periods of time, especially if the controller is boxed up in a model on a hot summer day. It would probably survive 9 to 11 amps for a half-hour of continuous running, but the voltage regulation would suffer somewhat, and all of the top cover components would overheat. A larger heat sink, or some sort of water cooling would safely permit high currents, up to 20 amps, for long periods of time.

REVERSING

If reversing is required, it can be done simply by using another channel and servo to actuate a double-pole double-throw switch connected as shown. This will switch rotation of most of the small permanent magnet motors commonly used for model work.

INTERFERENCE SUPPRESSION

After heavy usage, some electric motors become generators of radio frequency 'noise' that can interfere with the idle speed characteristics of these controllers. The low motor

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speed range can be severely compressed, almost obliterated by an electrically noisy motor. The author has found that this R.F. hash can be suppressed and idle speeds restored by using a choke in series with the motor and collector of the Darling-ton output transistor. Although a number of chokes will work, for a typical 12-volt, 1.2 amp max motor, the following is recommended: Wind 25 to 35 turns of No. 22 or 24 enamelled magnet wire on a ferrite or powdered iron coil form, 1/4 inch

diameter by 1 inch long. These coil forms are commercially available. Also, for stubborn cases, it might help to add a 500mfd, 25-volt electrolytic capacitor across the 12-volt leads entering the control box; observing the proper polarity.

OPTIONAL

For those builders who wish to have a slightly lower idle speed, change R2 to 15K (1/4 or 1/2W, 5%), and C7 to .22 mfd. disc ceramic, 12 volts.

PARTS LIST

- R1 Trim pot, 10K Miniature Mallory MTC14L1 or equivalent
- R2 Resistor, Carbon 6.8K 1/4 or 1/2W, 5%
- R3 Resistor, Carbon 750 ohm 1/4 or 1/2W, 5%
- R4 Resistor, Carbon 10K 1/4 or 1/2W, 5%
- R5 Resistor, Carbon 1K 1/4 or 1/2W, 5%
- R6 Resistor, Carbon 1.5K 1/4 or 1/2W, 5%
- R7 Resistor, Carbon 510 ohm 1/4 or 1/2W, 5%
- R8 Pot, miniature 200K Linear Taper, Mallory MLV25L or equivalent
- C1 Capacitor, Electrolytic 10 Mfd 25V
- C2, 8 Capacitor, Epoxy dipped film, .1 Mfd, 50-600V
- C3, 5 Capacitor, Disc Ceramic .05 Mfd, 12V
- C4 Capacitor, Film, non-polarized, or tantalum electrolytic, 1.0 Mfd, 50V + or - 10%
- C6 Capacitor, Disc Ceramic .01 Mfd 12 to 25V
- C7 Capacitor, Disc Ceramic .15 Mfd 20% 12 to 50V
- IC-1, 2 NE-555 or SE-555
- IC-3 SN-7400
- Q1 2N697, HEP S0014
- Q2 2N6284, HEP S9142
- 1 Plastic box, w/aluminum cover 2-1/8 x 3-1/4 x 1-1/8 inches (GC Electronics No. H4-723)
- 1 Aluminum Heat Sink for TO-3 (2N6284) type transistor
- 1 Nylon Steering Arm, 1/8 hole (Goldberg SA-180)
- 1 Plastic Base, 1/8 x 4-1/4 x 2 inches
- Misc: Wire, four 5/16 dia. grommets, one 3/8 dia. grommet, solder or crimp lugs, screws, nuts and washers.

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left which cannot be said by the sketches alone. I will make an additional point or so. First, the horizontally mounted pendulum in my opinion, is the best way to go. The linkages, as you can see in the illustrations, are very simple and straightforward. And as before, all linkages must be free of any kind of bind. If you do not take heed of this warning, destruction of your model will be guaranteed. It is analagous to having an R/C model's aileron or rudder stuck in one position.

As stated before, it is better to use the correct size piano wire for making

F/F Scale Continued from page 49

doesn't make any difference how well the interior has been done. Again, the same applies to models. So take your time and do it right!

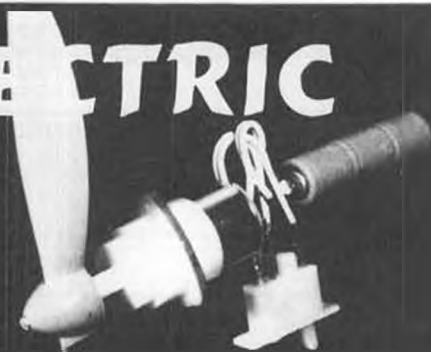
Just the other day I had to buy some more nitrate dope. This time I decided to buy what is called non-tautening nitrate dope. This comes with the plasticizers already added so one doesn't have to worry about adding TCP, castor oil, or any other type of plasticizers. It is super to

work with. Pinning down of the structures during drying really isn't necessary, but I still do it out of habit. Again, this product can be purchased anywhere that aircraft parts and accessories are sold. There are usually one or more of these outfits at the local airport. For those of you who can't be without butyrate, it too comes in non-tautening. Check the yellow pages.

Now I would like to complete the last portion of the pendulum articles I started a couple of months ago. There really isn't too much

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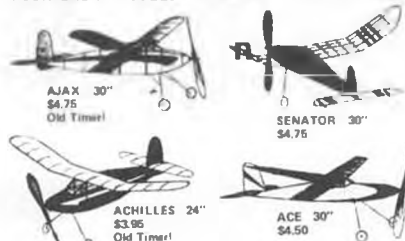
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the holes in the brass fittings. This way there is no slop in the movements of the linkages. One item that may surprise you; the pendulum does not have to be situated at the CG as depicted in most plans incorporating pendulums. Another advantage is that the horizontally mounted pendulum can be situated under the floor of your model so that it will not be seen. Still another plus for this type of set-up is that the ailerons use a kind of torque tube arrangement instead of the way they had to be installed in my Heath Parasol. No big thing except it does save some time. It also lends itself to knock-off wings. Again, the illustrations clearly show how this is done.

If knock-off wings, or plug-in wings are used, the following is the simplest way of hooking up the pendulum to the ailerons. Take two pieces of telescoping brass tubing, each about 1/4 to 5/16 inch long. The 1/16 OD and 3/32 OD will work just fine.

Insert the smaller into the larger just a tad more than a 1/16. At this point, take a pair of needle nose pliers and squeeze. Actually, you are squeezing just the end of each tube. One of these brass tubes (round end) will

be soldered to the fuselage linkage, the other to the aileron linkage. When mating the wing to the fuselage, just make sure that these two brass tubes fit into each other and the pendulum is now set up. The size of the wire used for the torque tube should not be less than .045 in diameter. Even 1/16 may have to be used, depending on the size of the model. One problem that can arise from using too light a wire, is that the ailerons can be moved up or down without moving the pendulum. Use discretion here.

One last comment. Notice that there are two pieces of piano wire that act like a guide for the pendulum itself. Actually, they keep the pendulum from rubbing against anything, which in turn could cause a bind. This could possibly happen in a severe bank. So really, they're kind of a safety measure.

(Several letters have been received from readers, pointing out a possible problem with Fernando's horizontal pendulum idea. It could explain the spiral dive crash he experienced with the Heath. The horizontal pendulum, with the weight aft of the pivot, will work fine as long as the weight is lower than the pivot point. However,

if the nose of the plane drops below a certain level, which can happen in most any normal flight, the weight will be above the pivot. At this point, the weight will swing all the way to one side or the other, giving full aileron deflection. With the nose already down, and adding full aileron, the control becomes locked, and you've got a guaranteed spiral dive to "terrible firma." wcn)

I hope that many of you will incorporate this type of pendulum in your next scale project. Just keep in mind that all designs do not require the use of pendulums, but are intended for that most unusual airplane you have been wanting to build which has flat wings. Included are some interesting approaches to pendulums as extracted from *Aeromodeller* June, 1958, for some comparisons.

I received a quick blurb from Jim Jones, manufacturer of that nifty balsa stripper. He says that in order to make strips wider than 1/8 inch either raise the blade by putting a flat plate under it, or remove the knurled knobs and slide the plastic slide down until the left slot is over the right hand hole in the fence. Use one knob to tighten. The range is increased from 9/32 to approximately 13/32, but one loses the scale and has to set the sizes with a ruler. So this little suggestion helps us even more.

Last but not least, I have finally had a chance to look over all of the latest kits from Fly-Line. This includes the Kinner Sport, and the two new rubber models, the Rearwin Speedster, and the Howard. I have deliberately locked them out of sight until I get some time to put them together. They are just great. The rubber models are the old Earl Stahl designs, and certainly these need no introduction to old-time scale modelers. The kits are fairly complete. Quality is first rate, and certainly this is one of the prime reasons that Fly-Line has been doing so well. I was tempted to build all three at the same time, but other projects have to come first. In fact, I've been thinking about putting pendulum ailerons in the Kinner.

I enclosed a few pictures of the latest creation by Gene Thomas. I just hope that they are good enough to reproduce for the magazine. These are of his Alexander Bullet at 1-1/2 inch scale. In order to help keep the cost of the kits down, he is using vacuum formed ribs. Note how realistically they look in the structure. They are quite functional as well. They should be very strong and relatively light with all those lightening holes. With a 54 inch wing, the amount of balsa would be

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- GC 503 Three Mast Chinese Junk \$62.00 ppd.

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rather staggering. He has come out with yet another interesting approach. His professional art background is certainly reflected in all of his kits. Incidentally, Gene's kits will now be coming out in a box with his own outstanding art work. Hopefully, these should be ready about September or October. ●

Hannan Continued from page 50

It seems that quite a number of models featuring corrugated cardboard construction have appeared in the model media recently. Most of the designers have suggested using a screen-door wheel-type tool for the creases needed for folds. Phil says: "I tried it and it doesn't work too well. Talked to the fellow who makes my shipping boxes, and there is a better way! He said to use a nickel. Takes fairly strong fingers, and it may get a bit warm with heavy use, but it really does the job. Good control, and much less chance of digging through the outer layer."

HANG IT ALL

Joel Rieman, who took the fine MB cover photo of Frank Zaic, sent us a Smithsonian Institution postcard showing an Otto Lilienthal hang glider. The unusual thing about this specific craft is that it had be-

longed to publisher William Randolph Hearst, who sponsored test flights circa 1896 on Long Island. Flights as long as 375 feet and altitudes up to 50 feet were achieved. Strangely, this information has been overlooked by most aviation history books. Does anyone out there have any contemporary accounts of these experiments? We would certainly like to print a more detailed description.

AND SPEAKING OF THE SMITHSONIAN

We've received a number of questions regarding the color of the original "Spirit of St. Louis" on display there. The cowling appears a golden color, which has even been mentioned on some 3-view drawings. Certain color films seem to accent this more than the unaided eye. In the interest of historical accuracy, it should be noted that the cowling was NOT this color at the time of the famous Atlantic flight. We have this on the good authority of the late "Dapper Dan" Burnett, the man who actually applied the "swirls" to the Spirit's cowling. He assured us that the metal was natural aluminum color when it left the factory, and that the golden effect was likely the result of a protective coating later added, having aged in that manner.

This account was given during one of several lunch hours we were privileged to spend with Dan, shortly before his passing. At the time, he was in charge of the crew restoring the "Jenny" in the San Diego Aero-Space Museum. The now-completed restoration serves as a fitting tribute to Mr. Burnett.

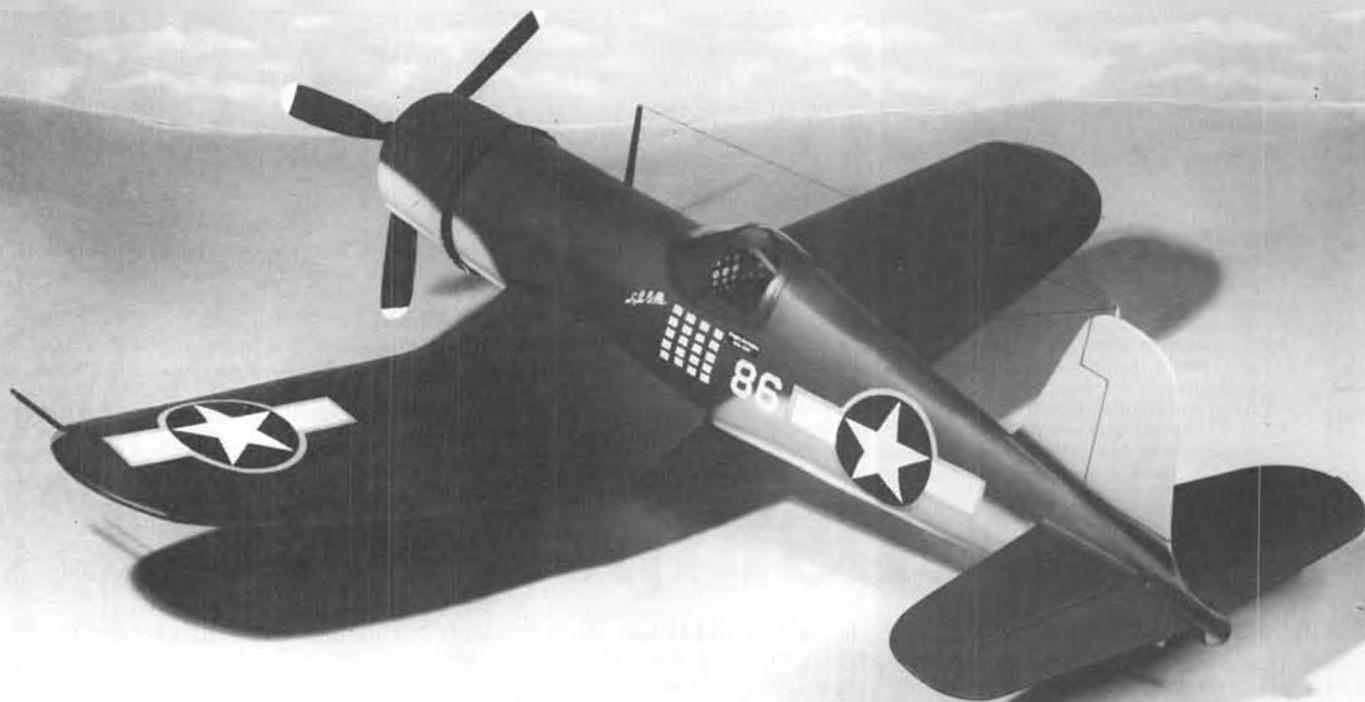
MODERNISTIC MODELS

Bill Pepin, one of the proprietors of Modernistic Models, favored us with a sample copy of their latest plan release, the Franklin Sport, drawn by Charles E. Steinchak. This is one in a series which feature a pleasant amount of detailing combined with a practical construction which seems to have that "right" feeling. A stamped, addressed envelope to P.O. Box 6974, Albuquerque, New Mexico 87107, will bring you a current list. Be sure to tell Bill you read about it in MB! At the end of his letter, he offered this profound observation: "Do you know why a Peanut model and a dog are alike? If there is only one tree in a field, they will both find it!"

RULES CHUCKLE

Seems some modelers are always on the lookout for loopholes in contest rules to "beat". Anticipating that possibility during their "Spirit of St. Louis" model event, Russ

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The prototype XF4U-1 was first flown on March 29, 1940. The Corsair was to become the most important Naval Attack Fighter of WW. II, and remain in production for 13 years, yet its first service trials had ended in failure in its chosen role. It did not reach maturity as a great fighting machine easily. It gave notice that it was to be flown and tested at all times like a true racing stallion, and was an airplane for inexperienced pilots to reckon with. Because it was an advanced design—and had a new and untried high horsepower engine the Corsair required many perplexing and difficult flight tests and service changes before assuming the role of the Navy's first line fighter.

The Chance Vought Corsair had a service life spanning two wars, performing every conceivable mission possible for a military flying machine. The Corsair had a 15 year life span of battle victories unequaled in the annals of aviation history. Vought ceased production of the F4U-1 Model on Feb. 2, 1945 with the delivery of the 4,996th airplane. In air-to-air combat the Corsair had destroyed 2,140 enemy aircraft with the loss of 189.

The Corsair's distinctive whistling war cry, caused by the wing-root inlets for engine air, earned it the nickname "whistling death" among the Japanese.

The Corsair's most unique feature was the bent (gull) wing which was necessitated by the most powerful engine ever installed in a piston engined fighter, coupled with one of the largest props in the world. Thus the inverted gull-wing permitted the short, sturdy landing gear required for carrier operations.

The first combat unit to receive the Corsair was VMF-124 and the first 12 machines arrived at Henderson Field on Guadalcanal on Feb. 12, 1943. On Feb. 13, VMF-124 demonstrated their superiority over the Wildcat by escorting PB4Y-1 Liberators all the way to Bougainville. The following day they saw combat for the first time, and the inexperienced Corsair pilots were badly mauled by some 50 Zeros. Two Corsairs, two Liberators, two P-40s and four P-38s were lost in this "Saint Valentine's Day Massacre", but the Corsairs soon gained superiority over the Japanese which was never lost. VMF-124 was subsequently credited with 68 kills against a loss of four aircraft and three pilots. Within six months, all Pacific-based Marine Fighter Squadrons had been re-equipped with the Corsair and the list of aces and the airplanes legend began to grow.

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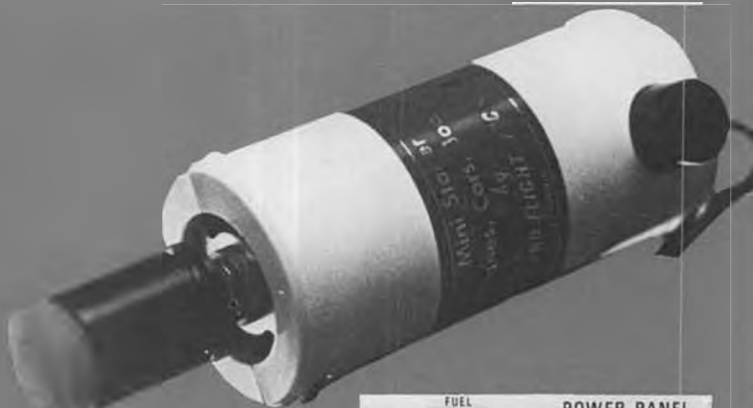
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Brown, of the Ohio Escadrill, Flying Aces Club, inserted this clause: "No profile fuselages please. Slim wasn't THAT slim!"

SUB-MINIATURE FLYING SCALE MODELS

We have mentioned on several occasions the smaller-than-Peanuts aircraft being flown by Bill Watson, Doug and Walt Mooney, and Chuck Conover. However, we had rather forgotten that the late Howard McEntee had also devoted considerable study to such models, and a brief summary of his efforts was published during 1953, evidently in *Air Trails*, or whatever its title was at that time. Dave Gibson was kind enough to forward a copy of the article for our examination. Some of Howard's conclusions are food for thought: The lowest practical minimum (size) turned out to be around 8 inches. We found this fascinating, since our "Escondido Mosquito" of some years vintage, measured very nearly 8 inch span, as do Gibson's current "Grapenut" scale models. McEntee continues: "The idea, of course, is to make a flying scale job with as few departures as possible. Thus, when someone sees the model there should be not the slightest doubt in their minds as to what the little baby represents."

McEntee favored the all-sheet balsa construction over the stick and tissue approach, pointing out the ease of repair advantages and possible greater resistance to warps. VIVE LA DIFFERENCE!

Dr. Dzus notes that a new AMA rules change proposal would allow monoplanes to participate in biplane events. Why not extend this thinking he opines, to allow greyhounds in horse races, and stock cars in the Indianapolis 500?

ELECTRIC WINDERS ANYONE?

A while back we printed a photo of Djou Carter winding his model with a battery-driven winder, and later showed a French equivalent being used during a Paris Peanut meet. Sears McCorrison mentioned Fred Hall's variation, and locally, Bill Noonan is using a converted cordless electric drill for the purpose. Curiously, to our knowledge, none of these clever devices have appeared in the modeling press. Why not? Or, how about one of you innovative manufacturers coming up with such a product? The half-A engine starters would seem to be close to what is needed, if a counter could be incorporated. Assuming the price could be kept within reasonable bounds, the market potential would seem to be exceptional.

ABOUT THOSE TOY ROCKET SHIPS

Our mention of the high collector's prices being commanded by the old Buck Rogers cast metal space vehicles, brought groans from Jack Lueken. It seems he had a children's program, "Jack's Magic Show", on television some years ago, and gave away literally scads of the rocket ships, which were virtually valueless at the time. Today, he is kicking himself, as he did not save even a single one!

WHAT'S THE PITCH?

It has been brought out by Ed Whitten and others that certain brands of rubber mold plastic propellers "Ain't what they usta be". Formerly almost crash-proof, they are now prone to break easily, at or near the hub. Our guess is that the manufacturers are using reground plastic, which is more brittle than virgin stock. Doubtless economy is their motive, but frankly, we'd rather see a price increase than a quality decrease.

REALLY BIG PEANUT!

In the August, 1977 Model Railroader magazine, are plans for Jimmy Carter's Plains, Georgia railroad station campaign headquarters. Included are details of a "Smiling Peanut" symbol which measures some twelve and one-half FEET in

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height! Author Gordon Odegard suggests that an actual peanut of the edible variety, would be just about the right size for HO scale model railroad layout use.

AND SPEAKING OF PEANUTS

General Dave Stott, Flying Aces Club, reports the current contest activities include a W.W.I Peanut event. Mass launches add to the fun and excitement, which Dave likens to "a fiction story right out of Flying Aces magazine. It really captures your imagination. Rather like when you were a kid 'flying' your solid models by hand, living all sorts of adventures. I think these events are a refreshing release from the rather work-like accent on scale modeling today . . . I'm not knocking that side of it. I am just saying it is nice to be a kid-type flyer again."

SILLY SIGN-OFF

The WEST COASTER notes that Playboy centerfold photographers use broad-angle lenses! ●

. . . Continued from page 19

keeping the overall weight, and thus the wing loading, down to a reasonable level.

The fuselage is built around a 3/32 sheet box backbone, with bulkheads and stringers giving the final shape. If 1/16 bulkheads seem too weak, try 1/32 ply or 3/32 balsa. For ease of covering and finishing, the cabane struts can be cut in half in the middle, and inserted into brass tubing joiners within the fuselage after finish is completed.

Top and bottom wings are the same, except for the center section construction. As there is no dihedral, the spars are joined at the sweep-back points with 1/16 ply doublers. Spar joints are scarfed for additional

strength. Webbing is recommended (1/16 balsa or 1/32 ply) between top and bottom spars, as far out as the outer strut ribs.

A little extra gap is needed between the ends of the ailerons and the fixed wing, because of the 11-degree sweep. Movement to the upper ailerons should be provided by adjustable-length struts.

The model is very easy to fly, however, maneuvers other than ordinary traffic pattern procedure require something more than is done with a run-of-the-mill pattern type model. The aircraft must be flown through the maneuvers, diving to gain speed for loops and rolls, and correcting with all controls as the maneuvers progress.

The original model is now in her 13th year, and although she has gained some weight with age (who doesn't?), she still affords many hours of soft, easy flight.

Even modeler's wives love to watch her, and that's a switch. ●

F/F Continued from page 57

model of Boeing's entry into the SST sweepstakes back in the late 1960's. There are few like him. This glider was designed to meet the requirements of the now defunct and short-lived ITCCC Formula, which prescribed certain wingspan and fuselage length for gliders. This glider, however, has outlived the event. It has been enlarged, shrunk and otherwise modified. The design still works well today. As a small ceiling indoor glider, it has few peers, enlarged by 1/3, it is competitive in Cat. II ceilings. It is a helluva design by a helluva guy.

ELECTRONIC THERMAL
DETECTING by Jon Fink

Jon Fink is a young man who is into the free flight scene, mainly as a very helpful assistant to his dad, Stan. Jon's interest seems to rest as much with the field of electronics as it does with free flight. With that interest, he began to study the ways he might assist his father with his efforts in electronic thermal detecting. As a result, Jon has completed his project and has filed this report.

"As anybody knows, you need good flights to win at contests, and to get good flights, you need a good thermal. The question is, how do you get a good thermal? I'm pretty sure that building a fire under the model is illegal. What you can do, however, is detect the thermals that are already there. Now in the Northwest this is sometimes hard to do because there are not always thermals to detect, but if they are there, it would be beneficial to have a method to find them. Some people have developed some pretty weird ways of detecting thermals. Bill Gaiser, I know, lifts his shirt to feel thermals on his side. Some people use mylar, a piece of silk on a pole, etc. etc. Some have undoubtedly wondered about the possibility of an electronic thermal detector. Well, being interested in electronics anyway, I know that I certainly have, and over the past year or so, have been looking for the schematic or kit of such a thing. I didn't find a kit, but my dad found a schematic in the 1964-1965 Frank Zaic Year Book, on pages 196 and 197. I took the schematic to my shop teacher who told me how to go about making it.

"Now, the hard part is not putting it together, it's getting the parts. You are probably thinking, 'What's he talking about. All you have to do is go down to the nearest Radio Shack

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and pick it all up for about 5 bucks, right?' Wrong! Some of it you can, but you will have fun getting the thermistor. All it says in the book is Fenwal GB32J2. That's the catalog number to a small California company, and it's going to have to be ordered by an electronics store. Depending upon the store, it will take from a month to three months. The Thermistor will cost about a quarter (*this must be a 'surplus' price. According to Allied's Electronics catalog, the thermistor is item No. 791R0427 and costs \$3.23. In the Newark Electronics catalog, the same Fenwal GB32J2 thermistor is \$1.95, their No. 30F1723. wcn*) and all the other resistors about a dime each. The switch will be a buck, the transistor about three dollars, as will the meter and the potentiometer.

You should buy an experimenting board for about two bucks and a styrofoam ball for mounting the thermistor. It all adds up to about 15 dollars.

"I don't suggest making this unless you have some experience in electronics or know someone who is willing to help you with it. However, if you do decide to make it, here are a few tips: You should make a mock-up of it on a 'breadboard' by building it over the schematic, with

small nails or pins at the contact points. Then, when you have it working, you can mount it on the circuit board and put it in a box. For easier transportation, you can have the Thermistor ball unplug from the box by using a 'miniplug' jack system. When you solder the transistor, you should be sure to use a heat-sink so you don't damage the components inside.

"When you go to find something to mount the whole thing on, you can do as we did and get some bamboo and an old car antenna and make an inexpensive model, or you can buy a telescoping fiberglass pole from Sears, Roebuck. The box should be made of thin, but strong wood or sheet metal. It should have ventilating holes for the transistor, since it is also sensitive to heat changes.

"To use, you set the potentiometer at midpoint and watch the changes that occur in the meter. A good thermal will build slowly, and stay at about 160 to 200 for 30 to 60 seconds. Good luck and happy thermalling."

I would like to add to Jon's comments by saying that the thermistor thermal detector he describes is a slight modification of the one in the Zaic Yearbook, and it does work. At the recent Boeing Management

Association contest, held in July, Jon's thermistor was attached to the Stalick mylar streamer pole, and with the two systems functioning, it was easy to tell if the thermals were there and how large they were when they appeared. As with any system, this one takes a bit of getting used to. My only recommendation for a change from Jon's plans would be the use of a larger dial on the ammeter, as one has to be quite close to the meter in order to read it.

Jon has since modified his mounting system to allow the thermistor to be attached directly to the Stalick mylar streamer pole so that the thermistor will now be approximately 22 feet from the ground and removed somewhat from the effects of minor changes in ground floor temperature.

BOEING MANAGEMENT ASSOCIATION SCHOLARSHIP RESULTS

The Eighth Annual Boeing Management Association Scholarship Contest is now history. Held on July 9 and 10 in Kent, Washington, the meet this year drew some 70 contestants under 19 years of age from all around the U.S. Prizes, in addition to impressive trophies, were \$1500 in college scholarships to the winner, \$750 for second place and \$250 for third. Special Junior Contestant awards are also made. The emphasis in this contest is upon the flier who can demonstrate abilities in more than one area of flight. Events are broken down into three categories, with 7 free flight events, including 2 indoor, 5 control line events and 6 "Specialty" events, including R/C Glider, and Rocket and Design Craftsmanship. A contestant, in order to be eligible for a scholarship must enter at least two of the categories.

Design Craftsmanship is one of the unique events in that the contestant must present his or her model in front of a panel of judges, all of whom are Boeing Management Personnel, including design engineers, test pilots, and others of similar persuasion. The model presented must have been flown in competition in one of the events. Judging is based upon design innovation, technical accuracy, execution, craftsmanship, and degree of difficulty. It is one event which causes the young modeler to think about what he is doing and to defend it in front of a friendly but knowledgeable group of experts. To win a scholarship, the contestant must score more points than his competition. To score, he can get 25 points for each first place, 20 points for each second, etc. The contestant

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can get a maximum of 100 points, since scoring is only counted for the top 4 events entered by the contestant. In case of ties, the number of contestants against whom the modeler competed is taken into account.

This year's winner, Hank Bull of Eugene, Oregon, had 100 points scored in control line, indoor H.L.G. and Design Craftsmanship events. Ted Stalick placed second, with 85 points scored in free flight events, and a third in design craftsmanship. Ted also won Junior Free Flight

High Point. Dan Smith, of Seattle, placed third in the Scholarship event, flying mainly free flight events.

It is my belief that contests like the BMA Scholarship Contest are superior examples of older modelers assisting younger ones in becoming proficient, not only in the enjoyable hobby of model aviation, but also in the larger arena of life. Such efforts should be encouraged, not only amongst the younger modelers but also with the organizations which sponsor such events.

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3. CH 407	6.21	0.160	1.025	160
4. EJ (Jedelski)	6.50	0.204	0.955	171
5. GF-6	6.17	0.170	0.999	164
6. Gottingen 361	6.90	0.114	1.250	131
7. Gottingen 417 (Mod.)	5.80	0.150	1.025	160
8. Gottingen 495	5.90	0.123	1.200	136
9. Gottingen 803	6.30	0.152	1.050	156
10. Hacklinger HA12	6.30	0.144	1.075	152
11. Hacklinger MP12	6.00	0.155	1.025	160
12. Horejlsl	6.64	0.129	1.155	142
13. Lindner	5.92	0.132	1.085	151
14. Oskamp	7.20	0.121	1.238	132
15. Rltz	5.60	0.150	1.010	162
16. Samann	6.55	0.125	1.163	141
17. Sokolav	7.10	0.150	1.113	147
18. Tahkapaa	7.00	0.140	1.140	143
19. Thomann	6.10	0.170	0.996	164
20. Thomann F-4 (SPL)	6.20	0.160	1.025	160
21. Thomas	5.60	0.160	0.988	166
22. Verbree	6.90	0.165	1.055	155
23. Woodstock (Jedelski)	5.70	0.185	0.945	173

Peanut Continued from page 51
was right on the main spar. No additional weight was required for flying.

The wing is built using a piece of composition board shaped to fit the wing spar. This will form the trailing

edge to the curve of the spar. The leading edge is soaked with water, formed to this curve and let dry. After building both panels, assemble the wing on a flat surface with 1-1/8 dihedral under both tips.

Tail surface construction uses

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laminated pieces for the tips and straight sticks for the remainder.

All but two of the struts are 1/64 plywood, in widths as shown. The strut between the middle of the front wing strut and the landing gear at the wheel pant is a piece of elastic (rubber band). This allows the gear to flex without damaging the wing.

Cover the model with tissue, and apply two or three coats of thin nitrate dope. The original model used silver tissue throughout, with the cowl and wheel pants painted red. Paint the struts either silver or light brown. The roundels and tail stripes are cut from tissue and doped in place.

The model was flown with a 6 inch loop of 1/8 flat rubber wound 300-350 turns. Both powered flight and glide are rather fast as compared to other high wing peanuts.

Yeloise Continued from page 47

then slicing through the paper between each tape strip with a razor blade. I peel them up from the linoleum as I need them to hold strip wood to the form.) The tail skid was made to the stabilizer outline. The edges of all the surface outlines were shaped by very light, careful sanding with No. 320 wet-or-dry sandpaper on a rounded-edge block. The ribs were sliced with a cardboard template and cut to fit the pinned-down outlines (the outlines were pinned with the pins on the sides of the wood, not through it).

It took a while to figure out how to mount the wings and landing gear satisfactorily, for I wanted the plane to be easily re-buildable. Paper tubes were used in the indoor tradition, with some thanks to recent experiences with R/C gliders for details. The tubes were made in two diameters, being rolled on 1/16 o.d. tubing and a 5/64 drill shaft. The larger ones were just right for the wings and the smaller ones were used for the landing gear legs. These tubes

were made by moistening one end of a 5/8 by 1-1/4 inch piece of tissue, rolling it one turn on the tubing (near the end) between the left thumb and forefinger, applying a bit of Ambroid across the paper at the tube and continuing the roll by spinning the tube slowly with the right thumb and forefinger. It helps to moisten the outer end of the tissue slightly, too, so that it sticks well. Spinning the paper tube on the form between the fingers smooths the glue and tightens up the paper tube. Before it dries, like *right away*, it must be pushed off the form and not touched or moved until it's dry. The ends often get crumpled pushing them off the form but this can be trimmed to the final size with a razor blade after the tube's dry. About ten tubes were made to get the six I needed for this plane. It takes a bit of practice.

Wheels. I've always looked at indoor wheels and thought maybe there'd be a Fulton Hungerford somewhere to buy them from when I really needed them. But no, I had to do them myself. I really soaked a piece of "A" grain, 1/32 square balsa about 12 to 14 inches long. I taped one end to a small 1-1/4 inch diameter bottle and pulled the strip around about six times. After taping it down and letting it dry, I pried it off carefully and salvaged 4 circles. The circles were spliced with a long diagonal cut and glued with first a coat of Titebond and then a spot of "Zap" cyanoacrylate cement. (The combination makes a terrific joint.) The "Zap" was applied from a drop on a glass plate with a dental tool. Each circle or rim was pinned over a drawing of the wheel. The hubs were made by drilling a No. 77 hole in the end of some 1/8 dowel and then cutting off 3/32 slices with a jeweler's saw. These were pinned to the board in the center of the wheel with a short length of .015 music wire. The spokes were cut from 1/32 square balsa, first with a 45° cut at the hub end and then with a 90° cut at the wheel rim to fit. Three of the spokes are on the outside of the hub and the other three are on the inside.

The finished wheels were a great source of satisfaction. They were mounted on short lengths of .015 music wire, which were, in turn, bound to 1/16 square (rounded a bit) struts with tissue and Titebond. Short lengths of "Hot-Stuff" applicator tubing were used to hold the wheels onto the wire axles.

The propeller assembly was the last major part of the plane to be built. The blades were cut to their pattern from .020 thick "C" grain balsa. They were soaked under the

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tap and then taped to a can at a 16° angle from the vertical. The can was 4 inches in diameter. Again, the tape was paper-lined so it wouldn't stick to the blades. The 16° angle was toward the direction in which the prop would turn, i.e., with the can vertical the angle should lean *left*. While the blades were baking in a 200° oven for 15 to 20 minutes, the propeller spar was tapered from a piece of 1/8 square medium-light balsa with a razor plane and then sandpapered. The dried blades were held flat with a weight while the spar was traced onto them with a razor blade, cutting a notch into which the spar would be glued.

I decided to try a 22 inch pitch and so built a jig for gluing the spar and blades together at the proper angle. This jig held the prop shaft of .015 music wire, glued into the prop spar, at a 90° angle to a base board. At the appropriate distance from this center point (3 inches), a 50° balsa angle bracket was mounted on the base. The propeller blades were lightly held to this angle bracket while the spar was tack-glued into each blade in turn. The final gluing was done with a fine bead of Tite-

bond on both sides of the blades and then the angle was rechecked.

The spinner was carved from a block of soft balsa. It was notched at the back with a rat-tail file, hollowed out, and glued onto the propeller spar. The prop shaft bearing is a short length of 1/16 diameter tubing (aluminum) lined with a piece of 1/32 o.d. teflon tubing. The nose block is laminated from hard 1/16 sheet balsa.

The paper tubes were mounted in the framework with Titebond. They were mounted so they extended beyond what would be the surface of the plane and then sliced off with a razor blade. Small scraps of 1/40 balsa were fit around the tubes to receive the covering tissue and reinforce the openings of the tubes. Some shims and adjusting were necessary to get the tubes lined up right. This was simple, for they were only tack glued in at first, and the joints could be dissolved with a drop of water if required, without dissolving the Ambroid-glued paper tube.

I had decided to dye the frame of the plane as soon as I'd seen John Triolo's winner. It took a while for

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yellow to convince me that it was the brightest and prettiest of a gang of Dr. Martin's waxter colors hanging out on my paint shelf. After thinning the color with 90% alcohol, it was brushed on the entire frame. The propeller assembly was sprayed with water-thinned color via the airbrush.

I spent a week running around trying to get the framework photographed and figuring out how to cover the plane. It wasn't the covering so much as the installation of the windows and windshield, as required by the rules, that had me stumped. I decided that they should be difficult to measure and therefore of some unusual shape, to protest their absurd inclusion in an otherwise beautiful set of rules. The windshield is more than 2 square inches of ellipse and the side windows more than one square inch of circle (or eyeball).

They were mounted thusly: Micro-lite clear film was sandwiched between two sheets of bond paper. The circles and ellipses were traced on the bond paper, 1/8 inch larger than the required size, and cut out with scissors. Using templates, and before covering, the proper size shapes were cut from the tissue, which was stretched on a wooden

frame. The upper layer of the bond-paper-Micro-lite sandwich was removed after laying it on a dark surface. Then a small bead of shellac (thinned) was run around the opening of the shape in the condenser paper. The condenser paper, on its frame, was lowered down to the exposed Micro-lite shape. The glued edge was pressed carefully to the Micro-lite all around the edge. After lifting from the table, the remaining piece of bond paper was peeled off the Micro-lite. Micro-lite is so thin it's difficult to handle ... so much so that it *shouldn't* be handled, unless it's mounted on a frame or between heavier sheets of paper. Wrinkles in it can be removed when it's lying flat by gently *blowing* the film flat.

The tissue ... condenser paper ... was dyed by spraying it with many thin coats of water tinted with Dr. Martin's yellow water-color, using an airbrush. The condenser paper was pre-shrunk. This was done by what's known as the alligator skin method. Using a pump spray, I first washed the front of our refrigerator, then wet it again. The sheet of condenser paper was held in front of the door and blown against it, then wet again with the sprayer. The spraying process was repeated about 5 or 6

times. The dried paper was quite wrinkled with a small overall texture. Though the plane could have been covered with the paper in this condition, I wanted a smooth covering job. To accomplish this I placed the condenser paper between two sheets of newspaper, sprayed them with water, and ironed it flat.

The tissue was attached with saliva. I found it frustrating to wet a brush with my mouth and brush it on, tried dipping it in the saliva and ended up licking the frame with my wet tongue. I am told that a beer or coke before covering helps a lot, but I didn't find that necessary. The covering job was conventional and straightforward, except in the area where the fuselage pod meets the tail boom. This area required a little extra care. After the tail boom and stabilizers were covered, the extensions of the stab spars were pushed through the covering on the boom and attached to the boom's framework. The job was kept neat by starting the holes with pins and using a minimum of glue. The rear spars were attached to the end of the boom with a small amount of glue so they could be removed and adjusted if necessary.

The first version of the plane had an 18 inch fuselage. This, together with the V-tail configuration, made for an almost impossibly trimmed plane. The center-of-gravity had to be at about 25% of the wing chord, which meant ballast in the nose. My first thoughts were that the V-tail was the culprit, but tests with a conventional tail showed the problem truly to be that of C.G. location.

The configuration shown in the drawings was arrived at through cutting the rear of the plane off at the end of the pod and rebuilding to a 20 inch overall length with lighter construction. This obviated the need for nose weight and brought the weight down to 4.25 grams. In its latest configuration, the plane flies very consistently to the left with the tail tilt shown, a slightly (1/8 inch) washed-in left wing tip and about 2° left thrust. The size of the flight circle is adjusted with side thrust ... the optimum is about a 40 foot circle for the force set-up shown.

In constructing the plane from the drawings, one can select a heavier, sportier airframe, or use light indoor wood in smaller sizes. It is not difficult to build to the 4 gram weight using light wood for all the structure, except medium 1/16 square for the fuselage pod longerons. The plane is still a satisfying flyer at 6 grams, although its flight is not quite so buoyant and times are shorter. Yeloise likes a 16 inch loop of .080 to .085 older and better Pirel-

li wound into her for 1200 to 1500 turns for an average flight. When the Lakehurst season starts, she'll get her belly full and an opportunity to stay up as long as she can.

For more information about Manhattans, send a buck or two to Ed Whitten, c/o Star Skipper's, P.O. Box 176, Wall Street Station, New York, NY 10005; he'll keep you posted. Let him know your thoughts and feelings on this growing new class. ●

Sparmann . . . Continued from page 37
hopes and the S1 was not ordered in quantity. However, a government sponsored factory was established under the aegis of Sparmann at Lilla Essingen, in Stockholm, in 1932, and ten of the fighter trainers were produced there.

The Air Force created a new category for the airplane, designating it the P-1, the first test (provflygplan) airplane. The S1, or P-1, went through several modifications. The original airplane had rounded wingtips, vee-notches in the trailing edge at the fuselage, a lozenge-shaped rudder, and a slightly shorter span horizontal tail; the cockpit arrangement was slightly different and there was no streamlined headrest.

The S1-A, as the airplane was called by Sparmann, had wingtips squared off at the trailing edge and the cutout eliminated; the span of the horizontal surfaces was increased 20 cm, elevator enlarged and the rudder changed to a triangle with a rounded tip and an overhang balance. The cockpit and windshield were modified and a huge headrest added. At least one of the ten airplanes was further modified with an enclosed canopy and retained the headrest.

The Air Force used the P-1 for training and liaison missions since it had a long range with a duration of 4 hours and 25 minutes. The excellent DeHaviland Gypsy Major engine of 130 hp gave the P-1 a top speed of 155 mph, which was as good as some first line fighters of the time. ●

Control Line . . . Continued from page 63

that MACA is a responsible, established organization capable of running its own show . . . or that the R/C Pattern fliers can't be trusted to go it alone and need to be watched constantly. Interesting thought?!

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how good the pilot may be. As it stands right now, our team consists of only fliers, no pit-men. Although all of these fliers have been in Combat long enough to be OK at pitting, there is no way that they are the best pit-men (pit-persons?) available.

So at the W/C's, these people are going to have to try to work together, and trade off pitting chores when all they should be concerned with is readying their equipment, watching the opposition fly, and getting psyched for the next match.

I feel that funding for a couple of pit-men to go with the team is important . . . important enough for you to write to John Worth and Johnny Clemens, asking that serious consideration be given to including pit-men in the FAI Combat Team. MACA plans to raise funds for just such a purpose, but we will need the help of the AMA here, if we hope to get the necessary money.

I'm writing to J.W. and J.C., so is Frost and a few others. Add in letters from the rest of you, and maybe we can get something going.

NEW PRODUCTS

Seems to be some new things around to let ya know about. First up is a kinda new engine from HP.

This is basically an HP 40F-RC with the carb chucked, and a really nice looking suction venturi supplied instead. Also supplied are extra head shims for dialing the motor in to fuel, prop and all those other variables.

These new HP's should be available by now, and early indications are that the price will be around \$85.00.

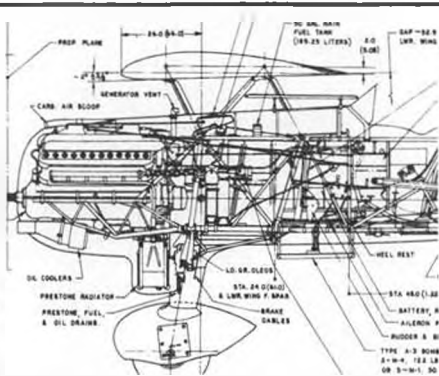
If you want one, but would prefer it in the .36 size, engine man Henry Nelson can supply cranks for either front or rear intake HP's. Contact Henry at 729 Valemont Drive, Verona, PA 15147.

Joe Klause, of Kuston Kraftsmanship, P.O. Box 2699, Laguna Hills, CA 92653, has a good handle on the needs of competition C/L fliers, and has several new items out that you probably can use.

The one that I see as the most needed is Joe's Universal Custom Needle Assembly (No. 510). This is a really effective looking needle assembly with very fine threads on the needle. With many Combat guys going to surgical tubing bladders, the high pressure can give fits when needling-it. If you find a 1/16th turn of the needle sending the engine from a WFO scream to a blorp-blorp

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Douglas O-25C	3	
Douglas O-31A/O-31B	3	
Douglas O-31C/Y10-43	3	
Douglas O-38/O-38B	2	
Douglas O-43A	3	
Douglas O-48A	3	
Fokker D-XVII	3	
General Western Meteor	1	
Travel Air 2000	2	
Waco ATO Taperwing	2	
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burble, you would do well to wrap your needle fingers around this unit. The \$4.50 price isn't cheap, but then neither is the needle assembly. High quality... check it out.

For the guys on hard tanks and pressure, look at the In Line Ball-Check Valve. This valve has a teeny hole in one end and a valve inside. The little hole lets pressure by, but the valve keeps fuel from going back to the engine via the pressure line. The valve is small enough to simply slip inside the pressure line. Selling for \$1.50, it sounds like the easy way out, if you don't care for flooded engines when the CD says 3...2...1...GO!

Last up is a single-leg landing gear unit for Slow Rat or Slow Combat planes. It is light, easy to mount, and includes one of Joe's new streamlined wheels. The gear leg itself is tapped 6-32 top and bottom for easy installation to the fuselage and for attachment of the wheel. Quite possibly this is just what you need for that latest plane. For \$2.95, I think you'll really like it.

NEW EVENTS GIVE NEW PERSPECTIVES

As the more observant may have noticed, I have recently become involved in some R/C car racing, competing for the first time at the '77 ROAR NATS in four different events, plus doing hours and hours of pool-side racing with friends on a black-top driveway.

As I am a bit familiar with R/C car racing and its rules, I knew in advance of the ROAR Nats that I would not be required to buck heads with expert-rated drivers in all of the

events I entered. Even though the Amateurs proved a bit much for me, at least I was allowed to start out in this class.

As I happen to enjoy car racing of any kind, I met some really good people who race locally (at least half of the attractiveness of any hobby/sport is the people involved and the social possibilities). There are local races every two weeks, my whole family can participate, and as I already have a couple of cars, we'll be getting into it fairly seriously next year.

In this particular area, both 1/8th and 1/12th cars are raced frequently and there are three separate classes of drivers: Novice, Amateur, and Expert. This is really nice; each of us can at least initially enter Novice and compete against others in the same boat (car? wcn), that of just starting out. If Novice happens to be a bit easy for any of us, we will be bumped up to Amateur and from there, work our way up to Expert (maybe).

As we all know, if the AMA was the sanctioning body for R/C car racing, my wife and I would automatically be forced to enter Open (Expert) class, while my boy and girl would be in Junior (Novice). (Heard of Novice, Advanced, Expert, and Master in R/C Pattern? wcn.) In the case of the ROAR Nats, this would be the most ludicrous situation one could imagine. I'd be up against the likes of Jianas, without a doubt the most competitive, hard charging R/C car driver I've seen, Bob Welch, Gene and Curtis Husting, Roger Curtis, Mike Rowland, Gary Kyes, etc.

I have as much chance of beating these guys in car racing as they do in beating me at Combat (that translates to zero chance, folks). At the other end of the scale, my kids would be up against Jimmy Welch and that wonder-kid of R/C car racing, Pete (RePete) Fusco, who at 10 years old, is a seasoned veteran and winner of many ROAR Nats places. RePete could blow my doors off with an absolute dog of a car, even if I had the best of equipment. What kind of a chance do you suppose my six year old boy and ten year old girl would have against him? That's right. Zero.

Yet our AMA, supposedly responsive to our needs and always looking for ways to better the hobby of model airplane flying, continues to keep us (and advancement of our favorite hobby/sport) saddled with a Junior/Senior/Open method of skill classification.

It could very well be that in the beginning of model flying there were good reasons for the age classifications, although I can't think of what they could possibly be. Regardless, it is obvious that the time came years ago to completely revamp our skill level/age level classifications.

In a number of ways, the AMA is progressive, but the AMA does have an image of being rather backward, and I would imagine that our classification system points this out all too well. If some of the things, like promotion of flying dog-houses (can you imagine what kind of view that gives the public of our hobby... a grown man trying to make a dog-house fly?!), publication of a commercial magazine, acquisition of a permanent AMA site, endless harangues over what, in the long run, are trivalities, maybe we could eliminate what I see as a very large stumbling block in the way of greatly accelerated growth in the hobby/sport of flying model airplanes.

Those of us already involved in this hobby seem to have learned to live with this Jr./Sr./Open thing. But think of all those people who have tried to break in, but gave up because of this problem. And what about all those people who, in the future, will be initially attracted and then driven off by your obsolete skill level (?) ranking system.

Just reading this and agreeing with the thoughts won't be enough on your part. If you agree, don't write to me, write to the AMA. Or your Dist VP. If letter writing gets to you, then call your VP. Call him even if it is long distance. In fact, call him collect if you have to, the AMA reimburses their officers for phone calls relating to AMA business.

We should have trashed our present system years and years ago. Let's do it now before it is too late. I'm writing letters and making phone calls. I expect your help. Go for it! SEE YA

I'm afraid to look at the clock, but I'll bet it's early morning by now. If I make it through this years Nats, it'll be an absolute miracle.

(Dan, the "AMA" that you and others are complaining about in regard to antiquated rules is you and the others! If you're going to write to anyone, write to your Control Line Contest Board. If the board throws out age classification, substitutes skill classification, and then the Executive Council says "No, you can't do it," then write or call your VP's. Too many members forget that the great nebulous "they" of AMA is none other than the members themselves. They are the ones who create the rules. If they don't like them, they should change them.

R/C Pattern went to skill classification several years ago, and it works ... just like it's working in R/C cars ... and we, the R/C Contest Board, some of that nebulous "AMA", were the ones who brought it about. If you're still stuck with age classifications [and I agree that it's not the way to go] then get your CLCB off its duff ... if that's where the problem lies.

We believe that all AMA events should have skill classifications. If for no other reason, it might give us old and not-so-skilled bastards a chance by not having to compete against some of these highly-skilled punk kids! wcn)

Power Boats . . Continued from page 39

from boat to boat. Let's face it, not everyone can afford more than one radio, but they could go to a contest with two boats and transfer the radio between heats.

2. The KBC-A charger is designed to operate from a 12-volt auto cigarette lighter plug, thus making charges at the racing site very easy.

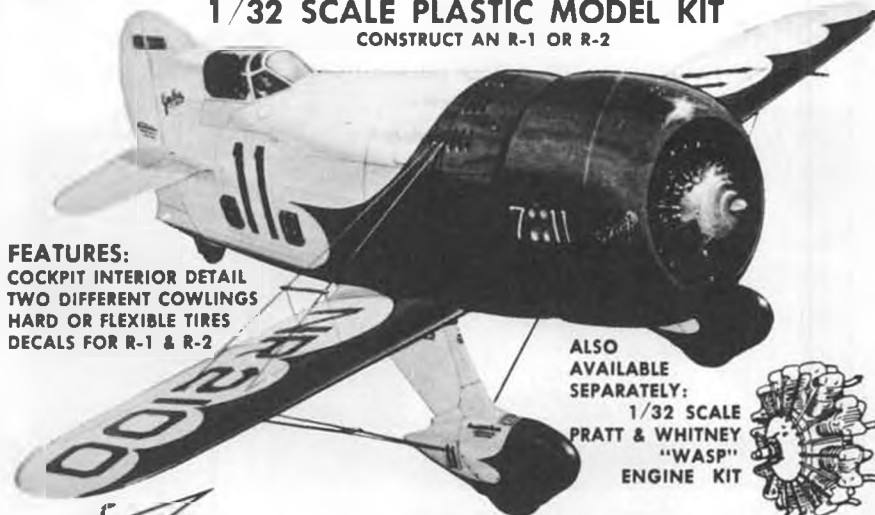
3. I was very impressed by the speed and power of the 15H servo. I tested the radio in my twin OPS .60 Dumas Vee, and found the 15H able to handle the boat with ease in the turns.

4. The plug-in module concept will be a must for boaters in the future. In June, the Minute Breakers held a contest which included 2 preliminary heats in each class, followed by a "winner-take-all" finale. The top 6 qualifiers in each class participated. In case of duplicate frequencies, the boater with the lower point total had to change frequencies. With the Kraft radio, that change is easy. And remember, as the num-

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ber of entries continue to grow at our contests, it will no longer be possible to run 3 complete heats in one day, so the new "Winner-Take-All" finale may be here to stay, and everyone had better have the ability to change frequency.

Happy Boating,
Bob Preusse

Sailing Continued from page 41

spills and spatters to prevent permanent damage from these substances. Remember that the fibers of the fiberglass are irritants, and commonly cause skin itching and irritation. When sanding, use a barrier cream or gloves, protective clothing and sanding mask, and careful clean-up methods as you work.

Fiberglass is just that, GLASS, and it will cut if you are not careful. When you sand, cut or trim anything made from fiberglass, keep in mind that it can be as sharp as anything known to man.

SOME ADDITIONAL HINTS

Your fiberglass hull and deck probably are fresh from the mold. If so, they may have mold release still on the surface. PVA mold release looks like a flaky film and washes off with water. Wax and other mold releases will require scrubbing with detergent. If the edges of the parts have not been trimmed, trim them when the time comes for assembly.

Stick with using name brand products in your model building. Look for proven modelers products and industrial adhesives.

Very important: Prefit and trial fit

all parts before installing them. Don't install anything until you check your building plan and building schedule. Your building schedule is the list you make of all components to be assembled before you begin to build to make sure you don't put something together in the way of something else. For example, you must be able to install the radio gear into the hull, so don't assemble components in such a way that it will block installation of that radio gear.

FIBERGLASS HULLS

Fiberglass boat hulls are available in different forms. A one-piece hull is supplied molded in one piece. A two-piece hull has two half-hulls which must be joined together by the builder. Hulls may come with edges reinforced and a mounting lip molded about the sheer edge. Often they come with a "straight" sheer; this means the modeler must put in a shelf or sheer clamp or gunwale strip in order to mount the deck and support the edge of the hull.

In the two-piece hull, trim the halves carefully. Hold the parts rigidly together with clamps or tape and laminate in a strip of fiberglass across the inside joint, between the halves. When the resin cures you will have a one-piece hull.

Before proceeding further, you will need to build a cradle to hold the model in place while you finish building it.

If your hull is of the straight sheer type, it will require a deck mounting shelf to be installed; proceed as follows. After trimming the sheer, laminate two strips of 1/8 x 3/8 spruce about the inside edge. This will give you a 1/4 plus wide

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shelf to support the deck. You may use other sizes and woods to fit your individual needs. Take care not to distort the hull at this stage. If necessary, brace the hull externally to hold its shape. Do not try to force the wood strips too tightly to the hull. This will distort the hull at the clamping points. Use a thixotropic resin to bridge the small gaps between the wood strips and the fiberglass. Another method is to use a small strip of fiberglass between the wood strip and hull with the saturated glass strip bonding to both the hull and the wood. On a racing model, remember weight should be kept at a minimum. Choose your building technique and materials with this in mind.

Locate the points at which the chain plates and various fittings will be attached to the hull and deck. Locate and install load spreaders and back up blocks for such items as shrouds (stays), head stay or job rack, mast step, back stay and any other item which will need to be fastened after the boat is assembled. These back-up blocks or load spreaders are generally blocks of light weight wood, such as spruce, which are bonded to the hull or deck so that when the fitting is screwed or bolted down to the fiberglass, the

pull is taken up by the block of wood. Remember that unless the load is widely spread out, fiberglass, especially thin GRP as in models, can not stand tension loads. Arrange the blocks to spread the load or to put the fiberglass in compression loading.

The bottom of your model must support the weight of a heavy keel located on a long lever-like fin, so it will need some sort of strengthening or "load spreading". If the keel is bolted on, the hull will need a keelson installed inside the hull. The keelson is sometimes called the hog, or occasionally the keel. To do this, you laminate a 1 inch wide strip of glass tape down the centerline inside the hull bottom. While this is still wet, laminate three or more 1/8 by 3/4 inch strips of pine or spruce on top of this strip right down the centerline. You could use several layers of the 1 inch cloth laminated in place of the wood strips, but they will weigh more. This keelson will give you the hull thickness to hang the keel on and support fore and aft. Load spreaders will still be required on each side of the keel bolts. The "STAR 45" calls for the keel fin to pass through the bottom of the hull and be glassed permanently in place. The keelson of wood is needed only

under the area below the mast step.

Check the beam measurements of your particular model; it may be necessary to spread the hull slightly or even to push it together to get the beam at the desired measurement.

* * *

I hope to utilize more of Dave's material in the near future. I understand that complete copies are part of the kits that he sells, so if you buy a copy of the directions, you'll be pleasantly surprised to find that a boat comes with it!

With the regatta season in full swing, there must be a few of you out there who take a black-and-white photo or two when you are not racing. Why not send me a clear print that shows us the action in your fleet? I can't be everywhere, and if you want to see what's going on elsewhere, don't sit on your duff and wait for the other guy to do something about it!!!

While reading one of the other modeling magazines I came across a well presented article by Jerry Julian on making buoys for sailboat race course markers. I'd like to add yet another way of skinning the cat. This technique was suggested by Ted Robertson, formerly of the Buffalo Club, and the first AMYA A-class Secretary. The sketch is really self-explanatory. Items needed are:

10 inch inflatable beachballs (I used some from Radio Shack)

D-rings from a craft shop large enough to let 8 oz. lead weights pass through.

16 oz. lead primary anchors.

8 oz. lead tensioning weights.

1 roll 3/4 inch glass fiber filament tape.

Upon construction, one needs only make sure that the balls are clean and dry before attaching the D-rings opposite the inflation nipple. Tie plenty of light polyester cord to the primary weight and wrap it around the primary. To launch, drop the primary weight and let it unwind on its way to the bottom. Then slip the secondary through the D-ring and plop it into the water. Presto, a taught moored buoy, that works no matter what the depth of the water (if you have enough cord).

I made a plywood box with a handle and the whole array of 5 or 6 buoys, weights and all fits right in. As an added help to the regatta director, we set two windward marks of different colors and use the one dictated by the prevailing wind at the one-minute-to-go start of the count. For depth perception ease, I do think that the balls should all be the same size.

We have found the system to have a couple of advantages over

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the buoys with the flags. The major one is that boats absolutely cannot snag or get hung up on them. We've even tried to snag keels on the mooring lines, and have been completely unsuccessful with that. Since the whole shebang fits in a box, it does make the trip to the lake a good deal easier on the Fleet Captain.

* * *

Remember SPOT, the darling of the STAR 45 class, that appeared in these pages back in December of 1975? Well, she is still alive and quite well. I sailed her in the 3rd Annual Class Championship Regatta (ACCR) . . . When will AMYA decide to call that a National Championship so that non-sailors will know what we are talking about? . . . For the third year in a row she won the event and now proudly wears '77 gold chevrons on her main. Before the rumors get out of hand, it is true that she was the inadvertent cause of the sinking of the second place boat . . . got caught to weather by a gust and whacked John Krick's boat a good one. John continued to sail the course and was near the finish when his boat sank by the stern and threatened to disappear. He got her running again and pulled out to a strong challenge to SPOT. John's boat was fiberglass, while SPOT is one of the "old-fashioned" wooden hulls. Maybe wood does go better.

Vince Santoriella was awarded SPOT'S DISH, an engraved silver bowl perpetual trophy that is given to the highest finishing rookie at the ACCR. Class Secretary Al Hemmalin set the site of next year's event at Marsh Creek, PA, so start planning for '78. The STAR 45 ACCR is the only event that has remained a "fun sail" rather than a thinly disguised fight. My hat is off to all the skippers who took part, the Hemmalins who ran it, and to John Rosebery, of the Tri-State MYC, who provided boat, buoys and a lake full of water.

* * *

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I'll continue to field questions for a stamped, self-addressed envelope, or in care of **Model Builder**, to: Rod Carr, 7608 Gresham St., Springfield, VA 22151. And remember to send in your annual \$5.00 dues to the American Model Yachting Association, 2709 S. Federal Highway, Delray, Florida 33444. •

Counter Continued from page 9 is the use of the integral tailcone as a fuel tank.

An injection-molded A4D Skyhawk kit for the .049 version is now on the drawing board and will be available soon.

Midwest Products has also announced the addition of walnut and mahogany to its extensive balsa and basswood lines. The new woods also feature the exclusive "Micro-Cut" processing, and are available in the most popular 24 inch long sizes.

Look for the new mahogany, walnut, and basswood racks next to the Midwest balsa rack at your local shop. For further information about any of its varied lines of molded products, write Midwest Products Co., 400 South Indiana St., Hobart, IN 46342.

* * *

Davis Diesel Development now has available "Li'l Stax" exhaust stacks for the Cox Pee Wee and Tee Dee .020 engines; companions to the "Stax" available for the .049 size Cox's.

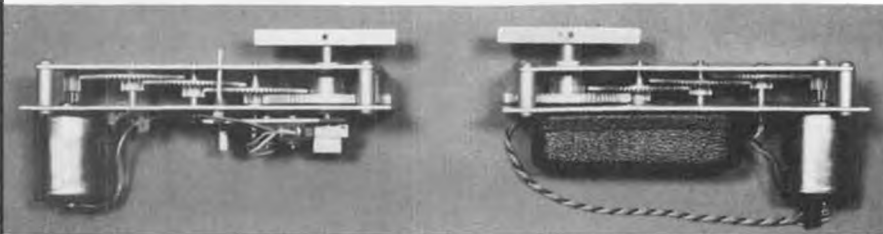
The .020 size is made of high-temperature red silicone rubber, and is installed by simply stretching it over the cylinder and allowing it to contour itself over the exhaust opening. It not only will channel the exhaust residue off to the sides, but will prolong the life of your engine by keeping dirt from its insides. It can also be used as a muffler, or throttle, by making simple modifications fully explained in the instructions.

Priced at 98¢ at your dealers, or \$1.00 and a SASE direct from Davis Diesel Development, Box 141, Milford, CT 06460.

* * *

Morrison Repla-Tech, 48500 McKenzie Hwy., Vida, OR 97488, announces that it is now a sales outlet for the well-known Raceplane Scale Drawings, by R.S. Hirsch. The 1977 catalog, available for 25¢, lists over 235 drawings, mostly five-views, plus special details in some cases. Included are racing airplanes from the 20' to the 70's, from the famous

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West Coast 12-Meter - \$30.00	Tar 1/5 - - - \$30.00
Vanguard "J"-boat - - \$50.00	T&A Petrel - - - \$30.00

Scale vessels, special purpose boats, one-of-a-kinds: Write for a quote, and for our 1977 Prochure and Used Sails list.

to the obscure.

All on 11 x 15 inch sheets, these black and white drawings are priced at \$1.00 per sheet, except for multiple sheet sets which are \$1.50 for 2 sheets; \$2.25 for 3 sheets; and \$3.00 for the four-sheet sets.

Excellent reference material for the builder, nice enough to frame, or just to pin over that paint smear on the workshop wall!

The world famous Bartels fiberglass propellers, pictured in sizes 7 x 3-1/2 and 7 x 4, are now available from Exportations, Ltd., 17835 Sky Park Circle, Suite E, Irvine, CA 92714.

These props come in an unfinished state, requiring some finish work and balancing, but no actual shaping. The price for the sizes mentioned is \$3.90 each, which seems rather high at first, but is not prohibitively so when the performance normally available from their use is considered, plus the fact that breakage is greatly reduced. Prop price per flight should be lower over a period of time.

Order direct from Exportations, and inquire about the other sizes on hand.

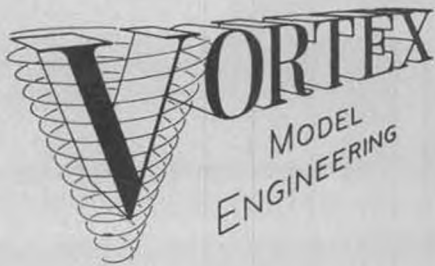
Model & Allied Publications, the English firm which publishes such well-known modeler monthlies as "Aeromodeller" and "Radio Control Models & Electronics", recently released a must book for R/C boaters, entitled "Model Boats Extra".

This roughly 7 x 9 soft-cover booklet contains 68 pages of information of interest and value to all R/C boaters, from the beginner to the expert. It includes chapters about yachts, hulls, engines, tanks, R/C systems and related electronics, in short, all you need to know to get in the water with a dependable and competitive boat. Included are full size plans for a 24 inch Air/Sea Rescue launch, with text and step-by-step photos.

We found it interesting, and believe you will also. It is available in this country from Bill Dean Books, 166-41 Powells Cove Blvd., Whitestone, NY 11357. We regret that we don't have the U.S. price, but a quick note to Bill (Dean, not Northrop) will get you this information.

We'll bet a rum-n-coke at our favorite San Diego restaurant (Kelly's Steak House on Motel Circle) that you don't know where you can get a phonograph record of a 1912 Blackburn Monoplane making a high speed (?) pass. Or a Bleriot. How about a Mk IX Spitfire?

Well, you would know all this and



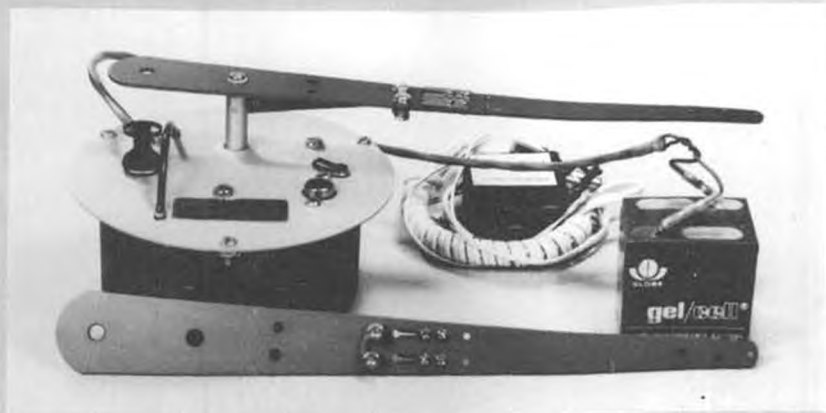
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more, if you were a reader of "PAM NEWS", an English publication devoted to Plastic Aircraft Models. True, for most MB readers, this is not our 'thing', however, for scale builders and researchers, the plastic model companies are an excellent source of information. The models and plans themselves are often extremely accurate, and when assembled, the plane is as good a guide for ratios and proportions as you can have prior to building your own R/C or control line scale project.

"PAM NEWS" is devoted to plastic airplanes and sources, as well as including plenty of information about specific airplane types and versions, colors, details, and mods.

Try a sample for a dollar, you'll like it. A subscription is \$5.00, all from the U.S. Agent, J.J. Daileda, 4314 West 238th St., Torrance, CA 90505.

Ultra long-reach hex wrenches, for all those times when normal length tools won't do the job, are now available from Harry B. Higley & Sons, Inc. Named Harry's Handy Hex Keys, they are available in the two most needed sizes, 3/32 and 7/64, as used with 4-40, 5-40, and 6-32 cap screws. The heavy shafts will not flex during use, and the hex key end is tempered so that the corners

will not round off the first time it is used. The Tee handle is of the proper size so as to prevent over-torqueing.

Harry's Handy Hex Keys are priced at \$4.99 per set, and will be repaired or replaced for \$1.25 if a failure should ever occur. Write to 433 Arquilla Dr., Glenwood, IL 60425, and don't forget to say that MB sent you.

* * *

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places, with its curved tip. As received, the tip has a .025 orifice, but due to the tapered design, it can be trimmed to any larger size required.

The untrimmed tip length is 1-1/2 inches, the capacity of this high pressure syringe is 1/2 fluid ounce, and it is priced at \$1.50. Send a stamped, addressed envelope for information on the complete line of syringe applicators.

A-West products are available at some hobby shops, and direct orders are accepted.

* * *

They are doing it to me again! In our August issue, I told you about the "Sting", by Myers Airplane Products, a name which didn't exactly thrill me as it reminded me of my sad experiences with some bees at our local flying field. Now comes the "Stinger II", a new biplane design from Master Kit, to supersede

its already well-known and popular "Stinger". This fully aerobatic ship, described as "easy to fly for the novice biplane", is designed for .40 to .45 power, spans 38 inches at a wing loading of 18-22 oz. per sq. ft. Flying weight will vary from 4-1/2 to 5-1/2 pounds, depending on engine, radio and finish.

The kit is expected to be available in early fall, and will be priced at \$64.95. It features all parts die-cut from appropriate weight balsa, ABS wheelpants, all hardware including pre-formed gear, machine-cut and sanded plywood parts, and nylon secured wings. Also included are full size and well detailed plans. It is claimed to be easier to construct than the original "Stinger", and a good, strong, gentle-flying biplane.

For further information and availability, check with Master Kit, 6 Fox Rd., Plainville, CT 06062.

It should be understood that my personal dislike for names like "Sting" and "Stinger", which bring painful memories, is no reflection on either of these two fine airplane kits. The low wing "Sting" and the bi-plane "Stinger II" should both do well in their respective classes.

* * *

Robart, 203 E. Illinois Ave., St. Charles, IL 60174, has just released information on a couple of its new products. First, a "Stick Mixer" for two-channel R/C transmitters of the Mode One type, using two sticks operating in different planes, one for each control. The addition of the mixer converts it to a Mode Two configuration . . . everything on one stick.

It is simple to install, the instructions are short and clear. However, a caution is recommended. It is required that the stick assemblies in the transmitter be rotated 90 degrees clockwise. We suggest checking to see if the existing wiring within your transmitter is long enough to permit that, or if you are prepared to re-wire or splice. Also, the resulting different physical configuration will require different clearances than originally needed. Our sample was marked "Cox Sanwa", so possibly the mixer is made in slightly different models to better accommodate different transmitters, all at \$8.95.

The second Robart item is called an "Ultra Fueler" and is an extremely well made plastic and aluminum single-point fueler. It is 13/16 square, requires a 3/4 inch hole for mounting, and is practically weightless. In use, all the plumbing, tank overflow and pickup, engine, and pressure, are connected to the rear of the fueler. It has two positions, one for 'fill', and one for 'run'. In either position, the proper connections are made between the different lines. Sounds like a simple but effective solution to what can be a bothersome problem. Only \$3.98, from most hobby stores, or check directly with Robart.

* * *

Tatone Products Corporation has some new additions to its already extensive line of engine accessories. Another muffler, though not just 'another' muffler. This one fits the .20, .35, and .40 class of rear exhaust engines, and is claimed to cut down the roar by 10 to 12 decibels, with little or no power loss. It blends a proportional volume expansion chamber with triple reflective tail cone baffles, for maximum efficiency both in noise reduction and heat dissipation. Easily attached with two screws, this muffler is designated Catalog No. 305-RX, and is priced at \$11.95.

For 1/12th scale glow engine powered racers, the Thunder Road Division of Tatone Products has a new Air Intake Filter, designed to keep all that dust and grime, as well as the rubber from electric starters, out of your engine intake. It is machined from aluminum, has a replaceable filter, and is easily attached with two screws. A filter of this type should soon pay for itself in reduced engine wear, not only prolonging the life of your engine, but increasing the enjoyment due to added dependability. Catalog No. TRA-504. Check your favorite dealer, or with Tatone Products, 1209

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Geneva Ave., San Francisco, CA 94112.

A flashing wing and tail light array, for scale and night glider flying, is now available from Vern Zundel. Using one I.C., 4 L.E.D.'s and the finest electronic components, this device comes completely assembled on a 1-1/2 x 1-1/4 inch P.C. board, and weighs 3/4 ounce. It will operate on from 4.5 to 7 volts, with a current drain of 13 mils at the lower voltage, which is recommended for the longest component and battery life.

The standard wire lengths are 48 inches for the wing lights, 36 inches for the tail light, and 14 inches on the anti-collision light. Obviously, they can be changed by the owner, or they can be ordered to any special length. A connector is also recommended for the wing lights, so that the system can be unplugged when the wings are removed. The wire size is only 32 gauge; the pair will easily pass through a 1/16 hole.

A single L.E.D. pulsating indicator is also available, to be installed in your transmitter or vehicle as a "Switch On" indicator. It is smaller than a postage stamp, pulses at one time per second, and is available for 4.5, 9, or 12 volts.

The price of the four-light system is \$15; the single is \$5.00 plus postage. All from Vern Zundel, 4956 Tiemann Ave., St. Louis, MO 63123. Tell him MB brought you the news.

Next to our vehicle, be it an airplane, boat, car, helicopter, or whatever, and those items directly related to getting it to operate, probably the next thing on a modeler's priority list is tools. We all know what we'd like to have in our dream workshop, but let's face it, many tools are out of the question simply because our limited use of them is not worth the investment. So it is nice to run into multiple-use tools or accessories

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that we can use with something we already have, to do better or faster work.

Such an item is the "Portalign Precision Drill Guide", available from Portalign Tool Corp., P.O. Box A-80547, San Diego, CA 92138. This drill guide attaches to most 1/4 and 3/8 inch portable electric drills, and enables you to do accurate drilling at 90 degrees or any other preset angle. A depth stop is incorporated for drilling to any desired depth.

You can drill dead center through round stock, do hand-routing or sanding with drum sanders, available in many sizes and grits. In all, it should come in handy for many jobs other than those directly involved in model building.

Included with your Portalign is an instruction booklet, explaining normal recommended uses. Included are some basic safety rules which are always good to re-read. Drop them a line for more information, including local availability and pricing; tell them MB suggested it.

Have you bought any balsa lately? Ouch! But don't blame Sig, Midwest, Testors or any other balsa manufacturer... or even your hobby dealer. It is a problem that starts

with the seed, though we all have to live with it. However, one way to cut the cost is to buy sheets, and cut your own strips.

And to make that job easier, Saflex Corporation has just introduced its Precision Balsa Wood Slitter, featuring all-metal construction, self-aligning guide, material hold down, and easily replaceable 'injector' blade. It will work on sheets from 1/64 to 1/4 inch thick, to produce squares in those dimensions as well as strips up to 1/4 inch wide.

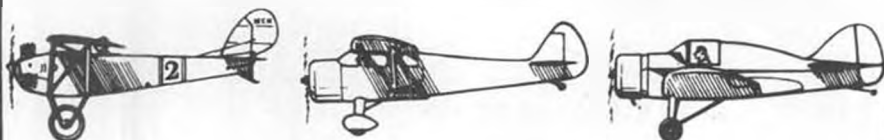
This precision tool is priced at \$19.95, plus \$1.00 postage, from Saflex Corporation, 43 Erna Ave., Milford, CT 06460.

R/C Nats Continued from page 15

Saturday. Following the last of the finals on Saturday, came the final heats in Formula 1 Pylon, which Jim Gager will cover later. At 5 p.m. Saturday, R/C Scale got its turn at last. . .

About that weather. In typical California style, each day was a carbon copy of the other, though we must say that the Riverside area threw in a few extras. The mornings were fairly cool, and almost dead calm. The bone-dry heat would continue to build until about 10:30 to 11:00

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a.m., when it was downright hot! Then, at 11:00 a.m., and you could almost set your watch by it, a breeze would start. By that time, everyone was happy that it arrived, as it would keep the air moving, and if you stepped into the shade, you could cool off and your perspiration would dry up completely. However, the breeze increased in volume until empty refreshment cans would take off down the apron like noisy jack-rabbits, fly tents would flutter, then flap, then rip up the stays, and throw poles at airplanes. Ya know when it

reached its peak? Right! At 5:00 p.m. when Scale was scheduled!

As Scale flight points are based on the best single flight, several of the Scale fliers chose to pass the first round on Saturday evening.

A total of 58 models was entered, which, based on the shortage in other events (except R/C sailplanes) compared favorably with last year (slightly more than at Dayton). Of the total, 10 were Precision (whoops, AMA) Scale, and the rest were Sport Scale. Considering that this was an FAI Team Selection year, the AMA Scale entry should have been larger. As in the Masters team selection, the team turned out to be a repeat of last time . . . Bob Wischer (Piel 'Beryl'), Steve Sauger (Fairchild 24R), and Bob Underwood (Wittman 'Bonzo').

In fourth place, Dave Platt was out with a new "old" SBD-3, not quite up to his famous museum piece of a few years ago, but still, very much in contention for a place on the FAI team.

George Rose was in fifth place, with everyone's favorite classic era model, the Curtiss Hawk P-6E. He won a special award from the Air Force for the best Army or Air Force scale model.

In Sport Scale, Bob Underwood, first president of the newly formed Scale Association, was first with his Russian Illyushin 102. In second was Scale Squadron member Don Lien and his FW-190, fresh from a first place win at the Morgan Hill World War II Scramble. To take nothing away from the quality of the aircraft, Don's smooth flying has a great deal to do with his success.

Don Srull journeyed from the East Coast to place third in Sport Scale with his interesting twin-engined Dornier 23. A very unusual aircraft.

Kent Walters, who placed fourth, certainly put on the most thrilling flight spectacle with his SBD-3 "Dauntless". Climbing until the ship was a spec in the sky, he would open up all dive flaps, point the nose straight down, then hold that attitude until everyone was ready to run for cover. At the last possible moment, he would release the bomb and pull out, with very few feet to spare. Unfortunately. . . .

In the last round, Kent waited just a fraction of a second too long to pull out. This, plus the fact that by now, the wind had come up, and probably kept the stab from rotating as quickly. . . . The "Speedy" hit full bore, at about a 45 degree angle, and disintegrated itself on the concrete runway. One thing can be said . . . if it was spectacular in flight, it was *sensational* going out!

We were especially pleased about the fifth place winner, because we had "bought" the model as a construction article before the end of the contest. The aircraft is a 1.8 scale P-38, designed and built by Art Johnson, a retired Air Force Colonel from Del Ray Beach, Florida. The big airplane particularly appealed to us because it is completely built up from balsa and ply . . . no glass or foam, which means that all materials can be purchased from your local hobby shop. Although large, with a 94 inch wingspan, the ship only weighs 10 pounds, and with Art piloting, looks *and sounds* like the real thing as it pours along at scale speed. Very impressive.

There were many other scale aircraft that didn't place, but were very interesting to view statically, and observe in flight, and we wish there was room to describe each one of them. Hopefully, the photos that accompany this report will help to convey the excitement of being present at this most interesting of all R/C events.

More next month. . .

Workbench . . . Continued from page 6

equipped with two official time-keepers (different for each round).

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INDEX TO ADVERTISERS

Ace R/C, Inc.	71
Applied Design Corp.	79
Astro Flight Inc.	86
Cal Aero-Model.	68
Cannon Electronics	76
Carr Sails	98
Century 21	91
Classic Era Model Plans	68
Cloudbuster Venture	67
Cox Hobbies	3rd Cover
Jim Crockett Replicas	68
Crump & Associates	99
Davis Diesel Development	88
D & R Products	90
Du-Bro Products	75
FAI Model Supply	76
Flight Systems Inc.	88
Flying Scale Models	92
Flyline Models	93
Fox Manufacturing Co.	74
G & M Models	97
Carl Goldberg Models.	5th Cover
Fred Hall.	76
Hilbig Industries	101
Howard B. Huebl	77
Hobbyoxy Products	73
HRE, Inc.	96
International Marine Exchange	72
K & B Mfg. Co.	2
Kraft Systems.	4th Cover
Kustom Kraftmanship	82
Larry's Hobby Supply	81
David Mainwaring	99
Majestic Models.	82
Micro-X Products.	100
Midwest Model Supply	81, 93
Millcott Corp.	77
Model Builder Binders	80
Model Builder Products 69, 78, 6th Cover	
Model Engineering of Norwalk	97
Model Rectifier Corp. (MRC) Cover 2 and 8	
Model Ships Inc.	83
Walt Mooney Peanuts	102
Sid Morgan Vintage Plans.	102
National Camera	67
Dennis O. Norman	77
Pacer Industries.	70
PAS-M-Co.	90
John Pond O.T. Plans Service.	91
Probar Design.	98
Proctor Enterprises.	67
R/N Models	102
Satellite City	101
Sig Manufacturing Co.	1
Smith Plans.	67
Sterling Models	84, 85
Su-Pr-Line	87
Testor Corporation	7th Cover
Top-Flite Models Inc.	89
Tyro Model & Supply.	79
VL Products.	82
Vortex Model Engineering	3, 99
Wardcraft Marine.	100
Peter Westburg	94
Windspiel Models	80
Williams Brothers	95

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Power and Wakefield will be in different groups from Nordic fliers. Groups will rotate to a different pole each round.

There will be 10 rounds of competition ... five each day ... with fly-offs starting at 1400 on Sunday. Entry fee is \$17, which includes Saturday night dinner.

Contact Roger Simpson, 2625 Queenwood Drive, Rancho Cordova, CA 95670, for further information. HOW TO WIN

Most modelers who enter competition, do so for the pleasure of competition, but also, once in a while, enjoy coming out on top. L.F. Randolph, editor of the Dallas R/C Club newsletter, recently decided to take

up racing. The results of his efforts seemed well worth passing on. Perhaps there is something here that could help you.

"With the announcement of a 1/2A Pylon race for August 14th, I decided this would be a good time to get my feet wet in the racing game. The first step was to choose an aircraft that would be competitive, and this turned out to be the Yellojacket, which appeared in the September issue of MAN. Yellojacket was completed in about three days, and that left four days for testing and getting acquainted before the contest. With the help of Matt Smith and his hot fuel, and Buddy Irwin with his advice, I had a competitive airplane.

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"The morning of the contest was great; a light breeze from the south to cool things, and a few light clouds to decorate the sky. I arrived at the field at 7:20 and was greeted by Willie Weise, who directed me to the parking lot by the strip. Randy Kent was busy putting up the pylons and the PA system, so I took the opportunity for one more test flight, which proved the need of a little more left trim in the aileron. This was followed by one more test flight and I was ready.

"The first heat I won hands down . . . by at least 3 laps over the competition, and this put me in the race for sure and gave me the confidence that I needed. I knew I could win and I was determined to do so. The

next heat was even better, the Yellow-jacket was really grooving and I was getting the timing down for the turns. This was my first race ever and it takes a little time to get the feel of the race course. I won this heat by 4 laps. . . .

"The rest of the contest was all down hill, and to shorten the description and blow-by-blow, I won all three places in the very first pylon race that I ever entered. This short article is to give help and encouragement to newcomers who might like to get into this most exciting form of competition. I will list my procedures in numerical order, and if they are followed to the letter, I will guarantee you will have the same kind of results that I did.

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7. Be the only contestant at the contest." ●



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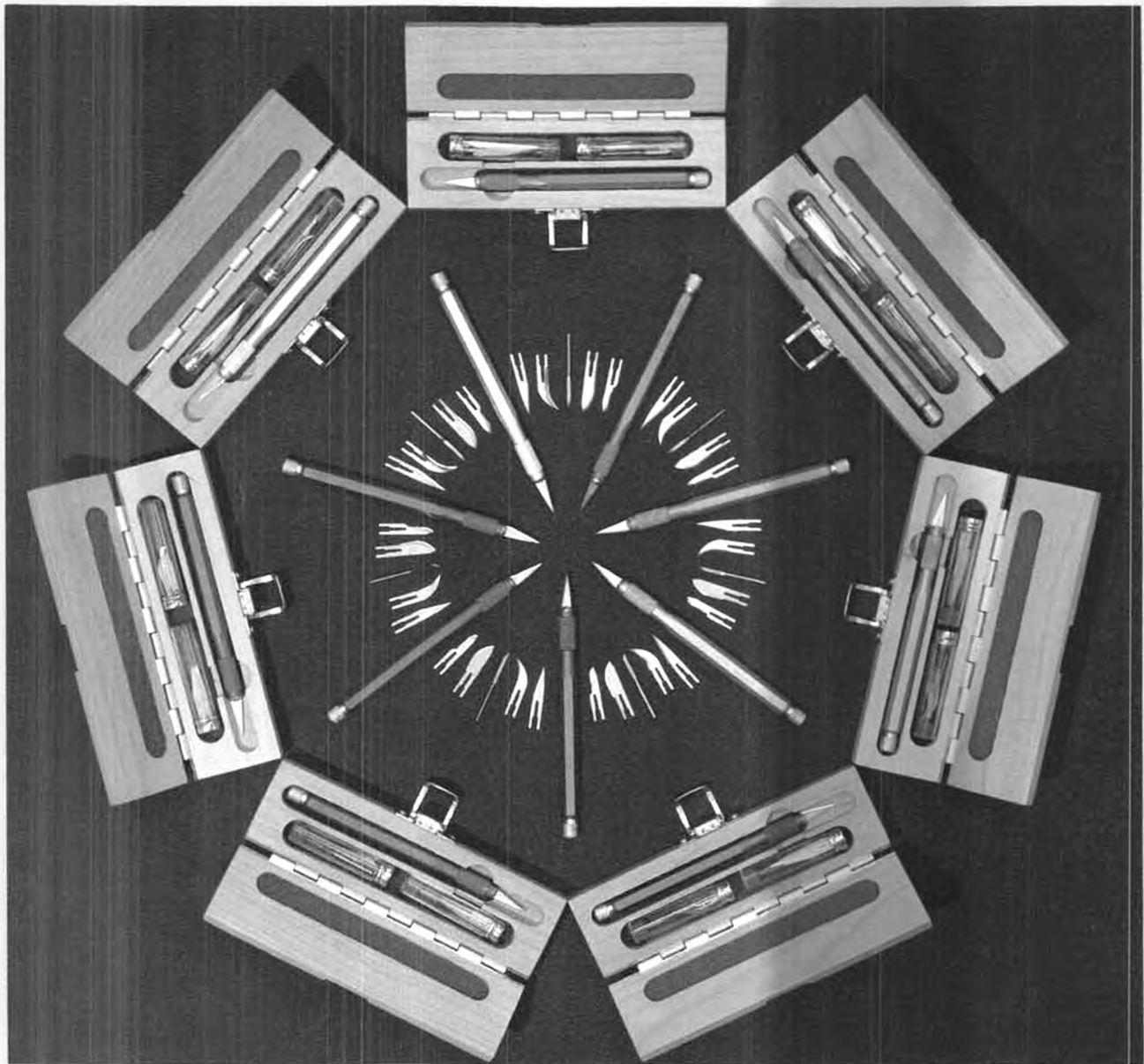
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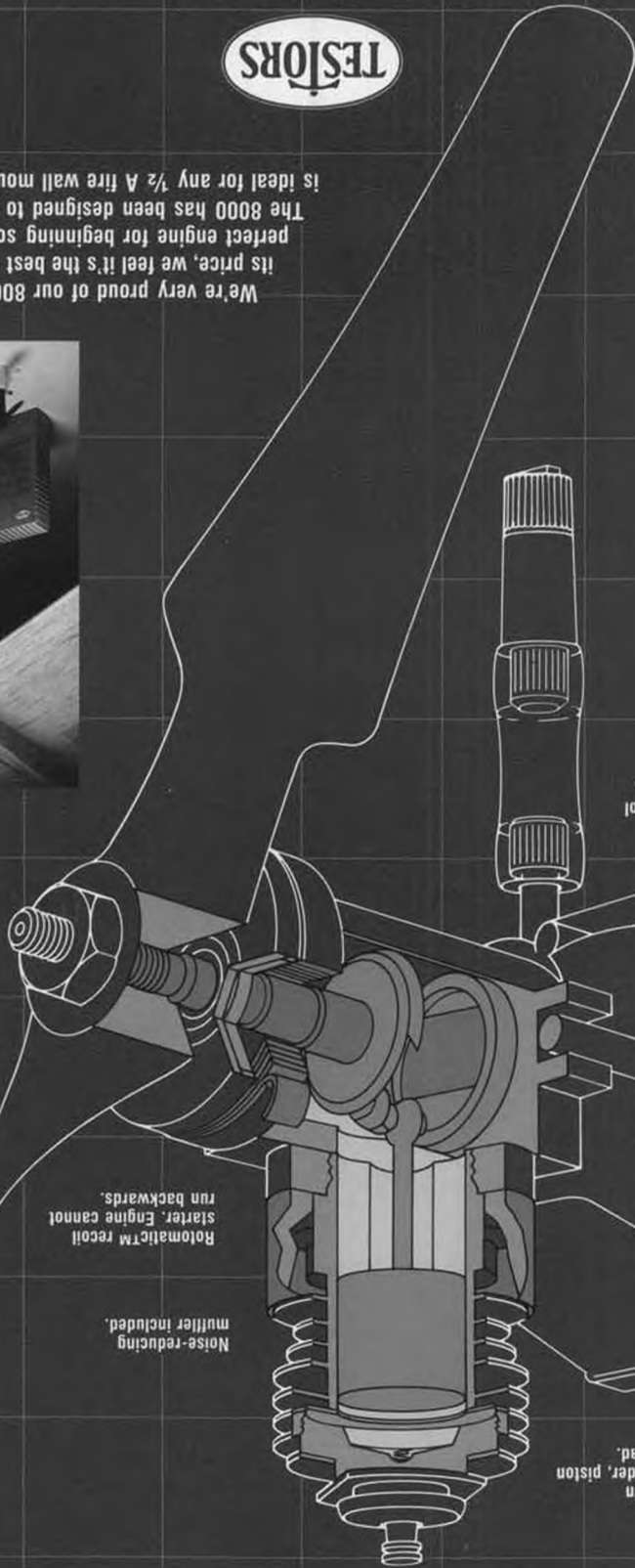


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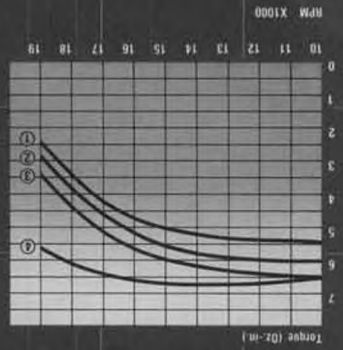
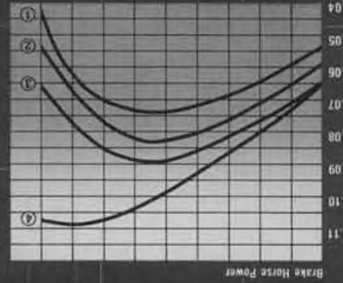
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