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FEBRUARY 1990

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volume 20, number 216

1989 Aerolympics
J.P.O. Fan Fly
Pylon World Champs
P.A.W. Diesel Story

BUILD:

Sparrow Hawk
Astro Porterfield Floats
Nelder's '38 Moffet Winner
Peanut Sablatnig KE 1

02
74820 08545 5

Aero Tiger Specifications:
#25000 Basic
#25100 Deluxe
Wingspan: 49½"
Wing area: 396 in.
Length: 31½"
Flying Weight: 38-44 oz.
Motor: .05 Direct Drive

Aero Sprint
Specifications:
#25500 A.R.F.
Wingspan: 50"
Wing Area: 450 sq. in.
Length: 36¾"
Flying Weight: 40-46 oz.

Pair Of Aces

AERO TIGER

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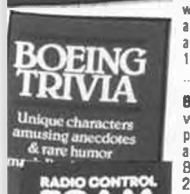

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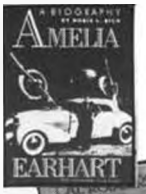

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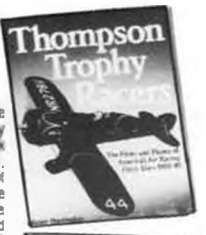

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FEBRUARY 1990

volume 20, number 216

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CONTENTS

FEATURES

WORKBENCH, *Bill Northrop* 6
DEAR JAKE 7
OVER THE COUNTER 8
BIG BIRDS, *Al Alman* 10
CHOPPER CHATTER, *James Wang* 12
ELECTRIC POWER, *Mitch Poling* 14
THE 1989 AEROLYMPICS, *Art Schroeder* 20
R/C SOARING, *Bill Forrey* 23
JET TRAILS AT J.P.O. FAN FLY, *Al Tuttle* 28
ELECTRONICS CORNER, *Eloy Marez* 30
PLUG SPARKS, *John Pond* 32
PYLON WORLD CHAMPS, *Dave Shadel* 40
MODEL DESIGN AND TECHNICAL STUFF, *Francis Reynolds* 42
ALL ABOUT ARFS, *Art Steinberg* 44
HISTORY OF P.A.W. DIESELS, *Andrew Nahum* 46
HANNAN'S HANGAR, *Bill Hannan* 48
FREE FLIGHT, *Bob Stalick* 50
CONTROL LINE, *John Thompson* 56

CONSTRUCTION

SPARROW HAWK, *Ernie Heyworth* 16
FLOATS FOR THE ASTRO PORTERFIELD, *Bob Benjamin* 26
NELDER'S 1938 MOFFETT WINNER O/T 38
PEANUT SABLATNIG KE 1 (2-FOR-1), *Walt Mooney* 53

COVER: Bob Violett's F-86, from his own kit, at rest on the apron at Deland, Florida, site of the first Fan Fly gathering of the J.P.O., Jet Pilots Organization, August 26 and 27, 1989. Model was judged best in static scale, and most realistic in flight.

Also present at the first J.P.O. Fan Fly was David Escobar, of Sarasota, Florida, with his scratch-built Boeing 767. It has a wingspan and length of 10 feet, weighs 29 pounds, and is powered by two Dynamax fan units driven by O.S. 77 engines. Uses Airtronics "Spectra" radio. Flights are very realistic. Photos by Al Tuttle.

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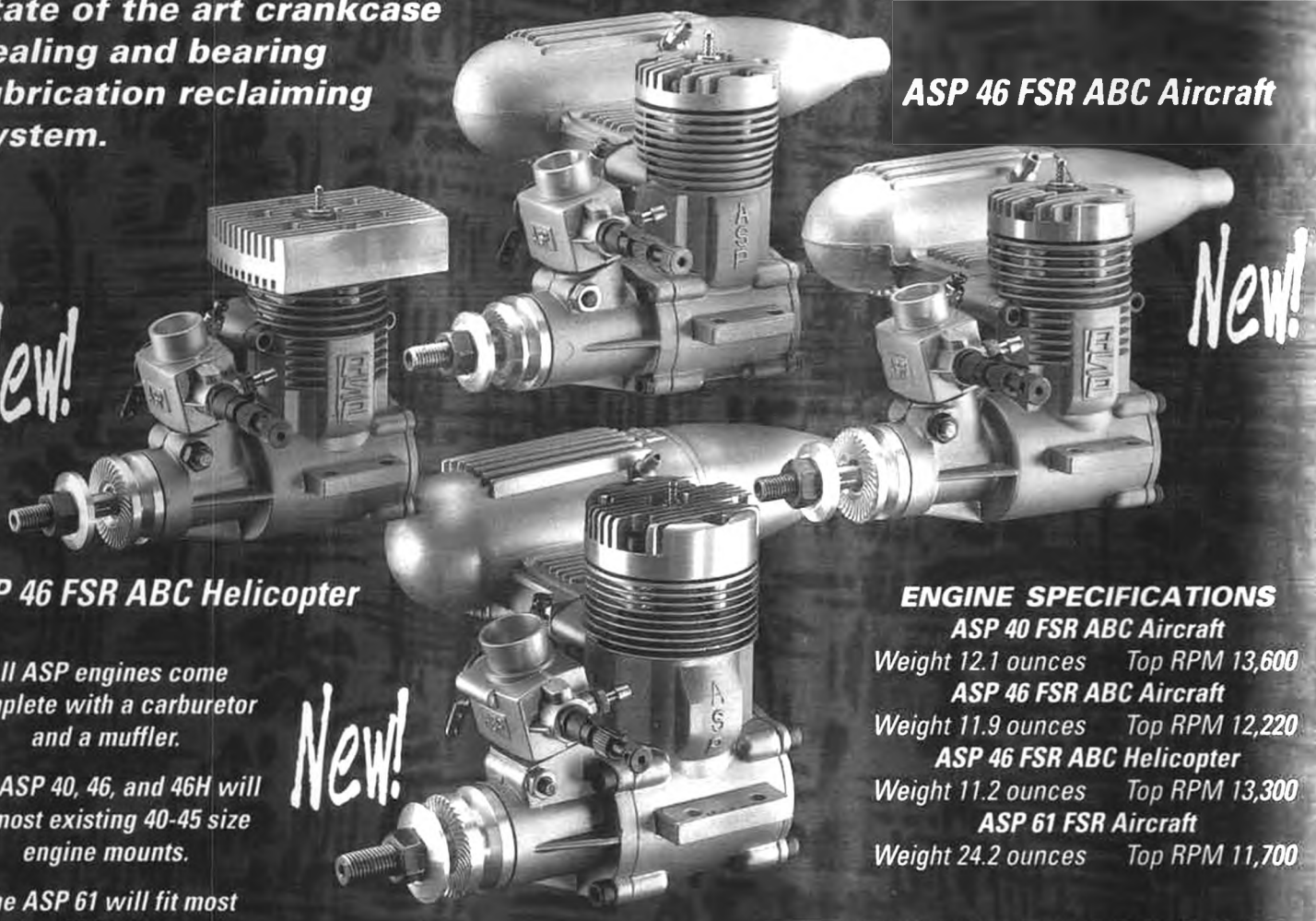

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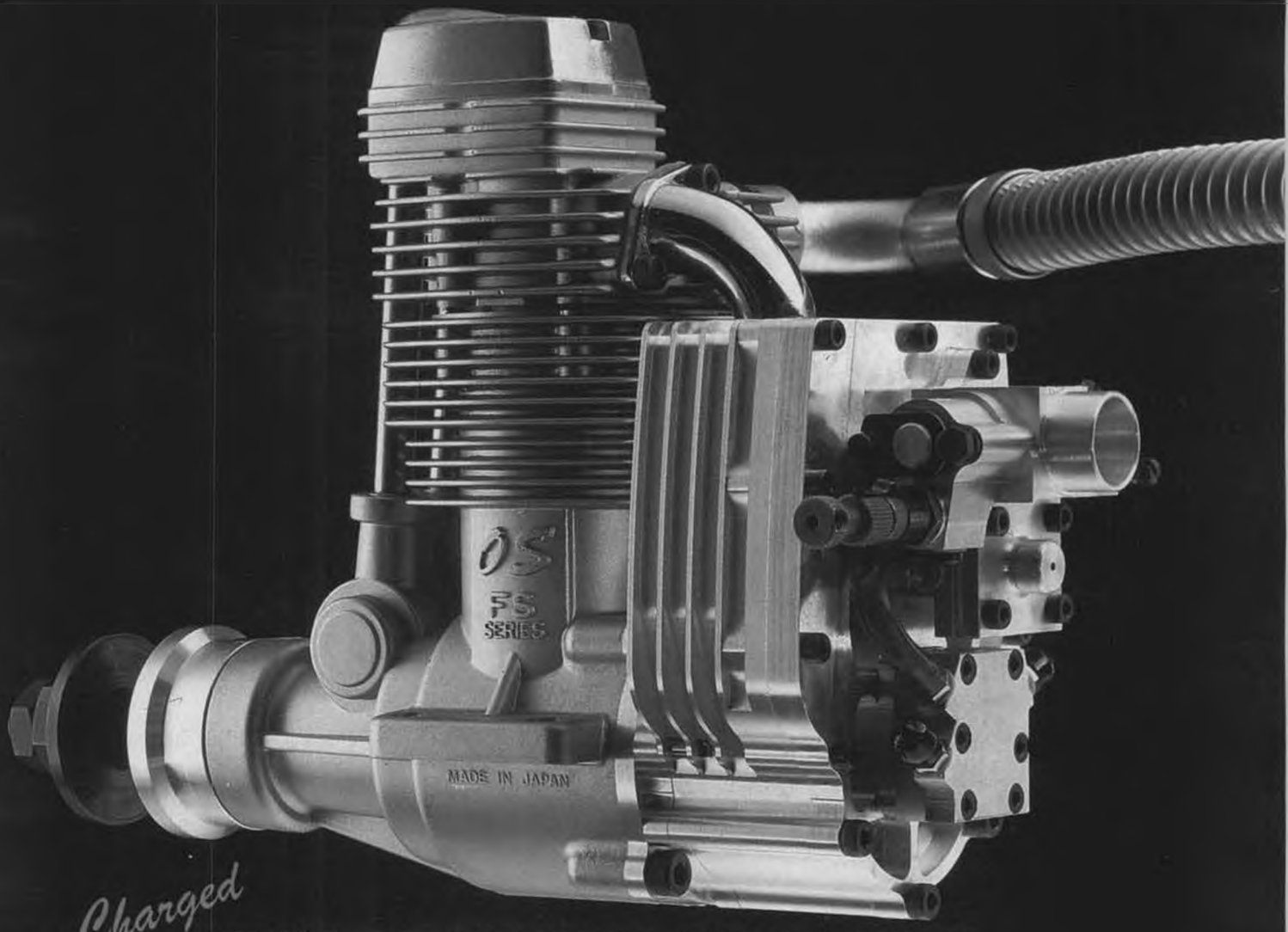

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from Bill Northrop's workbench

It had to happen sooner or later, folks: rubber-powered O.T. R/C! Luigi Michell, of Viareggio, Italy, sent this photo of his Gordon Light 1932 Wakefield Winner equipped with a tiny Futaba receiver and a single S-33 servo controling a small rudder tab. Neat! Looks like just the thing for inner-city flying at the local park. Could this become the next "new" O.T. R/C event?

• Official word is out that the Tenth International Tournament of Champions for radio controlled aerobatics will be hosted by Circus Circus Hotel/Casino in Las Vegas, Nevada, November 8-11, 1990.

In the past, the TOC competition flying took place at the R/C Model Airfield in North Las Vegas Regional Park. Circus Circus was instrumental in the original construction financing and ongoing improvement of this facility, but the site is currently being developed for other uses, and a new location is planned, hopefully in time for the 1990 TOC.

According to William G. "Bill" Bennett, chairman of the board of Circus Circus Enterprises Inc., an R/Cer himself, and founder of the TOC, "If we can't stage the tournament at this new location, I have two alternate sites under consideration. One is under my complete control, so I can assure fans and participants that the Tournament of Champions will definitely take place on the dates originally announced."

Total purse for the 1990 competition is $126,500. Inaugurated in 1974 by Bill Bennett, the TOCs have awarded close to half a million dollars in total prize money since their inception, making them the richest events in the history of aeromodeling.

Innovations established by the Las Vegas contest have significantly influenced the sport. With each successive event, the TOC has adopted rules which have brought miniature aircraft competition closer to its full scale counterpart, and in 1990, full-scale aerobatic contest rules will be followed as closely as possible.

The strictly invitational contest is limited to 20 contestants, 10 from the United States and 10 from other nations. Five U.S. contestants were invited based on their individual combined placement in both the 1989 U.S.A. National Masters Radio Control Pattern Event and the 1989 U.S.A. F3A team selection finals. Five international contestants were invited according to their placement in the 1989 F.A.I. Radio Control Aerobatic World Championships. The remaining contestants and alternates were invited at the discretion of the contest management.

Each contestant must fly Known Compulsory, Free, Unknown Compulsory, and Three Minute Free programs. Aircraft must be replicas of actual full-size planes designed for aerobatic competition, although military primary trainers are also acceptable. A special prize of $3,500 cash is awarded to the model judged the best in scale finish, markings, and workmanship among those actually flown in at least three rounds of competition.

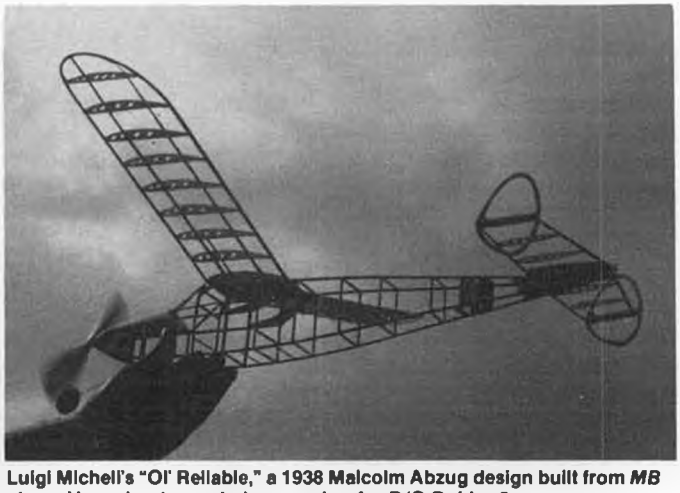
The Contest Director for 1990 will again be aeromodeler, former R/C Aerobatic World Champion, and former R/C systems manufacturer, Phil Kraft. Jim "Doc" Edwards, dentist from New Albany, Mississippi, will also repeat as chief aerobatics judge.

WHAT SIZE FLOATS?

We've been searching for a set of floats, or plans for same, to use on a "one of these days" project, on which the floats should be, according to the 75% of overall fuselage length rule, about 42 inches long. This length seems to fall in between the lengths of all kit and ready-built floats we have come across. For 60-size aircraft, 35 to 38-inch floats are available, and from there they seem to jump up to 48 inches and over for the giant-type models.

Noting the nice set of plans that Bob Benjamin drew up for the floats he built to

The radio installation in Luigi's rubber ship. Futaba servo shown was later replaced with an even lighter Cannon Micro. Rudder control via cables.



Luigi Michell's "Ol' Reliable," a 1938 Malcolm Abzug design built from *MB* plans. How about a scaled-up version for R/C Rubber?

use with the Astro Flight electric-powered Porterfield Collegiate (reviewed in the Oct. '89 issue) and published in this issue, we are going to seize the opportunity and have the plans blown up for the 42-inch length we're looking for. In case anyone else would like to build their own floats, and are interested in having these plans in some other size, let us know. If we receive enough requests, we'll pick out the most desired sizes and offer enlarged or shrunk plans to suite. Aside from being on your own for material sizes, at least you'd have properly sized bulkheads and keel forms.

HERE WE GO AGAIN

Sometime back in 1988 we had the audacity to suggest the use of R/C for the sole purpose of retrieving a free flight model. By strange coincidence, many of the dissenters lived in areas accessible to adequate open space for flying free flight, a rare commodity in this age of rapidly expanding housing and industrial development. On the other hand, many agreed that it came down to a simple matter of two choices; use R/C recovery or discontinue the hobby of outdoor free flight!

In discussions with various modelers about the ways and means of using R/C for model recovery, the subject has dealt almost entirely with gas models of all sizes. Any mention of rubber or glider resulted in the conclusion that it was darn near impossible, and would take special equipment either not available or difficult for the average modeler to create. Fritz Mueller showed us that it's not impossible, with

Continued on page 105

ADVICE FOR THE PROPWORN

—By Jake

Dear Jake:

Three kids came to my house this Halloween in Dear Jake costumes. Scared a fur ball right out of my cat! Are you making money off costume sales now?

Harve in Hopewell, NY

Dear Harve:

Two kids came to your house in Jake costumes. The other one was me. I think your cat knew. Thanks for the Milk Duds.

Jake

* * *

Dear Jake:

Aviation trade journals are always talking about measuring the "agility" of fighter aircraft. Everybody sort of knows what agility is, especially if you think in terms of an athlete. But what does agility mean for an airplane, and how do you measure it? Does it have something to do with how fast your plane can turn?

Virgil in Vermont

Dear Virgil:

Agility is a tough term for the aviation industry to define. It has to do with the nimbleness of an aircraft in a combat situation, but it covers much more than just turning capability. Agility parameters address turning (flat and banked), acceleration, deceleration, pointing the fuselage without changing the direction of flight, and an aircraft's ability to turn and run after launching a weapon, just to name a few. Measurements are usually of time, such as time to turn 90 degrees, time to pull from 1g to 6g's, and time to go from 600 knots to 95 knots.

There are as many definitions of agility as there are people talking about it. Perhaps the most illuminating definition was that offered by Dr. Martin Brinkwell of the McDonnell Douglas Aircraft Company. Dr. Brinkwell put it in terms we can all relate to when he said, "Agility is when you hop off a bus, then realize in midair that you are going to land in a doggy muffin. If you have agility, you'll be able to sell your shoes before you land."

Jake

* * *

Dear Jake:

I read in Scientific American *that anthropologists from Berkeley have been looking for signs of intelligent life under your hat. My guess is they haven't found any yet.*

Frank in Redondo Beach

Dear Frank:

Findings so far are that my hat was apparently manufactured by intelligent beings, but that no classification as to the life form of the hat's present owner is currently possible.

Jake

* * *

Dear Jake:

How is a monocoque structure different from a braced truss structure?

Would Be Engineer in Wausaw

Dear Would Be Engineer:

The monocoque uses only one rooster.

Jake

* * *

Dear Jake:

Is it true that Thomas Jefferson was our country's first model airplane hobbyist?

Nicholas in Spartanburg

Dear Nicholas:

Almost. There were no airplanes in Jefferson's era, so there weren't any model airplanes either. But as an inventor in his own right (did you know that Jefferson invented the dumb waiter? Well, actually he invented a left handed wine steward named Leonard), Jefferson was an ardent follower of the Montgolfier brothers' hot air balloon experiments in France. In 1799, he actually accompanied the Montgolfier brothers on an aerostat flight over the French capitol. It was during this ascent that he distinguished himself as the first statesman to throw up on a government building from an altitude of more than 100 feet. Upon his return to the United States, Jefferson set up a small side business at Monticello to sell model hot air balloons and propeller beanies, and thereby established himself as one of America's earliest aviation enthusiasts.

Jake

* * *

Dear Jake:

How many aeronautical engineers does it take to change an analytical reference system?

Wise Guy in Wapakoneta

Dear Wise Guy:

Four. One to hold the airplane, and three to rotate the axes.

Jake

* * *

Dear Jake:

If there are dinosaurs living in Central Africa, how come nobody's ever photographed one? It seems to me that since the airplane and the helicopter have made even the remotest corner of the world accessible, that it should be real easy to fly out and get a picture of one of those dinosaurs in an airplane or a helicopter. Pretty solid proof that they don't exist, don't you think?

Scoffer in Scarborough

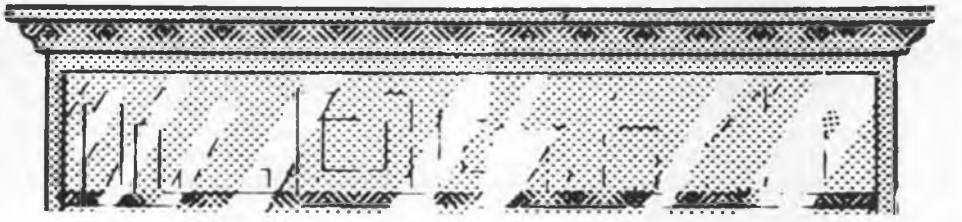
Dear Scoffer:

I don't believe there are any helicopters that a dinosaur would fit in. There are some very large cargo airplanes that could probably hold a dinosaur, but the odds of finding a Brontosaurus in a C-5 are very slim. So I guess I'm not at all surprised that no one has ever taken a picture of a dinosaur in a helicopter or an airplane.

Jake •

OVER THE COUNTER

All material published in "Over the Counter" is quoted or paraphrased from press releases, furnished by the manufacturers and/or their advertising agencies, unless otherwise specified. The review and/or description of any product by MB does not constitute an endorsement of that product, nor any assurance as to its safety or performance by MB.



• Byron Originals has finally announced the release of their long-awaited 1/4-scale Ryan ST-A—and the result looks to be well worth the wait. According to Ken Bundt, who oversaw the Ryan project at Byron, "The Ryan is one of the greatest flying models we have ever introduced. Overall performance is fantastic; it is very docile, possesses tremendous aerobatic prowess and provides enough ease of handling to make its pilot want to stay up all day long. Full flap landings are slow and very predictable."

Byron's Ryan ST-A kit is exceptionally complete, requiring the builder to supply only the engine, radio, glue, and choice of finish. *Everything* else is provided, right down to the last nut and bolt. Construction follows typical Byron practice, i.e., molded fiberglass fuselage, cowl and wheel pants with all panel lines included; molded polystyrene foam wings and tail surfaces (the wings are of plug-in design for ease of transport and storage); Byron's proven and functional landing gear oleo struts; *complete* hardware package, and so forth. We don't have room here to list all of the kit features, but if you're interested and want to find out more, contact Byron Originals direct at P.O. Box 279, Ida Grove, Iowa 51445, or call (712)364-3165. The Ryan kits are available now, either from your favorite hobby dealer or direct from the factory for $439.95 plus $10.00 shipping.

* * *

Enya is coming out with a couple of real brutes in the form of the new 80XF and 80XF-H (helicopter) engines. Both are side exhaust, have ringed aluminum pistons running in steel liners, feature the GM-10S carb which is adjustable in high, mid and low end throttle speeds, and perhaps best of all, both engines have the same mounting bolt dimensions and exhaust port size as the popular Enya 60XF engines, making the new 80s a drop-in replacement for those looking for even more power. Both versions of the new 80 are rated at a full 2.0 horsepower at 16,000 rpm.

No word on the prices, but you can get this and other technical information from Altech Marketing, P.O. Box 391, Edison, New Jersey 08818-0391.

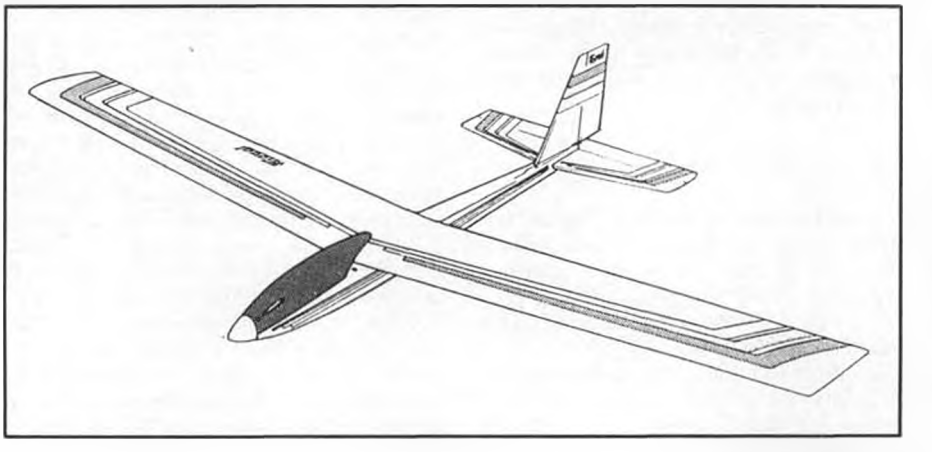
* * *

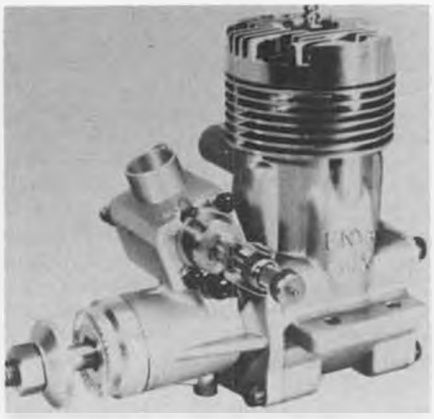
Royal Products has three new additions to the Royal-Air series of ARF model aircraft, and interestingly, all three share the same basic design. "Easysoar" is a simple V-dihedral, two-channel glider intended for light duty high-start use or for light-wind slope soaring; it retails for $109.95. "Powersoar" is the same model but with provision for an .049 to .10 gas engine to be mounted in the nose, making a lightweight motorglider; this one also goes for $109.95. "Electrosoar" is an electric powered version of the Easysoar and comes complete with motor, folding prop, spinner, and wiring harness; it sells for $124.95. For the Electrosoar, a third servo is strongly recommended for on-off motor control.

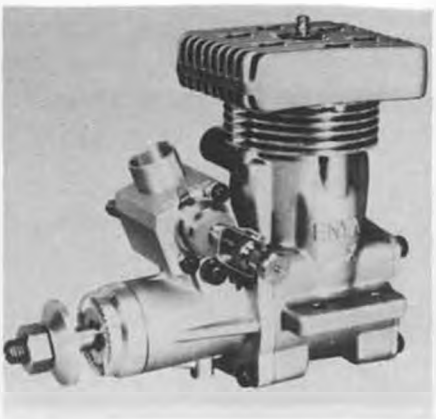
The latest title from Zenith Aviation Books.

Left: Byron Originals' new 1/4-scale Ryan ST-A.

Below: The "Easysoar" ARF R/C glider from Royal Products, also available in gas and electric motorglider versions.







Enya's new 80XF (left) and 80XF-H engines, imported by Altech Marketing.

All three models share the same specs: 66-1/2 inch span, 495 square inches of wing area, and an overall length of 40-1/4 inches. All employ a traditional balsa/ply framework pre-covered with a colorful polyester film, and a basic hardware package is supplied with each.

From Royal Products Corp., 790 W. Tennessee Ave., Denver, Colorado 80223-2875.

* * *

The new Supertigre X-61 imported by Great Planes Model Distributors is intended especially for competition Pattern flying. The engine makes use of a unique porting design called TST Schnuerle porting, which results in an even greater output than the earlier S-61: 2.2 bhp at 18,500 rpm are the quoted figures. The X-61 weighs in at 17.7 ounces, is of rear exhaust design, and features Supertigre's familiar ultra-high cylinder head fins for improved cooling.

To be sure, the X-61 is a massive powerplant, but its physical size pales in comparison to the new Supertigre G4500, the latest and by far the biggest addition to the S-2000 and S-3000 series, which have already proven themselves as some of the most popular large two-stroke glow engines available. The G4500 pumps out a whopping 4.5 horsepower at 8,000 rpm, and at a weight of just over three pounds, it has about the best power-to-weight ratio of any large glow engine produced.

The last of the new engines from Great Planes is the O.S. 91 VR-DF ABC, the biggest and most powerful ducted fan engine produced by that company. The rated figures of 4.6 bhp at 22,000 rpm represent an almost 20% increase over the O.S. 77 VR-DF, providing a real kick in the tailcone for high-performance ducted fan aircraft. The heat sink head shown in the photo is standard, but O.S. also produces a small head for tight installations.

All from Great Planes Model Distributors, P.O. Box 4021, Champaign, Illinois 61820.

* * *

Born Again—Spitfire PS 915 is the title of the latest offering from Zenith Aviation Books. Written by Wally Rouse, this is a special edition of the Warbirds Worldwide series imported from England, and deals with the history and recent restoration of a Mk. XIX photo reconnaissance Spitfire, PS 915, originally built in March, 1945. As with the other Warbird Worldwide periodicals the black-and-white and color photography are absolutely first rate, second to none. *Born Again* comprises 48 pages in an 8-1/2x11-inch format, contains 140 photos, and is priced at $9.95 from Zenith Aviation Books, P.O. Box 2, 729 Prospect Ave., Osceola, Wisconsin 54020.

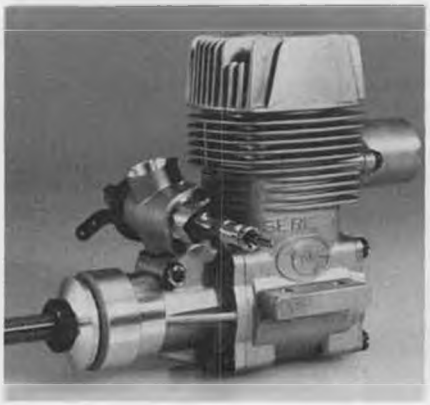
* * *

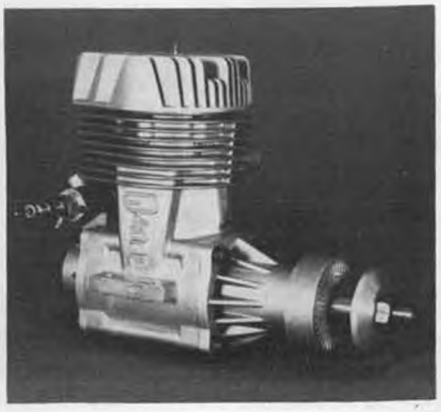
Latest word from Great Planes Model Manufacturing is that they are now producing kits for the Ultra Sport 40, billed as the "ultimate sport plane." As the photo shows, the model is of clean, contemporary sport/pattern design with a deep fuselage profile for good knife-edge flying. Span is 55 inches, wing area 566 square inches, and the engine requirements are a .40-.45 two-stroke or .60-.70 four-stroke. The airplane is also a good candidate for retracts, which

Continued on page 105

The Ultra Sport 40 from Great Planes Model Manufacturing.

The 1/4-scale DG-202 sailplane offered by Scale Glider Components.





Three new powerplants from Great Planes, from left: the Supertigre X-61, Supertigre G4500, and O.S. 91 VR-DF ABC.

BIG BIRDS

By AL ALMAN

AIRCRAFT ART

Remember the cartoon art work that decorated the noses on so many WWII aircraft? These original creations, replete with ribald slogans, ranged from feisty mice to bare-breasted bimbos and gave each plane its own distinct personality.

Well, Coverite (420 Babylon Road, Horsham, Pennsylvania 19044) picked up on this and now have 15 miniature WWII nose-art decals available.

And even though these stickers were designed with 40 to 60-sized airplanes in mind (they're 4" in diameter), and could also be used on some of our (smaller) Big Birds.

One of the 15 WWII-type nose art decals being produced by Coverite. Info in text.

Would you like to have all 15 decals available in Quarter-Scale size? Then let Coverite know that we're a viable part of the market. Enough letters and calls should get them grinding out the decals in our size, also.

By the way, the 4-inchers are retailing for $2.50, which ain't a bad banana. I'd expect a larger size to also be decently priced.

MOKI

About six or seven years ago there were a number of Hungarian-made Mokis being used around the country. I knew some of the guys who had them and they were all very happy with their engines. After having a chance to "play with" a Moki-powered Pitts I could see why the engine was held in such high esteem.

It's a quality piece of machinery and sports a mighty fine power-to-weight ratio on glow. This heavy free-breather has a 1.5 cubic inch displacement and weighs only 2.5 pounds.

Bob Davis (Davis Diesel Development, P.O. Box 141, Milford, Connecticut 06460) will be importing the Mokis and should have some in stock by the early part of 1990.

And you won't have to worry about being stuck with an orphan because parts and service will be available from Davis.

SETTING UP A SHOP

I've just about finished setting up my new workshop. Following the good advice of many cohorts, considerable time and effort went into insulating both the walls and roof in addition to carefully planning for lots of light. Of course I also made sure there'd be plenty of plug-in receptacles and a generous-sized workbench.

And although I sorta do lean toward the belief that a clean workbench is the sign of a sick mind, I've come to realize that regardless of size, a reasonably neat and clean work area is essential. I can't begin to count the times I've not started nor finished projects because my workbench and surrounding area were so terribly messed up that I had no place to work.

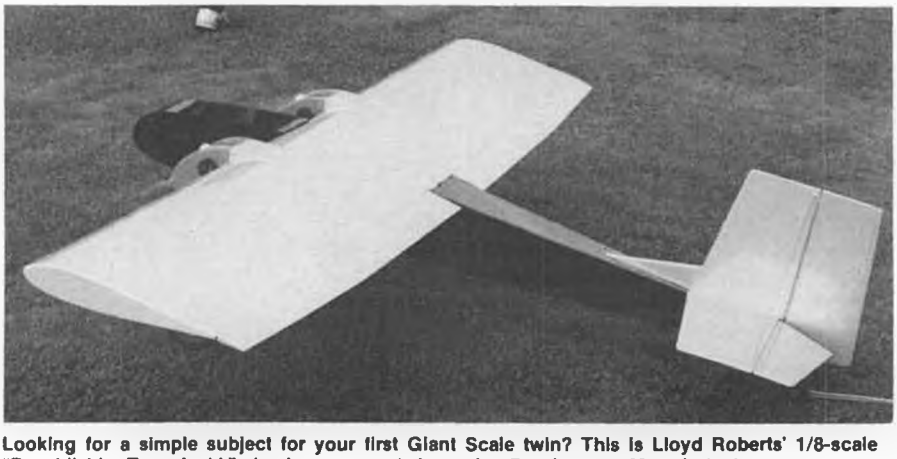
Since so many folks have housewarming parties, I figure on hosting a shop-warming party early next year. Of course I don't expect guests to bring any food or the kind of knickknacks suitable for display in a house, but an assortment of power tools would be a nice gesture.

Ed Zemaitis has completed his magnificent ten-toot-span Martin PBM-5A Mariner and has performed taxi tests on both land and water, but no flights yet. Should fly beautifully at only 28 pounds.

SCALE TWIN ROADRUNNER

This from Lloyd Roberts who lives up in Camden, Maine.

"I have for your scale enthusiasts the Polish equivalent of the 'Heavyish Bomber,' the little known 'Drooblishka Troopinski' . . . a STOL troop carrier designed in the late '30s using scaled up BSA single cylinder motorcycle engines of approximately 500 hp.



Looking for a simple subject for your first Giant Scale twin? This is Lloyd Roberts' 1/8-scale "Drooblishka Troopinski," also known as a twin-engine Roadrunner. More in text.

"The model, with a seven-foot wingspan, is about 1/8 scale using two O.S. 70 Surpass 4-strokers. The designer had hopes of entering it in the world aerobatic championships, thus the symmetrical airfoil.

"The absence of markings is scale; the sole specimen prototype was destroyed early in WWII before painting was completed. The model was made from a faded photo in a 1937 copy of *Air Trends* magazine found in the attic while investigating a roof leak. The article states that flying characteristics were impeccable.

"Bill Carpenter of C.H. Electronics fame must have seen the same issue of *Air Trends* because there is more than a similarity to his giant fun design 'Roadrunner.' The model is a delightfully groovy but stable (if that's possible), machine and with 45 degrees of flaps takes off in about ten feet and is thoroughly aerobatic."

Thanks, Lloyd. Now scale buffs can have it all; a well-documented bird that makes every pilot look good. This would certainly be a great first project for anyone getting into scale.

Photos on this page were taken at the 1989 DCRC All Scale Contest in Bealeton, Virginia.
Top: Nice looking Monocoupe entered by one W. Cann.
Right: Dewey Soltow's Sopwith Pup. Dewey scaled up his own plans from ones that appeared in RCM.
Bottom: A big Morane Saulnier by an unidentified builder, being wheeled out by an equally unidentified young lad.

OSHKOSH: IMAA RALLY OF GIANTS

The IMAA (International Miniature Aircraft Association) 10th Anniversary Rally of Giants will be held at Wittman Field in Oshkosh, Wisconsin, on June 28, 29, 30 and July 1, 1990.

This is it, folks: Mecca. The place to be if you love aeroplanes. Need more specific info? We've got flyers. You can get 'em from me or write to: Event Director Jim Smith, 54575 Cornell Drive, Mishawaka, Indiana 46544.

Registration, overnight aircraft storage and exhibitors will be indoors. We're gonna have two flight lines, tractor and flatbeds to transport airplanes and trams to and from the campsites on a regular schedule.

Also, at this time (October '89) our planning includes a Float-Fly to be located about four miles from Wittman Field.

SAFETY

Any tool can be dangerous if not handled properly, although some tools are potentially more dangerous than others. Torches fall into this latter category.

Within a few days of each other two friends of mine got careless and both came mighty close to burning up the planes they were building, and possibly their workshops, too.

Both situations were similar. A framed-up fuselage was moved "safely" out of the way so the landing gear could be soldered/brazed together. Yet, in spite of the apparently "safe" distance between fuse and torch, rear longerons got charred.

Both guys were able to repair the damage to their respective airframes, but these accidents shouldn't have happened; they were avoidable.

Do your soldering in an area that's completely separate from your building board and far removed from anything that's flammable. That second or two of carelessness can cost dearly.

MARTIN MARINER

Last year I ran a photo of Ed Zemaitis' great-looking Widgeon finished in Coast Guard colors. Well, Ed's been busy again, and in his spare time managed to "throw" together this magnificent PBM-5A Martin Mariner (he actually started building this bird two years ago).

This 1/12-scale bird spans 10 feet, is powered by two Saito 80 4-strokers and

Continued on page 66

CHOPPER CHATTER

By JAMES WANG

• This month we have our 500 flights update on the GMP Legend that was reviewed in July, 1989 issue. In fact, the flybarless Legend will serve as an excellent example for continuing last month's discussion on the theory of the Bell stabilizer bar. We will explain the physics behind why and how a flybared and a flybarless helicopter handle differently. Specifically, this month we will emphasize the handling qualities of flybarless helicopters.

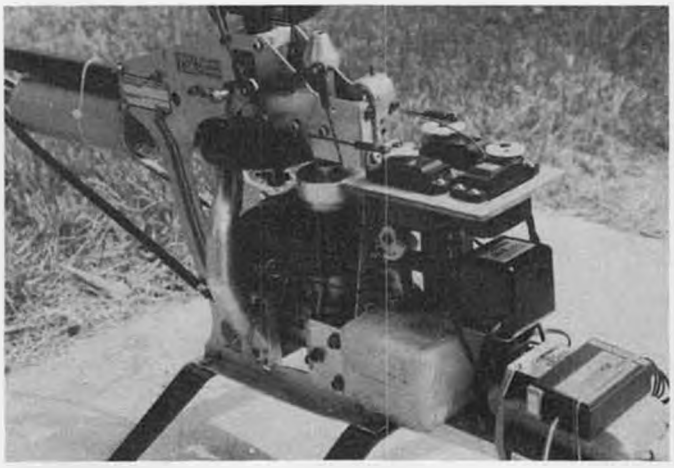
As usual, before we discuss our monthly heavy-duty topics, let's first shoot some breeze on what's happening in the R/C helicopter community. In the December '89 issue I mentioned that Ernie Huber, five times National R/C helicopter champion, retired from his job and is devoting 100% of his time to teaching R/C helicopter flying. I received a brochure of his flight school a few weeks ago. The color brochure shows there are two classes. Introductory classes are $845 per person, and intermediate classes are $995 per person. Each class starts on Sunday and ends on Friday. The prices include lodging and all meals at his 60-acre ranch near Daytona Beach, Florida. Ernie provides the helicopter of your choice to learn on. All you have to do is to show up. Each class session has only four to five students. To get a brochure and registration information, send a check for $2.00 to him at R/C Flight Training Center, P.O. Box 727, Crescent City, Florida 32112-0727.

The next thing on the agenda is that I have been using the MAS Skytach for six month now. In the August, '89 issue I showed a picture of it. It is an optical tachometer used for measuring the model helicopter's rotor rpm. The tach works on strobo-effect principle. Inside the tach there is a 2-inch diameter spinning disc. On the disk there are two holes. When the disk is spinning at the same rpm as the model rotor, then the rotor appears frozen as you look through the spinning disk. Before the Skytach was available, I built a similar unit with a potentiometer to adjust the electric motor rpm. The unit worked alright; however, the Skytach uses digital electronics instead of analog circuitry, thus it is easier to match the Skytach rpm with the model rotor rpm. At $164.95, the Skytach is not cheap, but it works extremely well. Whenever you read in my columns that such and such a model helicopter runs at X-rpm, the readings are usually based on the Skytach measurement. It's much safer than conventional model aircraft tachometer.

Our columnist does a nose-in hover with his flybarless GMP Legend—a piece of cake! James reviewed the Legend in the July '89 issue; this month it's the subject of a 500-flight update.

Recently, I tried some Hybrid Hobby Products wood rotor blades. Ray Stonge, the owner of Hybrid Hobby, designs and cuts his own blades. There are two versions, the stock version which looks identical to the original helicopter manufacturer blades, and high-performance blades which have Ray's own airfoils. His airfoils are usually thinner than the stock airfoils and are evolved from his own experimentation through trial and error. By the way, Ray does superb hot dogging with his Schluter Scout. My friend, David Ramsey, says Ray does a nice arching knife-edge flight with the Scout. Ray does not use balsa wood for the trailing edge; instead he uses Obechi for the trailing edge, and maple for the leading edge. An Obechi trailing edge is less likely to get dinged.

I have pointed out before that the reason balsa wood is commonly used is to keep the blade chordwise cg forward to prevent blade flutter. The side effect of forward chordwise cg is that the helicopter's longitudinal and lateral stability will also improve. However, the question of forward chordwise cg improves model helicopter stability by how much is always not sure. Well, Concept blades all have very forward chordwise cg, about 27%, and the little Concept seems to fly extremely well. Model helicopter blades are much stiffer in scale than real helicopter blades. Therefore, the beneficial effects of forward chordwise cg may not be all that useful to the stiff-bladed model helicopters. How-



The faster they go, the better James likes 'em. Note his original design through-the-frame exhaust header and tuned pipe, custom made for him by MACS Products to reduce profile drag and improve top speed.

Ouch! Here you see the result of pilot error. Not as bad as it looks; the landing skids and struts absorbed the majority of the impact, leaving the side frames unbent—an excellent design feature.

Jim O'Brien holding his precious GMP Legend Elite. The beautiful pearlescent white and blue paint job was done by Royce Brademan.

Hybrid Hobby Products' weight kit for model rotor blades consists of a two-part epoxy mixture (A and B) and a heavy bronze powder (C), all of which mixes up into a hard, heavy paste—more in text.

ever, forward chordwise cg blades definitely help prevent blade flutter. Yale blades also use hard wood for the trailing edge. The reason Yale blades, Hyrid blades and other model blades do not have flutter, even though they have their chordwise cg usually at about 35% to 40% back from the leading edge, is because model helicopters have relatively stiffer cyclic and collective control systems than real helicopters.

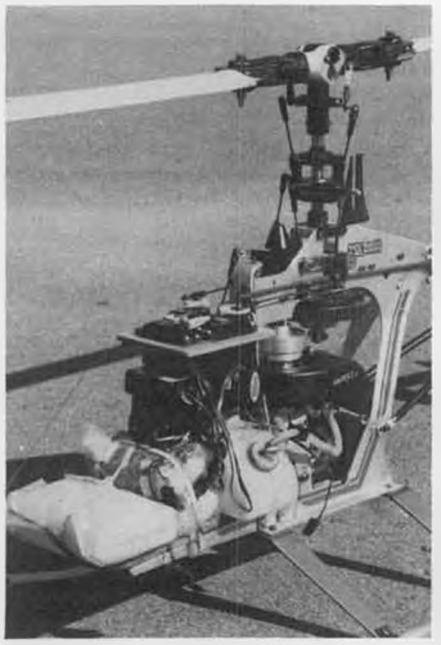
Most people may think that the stiffer the blade, the better; that's why we see advertisement for kevlar blades. In reality, a softer blade would be just as good for aerobatics because the majority of the blade flapwise stiffness comes from centrifugal force, and very little is due to material stiffness itself. Real helicopter blades are all very soft, comparatively. That's why if you look at a real helicopter sitting on the ground, the nonrotating blades usually droop at least one to two feet at the blade tip.

While chatting with Ray on the phone, we discussed the effects of the location of the blade lead-lag pivot. Ray says from experimenting, he found that rearward chordwise pivot gives a damped control response. Forward pivot makes the helicopter jittery and noisy. Anyone else discover similar or opposite results? Please write in and let us hear of your experiments. Ray manufactures a complete line of wooden blades for almost all the model helicopters on the market, from the Concept 30 to all the 60-size helicopters. He sent me his regular blades and his high performance blades for the Legend and Magic. The high-performance blades come with slotted hole and metal weight. Upon testing, the thinner high-performance blades seem to give more sensitive control response, and are better for aerobatics. He also sent me a weight kit which is shown in the picture. The weight kit is an alternative to lead rod. As shown in the picture, jar A and B contain chemical liquids which mix together like epoxy. Jar C contains something that resembles bronze powder which you mix in with the epoxy. Then the entire mixture is poured into the slot in the blade. The weight kit is $6.25. Some people may prefer using the weight kit over the lead rod because they may think the metal epoxy mixture is safer. Well, I am still quite satisfied with the lead rod method and I have yet to have a lead rod flying out, even in a crash. Call Ray at Hybrid Hobby products for a complete price list of his line of blades. He also sells unpainted and prepainted plastic canopies. Next month you will see Ray's painted canopy in my Magic review. His number is (203) 276-8465.

Now let's move on to this month's topic, the 500 flights update on flybarless Legend. First let me correct what I said in the last Legend review. I said in forward flight the flybarless Legend would nose up when power is chopped. Sorry, I meant the nose should drop when power is chopped. On the other hand, when you suddenly hit full collective in forward flight, flybarless helicopters tend to pitch nose up. The full physics behind this phenomenon was explained in a technical article I wrote for the British *Radio Helicopter USA* magazine a year ago. But for the benefit of our readers, let me briefly go over the physics here.

For all helicopters, when pilot suddenly increases the collective pitch, the immediate tendency is the main rotor rpm would drop slightly due to increased drag at higher blade pitch angle which produces more torque to bog down the engine. As the blade tip velocity slows down, the ratio of blade tip velocity relative to forward flight speed changes drastically between the advancing blade side and retreating blade side. This generates unequal lift distribution between the left and right side of the main rotor disk, which causes the rotor

Continued on page 99



A custom made Cobra/Legend with the Airtronics Vanguard six-channel PCM radio, Webra .61 Speed engine, and flybarless Legend main rotor head. Note that the receiver and battery are wrapped in foam and sealed in plastic bags.

The flybarless Legend in a high-speed pass. This one has an O.S. .61 rear exhaust fitted with a Magna pipe. At only nine pounds, it *moves!*

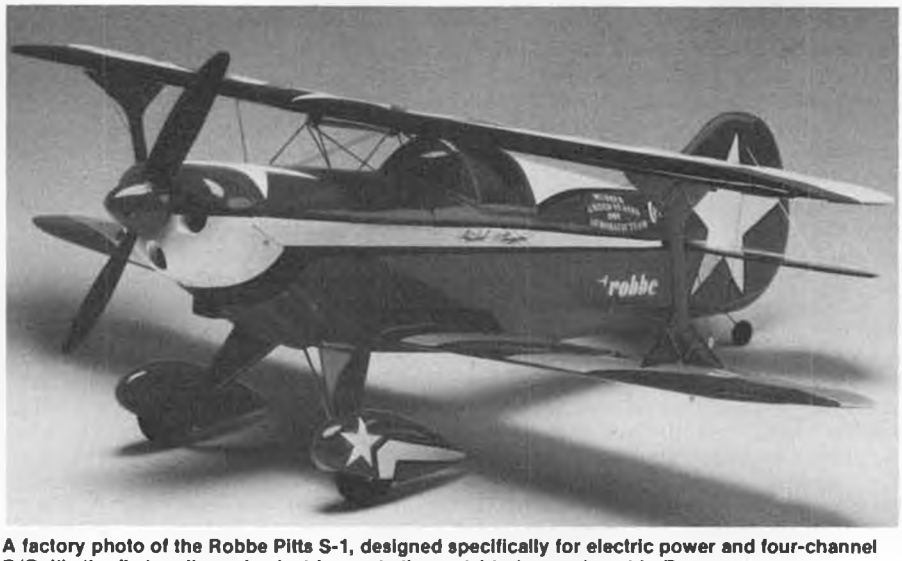
ELECTRIC POWER

By MITCH POLING

• Well, folks, I am here in Weisbaden, West Germany, and have I been having fun! Just by chance there were three excellent electro meets in the area within a month of my move here, and I got a chance to see some very interesting electric technology. I am very impressed by what I have seen; the accomplishments here are very stimulating, and I am ready to tackle hundreds of new projects. We found a house with a nice area for a workshop, and I am ready to have fun. My APO address is at the end of the column so you can write directly to me.

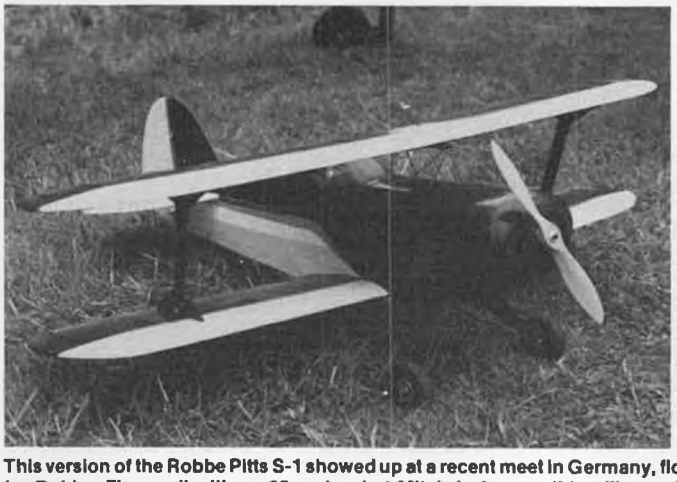
The first contest was at Lauterbach, just north of Frankfurt, at the Lauterbach Model Club field. This is a spectacular field on top of a hill with a view for miles across rolling countryside. The clubhouse has a meeting room and, of course, a beerstube! For the contest, there was a special tent set up, with a big table loaded with superb pastries, and beer to chase it down, plus excellent bratwurst and brotwurst. This is the first annual electro contest sponsored by Robbe, which is well-known for its electro models and motors. The contest was for simple duration and landing points to encourage pilots of all skill levels to compete. Between rounds other models flew for demonstrations and for fun. Robbe had a special display trailer there with models and motors. My German is "Schule Deutsche" from twenty-five years ago, but between that and the helpfulness of the Robbe people, who speak English, I got quite a bit of information.

First off, the photo shows Michael O'Flanagan with his Pitts S-1 electric scale model. Michael works for Robbe and this is his design. Michael did a demonstration flight at the electro fly, and I was impressed by the plane. The plane is powered by seven cells and a Mabuchi 540-type motor (a little over 100 watts), using a 2.5 to 1 reduction and a Futaba MC 7 electronic speed control. It is four channel, 1400 grams (3.1 lbs.), with a 40 inch span. The motor and prop are available from Robbe as a special unit for the S-1. This was a very windy day, and Michael did a takeoff from grass, climbed out, did rolls and loops and some circuits around the field, then landed. He then proceeded to take off again and do some more flying! Total flight time was about five minutes. The S-1 handled the wind well, though at times you could see the gusts rocking the plane. The flight style was floating and gentle, "Jenny" style, characteristic of a light wing loading and medium power. I asked Michael about the choice of seven cells and a 540 motor. He said he had designed the plane for this because of the overwhelming popularity of this size of power unit. This is a valid reason, but I think that if you want to really exploit the abilities of this plane, a ten- to twelve-cell motor (150 to 200 watts) will give the "Pitts-style" performance. An Astro cobalt 15 is a natural choice, ten cells for direct drive, or twelve cells on gear drive (twelve cells will overheat the motor on direct drive). Now brace up! The suggested retail price of the Pitts is $199, and the sale price from Robbe is $159.95. Contact Robbe at 180 Township Line Rd., Belle Mead, New Jersey 08502; phone (800) 527-6223 (ordering phone) or (201) 359-2115 for information. This is an expensive kit. It is very well designed, very pretty, and flies right, so you are getting what you pay for. I hope to see many more scale designs from Michael. The electric power unit is #31987, and is $91.50 retail, on sale at $73.20 from Robbe.

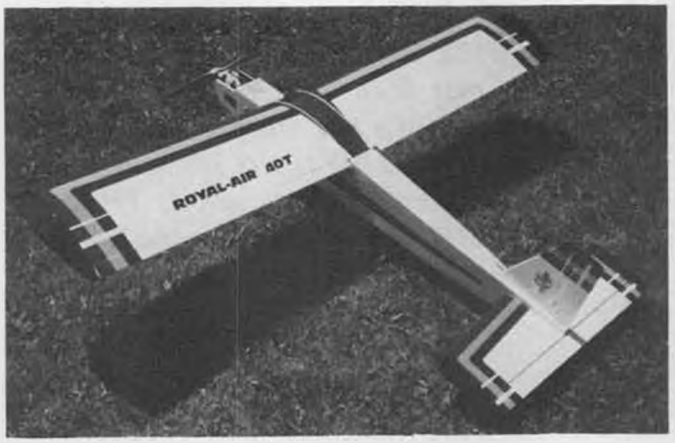


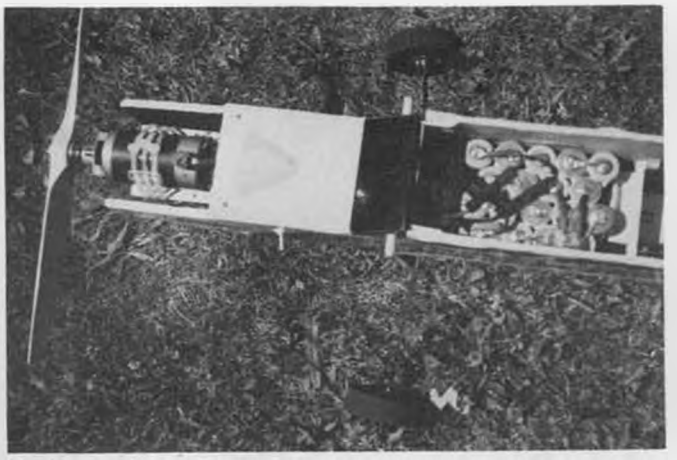
A factory photo of the Robbe Pitts S-1, designed specifically for electric power and four-channel R/C. It's the first really scale electric aerobatic model to be produced in Europe.

Robbe is producing and selling the Keller motors, very good news for anyone who has had problems trying to get a Keller motor. Availability should now be much better, as Robbe has excellent production



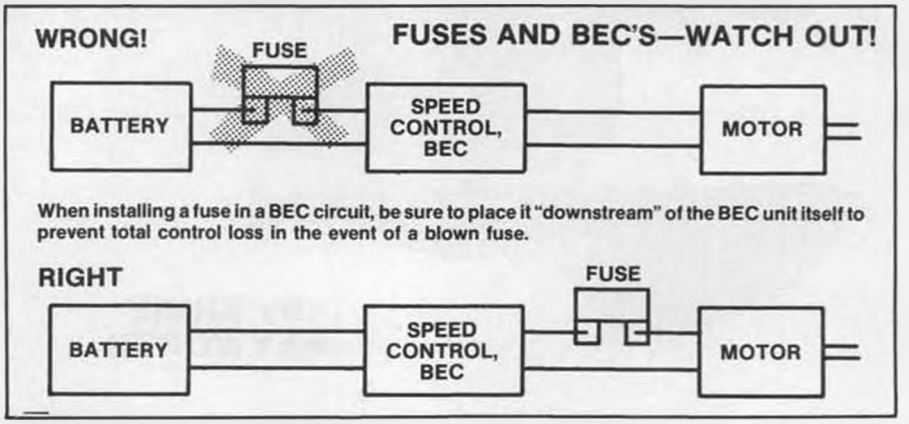
This version of the Robbe Pitts S-1 showed up at a recent meet in Germany, flown by Michael O'Flanagan (that's him on the right), who designed the model for Robbe. Flew well with an 05 motor, but Mitch feels something like an Astro 15 on 10 or 12 cells would yield more "Pitts style" performance.





The inherent light weight of the Royal-Air 40T makes it an excellent candidate for an ARF electric, as Bill Kunert proved to one and all at a recent midwestern electric contest. Power system (shown at right) is an Astro 40 cobalt on 21 cells. Weighs in at 7-1/2 pounds.

facilities which will be even larger next year, when they move into their new plant. I talked to Heinz Keller, and he says that he now acts as the technical advisor. This should ensure the continued very high quality that Keller motors have been famous for. The big news, however, is that the Keller line now includes a complete line of neodymium-boron-iron magnet motors! I have mentioned these magnets briefly in a previous column as being the forefront of the technology, and I was astonished to see Keller motors from 100 watt (05) to 300 watt (40 size) on display with these magnets. The future is now! Prices are about the same as for cobalt motors in the smaller (100 watt) size, and somewhat less than cobalt for the larger sizes. The following table gives the sizes and German prices in DM (1.80 DM = $1). I do not have a U.S. price list. Also, 25.4 mm = 1", 28.3 g = 1 Oz.

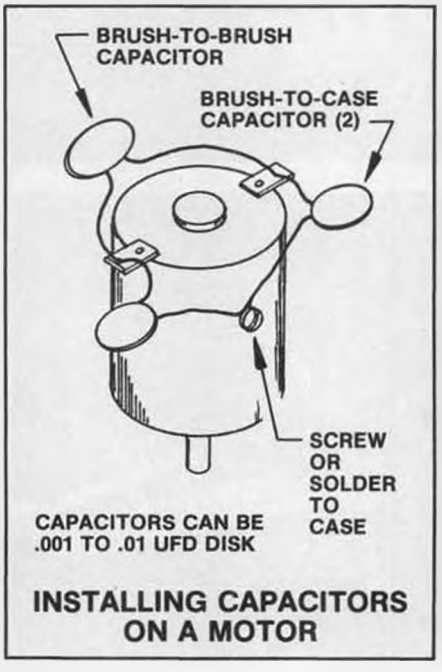


As you will notice, all the motors are the same diameter, 34.5 mm, and power is increased by lengthening the armature. The diameter is the same as the popular 540-style motors, so all these motors could be installed in conventional "05" planes. I think this could result in performance close to terrifying! If you try it, be sure the structure can take it. According to the literature, the neodymium-boron-iron magnets are even more powerful than the cobalt magnets. They will withstand temperatures up

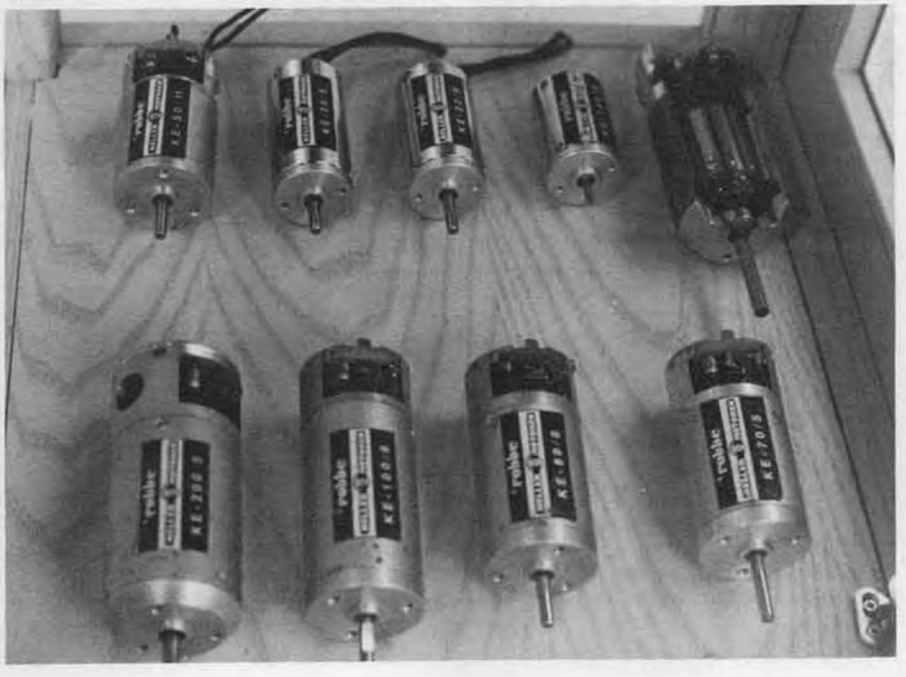
Continued on page 65

Motor	Cells	Watts	Wt.(g)	Size (mm)	DM
KE 540 S, M or T	6-7	100-160	170	34.5x50	199
KE 22/5,9,12	7-10	180-240	250	34.5x65	209
KE 25/4,5,6,8,10,12,13	7-14	200-280	290	34.5x71	249
KE 35/5,6,8,10,12	7-16	200-300	335	34.5x77	309
KE 40/10,14	8-18	200-350	360	34.5x84	340

Right: Keller's new line of neodymium-boron-iron magnet motors. Even more powerful than cobalts, and priced about the same. Text has details.



INSTALLING CAPACITORS ON A MOTOR



Sparrow Hawk

Ready for something different? Here's an out-of-the-rut R/C glider designed primarily for slope soaring, but which can hold its own in a thermal as well. Three different wing configurations are detailed on the plan.

By ERNIE HEYWORTH

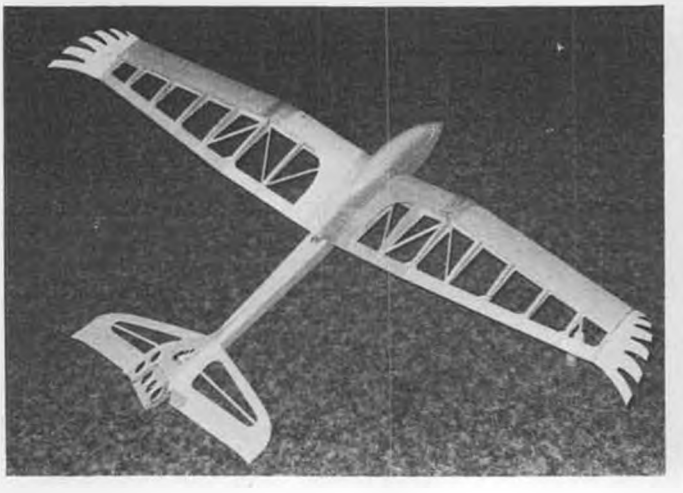
• During this long winter of 1988-89 I made my decision. I would design and build a sport-slope flyer to better fit our local situation. My reasoning for designing something new while the shelves have many kits available went like this: in upstate New York in the Fingerlakes region, we have fair ridge-soaring all year long and some thermal flying when the sun shines. Our ridge will not fly the three- and four-pound California stratographic rocks but it will eat up a "Flatlanders" fluffy thermal machine.

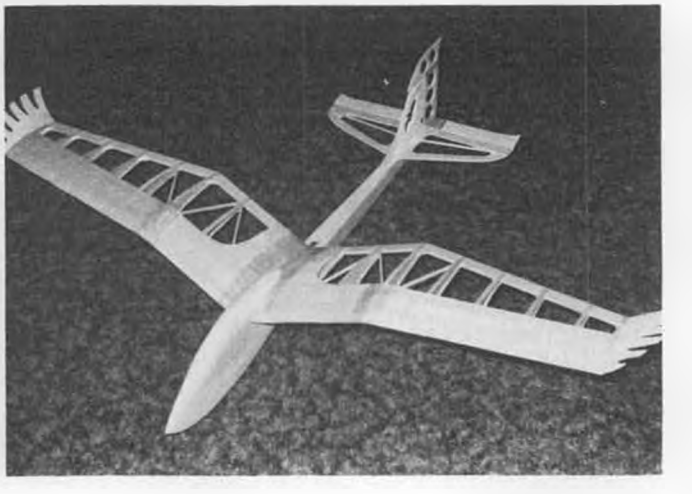
So the demand and challenge was apparent: to design a rugged seven- to nine—ounce per sq. ft. sloper; one that was quick and maneuverable; something not big and awkward that would not be rolled up in turbulence. At the same time we wanted it to be large enough so that we could go out into a thermal and still see and enjoy the plane.

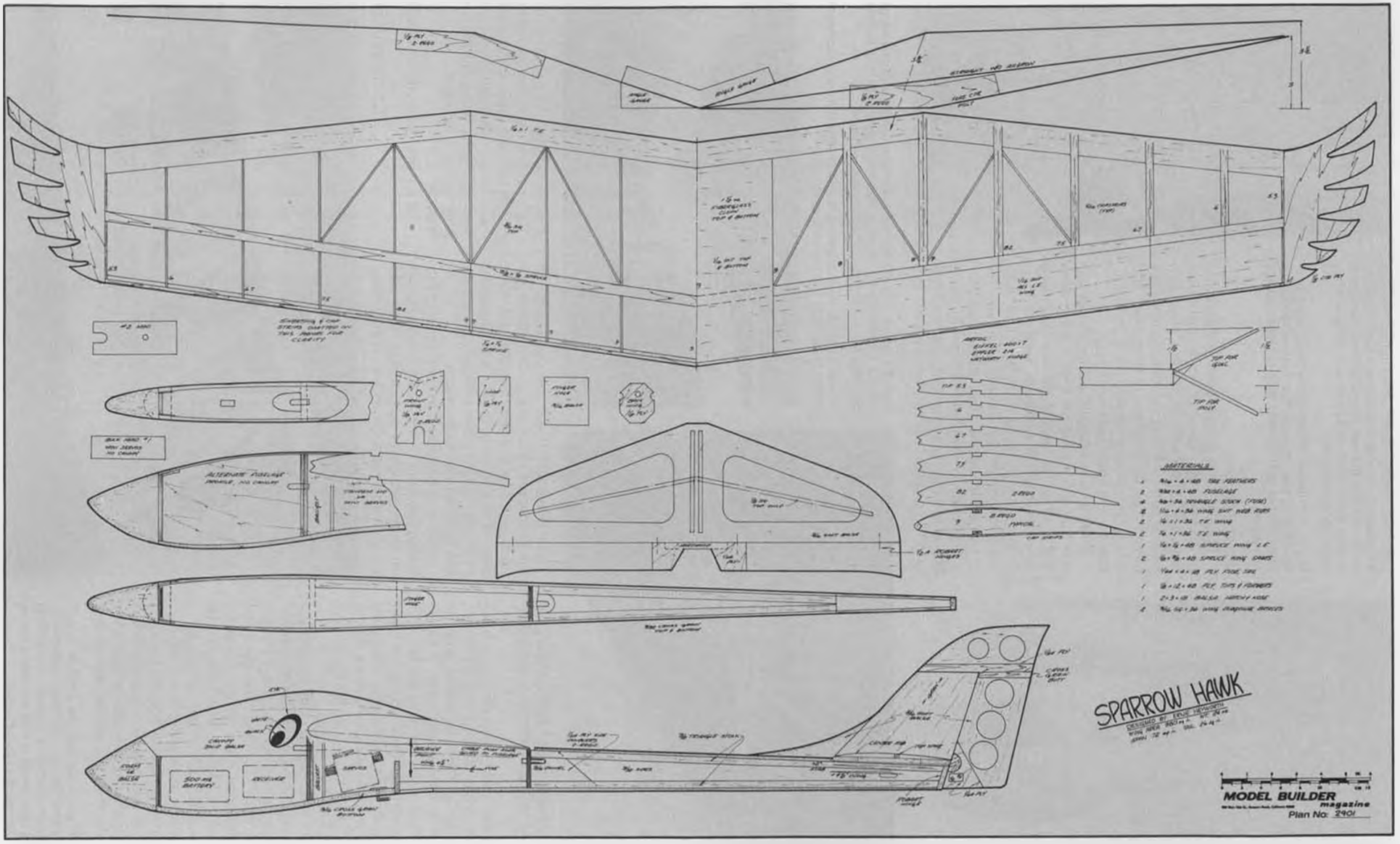
The mix of slope designs available have been developed empirically and all look somewhat alike. They are successful when compared to each other. To break away

Right: Designer Heyworth with the No. 1 Sparrow Hawk prototype. It's a well-proven design; several others have been built by our author's flying buddies in the Fingerlakes area of New York state.

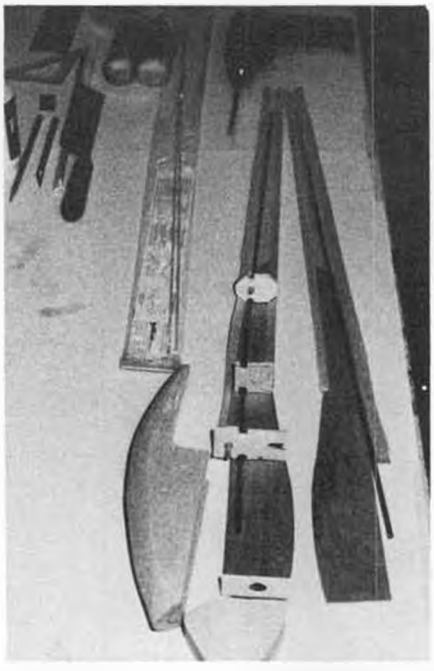
Below: Two views of the Sparrow Hawk sans covering. The "pinion feathers" at the wing tips are cut from 1/8-inch Lite-Ply.





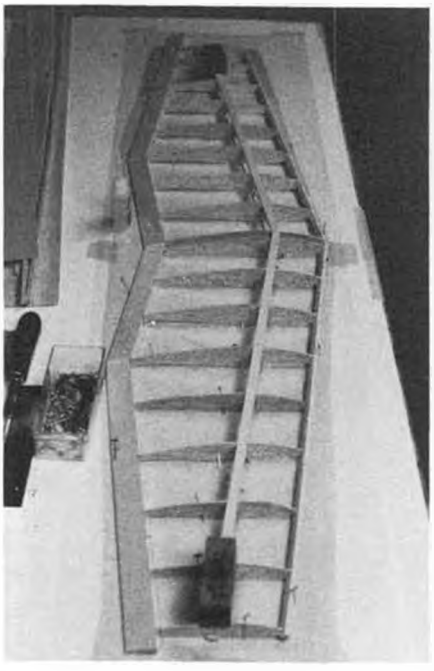


FULL-SIZE PLANS AVAILABLE—SEE PAGE 106



Left: The fuselage under construction. Formers are glued to one side and pushrod tubes installed before joining the two sides together. Canopy is a solid balsa block hollowed out using a rotary file in an electric drill.

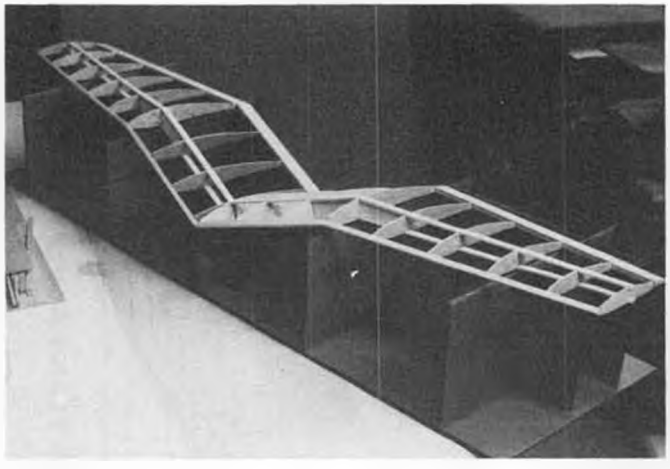
Right: No matter which of the three wing configurations you choose, the basic structure is first built flat on the board, then cut into sections as required.



design features.

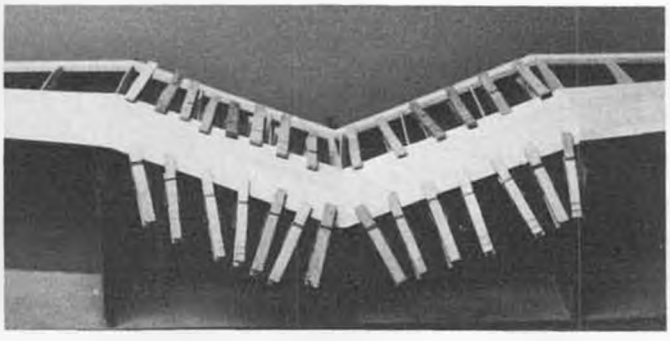
This has been a fun project in that on the prints I was able to offer both width fuselages and different front profiles. The hatch version is more like the standard slope flyer of today as developed by time, trial, and error. The canopy version is my contribution to empirical data or heresy.

What was accomplished by the group was that we settled on 4-foot wing spars and a fuse big enough to hold standard servos. We left flexibility of wing configuration, gull, poly, or straight to the individual. Also, the airfoil could be similar to a 214 or a flatbottom. Fuse length, tail moments and volumes weren't cast in stone but it is strongly suggested that you not turn the print around and make a canard.



Left: To insure proper alignment, the Sparrow Hawk's gull wing is built in a simple cardboard jig. Such a fixture is obviously not necessary when building the V-dihedral or polyhedral versions.

Below: Leading edge sheeting is added after the wing sections have been assembled. Only the top side is sheeted.



from this is heresy but I had a theory for change and this project was a good test bed.

Most planes today have very little fuselage area in front of the wing. I felt that more fuselage in this area would give me forerudder to turn against. Yes, it works but it also took away some of the features of weather-vaning. That's good and bad news together; it turns on command beautifully into the wind where we fly the most, but is slow to turn back on the downwind leg.

The other challenge in this design was that I wanted to please my flying buddies' individualistic ideas of what they thought was "good stuff." I polled nine guys and got nine different ideas of what a good design looked like. Some, "the brave builders," wanted gull wings and canopy—shaped fuses; others, "busy people," wanted an easy-to-build, easy-to-fly box. I wanted all of them to have a design class somewhat similar in size and performance so we could compare planes talent and

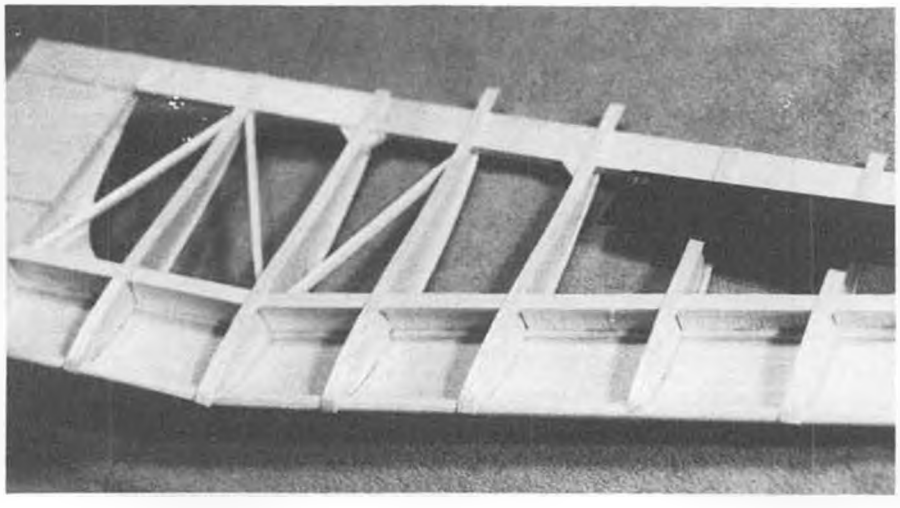
The plans with the article show some of the simple variations that you can do to get your own ideas or features put into your own sport slope soarer. This gets you away from assembling other people's designs to the letter of the instructions.

You must be careful to keep some of the basic principles of aerodynamics as found on these drawings such as tail, stab and wing volumes and the angles in which they join the fuselage. Be prepared to meet the challenges or mess that you get into when you go beyond following the instructions. If all else fails and you're in an impossible mess call up a flying buddy and ask for advice; "He's full of it!"

WINGS

Set the wing plans down on a flat surface

Continued on page 70



Right: Full-length capstrips are used in lieu of leading edge sheeting on the wing's underside. Top and bottom capstrips overlap the trailing edge and are later faired in with a sanding block, creating a very strong rib/T.E. joint.

TOP GUN!

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Aerolympics '89

The 1989 FAI World Championships for F3A (Pattern), F3C (Helicopters), and F3D (Pylon) took place in Tidewater, Virginia in late August. Weather was warm and sunny, winds were capricious and the competition was red hot!

By ART SCHROEDER

• As summer moved toward fall, the Academy of Model Aeronautics unveiled its latest version of Aerolympics at Fentress Naval Auxiliary Landing Field located in Chesapeake, Virginia, not far from Norfolk. Aerolympics, a term coined by AMA Executive Director John Worth, means a model airplane world championship that encompasses more than one event. The first Aerolympics were held at Lakehurst N.A.S. in 1974 and included control line and radio scale events. 1989's version was for pattern, pylon and helicopters. AMA was the organizing body and host with FAI (Federation Aeronautique Internationale) as the governing organization. AMA did an outstanding job with the championships; contest director Bob Underwood can well be proud, but it would not have been possible without the support of so many members of the Tidewater R/C Club. It was a great show!

Teams from 30 countries were entered in F3A along with Hanno Prettner, the defending world champion. Twenty countries and previous champion, Curtis Youngblood, made up the F3C field with 11 countries and defending champ, Dave Shadel, populating the F3D field. All in all, there were 226 individuals competing, managing, or serving as mechanics, a sizeable group by any standard.

The Helm helicopter demonstration team put on a most impressive display of precision flying. In the F3C competition the Japanese pilots took three of the top four places, and top team honors.

In helicopter competition (F3C), the Japanese team served notice that they were a force to be reckoned with by holding the top three places after round one. Yukihiro Dobashi was the early leader and a model of consistency with first or second placements in every round. His teammate, Kazuyuki Sensui, was nearly as sharp finishing the meet a scant 2.5 points off Dobashi's championship score of 691. The only American to crack the Japanese dominance was defending champion, Curtis Youngblood.

The Bruce De Chastel family of Australia. All are active in modeling. Bruce placed third in F3D Pylon, preventing an American sweep.

The three winning F3D teams, from left: United States, Australia, and Japan.

U.S. F3C Pylon flier Gary Hover (center) took fifth place. Four of the top five places went to American pilots.

The intense concentration of Hanno Prettner is evident before an official. Hanno actually plans the flight and visualizes it as he stands by the runway.

Youngblood had problems in round one with a faulty tail rotor blade and had to take a zero on at least two maneuvers. Round two was an under 200-point, subpar effort. However, the champion made a strong comeback in rounds three and four for a final score of 646.5. Fourth place was taken by another Japanese, Shizuo Ishikawa at 641. Other members of the American team included fifth-placer, Robert Gorham (630.5); Tim Schoonard in ninth (611.5); and Thomas Dooley in twelfth place (601). Youngblood's score (flying as a defending champion rather than a team member) did not count for the team trophy.

With three of the top four places, Japan took the team honors followed by the United States and Federal Republic of Germany.

A typical example of the contemporary F3A Pattern model is the "Flash," flown by Peter Wessels of Germany.

This writer has very little experience in the specialized world of helicopters and I've not seen any real 'copter flying for several years. But that inexperience did not keep me from recognizing that I was watching very special performances by truly skilled modelers. Maneuvers were as precise as I've come to expect from pattern airplanes and the auto-rotations were simply incredible. Competition was close with a scant 10% separating the top seven or eight fliers.

AMERICANS REPEAT

Over at the "go fast and turn left" crowd a real "barn-burner" competition was underway! After eight rounds (in a series of twelve), Dub Jett and Bruce Richmond—both of the U.S.—led the pack at 535.2. The scores were the cumulative total of times in each round with two rounds (slowest times) dropped. The leaders were (literally) followed by Dave Shadel (1987 World Champion at 542.2), Zdenek Hnizdil (Czechoslovakia at 555.8) and Gary Hover

Another view of the "Flash" models used by German flier Peter Wessels, this time with Peter himself. Uses JR radio equipment and an O.S. long-stroke .60.

(U.S. at 559.3). There was some question as to whether Shadel could repeat as World Champ.

Not to worry! Shadel topped round nine at 72.1 and really opened things up in round ten with a world record 71.3 (1:11.3 minutes) putting him in the lead position. After round ten the leader board showed Bruce De Chastel of Australia in second, Dub Jett third followed by Bruce Richmond and Gary Hover. FAI scoring is different from American Formula I (as are the airplanes and fuels) in that elapsed time of each individual in each heat is recorded rather than the awarding of points for place in a heat. Therefore, second placing racers in one heat might have times better than winners of another heat. In effect, FAI racing is not pure "head-to-head" racing.

Dave Shadel coasted in rounds eleven and twelve and wrapped up his second championship with a final score of 757.5. And the United States team also repeated with Dub Jett in second, Bruce Richmond in fourth and Gary Hover in fifth. Australia's Bruce De Chastel prevented an American

Giichi Naruke of Japan placed fifth, flying his "Silent." His teammates placed sixth and seventh, putting the Japanese team in second place overall.

Canada's Dave Patrick flew his Conquest V to eleventh place; the Canadian team came in third. The Conquest is a very poplar F3A Pattern design. Dave's is powered by a YS 60 RE, registered 91.5 db.

sweep with his third place finish. The U.S. team was followed by Australia and Japan.

If numbers of competitors and entering countries is any indication, F3A (Pattern) is still king of the R/C competition world. It certainly drew the largest crowds at Tidewater and it did not disappoint as the event was fiercely contested, had some interesting developments in design and equipment and posed the long standing question, "Can anyone beat Hanno Prettner?"

THE CHAMP

Every sport develops its dominant figures (Palmer and Nicklaus in golf, Abdul Jabbar and Bird in basketball, and Peyton in football); the list is endless. The most dominant R/C pattern flier of the eighties has been (and continues to be) Hanno Prettner. Along with his near impeccable Tournament of Champions record (he has won all but one of that prestigious affair) and numerous national and European championships, Prettner has won five F3A World Championships in a row. In fact, Prettner's only "non-win" since he first became World Champ in Springfield, Ohio in 1977 occurred in 1979 when illness precluded his entry. Clearly, the way to "beat" Hanno Prettner is to somehow get him sick!

There have been 16 F3A R/C Aerobatics World Championships held since the events inaugural running in Zurich in 1960. That was won by Ed Kazmirski of Chicago, Illinois. Until the Prettner era, only two fliers have won two in a row: Ralph Brooke (USA) in 1963 and 1965 and Bruno Giezendanner (Switzerland) in 1969 and 1971. A third flier, Wolfgang Matt (Leichtenstein) has won twice in nonconsecutive championships, 1975 and 1979. Prettner has flown in nine championships overall, winning six of them. If that doesn't make the aerobatic whiz from Klagenfurt, Austria a dominant sports figure, I don't know the meaning of the word!

As I'm sure you've figured out by now, Prettner won F3A in Tidewater. And he did it in convincing fashion. He took top score in all but one of the preliminary flights and topped two of the three finals rounds. In the preliminaries, his closest competition was Ivan Kristensen of Canada and Wolfgang Matt. Following the leaders were Giichi Naruke (Japan), Chip Hyde (USA), Bertram Lossen (FRG), Yoichro Akiba (Japan), Tony Frakowiak (USA), Dean Koger (USA) and Hajime Hatta (Japan).

Who says all Pattern models look alike? Witness the "FYG-LEAF" biplane designed by Ken Bonnema and flown by U.S. flier Tony Frakowiak to a very creditable ninth place finish. Really turned some heads, and surprisingly, it was not the only biplane entered—see text.

Team standings in F3A Aerobatics are determined by scores garnered in the preliminary rounds with the individual championship determined in the finals (17 fliers qualified) by combining the preliminary score and three finals scores (low score of the four is dropped).

Not surprisingly, Hanno Prettner of Austria retained his World Champion status, flying a "SupraStar" ARF from EZ Sport Aviation. It's remarkable that the World Championship model is a production item that can be purchased ready-built in a hobby shop. All we need now is an ARF Hanno to make us all winners!

After the preliminary rounds, the U.S. team of Chip Hyde, Tony Frakowiak and Dean Koger had won the team trophy. This is the first team win for the USA since 1983 and testimony to the skills of our 1989 team. It was a genuine thrill to see "Old Glory" flown on the center mast at the awards ceremony. It is also proof that using FAI's turnaround rules as our top AMA pattern event throughout the country will tend to make America once again a force in world competition.

Prettner was simply unbeatable in the final rounds. It is not easy to analyze why Hanno Prettner wins time and time again. The man clearly has all the qualities of a competitor and champion: dedication, natural skill and desire. But, all the top 17 qualifiers had those qualities as well!

Continued on page 88

Team Finland: Tero Vallas, Ari Syrja and Esa Eirola, with team manager Erkki Haapanen standing in back. They didn't win, but no national team tried harder!

R/C SOARING

By BILL FORREY

SIMPLE, CHEAP PITCH COMPENSATION

My first offering to you, kind readers, comes from Paul Brabenec of Wilson, Wyoming. Paul picked up on my March 1988 R/C Soaring column which included a piece from Mike Watson on modifying a no-frills transmitter for trimmable trailing edge capability, an idea which is kinda nice for such models as a Windsong, etc. Paul's letter speaks for itself, so here it comes:

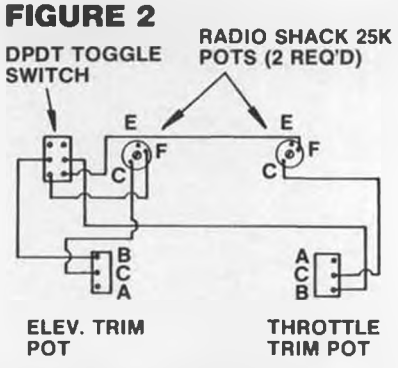
"Dear Bill, Thanks for your most informative regular column in *Model Builder*, which is what I buy the magazine for! I've taken lots of info, advice, and inspiration from it over the past three years.

"I've used Mike Watson's 'How to Reflex a Trailing Edge for Five Dollars' article in a four-channel, two-meter sailplane to give elevator compensated spoiler activation at the flip of a switch. The radio is a Futaba 4NL AM system. (See Figure 1 for external mods.)

"I use a small screwdriver to adjust the throws on spoiler and elevator through small holes in the transmitter case. This way the pots can't be inadvertently thrown out of adjustment between flying sessions.

FIGURE 1

FIGURE 2



The necessary external transmitter modifications and simple schematic for Paul Brabenec's pitch compensation mixer.

"I didn't really have enough range in the elevator trim tab to compensate for spoiler deployment, but the 25K pot provides plenty of movement.

"I thought this setup might be of use to some of your other less sophisticated sailplane lovers.

"I fly from slopes around the Teton Mountains and the spoilers really help me hit a small ridge top or go for a hand catch. The only alternative is sagebrush!

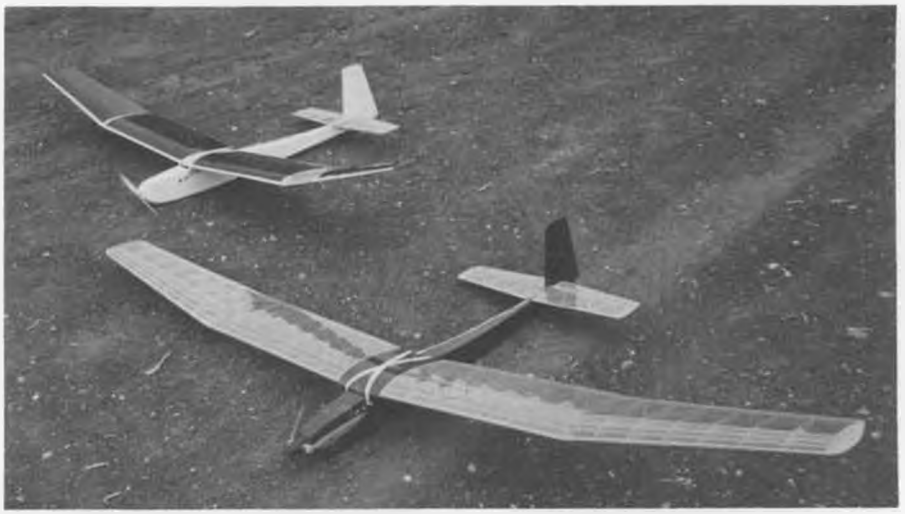
"Thanks again, Paul Brabenec."

The schematic Paul included is Figure 2. It looks like the only items you will need to execute this simple pitch compensator are two 25K PC Board Pots, one DPDT toggle switch, and some fine hookup wire. Can't beat that for simplicity!

SKYWALKER CONCENTRIC PUSHRODS

Our next idea comes from the frozen north: Alaska! Greg Harding of Kotzebue sends in his solution to fitting two standard-size pushrods inside a 1/4-inch arrowshaft tailboom when no miniature rods are available. Note, this applies to those pushrods where both inner and outer elements are nylon (such as Nyrods, Sullivan #503, 504, 505, 506, 517, or 518, etc.). Always test your adhesive to make sure it bonds to the pushrod adequately before you commit to an aircraft installation.

"Dear Mr. Forrey, While going through some old model magazines not long ago, I came across your November 1988 column in *Model Builder*. It featured a construction article for the Dick Vader designed Skywalker 50. It must not have impressed me when I first saw it, but on a second look, for some reason, it struck me so heard that I had to sit down and build one.

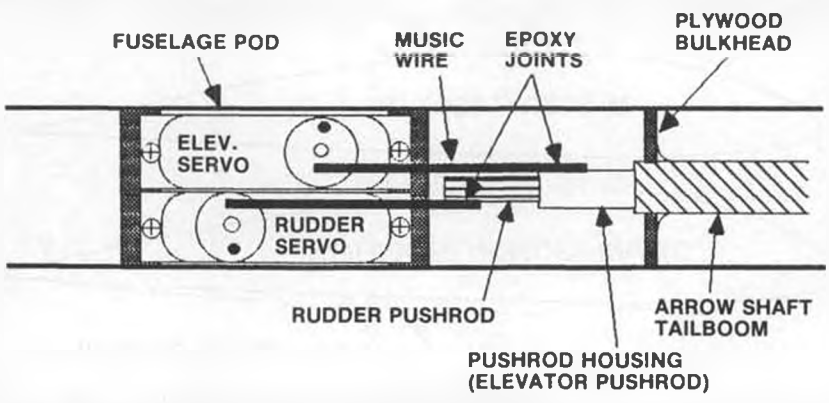


The venerable Pierce Arrow becomes electrified, by none other than the original designer, Ed Slobod. The model in the foreground uses a seven-turn geared Astro 05 Cobalt, while the other has a newer six-turn direct drive Astro 05 Cobalt. Surprisingly good fliers even at over 13 oz./sq. ft..

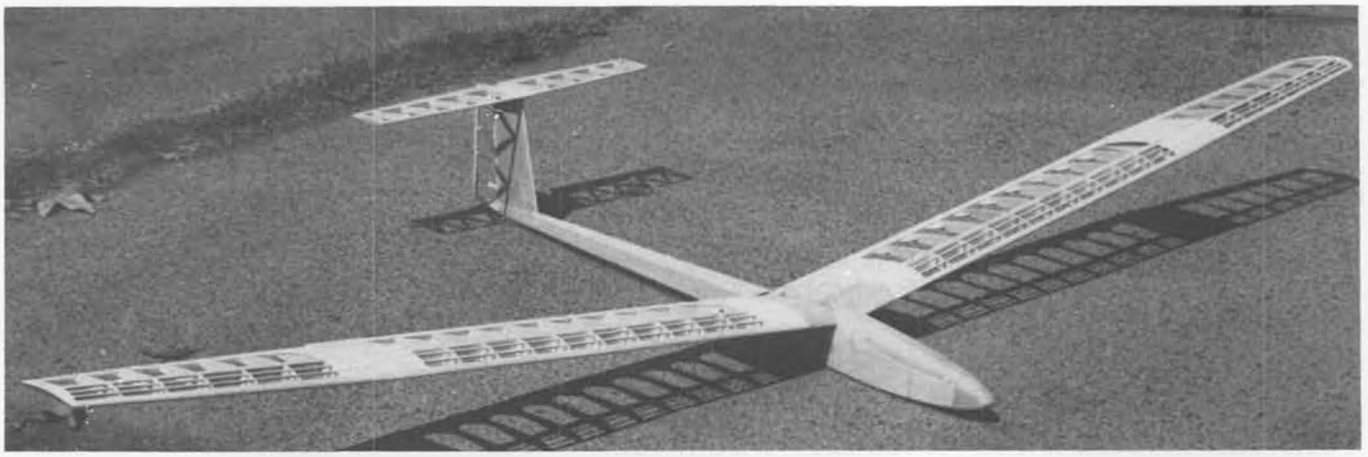
"I live in northwestern Alaska, about 400 miles from the nearest hobby shop, so I try to keep pretty well stocked on hardware. I was almost done with the Skywalker when I went to dig up the necessary small-sized pushrods and was surprised to find that I had none but the large standard size. Being unwilling to wait for the mail to bring me the recommended pushrods, I came up with what I thought was a mildly interesting way of using the large pushrod.

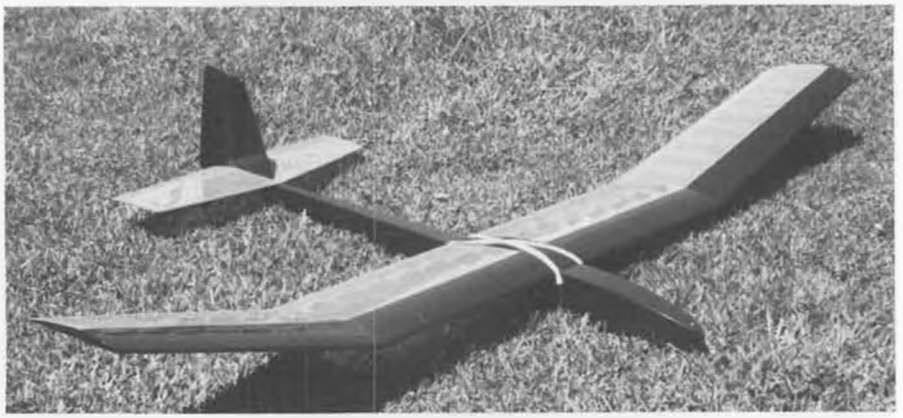
"Rather than attempting to run two pushrods down the tailboom side by side, I used the standard rod for rudder control and used the housing as the elevator pushrod by allowing it to move freely within the fiberglass arrowshaft tailboom. Concentric pushrods! The music wire attachment between the plastic pushrod and the servo and tail surface must be epoxied to the side of the pushrod for this to work. It also allows the receiver antenna wire to be run inside the inner (rudder) pushrod.

"Another more important modification was to imbed a two-inch piece of music wire in the trailing edge of the wing at the



Greg Harding sends in this solution to the problem of not being able to buy the right size pushrod for his Skywalker pod-and-boom sailplane.





Slobod-designed two-meter competition sailplane features a flat center section and a Pierce Arrow airfoil (turbulated flat bottom). A good flier, very responsive, but too slow even in a modest wind.

Above: Ed Slobod's desire for a scale-like floater resulted in this T-tail sailplane with simple "V" dihedral, Paragon airfoil, and flaps which double as allerons. A nice flying ship, says Ed, but not strong enough for zoom launches.

center to protect it from the wing hold down rubber bands. Other than that, my Skywalker was built just as shown in your article (which is a rare thing for me), and it flies beautifully. On its third flight (including one test glide), I was able to ridge-soar off of a large building.

"I've enjoyed the Skywalker very much, as I have your column. Keep it up, Greg Harding."

Thank you Greg. Your computer illustration is quite remarkable, too!

Keep this idea filed away in your brain for future reference, kind readers, it could give you other ideas. Say, has anyone tried concentric flap and aileron arrowshaft hinges which could double as torque rods? Think about it. Has anyone successfully used this idea before? Share it with us, please.

ED SLOBOD: PORTRAIT OF AN EXPERI-MENTOR

Anyone who has ever witnessed a Pierce Aero Paragon, Gemini MTS, Pierce 970, or Pierce Arrow soar through the air, or felt the superb handling and performance of these sailplanes, has seen the careful handiwork of Ed Slobod.

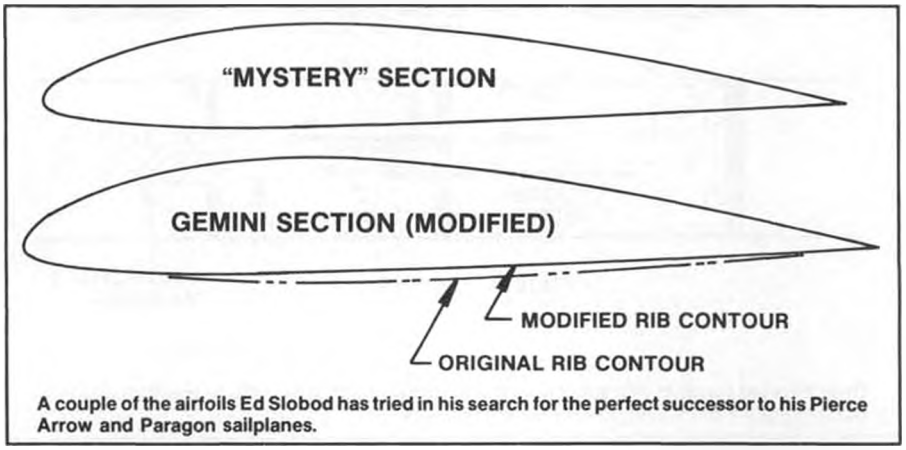
Ed has been called the "Father" of the two-meter class RC sailplane because in the mid-seventies his Pierce Arrow was the first kit of this class. Today his company is one of the oldest in the R/C glider kitting business and features two kits which after many years still show up at soaring contests in respectable numbers—the Paragon and Gemini MTS.

Ed is an experimenter and a prolific builder of model sailplanes. Being more of a craftsman of wood, he prefers traditional-type construction techniques over progressive and expensive composite techniques.

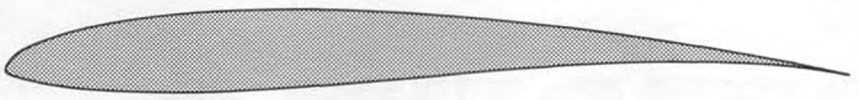
Ed is a perfectionist. If a model flies well, that's not good enough. It must meet or exceed his design specs or it becomes a permanent resident in the Slobod Museum (the rafters of his garage).

For years Ed has been seeking a worthy successor to the Paragon, Gemini, and Pierce Arrow designs. So far his R&D work has not yielded what he feels is a significant

Noted sailplane designer Ed Slobod shows off two of his electric motorgliders. On the left is an Astro 15 Cobalt powered ship that uses the original 100-inch Paragon wing to lift its 65 ounces; on the right is an 88-inch model using a Paragon airfoil and powered by an Astro 05 Cobalt.



A couple of the airfoils Ed Slobod has tried in his search for the perfect successor to his Pierce Arrow and Paragon sailplanes.



WORTMANN FX 60-100

NR	X/T	YO/T	YU/T
1	1.00000	.00000	.00000
2	.99893	.00023	.00015
3	.99572	.00086	.00070
4	.99039	.00193	.00151
5	.98296	.00341	.00251
6	.97347	.00534	.00377
7	.96194	.00766	.00515
8	.94844	.01035	.00659
9	.93301	.01342	.00802
10	.91573	.01681	.00941
11	.89668	.02053	.01072
12	.87592	.02447	.01186
13	.85355	.02864	.01280
14	.82967	.03298	.01347
15	.80438	.03747	.01381
16	.77779	.04200	.01373
17	.75000	.04652	.01329
18	.72114	.05089	.01241
19	.69134	.05511	.01118
20	.66072	.05905	.00951
21	.62941	.06275	.00748
22	.59755	.06608	.00496
23	.56526	.06911	.00217
24	.53270	.07174	-.00092
25	.50000	.07409	-.00405
26	.46730	.07596	-.00731
27	.43474	.07750	-.01045
28	.40245	.07845	-.01357
29	.37059	.07898	-.01637
30	.33928	.07888	-.01895
31	.30866	.07838	-.02100
32	.27886	.07720	-.02275
33	.25000	.07565	-.02389
34	.22221	.07339	-.02475
35	.19562	.07081	-.02500
36	.17033	.06754	-.02503
37	.14645	.06404	-.02447
38	.12408	.05989	-.02377
39	.10332	.05569	-.02246
40	.08427	.05086	-.02110
41	.06699	.04609	-.01913
42	.05156	.04056	-.01730
43	.03806	.03523	-.01481
44	.02653	.02948	-.01247
45	.01704	.02368	-.00970
46	.00961	.01775	-.00691
47	.00428	.01144	-.00436
48	.00107	.00574	-.00200
49	.00000	.00000	.00000

improvement over any of them. Ed tends to be too demanding of his models, a fact which keeps his less critical modeler friends shaking their heads, but waiting patiently for "the big breakthrough."

Ed has that same kind of inexhaustible curious energy driving him on that once drove Thomas Edison. It is said that Edison ran through 10,000 experiments before he eventually produced a workable light bulb. Ed may yet produce his successor!

I think we can learn something from Ed's many experiments with different wing designs and airfoils. That's why I'm offering you a peek at his most recent letter to me.

Some thoughts on modern airfoils and conventional building techniques, By Ed Slobod

Dear Bill . . . At present I have 20 flyable sailplanes in my garage, including the electric motorgliders, plus about eight 2-meter wings, most of which came into existence in the past four years since I retired. (Ed retired from Hughes Aircraft where he was a wind tunnel model builder. -wrf) *There is no way that I could put these in anything resembling the proper chronological sequence, so you will find my discussion somewhat rambling in nature.*

Let's start with my attempts to design a Pierce Arrow replacement. The biggest question here was who to design for. The beginner and sport flier already had the Gentle Lady and others, and there was no real need for another two-meter of that type. However, in terms of potential kit sales, these people represented the larger segment of the market.

The other end of the scale is the contest ship which had to be zoom launchable and with some sort of glide path control. Smaller market and higher price. Regardless of which was chosen, the ship would have to satisfy my standards of performance which are such that I already have about eight two meter wings. They aren't bad, but they fall short of meeting my requirements. I refer to them as my "Not Quite Ready for Prime Time" wings. Among these are wings using the following airfoils:

1. *Bame 253515 (2.5% MCL)*
2. *Eppler 374*
3. *"Mystery" (see drawing)*
4. *Pierce Arrow with multi-spar*
5. *Selig 3021*
6. *Flattened Gemini*
7. *Modified Gentle Lady*
8. *Pierce 970 (9% flat bottom)*
9. *Thinned RAF 32*

Some of the above were built using the same airfoil templates I used to make 112 to 116 inch span sailplanes. They performed quite well at those spans, but not as well at two-meter span.

However, in one instance, the reverse was true. The Selig 3021 at two meters was at least interesting, so I made one at 114-

Some of the SFVSF gang with Ed's cross-country electric motorglider. Set an official 31.8-mile distance record, but a longer 58-mile flight ended in disaster when the wing failed in strong lift.

Continued on page 94

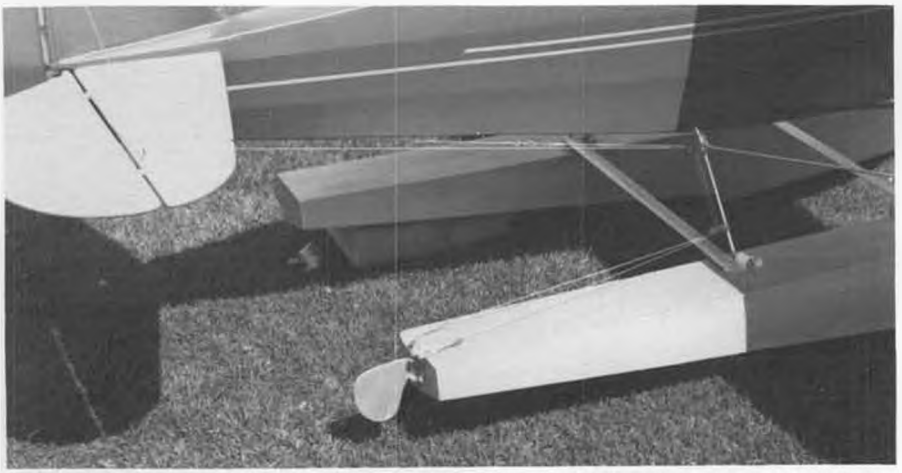
One of Ed Slobod's aileron ships, built with the "mystery" section shown on the previous page. Ed claims to have not had much luck with aileron models, but this one looks "right" to us!

Astro Flight's PORTERFIELD

gets its feet wet!

By BOB BENJAMIN . . . Make your next project an electric floatplane! Although designed for the Astro Flight Porterfield, these floats can be adapted to any model of similar size.

• At the end of my recent product review on the Astro Flight Porterfield, I mentioned an interest in putting my airplane on floats, and promised to get a performance report to you if things worked out. As you can see, they worked extremely well! Because a very accessible small lake happens to be located about a ten-minute drive from my home, the thought of doing a float conversion on the Porterfield occurred as soon as I realized what a great sport scale airplane it is. Since the lake is literally in the shadow of the Washington State Capitol and is very popular with picnickers, joggers and a flock of tame ducks and geese, it was obvious that only the quietest, most unobtrusive models would be welcome. Based in part on the success of the Porterfield, my friends and I have standing permission from the Capitol Grounds and Buildings office to use the area. I doubt seriously that this would have happened had we shown up with the usual noisy airplanes.

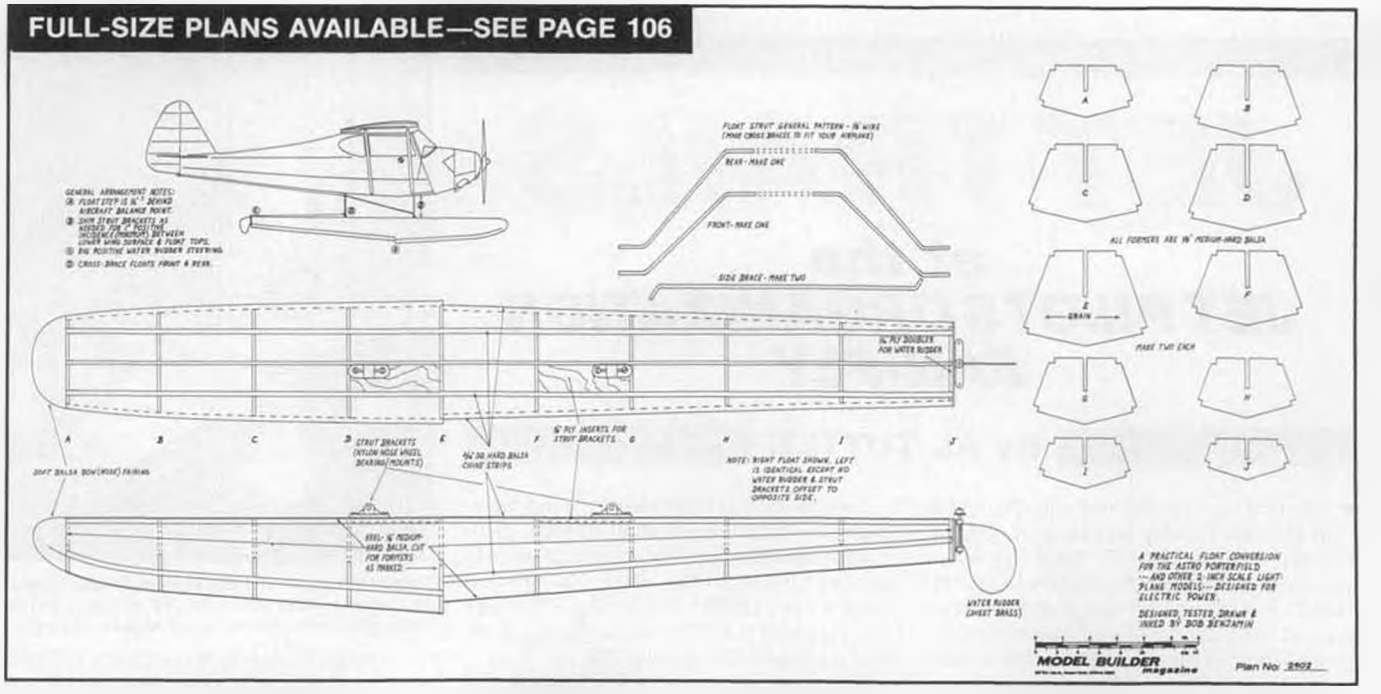


A close view of the water rudder and cable steering setup. Dual pulleys were soldered to the rear float strut and 2-56 clevises used to adjust the cable tension.

A nice, scale-like climbout at slightly reduced power makes the little Porterfield virtually impossible to distinguish from the full-size machine. The local gulls, ducks and geese don't seem to be bothered at all by electric floatplanes.

Aside from the obvious public relations value inherent in flying electric, there is another concern I'd like to address here. As those of you who already fly electric are no doubt aware, there is still a strong preconception in the minds of many of our fellow modelers that electric airplanes are

FULL-SIZE PLANS AVAILABLE—SEE PAGE 106

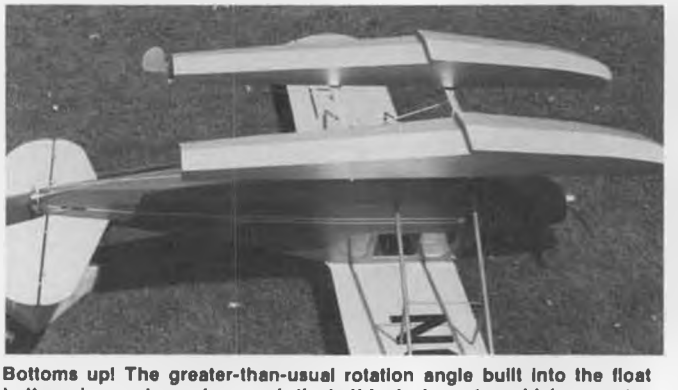


underpowered, overweight, and aren't practical. I have chosen to spotlight this scale electric floatplane as proof that the aforementioned notions need not be true.

We have all seen electric airplanes that were disappointing in performance. As has been mentioned in the several articles on electric flight that I have written for *Model Builder* in the recent past, I am convinced that using top quality equipment is essential to getting good performance in electric flying. Inexpensive motors, bargain wiring and connectors, any old prop, and the first battery pack that comes to hand just won't cut it. I'll be mentioning specific items of equipment with which I have had good results, but be aware, these are seldom the least expensive options available! I feel strongly that as long as modelers in general perceive that electric flight must for some reason cost less than "gas," they will continue to be disappointed with the performance of their airplanes. Quality doesn't come cheaply. However, if we are willing to pay for them, current state-of-the-art electric flight systems can be made to perform on a par with the "wet power" models with which they are compared.

Shortly after completing the evaluation of the Astro Porterfield for *Model Builder*, I replaced the kit wing with a custom-built one incorporating scale dihedral and rib spacing, plus ailerons, in order to improve scale fidelity for static judging, and to

Continued on page 77



Bottoms up! The greater-than-usual rotation angle built into the float bottoms is easy to see here, as is the half-inch-deep step which promotes clean planing. Also clearly visible is the open cabin window, mentioned previously as a cooling and access modification.

Taxiing out for takeoff. Here the floats are totally in the displacement mode, and a minimum of power is being used.

A takeoff from nearly glassy water. This has to be the clincher for modelers who doubt that electric floatplanes are practical; smooth water takeoffs are tough for *any* floatplane. The Porterfield was rocked gently with the ailerons to break one float free before the other, hence the slight bank.

Just about to touch down—note the slight up-elevator deflection. Floatplanes should not be flared for landing, but rather flown onto the water in a nearly flat attitude.

JET TRAILS

at the JET PILOTS ORGANIZATION FAN-FLY

By AL TUTTLE

• The first sanctioned Jet Pilots Organization Ducted Fan-Fly was held in Deland, Florida, August 26 & 27, 1989. The event was sponsored by the Deland Golden Hawks R/C Club. Although the turn out was rather disappointing (fifteen entries), those who did participate had the opportunity to do plenty of flying.

The Deland flying site is excellent, with plenty of spectator parking and lots of room for the participants. The club members did a good job in setting up the pit and spectator areas. Although the modeler turn out was small, the spectator turn out was tremendous, which was due to advertising in the local newspapers and radio stations.

This shot of the pit area proves that while the meet attracted only 15 participants, the spectators turned out in force, thanks to extensive newspaper and radio advertising by the meet organizers.

Two flight lines were used and a spotter was required for each pilot while he flew. The lines were run safely, efficiently and close-in flying was a no-no. The quality of flying was good with only a couple of crashes during the two days.

Twenty-one aircraft were entered, fourteen of which were Violett models. (This makes sense as the Violett operation is in nearby Orlando.) The rest of the models were a Byron Bullet, BD-5J, MIG-15, Cook F-4, Jet Hanger KFIR, Yellow Aircraft F-16, and a scratchbuilt Boeing 767.

The most impressive model to me was the scratchbuilt Boeing 767 by David Escobar, of Sarasota, Florida. The model weighs 29 pounds, with a wingspan of ten feet. Fuselage length is also ten feet. It is powered by two Dynamax fan units with O.S. 77 engines. Construction is of balsa, foam and fiberglass. The retracts are homebrew and the radio used is the Airtronics Spectra. David flew the plane several times and it appeared to handle very well, even during axial rolls. Wing loading appeared to be quite light, as the plane's glide ratio was excellent as evidenced during his landings. The plane seemed to float forever before lightly touching down. David said

One of the prettiest of the several Violett "Vipers" to show up was this KBV .72 powered model belonging to Hicks Milner of Atlanta, Georgia.

the model took him ten months to build and that it had only been flown four times prior to this fly-in.

Another nice machine was a Viojet-powered Byron MIG-15 by David Nicholson, from Ponce Inlet, Florida. The model weighs 12 pounds and uses a Viojet/KBV .72 for propulsion. The plane had seventy-eight flights at the time I took the photos. His other plane is a Jet Hanger Kfir, weighing eleven and three-quarter pounds and is powered by a Viojet/KBV .82. David is an avid ducted fan buff who enjoys modeling the unusual and rare types of aircraft.

Norm Holland, from Maitland, Florida, was there with his Byron BD-5J, powered by a Hurricane fan and Picco .90. Norm was plagued by engine problems but managed to get in a couple of flights.

Daryl Shade, from West Palm Beach, Florida, entered his Rossi .90-powered Byron Bullet. This was Daryl's first fly-in and although understandably nervous, did a nice job of flying.

Bob Fiorenze, from Winter Springs, Florida, flew his Tom Cook F-4 and as usual, put on several crowd pleasing flights.

Jerry Keller, from Sarasota, Florida, brought his Viojet/KBV .82-powered Yellow Aircraft F-16. Jerry claimed he built the plane in eight days including the mods for the Viojet unit. Jerry had engine problems but I did see him get one flight in.

David Robbe, from the Orlando area, who is a college student and also works for Violett, showed up with his pretty red Ag-

Our author's vote for the "Most Impressive Model" goes to David Escobar's Boeing 767. Weighs in at only 29 pounds, flies beautifully.

David Nicholson flew a Jet Hangar KFIR and a Byron MIG-15, both powered by Viojet fan units. MIG has 78 flights, still looks great.

Master builder/flier Bob Fiorenze put on several crowd pleasing flights with his Tom Cook F-4 Phantom. He's from Winter Springs, Florida.

Just some of the 14 Violett models, mostly Vipers and Aggressors, that were entered. Bob Violett Models is located in nearby Orlando.

Bob Violett's own F-86 received awards for Best Static Scale and Most Realistic Flight. Bob's other F-86, done in green camouflage, was damaged slightly on Saturday when the engine flamed out. *Model Builder* will feature a review of the F-86 in the near future.

Good looking Rossi .90 powered Byron Bullet is the work of Daryl Shade, of West Palm Beach, Florida. Fast, smooth performer.

gressor II. It is powered by a Viojet/KBV .82, has an experimental pipe, and the propulsion system is mounted on soft mounts. The plane not only goes like smoke, but is very, very quiet.

Other modelers flying Violett models were: Hicks Milner, Atlanta, Georgia, a KBV 72-powered viper, and Jerry Caudle, Metropolis, Illinois, a Viper. Last, but not least was Bob Violett and his lovely daughter, Patty, representing Viojet products. Bob had a beautiful F-86 all done up in green camouflage. Unfortunately, Bob dinged it up a bit on Saturday when he had an engine flame out. On Sunday, Bob broke out another F-86 and put on several excellent flights. Bob and Patty flew their Vipers and Aggressors as well.

Dave Tyson, president of JPO, flying his Viojet Aggressor and Dave Nicholson flying his MIG-15, put on crowd pleasing dogfights several times during the weekend.

The first presentation of a JPO trophy went to CD Ken Basso, of Deland, Florida. I understand that this was Ken's first attempt at CD'ing an event. One would never know it, as it went quite smoothly. The award for most outstanding performance went to David Ribbe and his Aggressor II. Most realistic scale flight went to Bob Violett and his F-86. Best static scale with documentation also went to Bob Violett and his F-86.

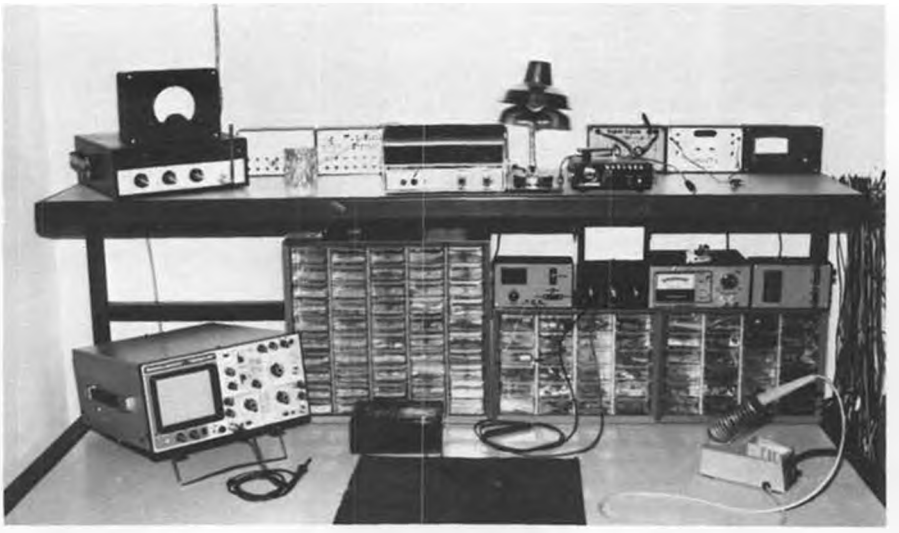
Sponsors of this first JPO fly-in were: Ace Hobbies, Daytona Beach; Bob's Hobby Center, Orlando; Bob Violett Models; Byron Originals; Fiorenze Hobby, Winter Springs; Frank Tiano Enterprises; K&B Manufacturing; Lucas Hobbies, Deland; and Yellow Aircraft.

What is the Jet Pilots Organization? Dave Tyson is the mover and shaker of this new organization. According to Dave, recent estimates have placed the number of jet model enthusiasts at 1000 to 2000 modelers in the USA and the time has come to orga-

Continued on page 64

A KBV .82 provides the push for David Robbe's lightning-fast Aggressor II. An experimental tuned pipe makes it exceptionally quiet.

Popular with the spectators was the Byron BD-5J owned by Norm Holland. Engine problems allowed him no more than a couple of flights.



Electronics Corner

By ELOY MAREZ

• SIX-METER R/C. My mention of a request for a schematic diagram for a 53 MHz high power RF amplifier for R/C use, a request which I did not see fit to help with, continues to bring mail. All "con"; as in "pro and con"! I turned down the request simply because I could envision such a transmitter shooting down airplanes all over the state, but it turns out that there is more to it than that. Read what Robert Rhoads, of Fair Oaks California, one of the many heard from, has to say about it:

"First I am delighted to see that you had second thoughts about an RF amplifier with which to boost a Six Meter transmitter, and rightly you should have. Federal Communications Commission Rules and Regulations Part 97 clearly state that a maximum of 1 (one) watt mean output power is permitted for an Amateur station to operate under the special rules for Radio Control of Remote Model Craft and Vehicles.

"With this in mind I am curious of an individual who would make a request for information of this nature in order to boost his transmitter output to 5 watts or more. Either he is not a 'Ham' which requires at least a Technician Class to operate on Six Meters, or if he is a Ham he better get his act together and comply with the existing regulations.

"There are some other thoughts to ponder also, concerning his proposed operation. If he is an AMA member, his insurance would likely be void should he be found liable for an accident and or an injury while transmitting in an illegal mode. If he is not an AMA member, he should again get his act together and become a member in good standing which requires operating in a legal manner, i.e., legal transmitter output and proper frequency.

"Finally, last but not least, as one who has taken the time and made the effort to become a Ham, I resent any bootleg operation and would not hesitate for a moment to invite the FCC to have a business visit with an individual such as he."

Bob is correct in all respects, however I am willing to give the original "requestee" the benefit of the doubt. Maybe he is a licensed Ham, but simply did not know that the rules limit us to one watt for R/C use. I didn't, and the reason is acceptable to me—I never had occasion to use or consider the use of anything but commercially available equipment for Six Meter R/C flying.

There is another possibility, being that the person in question lives and flies out in the Kansas prairies and is convinced, as a vast majority of R/Cers are, that the radio signals their transmitter generates are confined to their flying area. Actually, what they believe is the reverse, that interference can only be generated at their field and must come from another R/C transmitter, but it amounts to the same thing. I've said it before but it bears repeating; the signal that shot you down might have traveled halfway around the globe to do so, don't assume that just because there were no other transmitters on the same frequency at the field or that no one else was turned on where you happened to be flying, you were not being subjected to radio interference as your model did it's last spin down to terra firma.

With the exception of another major error in the thinking of a lot of R/Cers; that $100 buys a dependable R/C system, I am fully convinced that the greatest numbers of crashes we now experience are the result of interference, or simply owner/flier aided poor construction/installation/maintenance practices.

Our initial writer was simply concerned about something all of us worry about, the longevity of his models. But then again, maybe he was aware of the facts and was unconcerned about anyone else's air-

Continued on page 91

Right: Our columnist is a great proponent of easy-to-read analog tachometers, but finding a good one isn't easy. In fact, the one shown here, the "Fastach" from Pegasus Electronics, is quite possibly the only expanded scale analog tachometer available; see text for details.

The D&B Electronics "Tela-Time," as previewed in last month's column. This most ingenious audio flight timer keeps you fully informed of your time in the air with a series of audible beeps—one beep after one minute, two beeps after two, and so on. Introductory priced at $29.95 and available now from D&B Electronics, P.O. Box 27727, Santa Ana, CA 92799.

Rebel

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Today's R/C helicopters are technological wonders with features such as autorotation, collective pitch, bell-hiller mix and automatic tail compensation. They can easily loop, roll and fly inverted in the hands of the experienced flier. Most of these machines require special engines, radios designed for helicopter use and specialized accessories so the initial cost can run between $750 and $2,500. Well worth it, if you want the best and GMP offers a wide range of these machines.

But what about the entry level modeler who wants to try R/C helicopters before making such a large investment? To meet this need, GMP introduces their new REBEL, a very low cost R/C helicopter specifically designed to help the entry level modeler test and develop his flying skills. REBEL can be flown with low cost airplane type 4 channel radios and a 40 - 50 airplane engine.

Initial cost of REBEL is about $250 - $325 if you add a gyro. Any entry level modeler will enjoy our new REBEL. It looks and flies great and is an excellent trainer and sports model. So don't let the R/C helicopter challenge pass you by, fly a REBEL.

For a complete line of GMP helicopters, call your local dealer today or send $2 to receive GMP's new illustrated catalogue describing our extensive range of R/C helicopters and accessories.

Simple, very rugged chassis.

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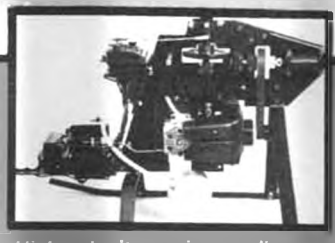

High velocity engine cooling.

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PLUG SPARKS

By JOHN POND

• After reading at least three of the best West Coast O/T newsletters, this writer has to agree that the 23rd SAM Champs at Jean, Nevada was the largest SAM Champs ever. Contest Manager Larry Jenno reported there were 270 paid entrants with the actual flight count being 109 radio controlled entrants and 148 free flight.

To get an idea of the size of this meet, there were 741 entries in the various free flight events that registered 1,200 flights in four days. The R/C boys weren't far behind with 571 entries and 1,086 flights. To this columnist, it was astonishing that many official flights were registered.

In some respects, the warm, calm weather was a boon as the lack of lift permitted many flights that would not have been possible with good thermals creating massive numbers of flyoffs and again long times.

To begin at the beginning, Larry Jenno, contest manager, and his assistant, Phil McCary, deserve many kudos for the amount of planning and work that went into this meet. To start things off right, a deal was negotiated with the Gold Strike Casino and Gambling Hall for the use of their two motels at the rather unheard of price of $16.00 per day. This cut down tremendously on the on-field trailers and recreation vans.

The best part was yet to come when the boys found the price of breakfast was less than a dollar and most full course dinners in the five dollar bracket. No one could say this was an expensive vacation.

For those unaware where the Gold Strike motels were located, they were 30 miles west of Las Vegas, about 15 miles from the California border. The casinos were originally located on the old Las Vegas highway, being rather small aimed at the so-called "last chance" gamblers. With the new super motels being put up, every effort by this management was made to attract activities such as the SAM Champs.

This writer spent a full week, Saturday to Saturday, so as not to miss any of the action, and there was plenty every day, thanks to Jim Adams' organizational ability and dedication to the Champs. Jim was also instrumental in starting (or should we say reviving?) many of the features found at the old Nationals plus a few new gimmicks. Jim was able to get the SAM 27 Newsletter editor, Ned Nevels, and a few of his reporters to publish a "Daily Blurb" (in this case called the SAM Champs Review) that was put out faithfully every day carrying the results of the previous day's flying. Great stuff!

For the girls, a Slot Machine Tournament was put on Wednesday morning for roughly two to three hours. The girls were broken up into groups with the winners in a "playoff." Marge Bernhardt was one of the lucky girls and made no bones about saying she enjoyed herself.

Sunday, October 8, was set aside for the Grand Collectogether as staged by SAM 25 (VAMPS) and the MECA group. Being located in the hotel banquet room, a tremendous crowd showed up. Trading and selling was very brisk with some prices reflecting the demand for certain items. Personalities from all over the USA and from foreign countries were noted, among those being Australian Gordon Burford, noted engine manufacturer; Colin Borthwick, columnist for Australia's *Airborne* magazine; perennial SAM entrant Ken Hinton, England; Canadian John Borthwick with a few of his cohorts; and several unnamed modelers from New Zealand. This meet had a truly international flavor!

Irwin Ohlsson was on hand to enjoy the festivities and exchange notes with engine collectors on the history of early Ohlsson engine manufacture. This MECA "Grando" was one of the best attended with a wide variety of available items.

While wandering around (without his camera as usual) this writer came unto Don McCluskey of San Antonio, Texas, who was displaying his Shrimpo S-4. Joan Bekins, who was running the SAM 27 table for sales of GHQ and Ohlsson T-shirts, kindly offered to take a picture. Photo No.

1. Seen at the "Grando" MECA Collectogether at the 1989 SAM Champs: Don McCluskey, of San Antonio, Texas, with his neat Shrimpo S-4, a 1939 Malcolm Abzug design. (MB plan #1080-O.T., $7.50.) Don built the Elf engine in the nose, including making his own castings. Joan Bekins photo.

2. The dry lake at Jean, Nevada, site of the 1989 SAM Champs. Flat as a billiard table and gorgeous weather all four days. The meet, traditionally held in July or thereabouts, was scheduled instead for October to avoid the scorching summertime heat of the Nevada desert—smart move! Don Cuthill photo.

3. Noted engine man Gordon Burford came all the way from Australia to attend the Champs, flew his Elfin powered Cleveland Viking in Class A Ignition R/C. Photo by Harold Johnson.

4. Here's something different: a 1940 "Thermaleer" as originally designed by Dan Veronica and built for R/C by Dick Bringgold of SAM 31. Beautiful workmanship is evident. Johnson photo.

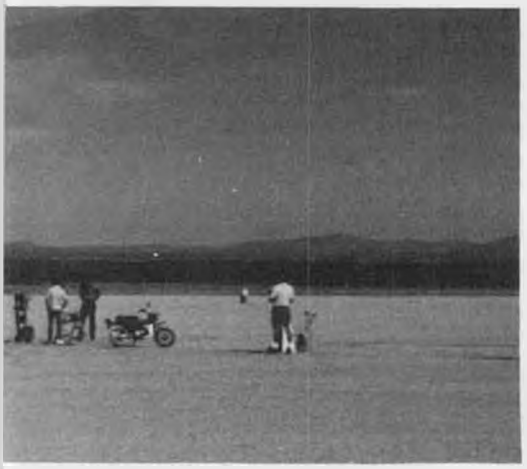
1 is the result, which shows an Elf Corncob engine in the nose. Eat your heart out, you collectors!

Via this column, I am reminding Don that he has promised to send sketches of his Miss Empire State, an early Heathe Model Airplane Co. kit. We are eagerly looking forward to this one!

While we are talking about engines and such, now is a good time to insert the "Engine of the Month" section. One will note as we are getting into the engines (above 150 now), more and more rare engines are making their appearance. Just make sure your subscription is up to date as we still have many little known engines from Australia, New Zealand, England, and the continent. Worth waiting for!

ENGINE OF THE MONTH

For this month's subject, we are indebted to Gordon Codding, 3724 John L. Avenue, Kingman, Arizona. Gordon runs



a small plan business that specializes in plans for full-size aircraft such as World War I subjects.

The Micron 30, a French engine designed by Mr. A. Gladieux, Paris, set the pace for diesel engines in the late forties. According to Mike Clansford, the Micron 5cc of 1946 vintage was the most successful competition engine on the continent. Actually, two models were made, of which we are featuring the second 1946 model. The second engine had improvements in the form of a heavier crankcase and an updraft-type intake carburetor.

Gordon claims the Micron 5cc was very similar to the Owat diesel which led to considerable confusion in identity. The fixed compression head, although simple to operate, required fuel changes in the mixture to suit climatic conditions. This was the problem with the Drone engine.

When Leon Shulman was in France with Uncle Sam's Air Force, there is no doubt he was influenced by the Micron design. Due credit to Shulman must be given for simplifying the engine with a one-piece crankcase casting, more fins for cooling and a general all-around better appearance. The Drone sold very well until the advent of the glow plug which eliminated all the pesky gadgets necessary in ignition-type operation.

Of note is the shutoff plunger in the Micron fuel tank. This spring-loaded plunger was simple to operate by simply pulling the plunger up to a notch for the small spring to rest upon. To operate as a shutoff valve, an engine shut-off timer is employed to pull the spring out of the notch, allowing the internal coil to pull the plunger into a tapered seal in the fuel line.

This system was used in England by the series of Frog engines and widely copied elsewhere. In America, the Atwood Timer tank and others of this type copied the idea. K&B produced a separate spring-loaded fuel shutoff which could be mounted anywhere convenient to the vicinity of the tank.

Another nice feature of the Micron engine was the rear-angled needle valve. Inasmuch as the engine swings a large propeller (12-13 inch dia.) this needle valve kept the fingers out of the propeller arc; a nice feature.

Codding, in a letter to this writer, mentioned a strap-on type of exhaust pipe was made for this engine, but has never been able to confirm this or locate such an exhaust attachment.

We don't have much in specifications except to say the Drone engine would be quite similar in bore and stroke. The Micron engine weighed 8 ounces as shown and was rated 1/4 horsepower at 7,000 rpm. A good running diesel!

MONDAY, OCTOBER 9

This was the day for final registration at the Gold Strike. Most of the fellows who came early used this day to check the flying field.

As Art Grosheider said, "Awesome! A dry lake bed, flat as a billiard table about two miles across. Paradise! No wind, oh God! Models going up all around the place. We had died and wound up at that

5. Action on the R/C flight line shows Bill Schmidt holding fellow Texan Lamoine Schrock's McCoy .60 powered Nimbus. Field marshal Ron Doig (right) observes the goings-on, while Jack Albrecht can't decide which model he's going to time. Photo by Don Cuthill.

6 (right). Tom Alden, of Canada, displays his beautifully built Fred Bowers Wakefield. This was the model that placed second behind Dick Korda's famous 54-minute Wakefield flight in 1939. Photo by Harold Johnson.

great contest in the sky! What a glorious day and the first of five."

However, such perfection was bound to have flaws, the first being the amount of dust generated by automobiles and motorcycles breaking the thin crust of the soil and leaving prodigious clouds behind them.

Photo No. 2 shows the free flight line looking from the far end in a rather huge semicircle. What gorgeous skies! The wind was practically nonexistent until afternoon.

Second, and the most common of all, was the lack of lift. Only those that climbed to great heights like the Texaco models were able to register good times. Most of the fellows, like Sal Taibi, found the early morning dew thermals were a considerable help. On the positive side of things, the short flights were a boon in disguise as all modelers were able to get in their officials.

7. Lending some female charm to the contest was nine-year-old Lisa Moment, of Urbana, Illinois, shown here with an Earl Stahl "Hi-Climber." Good to see youngsters getting involved in Old Timers. Harold Johnson photo.

8. Sal Taibi (left) rarely fails to do well in O.T. F/F Scale with his big seven-foot Corben Super Ace and the '89 Champs was no exception; he took second with a flight time of 29:10. Don Garafalow, the model's original designer, on right. Photo by Jim Alaback.

Test flying was the order of the day. Who could resist flying in this great area? Gordon Burford, who was brought to this meet by the writer, simply had to test his Cleveland Viking kitted by Astro Flight.

This model was powered by one of Gordon's replicas of the Elfin 2.46 diesel. As usual, impeccable work results in a good engine. Burford's engine aroused such interest that modelers on the field were trying to place orders with Gordon.

Wouldn't you know it! Before Burford left the field, that incomparable horse trader, Howard Osegueda, was seen adding the Burford engine to his collection. Some guys know how!!

Burford is seen with his Viking in Photo No. 3. The replica Elfin 2.46 diesel starts so well, he only hand props the engine. According to reports, "Burf" may only produce 100 and then no more.

To offset this, the latest news from John Targos, proprietor of "Argo," is that he will be offering replicas of the Elfin engine also. John is taking orders from the interested modelers. No price has been set as yet, more or less waiting to see what sort of demand results. Of course, the larger the run of the engine, the more the machining and casting parts can be reduced. For those interested, the following addresses are given: Gordon Burford, 86 Tierney Drive, Currumbin, Queensland, Australia, and

9 (right). Curtiss Robins were popular in O.T. F/F Scale; two placed in the top five at the SAM Champs. Shown here is Jim Robinson's six-footer built from Comet plans and powered by an O.S. .20. Harold Johnson photo.

10. One of the entries in Gas Scale was Larry Clark's attractive double-size version of Earl Stahl's Rearwin Speedster. Johnson photo.

11. SAM president Jim Adams manages a smile in spite of the problems he's having with his Curtiss-Wright Junior. Difficult to trim, it was damaged on a test flight. Johnson photo.

John Targos, Argo USA, 3229 Dianora Drive, Palos Verdes, California 90274 (Special price $80.00; deposit required to qualify for special price.)

ANNUAL SAM "BEAN" FEED

This has become a misnomer as the original idea was to meet on the field after flying was over and have an open fire with beans in a pot plus ice cold beer and refreshments. This made for a much more informal get-together, allowing people to circulate and meet old friends plus new acquaintances.

This year's opening "Bean Feed" was completely sold out. I don't believe you could have wedged another 10 above the 300 sold seats. In this respect, this writer was quite unhappy when Australian visitors, Josie and Gordon Burford, well-known model manufacturer, MAAA Hall of Fame, CIAM representative, could not be accommodated. They waited on standby and finally left. Nothing like cementing foreign relations!! When it came time for the banquet this columnist made a point of soliciting tickets from those who were unable to use their tickets. This worked out much better.

The main feature of the Bean Feed was the awarding of 25 raffle ticket prizes plus the opening remarks by the Free Flight Director, Jim Perssons and R/C Director, Don Bekins. When the nit-picking questions started, this writer left. Sometimes we draw too fine a line!

However, no matter how you looked at it, you could not detract from the careful preparation of the organizers and officials. This was proven on the field, day after day, as up to date results were available throughout each flying session.

12. Ed Koneles, of Wauconda, Illinois, shows his "Convertible" cabin rubber model, a Dietrich design from one of the Zaic Yearbooks. Photo by Harold Johnson.

This writer particularly liked the care taken by the recorders in posting times and then marking each time with a stamp "recorded." Not much margin for error here!

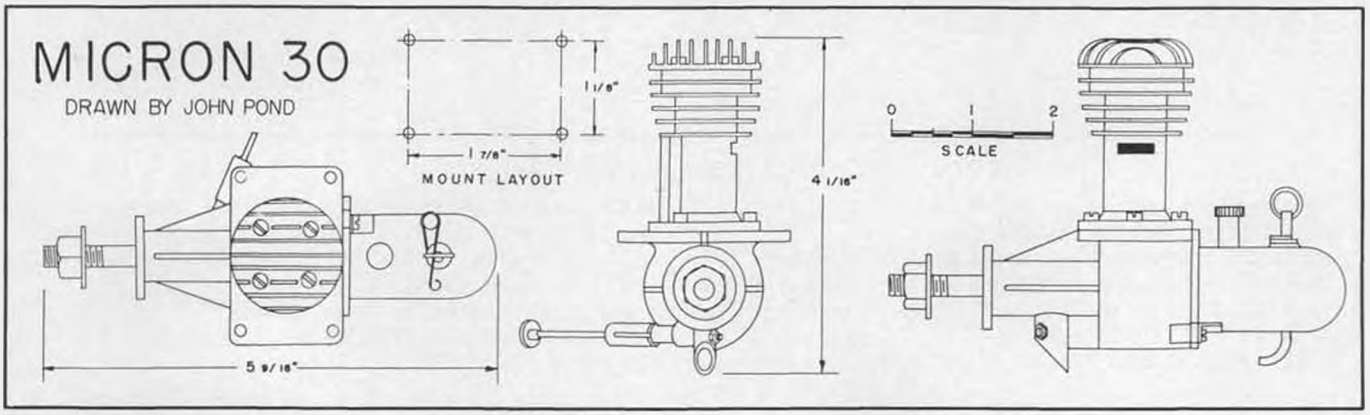
TUESDAY, OCTOBER 10

Flying gets started in earnest and so do the photos. This writer cannot compliment Harold Johnson, 1415 Trollhagen Drive, Minneapolis, Minnesota 55421, enough for the excellence and amount of photos taken. Harold has been doing this for so long, he is regarded as the Official (Unofficial) SAM photographer.

Johnson also explains that he took a lot of posed shots rather than action photos. He has found that the subjects move around quickly when launching. This only gives you one chance as you never know (until developing) what you have.

Harold opted for the more conservative approach to give the viewer a more studied look at the flier and airplane. No need to apologize, Hal, your photos are great!

Starting off the parade of photos, we



1989 SAM CHAMPS RESULTS

October 10-13
Jean, Nevada

RADIO CONTROL

ANTIQUE (30 entries)

1. Joe Perry	Cumulus/Rossi 60	*44:48
2. Jim Kyncy	Anderson Pylon/Rossi 60	*43:33
3. Stan Lane	Anderson Pylon/OS 60	*42:17
4. Eut Tileston	Lancer/OS 40	*35:38
5. L.A. Johnston	Dallaire/Fox Eagle 1	*34:19

1/2A TEXACO (77 entries)

1. Tom Smith	Anderson Pylon	*45:50
2. Eldon Breazier	Anderson Pylon	*45:19
3. Bill Schmidt	Comet Sailplane	*42:08
4. Ken Kullman	Foota Westerner	29:48
5. Murville Lipsey	MG	29:34

TEXACO (64 entries)

1. Jim Reynolds	Bomber/OS 61FS Cnv Ign	40:00
2. Stan Lane	Anderson Pylon/OS 60 FS	35:41
3. Ed Hamier	Bomber/Anderson 61	31:11
4. Arnie Hernandes	Guff/OS 40 FS	30:21
5. Jim Kyncy	Anderson Pylon/OS 60 FS	29:46

ELECTRIC TEXACO (23 entries)

1. Tom Christian	Leisure Bomber	*48:43
2. Fred Mullholland	Leisure Bomber	*48:22
3. Ray Westland	Leisure Playboy	*47:30
4. Jack Albrecht	Leisure Bomber	*46:31
5. Peter Rafferty	Leisure Bomber	29:36

ELECTRIC LMR (21 entries)

1.George Joki	Leisure Bomber	29:11
2. Dale Tower	Leisure Playboy	28:32
3. Fred Mullholland	Leisure Bomber	28:27
4. Ray Westland	Leisure Bomber	28:10
5. Peter Rafferty	Leisure Bomber	27:12

OHISSON SIDEPORT (24 entries)

1. Bob Angel	Schmaedig Stick	20:09
2. Dale Tower	Lanzo Bomber	19:55
3. Howard Osegueda	Scram	18:04
4. Ed Hamier	Lanzo Bomber	17:52
5. Jack Albrecht	Lanzo Bomber	17:21

OHLSSON (23 entries)

1. Jim Kyncy	Anderson Pylon	12:51
2. Jack Albrecht	Anderson Pylon	11:03
3. Howard Osegueda	Lanzo Bomber	10:03
4. Walt Geary	Zipper	8:40
5. Walter Conrad, Jr.	Lanzo Bomber	8:01

OLD TIME GLIDER (11 entries)

1. Don Bekins	Thermic 50	20:00
2. Bob Sliff	Thermic 100	14:42
3. Russ Thomas	Thermic 100	8:25
4. John Pond	Floater	3:16
5. Ron Doig	Soarer	2:16

CLASS A IGNITION LER (33 entries)

1. Larry Davidson	Playboy Jr./Elfin 2.49	*28.00
2. Jim Reynolds	Bomber/Elfin 2.49	*24:47
3. Bruce Norman	Bomber/O&R 19	19.37
4. Jack Phelps	Bomber/Arden 19	19:19
5. Gerald Martin	Bomber/Arden 19	17:48

CLASS B IGNITION LER (39 entries)

1. Jim Reynolds	Bomber/Orwick 29	*25:30
2. Joe Perry	Bomber/Torpedo 29	*23:49
3. Bruce Norman	Kerswap/Torpedo 29	20:26
4. Ed Shilen	Playboy/Forster 29	20:19
5. Murville Lipsey	Playboy Cabin/Torpedo 29	20:01

CLASS C IGNITION LER (61 entries)

1. Jim Reynolds	Bomber/Orwick 64	*34:50
2. Don Bishop	Bomber/O&R 60	F*32:24
3. Joe Perry	Bomber/Edco 65	*32:23
4. Bob Angus	Bomber/Orwick 64	*31:22
5. Jack Albrecht	Bomber/Anderson 65	*30:51

CLASS A GLOW LER (28 entries)

1. Jim Reynolds	Playboy Sr./K&B 3.25	*30:53
2. Jim Kyncy	Kerswap/K&B 3.25	*29:39
3. Bruce Norman	Kerswap/Supertigre 19	20:11
4. Joe Perry	Bomber/K&B 3.25	19:54
5. Eut Tileston	Lancer/K&B 3.25	16:55

CLASS B GLOW LER (33 entries)

1. Jim Reynolds	Playboy Sr./K&B 3.25	*30:00
2. Jim Kyncy	Kerswap/K&B 4.9	*29:44
3. JOe Perry	Bomber/ST 29	*29:34
4. Art White	Bomber/K&B 3.5	*22:46
5. Bruce Norman	Bomber/ST 29	20:49

CLASS C GLOW LER (37 entries)

1. Eut Tileston	Lancer/OS 40	*32:28
2. Jim Reynolds	Playboy Sr./ST 35	*31:59
3. Bob Munn	Playboy Sr./ST 35	*29:37
4. Joe Perry	Bomber/ST 35	*28:48
5. Bruce Norman	Bomber/ST 35	*21:00

PURE ANTIQUE (37 entries)

1. Gerald Martin	Bomber/dnr	*42:36
2. Don Bishop	Bomber/Orwick 73	*40:26
3. Dick Bringgold	Bomber/Orwick 64	*37:27
4. Peter Rafferty	Bomber/Anderson 61	*37:13
5. LaMoine Schrock	Dallaire/Hornet	28:37

LEE RENAUD 1/2A TEXACO (28 entries)

1. Jim Kincy
2. Murvill Lipsey Jr.
3. Jack Warkins

R/C GRAND CHAMPION
Jim Reynolds

PERPETUAL TROPHY WINNERS

COMPRESSED AIR - Bert Pond
ERNIE SHAILOR TROPHY - Don Weitz
RICHARD WHITE HIGH TIME C CABIN - Don Weitz
DANNY SHEELDS TWIN PUSHER TROPHY - Ed Wallenhorst
ED KELLY TROPHY HIGH TIME C PYLON - Don Weitz
FEATHER MERCHANT AWARD
BEST PERFORMING IGNITION ENGINE - George Niebauer
MARQUART TROPHY HIGH TIME 30SEC. - Walt Johnson
LANZO TROPHY — HIGH TIME R/C TEXACO - Jim Reynolds
ROBERTS TROPHY HIGH TIME IN R/C -Tom Christian
SPIRIT OF S.A.M. CONCOURS
JIM ADAMS AWARD - Clarence Bull
OHLSSON PERPETUAL TROPHY
Donated by Don Bekins - Jim Kyncy

FREE FLIGHT

SMALL FUSELAGE (32 entries)

1. Bob Dodge	17:53	Double Feature
2. Mik Mikkelson	17:39	Stahl Weight Rule
3. Jim Quinn	8:50	?
4. Bill Cushenbery	8:40	Dynomoe
5. Ed Konefes	8:27	Crusader

LARGE FUSELAGE (45 entries)

1. Bill Cushenbery	14:53	Lanzo Cabin
2. Bob Dodds	10:56	Korda D.T.
3. Ed Wallenhorst	10:25	Lanzo Duplex
4. Tom Alden	9.59	Verdier 36
5. Bill Gibbons	9:40	Nelder Muffet

PRE 37 WAKEFIELD (25 entries)

1. Tom Alden	10:10	Verdier 36
2. Ed Wallenhorst	9:40	Lanzo Duplex
3. Mik Mikkelson	9:27	Copland
4. Jack Jella	8:24	?
5. Bill Gibbons	7:31	Lanzo Duplex

38-39 WAKEFIELD (30 entries)

1. Bud Romak	11:46	?
2. Bill Cushenbery	11:02	Kansas Wakefield
3. Don Reid	9:51	Korda
4. Jack Phelps	9:06	Korda
5. Ed Wallenhorst	8:52	Korda

COMMERCIAL RUBBER (33 entries)

1. Ed Wallenhorst	8:45	33 Gordon Light
2. Don Reid	8:19	Miss Canada Sr.
3. Bob Langdon	8:17	?
4. Ed Konefes	7:56	
5. Mik Mikkelson	7:24	Gordon Light

H.L. GILDER (16 entries)

1. Jason Youck	3:58	Huquelot
2. Jim Kutkuhn	3:53	A Orthoff
3. Terry Rimert	2:34	Huquelot
4. John Bortnak	2:28	Zoomer
5. Dave Ramsey	1:57	Sevenal

TWIN PUSHER (16 entries)

1. Ed Wallenhorst	3:03	Simmers
2. Mik Mikkelson	2:47	Burnham
3. Tom Boyle	1:19	?
4. Fred Emmart	1:15	Manulkin
5. Bob Dittmer	1:10	Burnham

SMALL STICK (40 entries)

1. Ed Konefes	8:33	Homesick Angel
2. Don Reid	8:17	Gollywock
3. John Rogusky	7:41	Gollywock
4. Bill Cushenbery	7:26	Gollywock
5. Ed Wallenhorst	7:19	36 Korda

LARGE STICK (39 entries)

1. Richard Seifried	13:18	Lamb Climber
2. Bob Dodds	13:00	1940 Record Holder
3. Ed Wallenhorst	11:52	Korda Stickler
4. Bill Gibbons	11:48	Lanzo Record Holder
5. Ed Konefes	11:22	?

RUBBER SCALE (19 entries)

1. Ed Wallenhorst	7:18	Alco Sport
2. John Portnak	6:57	Renard R-31
3. Mik Mikkelson	4:41	Curtiss Robin
4. Bud Romak	4:37	?
5. Jerry Romak	3:45	Curtiss Robin

COMPRESSED AIR (3 entries)

1. Bert Pond

GRAND CHAMPION—FREE FLIGHT

JOHN BORTNAK

SPECTACULAR CRASH TROPHY Donated by Larry Jenno

Henry Hill-Clipper

PYLON A (62 entries)

1. Chas. Atkinson	15:00	Comet Interceptor	Elfin 2.49
2. Bruce Augustus	13:22	Stratostreak	Elfin 2.49
3. John Bortnak	13:18	Stratostreak	OS15 Conv.
4. Sonny Soto	11:10	Playboy	Elfin 2.49
5. Bob Oslan	11:01	Stratostreak	OS15 Conv.

PYLON B (56 entries)

1. Don Weitz	19:45	Swoose	OS25 Conv.
2. Bob Oslan	14:56	Ranger	OS25 Conv.
3. Jerry Rocha	13:53	Gas Bird	O&R 23
4. Larry Clark	12:20	Foo 2-U-2	OS25 Conv.
5. John Bortnak	11:51	Wasp	OS30 Conv.

PYLON C (52 entries)

1. Don Weitz	24:27	Playboy	OS40 Conv.
2. Geo. Niebauer	23:46	Sailplane	McCoy 60
3. Bob Oslan	14:11	Sailplane	Atwood
4. Sal Taibi	13:51	Foo 2-U-2	Wahl Tiger
5. John Bortnak	13:42	Wasp	OS30 Conv.

CABIN A (39 entries)

1. John Bortnak	12:47	So Long	OS15 Conv.
2. Mike Poorman	9:39	Westerner	Hornet 19
3. Sal Taibi	9:36	Brooklyn Dodger	Elfin 2.49
4. Chas. Atkinson	8:56	Bay Ridge Mike	Elfin 2.49
5. Don Hannum	8:01	So Long	Elfin 2.49

CABIN B (33 entries)

1. John Bortnak	12:14	So Long	OS25 Conv.
2. Mitch Post	9:16	Dodger	Torp 29
3. Jim Belson	8:16	Dodger	Forster 29
4. Ray Chalker	7:51	Dodger	Forster 29
5. Tom Alden	7:27	Gladiator	Torp 29

CABIN C (49 entries)

1. Don Weitz	19:49	Playboy Cabin	OS40 Conv.
2. Sal Taibi	18:27	Playboy Cabin	O&R 60
3. Richard Seifried	13:31		
4. R. Reinarz	11:11	Playboy Cabin	Super Cyke
5. John Bortnak	10:42	Dodger	OS30 Conv.

020 REPLICA (47 entries)

1. Chas. Atkinson	14:0	Comet Intercepter	Cox .020
2. Jerry Rocha	10:23	Stratostreak	Cox .020
3. Bruce Augustus	10:15	Stratostreak	Cox .020
4. Dick Lyons	8:33	Kerswap	Cox .020
5. John Bortnak	8:14	Foo 2-U-2	Cox .020

1/2A TEXACO (23 entries)

1. Mik Mikkelson	47:31	Miss Fortune X	Cox.020
2. Sal Taibi	45:12	Powerhouse	Cox Baby B
3. Dick Lyons	45:00	Red Zepher	Cox Golden Bee
4. Don Nordlund	39:41	Ehling	Cox B.W.
5. Clarence Buli	36:35	Lanzo Bomber	Cox 049

30 SEC. ANTIQUE (45 entries)

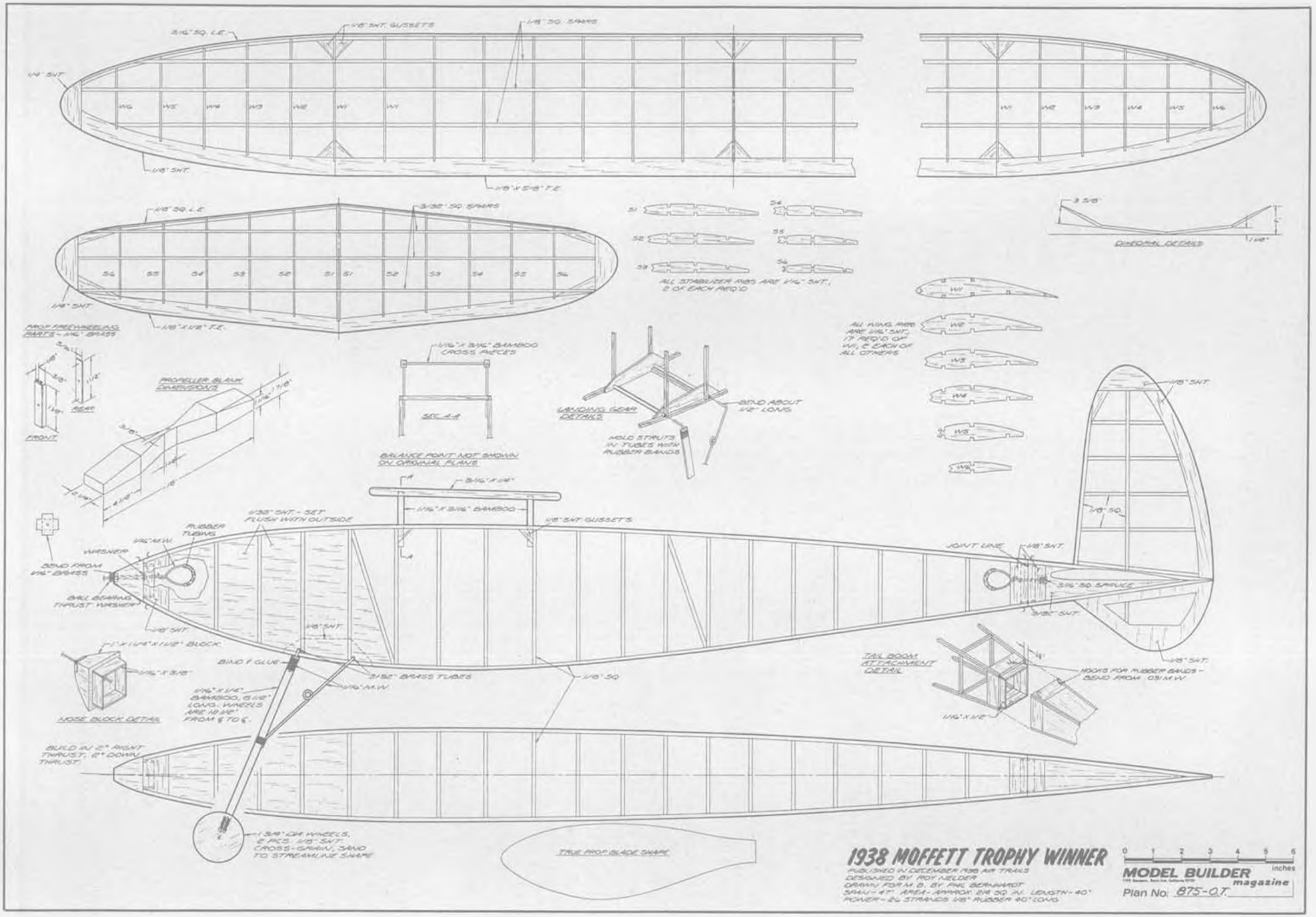
1. Walt Johnson	12:34	Comet Clipper	O&R 60
2. Tom Alden	10:09	Flying Midget	O&R 60
3. Abe Gallas	8:52	Kloud King	Bunch
4. Larry Boyer	8:50	Comet Clipper	?
5. Bob Dittmer	8:08	Powerhouse	Orwick

FUEL ALLOTMENT (22 entries)

1. Jim Kelly	13:01	Shereshaw Champ.	O&R 60
2. Mitch Post	12:58	Anderson Pylon	Spitfire
3. Bud Warren	11:19	Suoer Buck	Super Cyke
4. Leon Nadolski	11:06	Anderson Pylon	Orwick
5. Jim Robinson	10:22	Flamingo	O&R 60

GAS SCALE (16 entries)

1. Bob Dittmer	33:10	Curtiss Robin	?
2. Sal Taibi	29:10	Corbin Super Ace	Vivel 35
3. Phil McCary	28:02	Curtiss Robin	Cox .049
4. Chas. Atkinson	18:45	Aeronca C-3	Cox .020
5. Bob Chambers	18:43	Taylorcraft O-57	Webra 1.5



1938 MOFFETT TROPHY WINNER

PUBLISHED IN DECEMBER 1938 AIR TRAILS
DESIGNED BY ROY NELDER
DRAWN FOR M. B. BY FRED BERNHARDT
SPAN - 47" AREA - APPROX. 214 SQ. IN. LENGTH - 40"
POWER - 2 STRANDS 1/8" RUBBER 40" LONG

0 1 2 3 4 5 6 inches

MODEL BUILDER magazine

Plan No: 875-0.7

13. World-class indoor flier, Bud Romak, also competes in O.T. F/F and showed up at Jean with this good-looking Comet Sailplane, powered by an Anderson Spitfire. Harold Johnson photo.

14. An Ohlsson .23 powers the "Spearhead Jr." built and flown by Larry Nigh of Cedar Rapids, Iowa. Model was recently approved as a SAM-legal Old Timer. Johnson photo.

have selected Photo No. 4 showing a simply gorgeous model of the "Thermaleer," a design by Daniel Veronica that appeared in the May, 1940 issue of *Air Trails*. Dick Bringgold, the main spark plug behind SAM 31, says he built this model just to prove there are other models besides the Lanzo Bomber. A conservative estimate showed about 40% of the R/C models were this Chet Lanzo design. No reports on how it flew, but here is hoping this model starts a new trend.

A typical photo (No. 5) of the R/C flight line is seen with Bill Schmidt holding a scaled Shereshaw Nimbus (by Lemoine Schrock?). Seen also are Jack Albrecht, timer, and Ron Doig, Field Marshal. This scaled Nimbus version originated by Schmidt has turned out to be a great performer. The 10-foot version was just a shade too big for good climbing performance. Seen in the background is the refreshment center where sandwiches and liquids could be obtained. Handy!

Over on the free flight side of things, Johnson took a series of beautiful photos with rubber-power models as the subjects. Seen in Photo No. 6 is a typical beauty by Tom Alden of Vancouver, British Columbia, Canada, with a great-flying Bowers 1939 Wakefield. Bowers will be remembered as the guy who flew second behind Korda's 54-minute flight, registering only 12 minutes for second place. The luck of the draw in starting order!

Before moving on, also worth mentioning is Photo No. 7 showing an Earl Stahl "Hi Climber" built and flown by Lisa Moment of Urbana, Illinois. Nice to see the distaff side of modeling. Only 9 years old!

WEDNESDAY, OCTOBER 11

More flying and more flying! Anyone who has seen Sal Taibi fly his free flight models is impressed with his style and confidence. He makes starting engines easy and his models are rarely out of trim.

To that end, Photo No. 8 is presented showing Sal on the left with the designer of the seven-foot Corben Ace, Don Garafalow. Old buddy, Don, has been designing and drawing models since the early days of Scientific, Star, and Best-By-Test Model Airplane companies.

The designer of the Corben Ace is listed incorrectly as Vito Garafalow, a Chicago modeler famous for his free flight rubber models. Don Garafalow should have been credited as this design has been in the Pond archives for over 15 years! A little slow on the credit, wouldn't you say, Don?

ANNUAL SAM BUSINESS MEETING

This year's SAM business meeting featured very little business with only two motions presented by President Jim Adams and approved.

The most interesting facet was the rather long report by the Secretary Treasurer, Don Dodds, who noted we are really in the black with the treasury approaching $40,000. He also mentioned the paid U.S. SAM membership at 2,170 with 1,390 abroad in England and Australia.

The highlight of the meeting was a new feature inaugurated by Jim Adams, a SAM Hall of Fame. Ten modelers were nominated: Chester Lanzo, Carl Goldberg, Walt Good, Gordon Light, Irwin Ohlsson, Bert Pond, John Pond, Sal Taibi, Maxwell Bassett, and Frank Zaic. Luckily, five were

Continued on page 102

OLD TIMER Model of the Month

ROY NELDER'S

1938 Moffet Winner

Text by BILL NORTHROP

• Ever since it was published in the December 1938 issue of *Air Trails*, Roy Nelder's 1938 Moffett Trophy Winner has been one of our favorite rubber designs.

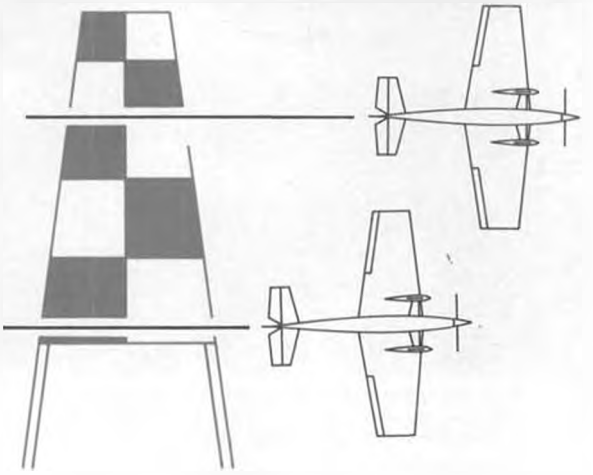
We remember this ship mostly because of its simple and functional, yet beautiful lines, accented by the elliptical wing tip, stab, and rudder outlines. The fuselage, though rectangular in cross-section, and built entirely of 1/8 square, has an extremely pleasing profile. The big, one-piece free-wheeling prop looks just right, and in fact, anything else, such as a folder, would seem out of place.

Only one modification has been made on our plans. The wire at the top of the main landing gear strut has been shown in two pieces instead of one. In this way, the gear may be added after covering, with a rubber band stretched across the bottom of the fuselage, to hold it in place.

Roy was (is?) a Canadian modeler, who won a free trip to the U.S. Nationals by taking first in the Canadian Moffett Team eliminations with a flight of 10 minutes and 37 seconds. He went on to win the International Moffett Trophy at the Nationals, in Detroit, with a flight of 5 minutes and 17 seconds.

The original model featured a long, slow, steady climb, using a 26-strand motor of 1/8-inch rubber, 40 inches long. The rudder was offset for a right turn. Both power and glide paths were in 70 foot diameter circles to the right. Down and right thrust were the only adjustments made after a proper glide was obtained. In windy weather, slightly more right thrust and a tighter power and glide pattern were used to prevent the model from mushing and losing its hold on downwind turns.

The 1989 FAI WORLD PYLON RACING CHAMPIONSHIPS



By DAVE SHADEL

• It's 6:00 a.m., and the U.S. Pylon Racing Team is heading for another gourmet breakfast at the local "7-11." After choking down a stale donut or burnt weenie sandwich, it's back into the trucks for the short trip to the field for the 1989 FAI Pylon World Championships in Chesapeake, Virginia. Pylon Racers representing 13 countries worldwide gathered for this biennial, exciting event!

Arriving at the field, they proceed to a staging area on a taxiway about half a mile from the runway. It's a warm, wet Virginia morning and time for the ritual "sling-off." For the uninitiated, the early morning "sling-off" is the high point of each day. U.S. Team member, Dub Jett, in his infinite wisdom, has been kind enough to bring along a wet-bulb thermometer. It is used to measure relative humidity. Each morning, all of the team members gather, place their bets in a pile, and try to guess the humidity percentage. The closest one wins the "pile!" (The winner is usually Mr. Jett as he's the only one who can read the device!)

On the first day of competition, the humidity starts off at a sultry 96%. The team wishes they had packed their boat props. In a short time, the pylon competitors will test their skills against the best in the world. Would the many hours of preparation be enough? They would find out soon enough.

The U.S. Pylon Team was there to prove that the 1-2-3 finish in 1987 was no fluke. This time, the goal was 1 through 4 as we had the 3-man team, plus defending World Champion, Dave Shadel. Would the U.S. Team repeat? Confidence was very high. All of the team members had run sub-world record times in practice and had a track record of awesome consistency. They were ready!

1987 World Champions Dave Shadel (left) and caller Jim Shinohara repeated their win in 1989. Aircraft is a fixed gear Stiletto P-51 designed by U.S. teammate Gary Hover.

The Americans all flew the same design aircraft, a Stiletto P-51 designed by team member, Gary Hover. Dub Jett's and Bruce Richmond's aircraft were built by Bruce and painted by J.P. Hanway. Gary Hover's and Dave Shadel's aircraft were built and painted by Gary and Jim Shinohara. Dub, Bruce and Gary flew retract gear aircraft, while Dave chose the fixed gear which he felt would cause fewer problems.

It's interesting to note that the U.S. Team protested some of its own aircraft prior to the start of competition in order to get an official interpretation from the FAI Jury. It seems that when Bruce Richmond built his and Dub's aircraft, he did not add the leading edge break that is a P-51 trademark. Therefore, the wing wasn't quite correct in planform, and to get an official ruling was important since the piece could easily be added, if need be. The U.S. Team was very sensitive to potential protests as they were a possible way that they could be beaten; hence, their forethought to protest themselves. The jury declared the aircraft legal.

Round One saw several strong challenges to the Americans' domination of the competition. Barry Lever of the United Kingdom, and 1985 World Champions Milos and Zdenek Malina of Czechoslovakia, had good times. Not far behind was Hans Sagemuller of West Germany. After one round, the U.S. had four of the top six

Members of the third-place Japanese team with their beautifully built models. They have shown great improvement since the last World Champs in 1987, and if their performance in F3C Helicopter competition is any indication, will soon be very tough to beat in F3D Pylon as well.

Silver medalist Dub Jett (center) with caller Bruce Richmond (left) and mechanic/genius Johnny Shannon. Model built by Bruce.

places.

Three rounds were flown on the first day of competition. As 12 rounds were planned, two of which would become throwaway, there was a lot of racing left to do. The U.S. finished the first day on top of the pile. Only nine more rounds to go.

Day two dawned once again warm and wet. Dub Jett allowed someone else to win the "sling-off" to avoid arousing suspicion.

Bruce de Chastel, of Australia, had received a zero score in rounds one and two due to dirt in his fuel system. He therefore had both of his throwaway scores and was

The fastest man in the southern hemisphere is Australian Bruce de Chastel (center), pictured with caller Gary Gau (left) and David Garner. Dirt in the fuel system cost Bruce a shot at the world title.

really on the "hot seat." No more errors or he would be out of it completely. Bruce had been on the 1985 Australian Team and only missed making the 1987 Team when the airlines lost his models on the way to the team selection. He had worked very hard to become competitive for 1989 and the first two rounds really hurt, especially since he had what was considered by most to be the fastest aircraft in the competition.

The Malinas found out in Round Four just what wake turbulence is all about when they got behind Gary Hover's Stiletto around the Number 3 pylon. They saw it as instant disaster and one destroyed model. We know it better as a "KAZE F—T." Other competitors who looked promising began to fall by the wayside. Only the U.S. Team and Dave Shadel were holding their own. Still on top with only six rounds to go.

Rounds Seven and Eight were flown on the third day of competition. We were being restricted in number of rounds flown per day since the Navy was using the field for carrier landing practice in the early morning and R/C Aerobatic Flying took over at noon.

Dub Jett continued to perform flawlessly, retaining his lead over Richmond, de Chastel, and Shadel. Hover had a "zero" in Round Two and a bad run in Round Five which kept him in sixth position.

When flying finished for the day, the teams retired to the hotel for some serious thrashing on engines and airframes—anything to make them go faster! Only four rounds to go and anyone still in the top five or six places had a shot at the win.

The fourth day of competition was different. A front had moved through during the night and the day dawned bright, clear, and much cooler and drier than before. Everyone missed it at the morning "sling-off." The humidity was down over 15%. This day would be *fast!*

On his Round Nine flight, Dave Shadel knocked off a very quick 72.1 second flight, with the aircraft slowing down in the last

Roger Langham of Australia fuels prior to a heat race. FAI rules require all pylon competitors to use the same fuel.

two laps due to a loose propeller. The flight helped his standing by moving him past Dub Jett and into first position. The Championship was still up for grabs, though, as the top five places were only separated by about five seconds.

Continued on page 96

Team Australia, from left: Roger Langham, team manager David Garner, Ian Haigh, Keiran Harvey, Gary Gau, and Bruce de Chastel. Bruce placed third individually; Australian team came in second.

Group shot of the victorious U.S. F3D team. Models were built by Bruce Richmond and Gary Hover. All had retracts except Dave's.

East meets West. U.S. team manager Don McStay (right) chats with Japanese team manager Yoshiro Sato (second from left), Yoshiro's son Bobo (left), and Mr. Yamazaki.

MODEL DESIGN & TECHNICAL STUFF

By FRANCIS REYNOLDS

A READER WRITES:

Let's start with a letter from Ed Westbrook of Chelmsford, Massachusetts. Ed requests a technical article on model propellers, questions "Lifting" Stabilizers, and points out some errors I made in connection with decibels. He also urges me to stick to the column title and give you lots of technical material and let those who are not interested read something else. He asks, "Have you gotten any letters complaining that you are too technical?" (No.) My personal answer to Ed's letter was roughly as follows:

PROPELLERS

Propellers would be a good tech. subject for the column but I doubt if I am qualified to write it. Aside from studying the propeller formulas in the aero books a bit, I haven't done any work with them and have no more than a basic understanding of them. George Abbott has written some good articles on model props. In particular I refer you to his article in *Model Aviation* of October 1986. You asked about props for electrics. I think the gas engine props are well-suited, but the folding props obviously have advantages for some types of electrics, and so do some rubber-power props.

The reason I haven't concerned myself much with model props (since the early days when we designed and carved our own), is that I think the model prop companies are doing a very good job. There would be little to be gained by trying to outguess them, except in specialized cases like racing. Of course selection of the right prop for a given engine and airplane requires a little thought and usually some trial and error. We may talk a bit about that someday.

LIFTING STABILIZERS

I agree with you, Ed, that most so-called "lifting" stabilizers on R/C models do not lift. The term may sometimes help to sell kits or it may show ignorance on the part of the "designer." Look at the position of the cg on the model. If the cg is in the usual 25 to 40% of chord range there is no way the stab can lift without causing the model to dive. On some free flight models with big stabs, or on tandem airplanes, the cg may be from 50% chord to well behind the trailing edge of the wing. Then the tail must lift to balance the model.

A positively-cambered airfoil on the stab of a normally-balanced model does nothing but add drag. Normally the tail will have a slight download. If the stab has a positive camber it must act at a negative angle of attack to produce that download, and the lift-to-drag ratio would be much poorer than with a sym. stab or a negative-camber stab.

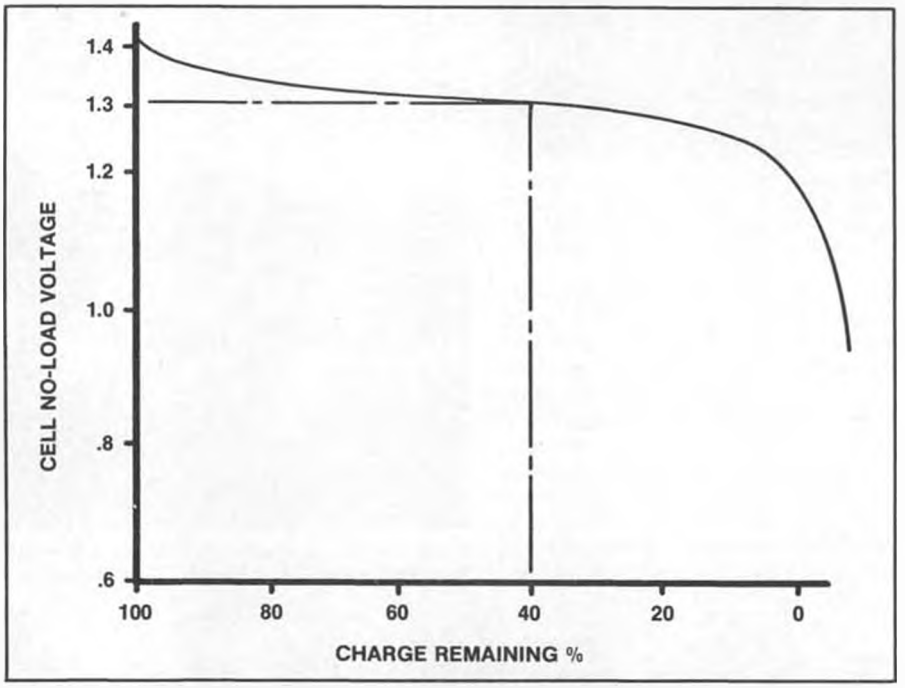
I WAS WRONG

(I thought I was wrong one other time, but I was mistaken.) I stand corrected on dB, Ed. Loudness is indeed perceived sound, not power. A decibel of sound is a logarithmic unit of sound power, and writers such as myself like to point out that ten more dB is ten times as much sound power, but the truth of the matter is that what we hear is only about twice as "loud."

Ed further points out that I carelessly said that going from 70 dB to 84 dB would be twelve and a half times as much "noise." That is wrong; it would be 25 times as much (sound power). When we add logarithms we multiply the power. 85-70=14dB increase. 14=10+4. A four dB increase is 2.5 times as much, and 10 times 2.5 is 25. Sorry.

(No, gentle reader, you are not the only one who is asking, "So what?" If you didn't see it, read Duane Gall's article on noise in the Soapbox on page 137 of the October '89 *Model Aviation*. Duane thinks there is a lot of hysteria in our current attitudes on the dB of model noise, and he makes some good points.)

FIGURE 1



THE CONTENT OF MD&TS

You touch on a chronic problem in connection with technical level for this column, Ed. Bill Northrop is concerned that I may get too technical, and it is true that we have some beginner readers with no aero background. On the other hand, many readers write, such as you, who obviously have a better command than I do of at least some of the material we cover. I have been getting into a little technical depth sometimes, but I always cover some of the basics at the same time. The basics may bore the advanced technical readers but will hopefully help the beginners get on board (not bored). I certainly don't underestimate the

Continued on page 82

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ALL ABOUT ARFS

By ART STEINBERG

• As is evidenced by my interest in almost ready to fly R/C airplanes, I am always on the lookout for an easier way to get things done. For many years I have been quite dissatisfied with the catch-as-catch-can methods used in training newcomers to become competent R/C pilots. The traditional procedure is that the beginner usually shows up at the local field with an unairworthy model, hoping that one of the more experienced fliers will take the time to help him out. Unfortunately, the people most willing to teach are not necessarily those who are most competent as fliers in their own right. So here we have a poorly built, marginally flyable, completely untested model in the hands of a low-time, inexperienced instructor, and one must wonder what chance the student has to ever learn to fly. The really amazing thing is that countless fliers have learned to fly under just such conditions, and having done so, they continue to teach others in the same haphazard way they learned themselves.

One example I can give is the time I was spending a lovely summer morning gently guiding my Buccaneer old timer through a blue and cloudless sky, lazily executing figure eights. The Saito .45 four-stroke was just idling fast enough to maintain a few hundred feet of altitude. At the next pilot station to my right a father was giving his eleven-year-old son a lesson on a .25-sized "trainer." As the model zipped all over the sky, the transmitter was frequently snatched away from the boy in order to avoid a crash. After I watched this for about ten minutes, the father proceeded to land the plane, while the boy, visibly shaken by the pressure, nervously mopped his brow. After striking up a conversation, I discovered that the lad had been taking "lessons" from his dad for about six weekends, and the best the boy had ever managed was to maintain two or three minutes of unassisted flying at a time. He was still unable to land or take off. Feeling sorry for the youngster, I offered to let him fly my old timer. He looked at my model with its seven-foot wingspan, and said, "I'm only a beginner, and I can't even fly my dad's little plane yet, so how could I fly that big thing?" Somehow he had the idea that large planes are much harder to fly than small ones, and regrettably, that is a notion held by most beginners. A lot of so-called "instructors" seem to think the same thing, it seems, judging from their use of gnat-sized models as trainers. Anyway, I finally persuaded him to give it a try, and what with my efficient Saito .45 engine and twelve-ounce tank, this young fellow flew my model continuously for over 30 minutes with no assistance at all. In fact, he even negotiated a respectable landing on his very first flight. On the next flight he took off and completed his first solo. By the time he went home he was feeling very proud of himself, his spirit and motivation were renewed, and his shattered ego was completely restored. Oh yes, his dad asked me where he could get a set of plans to build himself a Buccaneer like mine!

It's just too bad that there is a prevailing attitude that in order to learn to fly R/C you "have to pay your dues," meaning that everybody is expected to crash five or six airplanes before learning to fly on his own. Well, I'm happy to say that there are a few people around who believe that students can be taught to fly safely and without destruction of equipment. R/C training is finally coming of age, as is evidenced by the establishment of a number of model flying schools during the last few years. These schools operate in somewhat similar manner, using true primary and basic trainers, and their success rate is practically 100%. With just a few days of intensive instruction on the right kind of model, almost every student achieves solo flight, and all this is done without demolishing even one airplane.

Now I would like to report that such a primary trainer as my Buccaneer is available as an ARF. The sad news is that the manufacturers have not yet marketed such an old-timer-type model. Unless you have the skill to build one yourself, the only way to get one is to buy it from a custom builder, but be prepared to part with at least a couple of hundred dollars. By no means is this really a lot of money, as many of the better ARFs do fall in that price range, and besides, a good old-timer will last for years, providing hundreds of hours of flying enjoyment. My present Buccaneer has been going for about five years, and has been the trainer for quite a few student pilots, seven of whom won their wings in 1989 and joined the AMA. I really get a kick out of teaching people how to fly. I vicariously feel their excitement at learning to master the controls, and after the first flight or two I can usually sit down in a comfortable chair and talk to the student while he flies at a safe and comfortable altitude. I hardly ever have to take over the controls, as the model moves slowly enough to allow for the usual mistakes a beginner makes.

I imagine that there aren't too many fliers around like me who enjoy teaching so much that they keep a primary trainer ready to go at all times just to provide

Many students learn to fly on typical ARF trainers such as this Royal-Air 40T, an excellent model but better suited as a secondary trainer. For primary flight instruction, nothing beats a gentle, slow-flying Old Timer. Art discusses the merits of Old Timers in this month's column.

One of many Old Timers that would make excellent primary trainers is the "Miss Delaware," flown by Eric Evans and his grandfather, Dan Evans, both of San Clemente, California. Eric learned to fly R/C on this ship. Unfortunately, this type of model is not presently available as an ARF.

instruction. The beauty of all this is that while the student is learning the basics on my airplane he or she is preparing an intermediate trainer in his spare time. I customarily leave it up to the student to decide if he wants to build his next airplane from a kit or go into assembling an ARF. Usually the student is ready for the intermediate trainer long before one has time to build one from a kit, so I often advise that the novice buy an ARF. I lean toward ARFs for a lot of reasons, and if you are a regular reader of this column you have been made aware that I feel they are built straighter than a model built from a kit, and therefore fly more reliably. Whatever the student finally decides, there are hundreds of models to choose from, and I provide them with a list of suitable airplanes. For example, if they decide to build, we might go for a Goldberg Eagle 63, or if the person is a really capable builder, we might choose a Senior Falcon. Should one desire to go the ARF route, then there are many models that will fill the bill nicely. As a matter of fact, the vast majority of ARFs seem to fall into the intermediate trainer class. I prefer the ones which have a high wing, ailerons, flat bottom or semi-symmetrical airfoil, tricycle landing gear, and a wingspan of at least sixty inches. Some excellent ARFs which immediately come to mind are the Thunder Tiger Skylark 40T from Hobby Shack, the Royal 40T, and the Skyward 40 or the Skyward 60 from Z-Planes. Any of these intermediate trainers will be a snap to fly after the student solos in the primary trainer.

After a few hours on the intermediate trainer, the next step can be almost anything the student desires, from low-wing sport planes to scale Piper Cubs, or even one of the ARF warbirds. All this can be accomplished without the heartbreaking experience of wrecking one's first airplane. Unfortunately, finding a dedicated instructor willing to furnish a primary trainer is almost as difficult as winning the state lottery, so I wish to go on record as an advocate of the formal R/C flying school method of learning to fly. As a matter of fact, I am so enthusiastic about this way to learn that I am presently involved in establishing such a school in the Southern California area. As we are blessed with almost ideal year round flying weather, we hope to set up a five to seven day course of instruction. The course will embody ground school instruction and around twenty-five to thirty hours of actual stick time. This should allow each student to solo in a primary trainer, and if time and skill permit, to gain some experience with an intermediate trainer.

So we can readily see that there is definitely a place for ARFs in a carefully thought out R/C training program, but only when the student reaches the intermediate stage. Sadly, we have no ARFs which will serve as true primary trainers, but perhaps some enterprising manufacturer will introduce an old-timer model which will do the job. When such an airplane comes along, we'll let you know all about it in this very column.

Bud Lavagnino managed to cram an O.S. .40FP into an EZ Sportsman 25 and is obviously pleased with the resulting high speed and snappy performance.

DREMEL TO THE RESCUE

I can't seem to function for even five minutes in my workshop without using my little variable speed Dremel drill for one job or another. The many things that can be done with this tool are just unbelievable, from drilling, to grinding, to polishing, to sanding, you name it. One of the most miraculous things it does is to slice cleanly through the hardest steel with the use of a cutoff wheel. This company has been around at least since I was a kid, and all their products are really built to last. My present drill was about ten years old when something shorted inside and it gave up the ghost. Talk about panic! I was in really bad shape without that tool, so i threw it in a box and shipped it right off to Dremel. I didn't hear from them for a couple of weeks, and during that time I managed to survive only because my good friend. Commander Bill Benson, kindly insisted that I borrow his.

Anyway, when a small carton arrived from Dremel I was overjoyed. When I opened the box I thought there had been some mistake, for instead of my ten-year-old, well-used drill, I found that they had shipped me a brand new up-to-date variable speed model. There was a letter apologizing because they had no parts to fix my obsolete and discontinued drill, so they just sent me the brand new one, only charging me a nominal $34 (probably what the repairs would have cost had they been possible). And the new drill lists for well over $100, so this has got to be outright pampering of a customer! I feel that when a reputable firm goes to such lengths to satisfy the consumer, they must be doing

Continued on page 62

Though a tight squeeze, the O.S. .40 appears right at home in the Sportsman 25. Model balanced fine in spite of the heavier engine. After many flights, this engine/plane combination has proved itself to be thoroughly practical.

The History of

P.A.W.

PROGRESS AERO WORKS DIESEL ENGINES

By ANDREW NAHUM

• American modelers who know something of European diesel motors may think of the English PAW engines, imported by Eric Clutton of Tullahoma, Tennessee, as a fairly recent product. Not so, for the company has a considerable history going back to WW II. Some PAW motors even are eligible for SAM contests in the UK.

PAW stands for "Progress Aero Works," a company created by a young German immigrant, Gunther Joachim "Gig" Eifflaender. Gig Eifflaender's father had come to Macclesfield, a small textile town in the north of England, to run a silk mill. That's

The first engine design by Gig Eifflaender, built in the late 1940s, in .13 and .18 cu. in. sizes. He used these engines for all of his C/L stunt wins in 1949/1950. Note that the fuel tank is an integral part of the crankcase front end and actually surrounds the crankshaft. Interesting!

where Gig grew up, becoming a keen aeromodeler while absorbing the culture of practical engineering that existed in the mill towns.

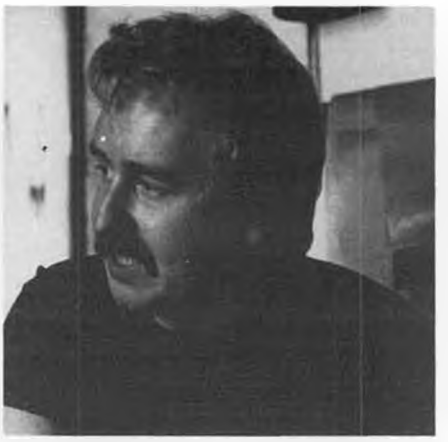
With the outbreak of WW II the family fortunes changed. As an "enemy alien" father Eifflaender was not able to carry on his business, and Gig was not allowed to continue working toward his engineering degree, for it included training in Manchester at the Metropolitan-Vickers company, a manufacturer that was secretly working on the first British axial-flow jet engine.

Suddenly there was no income for the family, so young Gig took the role of family provider, turning his aeromodeling hobby into profit. He hand-carved thousands of propellers for rubber models that were sold through model shops. Soon, a government contract to make wooden parts for aircraft recognition models was won by Gig. Gig became chief designer and his whole family (including grandmother) were soon working in the small factory that he created out of a former tennis pavilion in the grounds of their fine house.

When the war ended, Gig steered the business back to propellers for rubber and gas models, plus wheels, and other small parts. After seeing diesel motors that were brought to England from Europe at the end of the war, Gig soon was building his own .13 cu. in. (2.2 cc) sideport diesel. Gig's interest in control-line stunt ships was kindled about that time (he remembers Ron Moulton, an editor of *Aeromodeller* magazine, coming back from the USA with a de Bolt Stunt Dragon) and he built his own ship fitted with an enlarged .18 cu in. (2.9 cc) version of his engine. With this combination Gig won most of the British stunt competitions he entered in 1949. In 1950, in Belgium, he became stunt champion of Europe.

I remember well seeing him fly his stunt

This .15 cu. in. diesel, the second generation Eifflaender engine design, was partly inspired by the successful radial-ported Elfin engines. It is rear disc valve induction, not drum valve as it appears. One example won C/L speed at the 1951 European C/L Championships. Interesting features include a screw-in crankcase front end, side mounted venturi, and engine mounting via the single threaded stud sticking out the back.

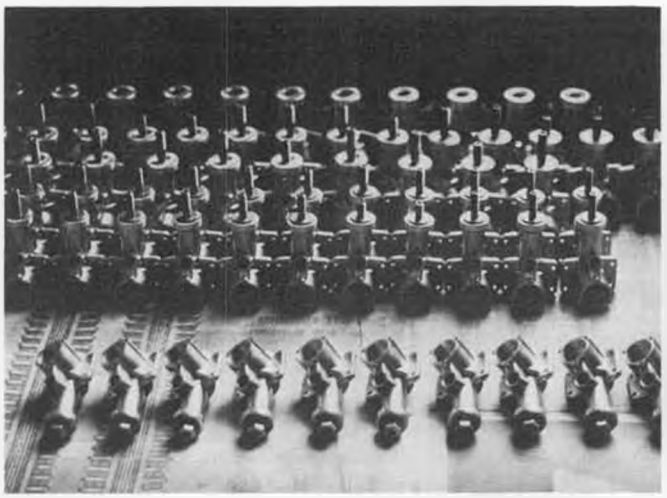


Gig Eifflaender, founder of P.A.W. A fine craftsman and a modeler who has excelled in many modeling disciplines—free flight, C/L stunt and speed—using his own engines. Gig was the European C/L stunt champion in 1950.

Tony Eifflaender carries on the design tradition. He has been on the British international C/L stunt team several times and regularly wins the Gold Trophy, Britain's top stunt award. Tony led P.A.W. to build the larger .29 and .35 size engines.

models, though a few years after this. They were extremely lightly built, unflapped, and they flew with shattering speed, to the accompaniment of a perfect, high-pitched keening motor run. The models appeared highly sensitive but they were flown with great accuracy and I still recall his perfect low pullouts from wing-overs and rock-steady, low-level, inverted flights.

In this period his main business activity was still wooden propellers and parts, though a few engines were made for friends and associates who did well with them in competition. His engine designs also started to evolve, as Gig became impressed with the power of the well-known Elfin motors. He designed a .15 cu. in. (2.5 cc) motor using three slotted Arden-style radial exhaust ports with transfer ports below and between them, and subsequently evolved his own successful pattern of transfer ports; almond-shaped scoops, reaching up between the exhaust ports to give considerable overlap. These engines, with rear disc induction and a shaft running on twin ball races, were well up to the best European standards at the time. In 1951 Gig lent his own example to a friend, Alan Hewitt, competing in the European Control Line Championships. It was simply taken straight out of his contest free-flight

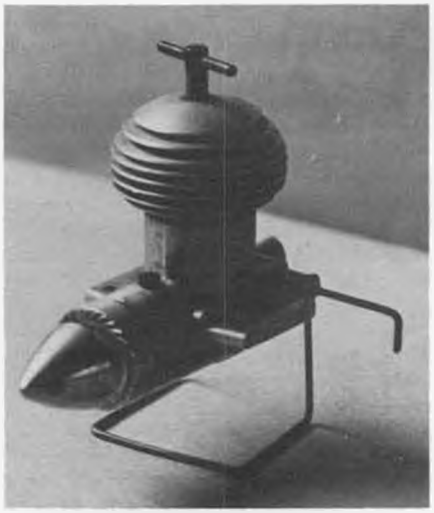


Machined parts for at least two sizes of P.A.W. engines awaiting final assembly. Three-bolt cylinder hold-down is a P.A.W. trademark.

"The eye and hand of the master!" Gig Elfflaender still grades and selects the critical piston/cylinder combinations for all P.A.W. engines.

model, with no special preparation, and then won the speed event at 98.92 mph (159.292 kph). Versions of this design went on doing well in free flight contests for several years, particularly in the hands of the noted competitor John O'Donnell. Some examples had the weight pared down to a mere 2-¾ ounces.

Up to this point Gig's skill at engine building had been largely dedicated to his own modeling interests. But when flexible plastic propellers arrived on the market, sales of his wooden props declined, so Gig redesigned his engine in order to produce



Further development of the Elfflaender .15 radial-port twin ball bearing design was this big-bore, short-stroke engine for high speed running. Had some F/F contest success in the 1950s.

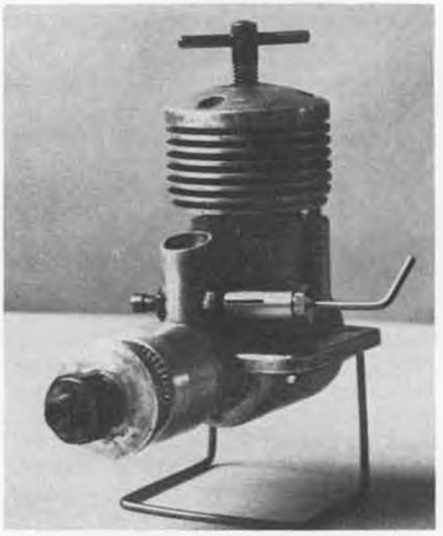
it for sale. Front rotary induction was adopted, though soon the twin ball races gave way to his own particular system using a front plain bearing and rear ball race. This combination tries to get the best of both worlds, for the plain cast iron bearing also serves as the rotary valve housing and an oil and gas seal—tasks that must be done by some kind of sleeve even in a twin ball race engine. Gig jokes today that a single ball race engine is 10% more powerful than a plain bearing one, but with twin ball races it may be 3% worse, so critical is the alignment of the bearings.

In 1957 the first PAW engine for general sale was released - the "Elfflaender PAW Special." *Aeromodeller* magazine called it "a very good engine right in the top class for 2.5 cc diesels, which, because of its rugged construction, should outlast many a model." Gig did not aim at the highest competition performance in his production engines, but instead for a combination of power, reasonable cost, and terrific strength. I spent much of my childhood and teens burning fuel through PAW .09, .15 and .19s in combat and general control-line flying and they certainly proved their durability and crash resistance! We would buy direct, visiting Gig in his tennis pavilion plant and he always greeted us with kindness and a ready smile. We marvelled at the machine tools, thickly coated with a furry deposit (a mixture of sawdust from the propeller machining operation and cutting oil), enjoyed the sound of new diesels on test, and watched his fascinating skill at metalworking. At that time he also offered a reboring service for virtually any model engine. All types, ancient and modern, arrived by mail every week. Perhaps because of this vast experience no one I have ever seen can start an unfamiliar engine faster than Gig.

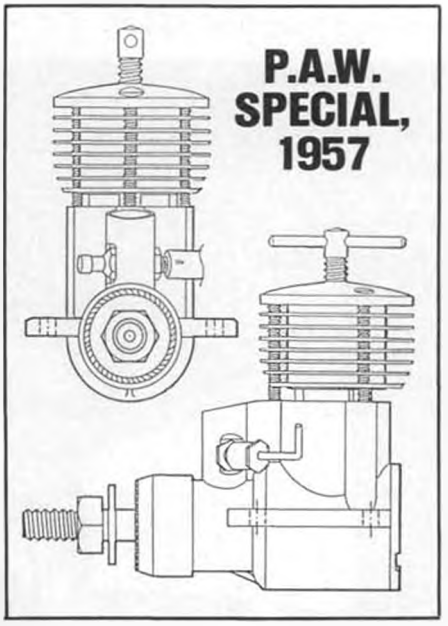
Soon PAW became purely an engine company, and that original "PAW Special" became the pattern for a range of engines of various sizes, including .29s and .35s. Over the years porting and internal details gradually changed and sub-piston induction was abolished, to allow efficient running with a muffler. Currently I fly one of their single ball race .061 cu. in. (1 cc) motors in a Goldberg Junior Falcon (my favorite rudder-only ship of years back) now fitted with three small Futaba 133 servos. The engine flies it beautifully with just the performance the airframe should have—good climb out (though no vertical performance!) and the possibility of rolls and loops. The motor throttles nicely too, which many people find surprising for a diesel.

Today PAW is a thriving family business. The two sons, Tony and Paul, do much of the machining, though Gig still does the important matching of pistons to cylinders.

Continued on page 62



The "P.A.W. Special" of 1957 was the first P.A.W. engine produced for general sale. It features Elfflaender's combination of a single ball bearing and cast iron plain bearing. The rugged crankcase design set the pattern for all subsequent P.A.W. engines and remains virtually unchanged even today. The P.A.W. Special became quite popular for C/L, and a .19 version produced in 1961 did well in C/L combat.



"Very little space is required for storage and transportation of Peanuts."

Our cartoon, by Georges Chaulet, of France, offers at least a partial explanation of why our Hangar column is so brief this month. The problem arises when one has too many Peanuts to transport at once, as yours truly discovered when preparing to move to northern California! The new address for Hannan's Hangar is: Box 860, Magalia, California 95954. Please bear with us if we are a bit slow in answering mail.

SPEAKING OF PEANUTS

Two important contests for them were conducted recently: The 13th Annual Indoor Contest of Flemalle, Belgium, featured two Peanut Scale model events and one for Pistachios, their smaller cousins. Countries represented (some by proxy) included Czechoslovakia, England, France, Germany, Poland, Japan, Sweden, U.S.A. (Walt Mooney and Dave Linstrum), and, of course, Belgium. Some 42 Peanuts and 19 Pistachios were entered and the variety was outstanding. A tenth country, Greece, would have been included, unfortunately the model, a beautiful Valkyrie canard, arrived too late to participate.

Top placers were as follows:

PEANUT DURATION, Junior:

1. Christoph Hanriot, France, Lacey M-10
2. Christoph Hanriot, France, Pottier 100
3. Joachim Lotz, Germany, Blackburn Mono

PEANUT DURATION, Open:

1. Thomas Merkt, Germany, Solar Challenger
2. Jurgen Weil, Germany, Cloudbuster
3. Jacques Delcroix, France, Lacey M-10
4. Tonda Alfery, Czechoslovakia, Heinkel 70G
5. Heinz Neumann, Germany, Sky Rider

PEANUT MAQUETTE, Open:

(With the primary objective accuracy rather than duration):

1. Tonda Alfery, Czechoslovakia, Chance Vought "Pancake"
2. Tonda Alfery, Czechoslovakia, Spitfire
3. Tonda Alfery, Czechoslovakia, Messerschmitt
4. Sylwester Kujawa, Poland, 1909 Clerget
5. Thomas Merkt, Germany, Bleriot XI

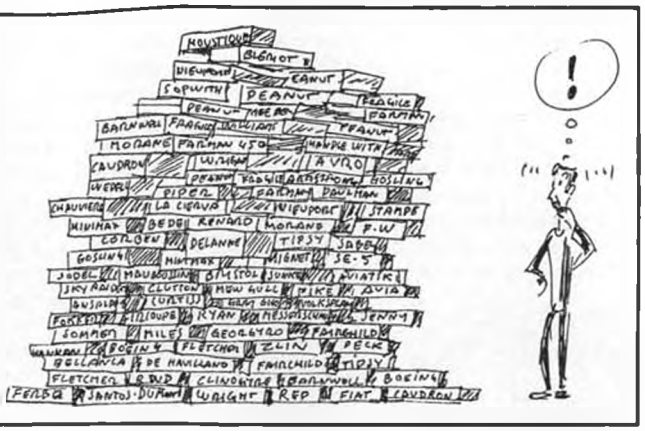
PISTACHIOS, Junior:

1. Joachim Lotz, Germany, Farman Mosquito

PISTACHIOS, Open:

1. Rainer Lotz, Germany, Windham Tandem
2. Rainer Lotz, Germany, Cloudbuster
3. Tonda Alfery, Czechoslovakia, Fike E
4. Jurgen Weil, Germany, Cloudbuster
5. Jacques Delcroix, France, Lacey M-10

The above quote notwithstanding, the storage and transportation of Peanuts *can* be a problem when you have as many as our columnist, as depicted in this cartoon by French modeler Georges Chaulet. Bill is shown trying to figure out just how the heck he's going to get all his models up to his new Northern California home without having to rent a U-Haul truck.



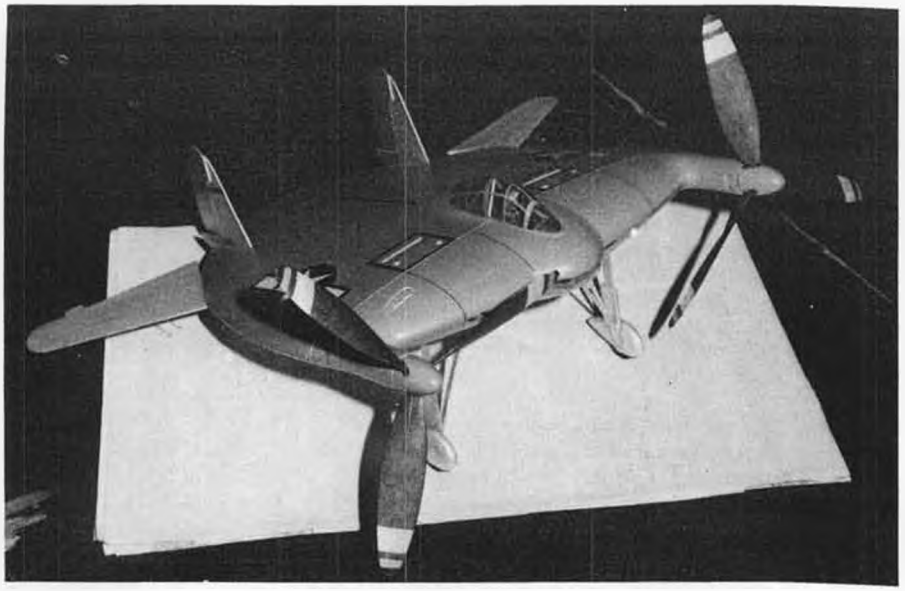
It is intriguing to note that the top Peanut duration time was two minutes and 33 seconds, while the best Pistachio achieved two minutes and 35 seconds! Perhaps Mike Arak was correct when he suggested that good Pistachios could successfully compete against Peanuts!

Our thanks to Heinz Neumann and Fernand Van Hauwaert for supplying this information. Another meet is set for next year.

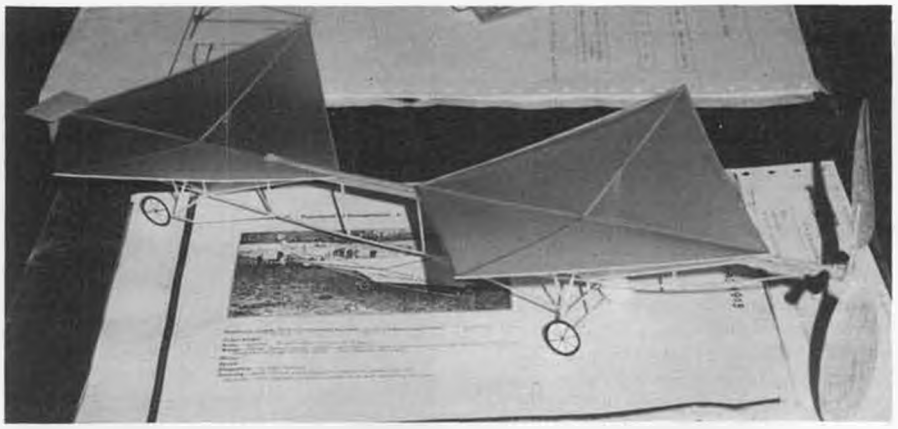
MEANWHILE IN JAPAN

The Third International Proxy Peanut Contest was sponsored by the "Nagoya Nuts," drawing models from several countries, including France, Germany and the U.S.A. The contest featured separate categories for aircraft of the Pioneer era, World War I, Golden Age, World War II, and Modern, and offered delightful prizes in the form of cast-metal "peanut men" plus Lacey M-10 Pistachio kits, evidently produced especially for this event.

Scale judging was ably conducted by Howard Voss, Akira Igami, and Kinya Ichikawa, and from Howard's report of the meet we have extracted the following: "It is normal for the members of the Shonai Peanut Scale group of Nagoya to have



Left: Incredible workmanship and detail on this Peanut scale Chance-Vought "Pancake," which won first in its class for Tonda Alfery at the 13th annual indoor contest at Flemalle, Belgium. Photo via F.L. Van Hauwaert.



Winner over 18 other Pistachio entries at Flemalle was this highly unusual but excellent flying 1909 Windham Tandem by Rainer Lotz, of Germany. Photo via F.L. Van Hauwaert.

Prolific rubber scale modeler from Detroit, Pres Bruning, displaying his latest project, a beautifully detailed French Brequet 693. An excellent flyer, and very attractively decorated in several different colors of tissue paper. Photo by Alan J. Frenkel.

everything prepared and perfect. How this group of modelers manage to do this biannual proxy Peanut Scale contest so successfully year-after-year is almost unbelievable. The first thing noticed was the degree of quality increase over the previous contest in 1987. There were 69 scale models entered plus 19 separate Piper J-3 Cubs (this year's one-design event).

"Scratchbuilding is the ultimate art in modeling, and requires a great degree of knowledge about modeling, flying and design. For scale contest entries, documenting your model is a must, for without it a judge has no way of knowing what you are trying to portray. This year's documentation was good; not perfect, but much better than before.

"The following day, at a much-too-early hour of 5 a.m., everyone was rousted out of their dreams for a trek to the flying site. The site is well-suited to Peanut and rubber-powered flying as there is a wide area for unobstructed flight. Dead center of the site is a tree. A big tree. A model-eating tree. We pitted from around this tree. I flew my CO_2 powered PT-20 fourteen times, and twelve times it ended in this tree. And it mattered not from where you launched. Most of the pilots had at least one flight into this tree. None sustained any real damage to speak of, and it became funny, after a bit.

"The wind picked up, it even rained a little, but we flew. Oh, how we flew! And the models flew better than ever. The proxy pilots coaxed the last few turns of rubber, and launched the perfect spiral up to the left and down to the right. Most, if not all, managed to get legal times for the flight logs and record books.

"To sum it up, it was a fantastic outing. Things could not have been prepared better. We even had use of the gym for some indoor flying later in the afternoon. And, of course, the award ceremony was the highlight of the afternoon. Everyone was still on the high of flying, relaxed and happy, so everyone was a winner! It was a happening that comes very seldom these days, where grown men, wives and their children, can get together and share a few short days swapping stories, telling horrendous lies, and truly enjoying each other's company. All this in a sport that is inexpensive, challenging, rewarding, and above all, downright enjoyable.

"My hat's off to the Peanut Power guys in Nagoya, and to the wonderful group of modelers from around the world who also believe as we do, and shared their building prowess with us (sending) their creations to fly and enjoy. Yes, they did it again, and made my life a little richer for having let me be a part of this fantastic event. I hope they invite me back for the next one!"

We plan to present a results summary and photos from this contest next month, thanks to Shoichi Uchida and Jiro Sugimoto.

HOW TRUE

From an article entitled, SELF-Launched Airplane, by L.D. Sunderland, published in the September 1977 *Sport Aviation*, we have extracted the following: "Wouldn't life be drab if we could not be free to conquer our own summits, whatever their size? . . . So turn off the ol' TV set and get busy building that airplane you've always dreamed of. . . . All homebuilts are self-launched by you yourself that is. If you doubt this, just keep watching the TV and procrastinating and see how soon yours gets launched."

Continued on page 68

Dan Walton really got carried away when presenting his Buccaneer Old Timer! Could this start a new trend in one-upmanship?

Right: Believe it or not, the flying model of Col. Bob Thacker's "Betty Jo" Twin Mustang is a Pistachio! Pascal Orsini, of France, goes so far as to employ a mini-diorama with his scale presentation. Photo via Van Hauwaert.

Free Flight

By BOB STALICK

• At this time each year, I share my New Year's free flight resolutions with anyone out there who cares to hear them. Why should this year be different? Well, for one thing, this is the beginning of a new decade. So, perhaps the resolutions are not so much for the new year as they are for the new decade. As this new decade approaches, it well might be time for a consideration of the future of free flight in the 21st century. One of my resolutions will be to initiate a survey of what the future holds for us who believe that free flight is the modeling hobby of choice, as it is for me.

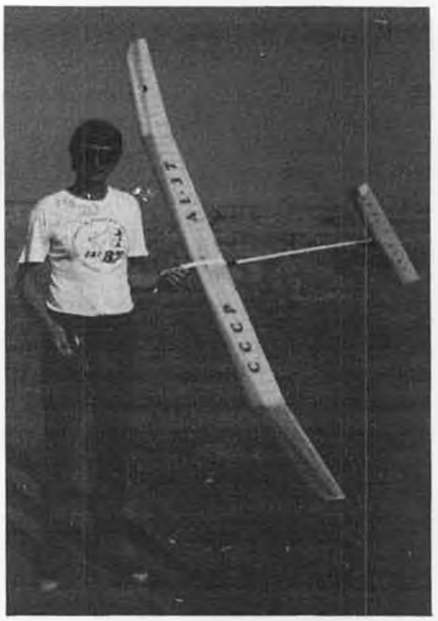
Now that I am regarded as one of the old guard of active free flighters, I find myself looking to the recreation of the free flight times that I missed or ignored in my younger days. I find Old Timer and Antique Ignition building and flying enjoyable and relaxing. Even though these models and times were a bit before I was old enough the be active in them, I still get a big charge out of reading about those days and recreating the ships that were flown then. My second resolution is to complete that old Flying Quaker that I began in 1976, and have ready to cover in 1989. It will be ready to fly in 1990.

My real introduction to free flight as a competitor—not a sport flier— began in 1957 at the end of what we now know as the Nostalgia period. I guess that is the reason that I am taken in by the charm, grace and performance of the ships from that era. Additionally, even though I was a sport free flighter in the late '40s and early '50s, my major source of inspiration came from a subscription to *Air Trails* given to me as a Christmas gift in 1947—so, I felt that I really was involved with those golden times. My third resolution is to build and fly some of my dream ships from that period.

Finally, I have long admired the elegance and grace of Greg Davis' finely crafted scale models. For nearly 15 years, I have been collecting scale information on the scale ships that have intrigued me over the years. The Fieseler Storch is one such ship, the Cessna AW is another. I have yet to begin building either one. My resolution for this year is to start the construction of one of these two models.

Now, if you are one of those free flighters who has the kind of dreams that I have, maybe it is time for you to make some resolutions as well. No time like the present exists to get started. And if you live in an area where you cannot fly outdoor free flight during the winter, as I do, then this is the perfect season to pull out those dog-eared plans of that favorite unbuilt model and get going. So, what's holding you back? Just do it!

Eugene Verbitsky, also from Russia, attended the Sierra Cup to fly F1C (FAI Power) with his state-of-the-art BE-43 design.



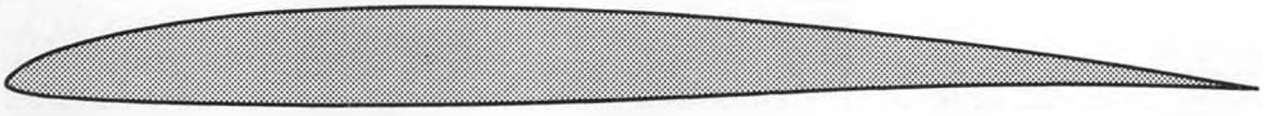
All photos this month were taken by Lyman Armstrong at the Sierra Cup meet in Sacramento last October. Shown here is Russian flyer Andres Lepp, who represented the USSR in F1A glider with his latest ship, the AL-37. Note bottom-mounted fin.

JANUARY THREE-VIEW;
Matt Gawain's Model 29 F1A

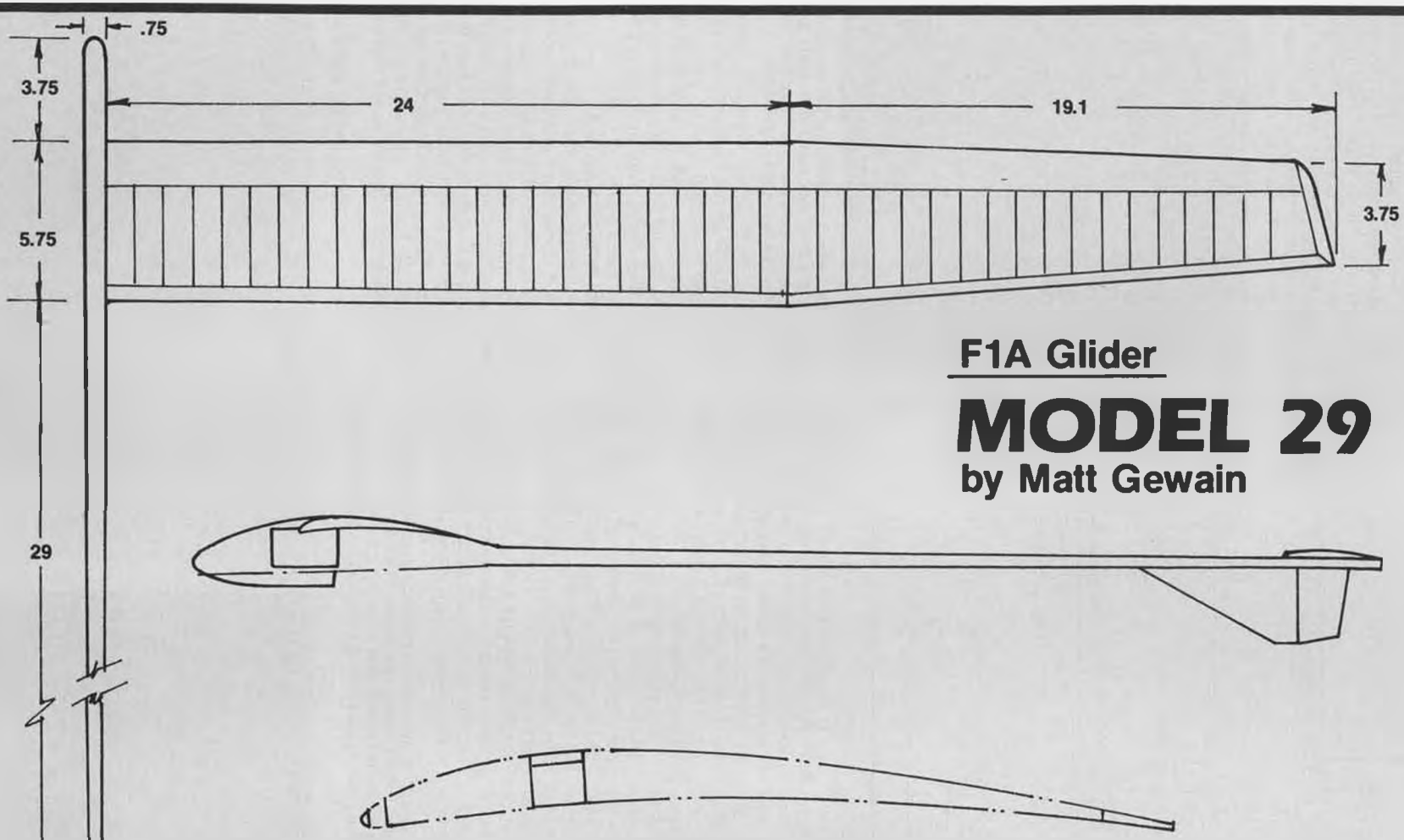
Matt Gawain is a successful F1A Competitor at the national and international level. The following comments give an insight into how an FAI design such as his Model 29 produces high quality performance. Matt says, "So far, Model 29 has been the most successful in the latest series of gliders I have built. The big changes designed into this series have been the use of the B6356 wing section, extreme washout built into the last four inches of each tip and the extensive use of vacuum-formed composite materials in the wing structure.

"The Benedek 6356 section has been used by Bob Isaacson and Randy Weiler with great success over the last few years. Based on the models I have seen, when built carefully, this could well be the best all around F1A section. Extreme wing tip washout is achieved by cutting the trailing edge four inches from the tip and propping the tip of the trailing edge a quarter inch off the wing jig when the tips are built. This trick has been used by Dale Elder for years and has resulted in models which have

DARNED GOOD AIRFOIL—QUABECK 2.5-8



STATION	0	1.25	2.5	5.0	7.5	10	15	20	25	30	40	50	60	70	80	90	100
UPPER	0.0	1.3	2.1	3.1	4.3	5.1	5.7	6.0	6.2	6.4	6.3	6.1	5.4	4.4	3.1	1.6	0.0
LOWER	0.0	-0.7	-0.9	-1.1	-1.4	-1.5	-1.6	-1.6	-1.6	-1.6	-1.5	-1.1	-0.6	0.0	0.3	0.4	0.0

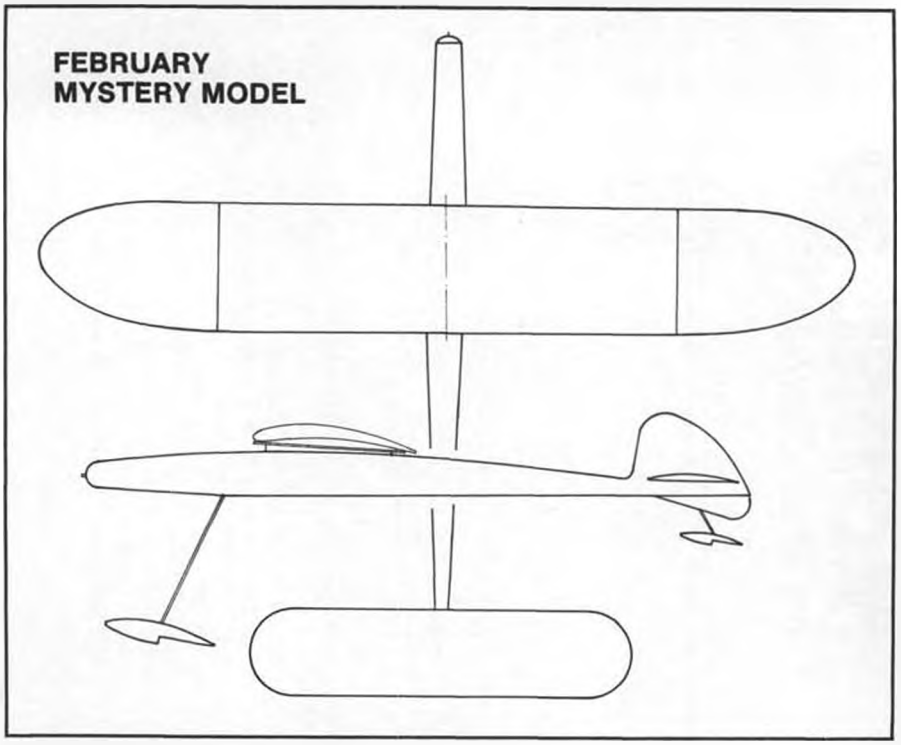


F1A Glider

MODEL 29

by Matt Gewain

Wing Airfoil:	B-6356
Leading Edge:	0.060 Spruce, 0.125 Balsa, 0.007 Carbon
D-Tube:	Foam Core with 1 oz. Kevlar/Safe-T-Poxy Shell
Spar Width:	Tapered from 0.375 to 0.125 to 0.06
Spar Construction:	Carbon top—0.060 Centers, 0.007 Tips
	Balsa Core with 0.007—0.003 Carbon Sides in Centers
	Carbon Bottom—0.014 Centers, 0.007 Tips
Ribs:	2 mm Rohacell 51, 0.003 Carbon Caps Top and Bottom
Trailing Edge:	0.5 by 0.1-0.03 Balsa, 0.003 Carbon Top and Bottom



excellent performance and stability.

"My use of the composite materials incorporates new materials and techniques into a D-Tube and rib type of wing. Composites are used to achieve a wing that is built with greater accuracy and strength than I have had in the past. This has resulted in an increase in both performance and consistency. Records from last summer's test flying at Taft in the early mornings show that Model 29 averages 3:44. This compares with an average of 3:20 for similar practice sessions a couple of years ago.

"Next year's models are being built now and incorporate Rohacell 31 D-tube cores and Rohacell 71 spar cores. This should increase strength and reduce weight as well as making the wing easier to build because I will not have the finishing problems I have faced using polystyrene foams."

As the three-view shows, the Model 29 appears deceptively simple (the good ones usually are), and can be enlarged easily. However, if you are interested in further information about this ship or structural foam, contact Matt Gawain at 3791 Inglewood Avenue #268, Redondo Beach, California 90278-1110.

The accompanying three-view and this article come directly from *Scatter*, the newsletter of the Southern California Aero Team, edited by Craig Cusick, 20134 Gresham St., Canoga Park, California 91306. For information about subscriptions contact the editor.

DARNED GOOD AIRFOIL -qbk 2.5-8

This section was also featured in a recent issue of *Scatter*, and according to the accompanying article, "The airfoil that we plotted for you this month is actually an R/C glider airfoil by Helmut Quebeck, who has been making a mark in R/C sailplanes with his unusual airfoils.

"The reason we include it here in a free flight newsletter is that we think this or an airfoil very much like it is used in Gil Morris' F1C flapper model called Two Timer. The 3-view of Gil's model is shown in Bob Stalick's column in the January, 1988 issue of *Model Builder*. The article on the model took the form of an interview with Gil by Jon Putnam, of the now defunct Nor'westers FF club in Oregon."

Hardy Brodersen, longtime NFFS executive, launches his F1C model. Hardy's ships are always easy to spot—he must have been impressed by a barber pole as a youngster.

Well, there you have it. An R/C glider airfoil that should do the trick for your next flapper free flight. You are planning to build one, aren't you?

JANUARY MYSTERY MODEL

OK, you anglophiles, guess this one. As you might think, the three-view of this little rubber powered floatplane came directly from *Aeromodeller* magazine many years ago. According to the article, the wing area is exactly one square foot distributed over a 32-inch span, and the construction is very simple. In fact the wing and stabilizer contain no spars at all. Although shown as a floatplane, the ship can

Continued on page 74

Below left: U.S. flyer Bob Isaacson is a consistent F1A winner and is credited with some of the design inspiration for Matt Gewain's "Model 29," this month's featured three-view. The ship Bob is holding is his own design, the "RI-14," which was the featured three-view in the June '89 issue.
Below right: Jackie Chen, one of China's best power flyers, flew F1C at the Sierra Cup. Jackie hopes to maintain his residency in the U.S.

SABLATNIG KE 1

A 1919 "Early Golden Age" design for Peanut Scale

By WALT MOONEY

This month's featured Peanut is also offered as a double-size (26-inch span) rubber scale plan; see page 106 for listing. No matter what size you build, it's a real cutie and a fine flyer to boot!

• The three-view for this airplane was found in the April/May, 1988 issue of the German Aviation magazine, *Flugzeug*. It had excellent lines for a Peanut scale, and was done in color. The wings and tail of the full-sized KE 1 were fabric-covered and finished in a translucent manner (probably clear dope), so that the structure showed through the covering. The fuselage and fin had plywood skins, finished with clear varnish. Wheel covers and engine cowl area were aluminum color. All this is shown on the *Flugzeug* three-view.

It was decided that the three-view would be enlarged at the local blueprint outfit on their Xerox 2080 machine and the model would be built directly from the enlarged three-view.

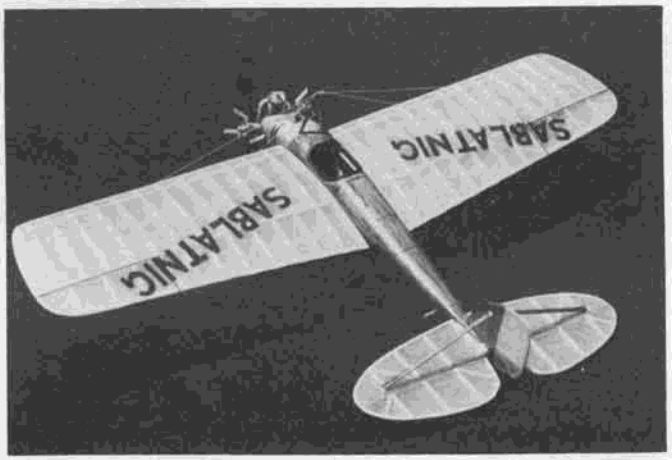
It turned out to be not quite that simple. First, the horizontal tail looked like an enlargement was a reasonable model variation. Second, the three-view arrangement was not arranged in a good format for a Peanut plan. Third, in common with almost every three-view I (or even the illustrious Bill Hannan) have found, the three different views did not match exactly in some important dimensions. So the original three-view was copied in four different sizes, three to make the three different views match and one for an enlarged horizontal tail. These were then cut up and pasted into the plan format you see. Once this was done, a Peanut and a Twice Peanut enlargement on the 2080 was easy. This last as an answer to some letters asking for larger models once in a while.

The model in the photos was built Peanut-sized, and made to be easily disassembled (and vice versa), for shipping to Japan for the "Nagoya Nuts" Proxy Peanut contest. The wings and tail surfaces were built with all the structure and covered with clear doped white tissue. The fuselage and fin follow conventional Peanut structure, were covered with condenser paper, clear doped, and then had the plywood grain drawn on then with a fine brown felt pen, followed by a total coating of yellow felt pen coloring. Details were drawn on the model with a fine black felt pen. The reason for the skewed "SABLATNIG" name on the wings was not apparent until the model was ready to put in the box.

Tail surface outlines and the wing tips were laminated. On the model shown, they are three layers of S-guage basswood 1x4 model railroad scale lumber. Kapler Mill Lumber Co. makes the scale lumber and it's available in most good model railroad stores. It is really lovely stuff to work. Pins were pushed through the plan around the inside of the outlines. Pin spacing is

Continued on page 68

Below: As with Walt's Itoh 62-160 Peanut (October '89 *MB*), the Sablatnig is designed to break down for shipping to Proxy Peanut contests. Shipping container is made from 1/4-inch balsa. With the wings folded, the reason for the angled lettering on the wings becomes apparent.



For the Peanut version of the KE 1 the horizontal stab was enlarged considerably over scale; the 26-inch model could probably get away with a smaller, more scale-size stab.

SCALE RIB SPACING IS SHOWN

3/32ND SQUARE LEADING EDGE

GUSSET

GUSSET

WING SPARS ARE 1/20TH SQUARE.

ROUND BAMBOO SPAR EXTENSIONS PENETRATE FUSELAGE AT TUBING LOCATIONS

SABLATNIG

SABLATNIG

WING TIPS ARE LAMINATED FROM THREE PIECES OF "S" GUAGE 1X4.

ROOT WING RIBS ARE 1/32ND THICK.

ALL OTHER WING RIBS ARE 1/32ND THICK.

ROOT AND TIP RIB AIRFOIL SHOWN AND METHOD FOR MAKING ALL OF THE INTERMEDIATE RIBS

NOTE THAT AILERON RIBS ARE NOT IN LINE WITH WING RIBS.

NOTE SCALLOPS IN WING TRAILING EDGE INBOARD OF AILERONS.

LEFT WING PLAN VIEW

GUSSET

1/16X1/8 TRAILING EDGE

GUSSET

RIGHT WING PLAN VIEW

1/16TH DIAMETER PLASTIC TUBES THRU FUSELAGE

UNLESS OTHERWISE NOTED
ALL STRUCTURAL PARTS ARE BALSA.
MODEL RAILROAD LUMBER (BASSWOOD) IS USED
FOR STRUTS AND CURVED FLYING SURFACE OUTLINES.

SCALE TAIL SIZE

HORIZONTAL TAIL OUTLINE IS LAMINATED FROM THREE PIECES OF "S" GUAGE 1X4.

HORIZONTAL TAIL SPAR AND RIBS ARE 1/32X1/16 ON EDGE TO PLAN

USE A PECK POLYMER THRUST BEARING

1/16X1/16

1/16X1/16

ALUMINUM TUBE REAR MOTOR PEG
3/32ND DIAMETER

FUSELAGE TOP VIEW

HORIZONTAL TAIL PLAN

FOUR INCH DIAMETER
PLASTIC PROPELLER FOR FLYING

LYCRA THREAD BRACING

SCALE PROPELLER SHOWN

DIHEDRAL

PLASTIC WINDSHIELD

VERTICAL TAIL SPAR AND RIBS ARE 1/32X1/16 ON EDGE TO PLAN

OUTLINE IS LAMINATED FROM THREE PIECES OF "S" GUAGE 1X4

LONGERONS ARE 1/16TH SQUARE

1/32ND SHEET TOP

LANDING GEAR WIRE IS NOT CEMENTED TO THE LANDING GEAR STRUTS.

WIRE TAILSKID

1/16X1/16

1/16X3/16

1/16X1/16

1/16X1/8

GUSSET

1/16TH SHEET COWL SIDE FILLIN

GUSSET INSIDE OF COWL SIDES

COLOR SCHEME
FUSELAGE AND FIN *** VARNISHED PLYWOOD
TIRES AND CYLINDERS *** FLAT BLACK
WINGS AND TAIL *** VARNISHED LINEN
STRUCTURE COULD BE SEEN THRU THE COVERING
BLACK LETTERING ON THE WINGS
ALUMINUM COWL
PROPELLER AND STRUTS *** DARK BROWN

FUSELAGE SIDE FRAMES ARE SHOWN HATCHED FOR EMPHASIS.

SIDE VIEW

BALSA WHEELS

AIRFOIL SHAPED CROSS AXLE CARVED BALSA

FRONT VIEW

THE THREE VIEW IS FROM FLUGZEUG MAGAZINE APRIL/MAY 1988

SAB KE 1 von Josef Sablatnig

Walt Mooney
9-25-89

Control Line

BY JOHN THOMPSON

SPREADING THE WORD

Still another excellent newsletter has appeared on the control-line scene—this one a regional special interest newsletter devoted to combat.

Neil Simpson, of Leicester, Pennsylvania, was kind enough to forward copies of the *New England Combat News*, an independent, nonprofit publication whose purpose, stated in Vol. 1 No. 1, is to "promote the sport of control-line combat in New England." A unique feature of the newsletter is that it is mailed free to subscribers, with the financing coming from advertising and donations.

The concept most prominently promoted in the first two issues is a slowed-down style of combat designed to interest beginners as well as to provide a little more relaxing form of combat for the more experienced fliers. A couple of concepts are mentioned, but the most talked-about is called "Geriatric Combat." The newsletter reports on a successful "Summer Sizzler" contest and plans for another one in September.

In addition to drawing 11 contestants for a day of flying the contest came off with only two midair collisions out of 22 matches, a ratio which would seem to indicate the success of the event at least in terms of reducing the carnage so often associated with combat.

The scoring rules for Geriatric combat are quite a bit different from standard AMA-style rules and at first glance would seem to be somewhat difficult for officials. However, the newsletter reports that the event has been successful and popular, even when using a system of recruiting judges from among the competitors.

Neil's cover letter explains the concept:

"I wanted to send you copies of *New England Combat News*, the control-line combat newsletter of New England. We, the New England combat community, use the newsletter as a vehicle to communicate with each other, build enthusiasm and promote control-line combat contests in the area. The newsletter is new...but it already seems to be working. Interest and participation in control-line combat is on the rise in New England.

"My second reason for writing is to talk about Geriatric Combat. I hate the name, but I love the event. Geriatric Combat is a very special combat event created by Steve Sacco, of Stonington, Connecticut. Steve is a very Successful New England combat flier. The event is so popular that it is virtually the only type of combat being flown in these parts.

"Steve's original two objectives were:

"1. To eliminate the advantage that the first plane launched has under the AMA rules; i.e., he can fly very aggressively at the start of the match, since, if a midair occurs, he will win on air time.

"2. To make the matches easier to score, with fewer timers.

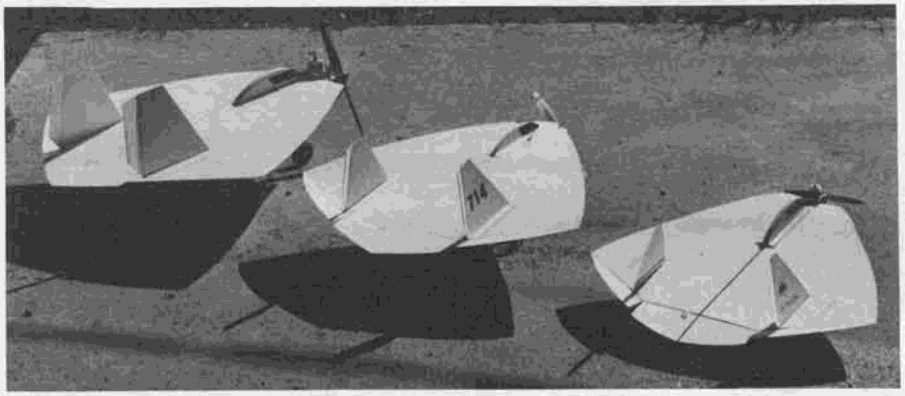
"Those objectives were fulfilled and these additional side benefits were also realized:

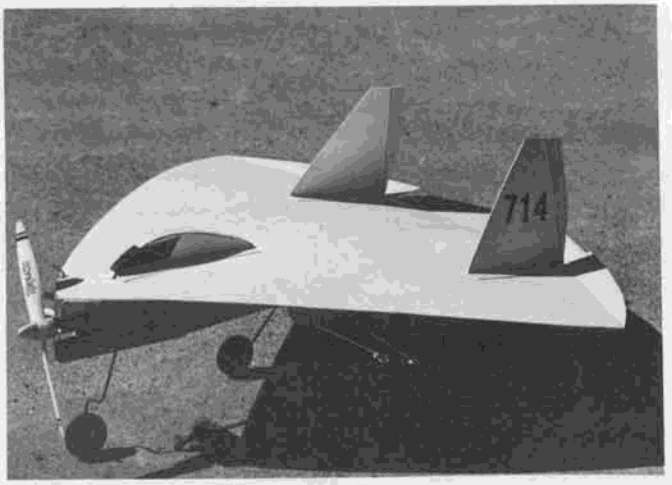
"1. The scoring system put sanity into the starting portion of the event. You receive 100 air time points if you are airborne within one minute. The one-flip 'Texas Launch' *(also practiced in the Pacific Northwest! -jt)* is not necessary since being airborne at the 59-second mark garners the same 100 points that would be received from a launch at the three-second mark. While the 'Texas Launch' with an experienced crew may not be dangerous, that technique emulated by the inexperienced can be. The one-minute starting period, with good equipment, actually allows plenty of time for a pilot to start his own plane and still get to his handle, attach the thong and get airborne.

"2. Every Participant gets to fly four matches win, lose or draw. Winning is nice (for some it's paramount); however, flying, competing and improving by doing so, even when it's not your day to win, is also important.

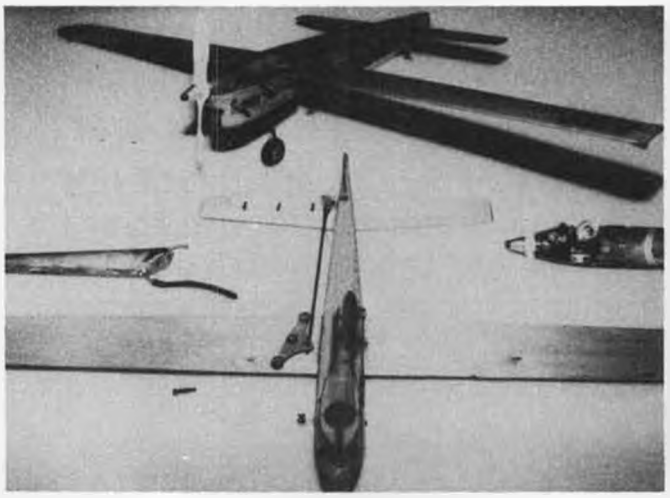
"3. There is a 73-mph (35 seconds/lap) speed limit. There is no restriction on airplane design; any engine *(if allowed)* up to .36, and any fuel system. This lack of restrictions allows the creative juices to flow with regard to the airplane/motor combination. A Fox Mark VI in a typical slow ship with a 10x6 prop seems to work well (10x4 prop if the motor is hot; 9x6 or 9x4 if the motor is tired). A slow ship with a 500-square-inch wing might be a way to slow the airplane and get it to turn better at the same time. Brat 28 and Fox stunt .35 motors also are being used. If you wanted to use a small motor, on a bladder, in a fast ship you would be legal, if you observed the speed limit. Lots of ways to go for those who enjoy the challenge of building a better mousetrap.

"4. The 73-mph speed limit combined with the severe penalty for a midair (both pilots) results in an extremely low mortality rate that no event—fast, slow or super-slow—that uses AMA scoring rules can

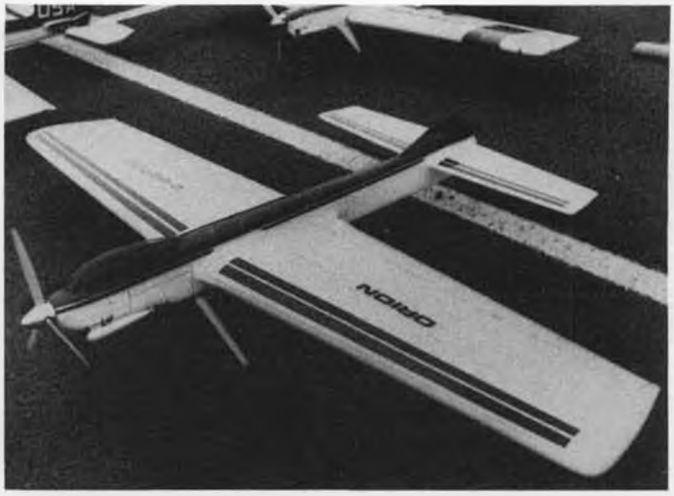




Photos on this page are of Richard Weprin's stealthy-looking "Python" models, in 1/2A, .09, and .19 size versions. Wingspans range from 20 to 26 inches, the wings themselves being made from posterboard.



Details of Lenard Ascher's high-tech "Mini-Rat" Class II Mouse Racer. Jim Cameron photo.



Alan Resinger's "Orion" stunter. Alan is a member of Canada's C/L Precision Aerobatics World Champs team. Jim Cameron photo.

even start to approach. The last Geriatric contest had a total of 22 matches with only two mid-airs. The percentage of mid-airs goes down with every contest held as the pilots began to realize that the cumulative scoring system combined with the severe penalties for mid-airs dictate that the first prerequisite of winning is to avoid the mid-air and then to garner points through accumulating air time and cuts.

" . . . It might seem at first to be just another set of rules for just another combat event, however, if you take the time to study and digest these rules you will come to realize that they are the answer to:

"1. The high mortality rate in combat.

"2. The problems with AMA and other midair collision rules.

"3. The difficulties we have attracting new people to our sport (Geriatric Combat is less intimidating to the newcomer than are most other combat events).

"In short, Geriatric Combat is too good not to be shared with the rest of the country."

Here are the rules used in New England for Geriatric Combat:

Young pilots duke it out in Jr. Class I Mouse Race at the 1989 N.W. C/L Champs. Photo by Jim Cameron.

GERIATRIC COMBAT SCORING RULES

This event is scored differently than the AMA method for two reasons:

- To eliminate the advantage that the first plane launched has under the rule; i.e., he can fly very aggressively at the start of the match, since, if a midair occurs, he will win on air time.
- To make the matches easier to score, with fewer timers.

While the overall objectives of the pilot are the same in this event as in the event with AMA scoring; i.e., get cuts and air time, the penalty for mid-airs is more severe, and there is not as much emphasis on "match winning." There is still some benefit in winning a match, but the main objective is to score points by getting cuts and air time, and avoiding mid-airs. There are no disqualifications nor match forfeits under these rules, only penalty points for various rule infractions. These rules are a modification to the scoring and penalty portions of the AMA combat rules. The other sections of the AMA rules (such as line specifications, pull tests and overall match conduct) are used as part of running the event.

Action shot from the 1989 Northwest Regional C/L Championships shows Marty Higgs launching a Class I Mouse Racer for teammate/pilot Remy Dawson. Jim Cameron photo.

MATCH TIMING AND CONDUCT

Only one stopwatch is used (to time the five-minute match period). Air times are awarded at specific times during the five-minute period, as given below. All matches run the full five-minute time period; however, there may be no reason to continue the match after a midair or fly away, if no further points are to be awarded for that match.

SPEED LIMIT (Optional)

Each plane will be timed prior to each "start combat" signal. If either plane is over the speed limit, no "start combat" signal will be given. If only one plane is going too fast, he can land and try to slow his plane down, but he won't get any air time points until he does slow down. A single plane flying within the speed limit will get air time points while his opponent is either on the ground or going too fast.

AIR TIME SCORING

Air time points will be given at the following times for planes flying at those times. If a plane is launched just prior to an air time point, he will be given credit for the air time at that point, if his speed is within the limit (if used). If his speed is not within the limit (if used), he won't get the air time points for that particular time point.

Plane airborne at 1 minute +100 points
Plane airborne at 2 minutes, 30 seconds +100 points

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CUT SCORING

Streamer and string cuts are scored as follows:

First cut	+100 points
Second cut	+150 points
Third cut and any additional cuts	+200 points
String cuts	–70 points

PENALTY POINTS

Midair collision (both pilots penalized)	–350 points*
Fly away (line cut or tangle; both pilots penalized)	–420 points*
Fly away (no tangle; line or control break only)	–530 points*
Pulling lines back in tangle (fly away resulting)	–780 points*
Pulling lines back in tangle (no fly away resulting)	–280 points
Handle release (plane/lines not restrained by thong)	–950 points*
Handle release (plane/lines restrained by thong)	–40 points
Major part (motor, tank, or wheel only) falling off	–380 points
Anything else falling off (including prop)	–10 points
Non-level flying (opponent's plane not airborne)	–170 points
Pit crew inside 75-ft. circle (running or pitting)	–210 points
Attacking before "start combat" signal is given	–70 points
Not in (or out of center circle 10 ft.) by 1 lap	–30 points
Deliberately out of center circle to avoid opponent	–220 points
Groping (touching to find) opponent	–40 points
Grabbing opponent (or his clothes)	–210 points

*For penalties marked with this sign, only the penalty points will be awarded, for that match, to the offending pilot(s).

MATCH WINNER POINTS

If, at the end of a match, the total scores for each flier are different (i.e., there is not a tie score), the flier who has the larger score will be given the following bonus for that match, except in cases where *-marked penalties were given:

Match winner points	+270 points

OVERALL WINNERS

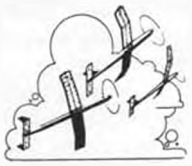
At the end of all rounds of flying, the overall winners will be determined by the total number of points, not by win/loss record. Any ties will be broken by fly offs.

CONTESTANT MATCHING

All contestants will fly four rounds. A number, or letter, will be drawn for each contestant, and he will fly as his number of letter comes up in the sequence. The following sequences will be used for the following numbers of contestants:

Five contestants (10 matches): 1-2, 3-4, 5-1, 2-3, 4-5, 1-3, 2-4, 3-5, 4-1, 5-2.

Six contestants (12 matches): 1-2, 3-4, 5-6, 2-3, 4-5, 6-1, 2-4, 5-1, 4-6, 1-3, 6-2, 3-5.



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Etc.

It will be interesting to see how the Geriatric Combat contest fares over a period of time. One of the assets of the existing AMA combat events is the simplicity of its scoring and procedures. It could be concluded after a time that the only significant factor contributing to the fewer mid-airs in the Geriatric event is the difference in speed; events, such as Fox .35 or FoxDoo combat, in different regions have had similar results without changing anything but the speed of the airplanes. Some fliers, in fact, strongly feel that AMA combat's "kill" (also commonly used in the Fox .35 events) actually saves airplanes by shortening matches—once the kill occurs, the match ends—and that it is primarily speed that is responsible for the carnage in fast combat. It may be, however, that the New England group has hit upon a successful combat alternative that will emerge as a popular event everywhere.

Another approach to the need to provide some opportunities for success for novice combat fliers is offered in the New England newsletter by Joe Fustolo.

Fustolo suggested that rather than run a separate event for beginners, it might make more sense to give an award or awards to the highest finishing "Class B" fliers at any given contest.

He speculated that fliers would learn faster when competing against experts, and also would be less likely to be involved in line tangles and collisions with experts than if all fliers were beginners.

It was suggested that a "Class B" flier would be someone who had never finished in the top three in an "open" combat event.

We'll be watching for more reports out of the Northeast on their progress in building up combat activity in the area.

ODDS AND ENDS

Speaking of rules:

Since the inception of Northwest Sport Race in 1976 and Northwest Super Sport Race in 1981, there have been a number of revisions of the rules for both classes, though their original concept remains virtually unchanged.

With each successive change, copies of the rules have been distributed far and wide. It may be that there are some fliers and contest officials in the far reaches of the control-line world who are using outdated rules for these two popular West Coast racing events.

Here's how to tell if you have the most current rules: In the bottom left corner of the rules for each event are a date and some initials.

Your Northwest Sport Race rules should say: *9/29/85 FL/jmt.*

Confusing as it may seem, there currently are two sets of legal Northwest Super Sport Race rules—one of them is the official rules and the other is a set of provisional rules being tried in the 1989-90 Northwest Sport Race Drizzle Circuit and likely to become official effective in May

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of 1990 at the Northwest Regional Controline Championships.

The official Northwest Super Sport Race rules are marked as follows: *11/1982 FL/jmt*. The new provisional rules, which expand the engine rule to allow sport .40 engines, are marked: *9/89 DC/jmt*.

If you have outdated rules or simply would like a copy of the current official and provisional rules, send a self-addressed, stamped envelope to John Thompson, 1520 Anthony Ave., Cottage Grove, Oregon 97424.

Speaking of Northwest Sport Race and Northwest Super Sport Race, the 12th Annual Northwest Sport Race Drizzle Circuit takes place at Delta Park, Portland, Oregon, at 10 a.m. on the following dates: Dec. 10, 1989, Jan. 14, Feb. 11, March 11 and April 1, 1990.

The DC is a five-contest series leading to championship trophies. Both NWSR and NWSS classes are raced at each contest. Each contestant is guaranteed three heats, with placing in the heats scoring points that lead to the feature races. Information is available from John Thompson at the above address.

The September issue's control-line column contained an erroneous address for Dox Generix, the maker of a number of control-line model airplane kits. Our apologies to anyone who has been trying to find Doc Passen to get a catalog of his fine products. The correct address is Dox Generix, P.O. Box 111, Jasonville, Indiana 47438.

Thanks to Sean Cochran, of Lancaster, California, for calling the error to our attention.

Speaking of kit makers, we have news of a change of address for Control Line Classics, maker of new kits for some old famous airplane designs.

Tony Drago reports that he has taken over sole ownership of the company and can be reached at the following address: Control Line Classics, 24981 Nogal St., Moreno Valley, California 92388. He adds that there has been some difficulty with forwarding of mail for the company; anyone who has been trying to reach Control Line Classics may want to try writing again to the new address.

Tony reports that he now has for sale large bushed and plated metal control horns, for $2.29 each. He is working on producing a line of four-inch metal bellcranks, which will be sold complete with mounting hardware. They have three control adjustment holes and line spacing for four inches, three inches and two inches. They will sell for $6.95 each.

Information on those and other Control Line Classics products can be obtained by anyone who sends Tony a large self-addressed, stamped envelope.

Finally, Tony reports that he is working on a kit for a profile version of the classic Oriental and a reproduction of the original Veco Tomahawk, plus "a few other sur-

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prises."

Jack Buehler, of Albuquerque, New Mexico, is in search of a source for some interesting scale kits, and has asked for *MB* readers' help. His letter explains:

"I got into model building in the late 1930s with the stick and tissue stuff of the time, and always with the emphasis on scale. In the early 1950s I discovered control-line scale, much to the dismay of my wife. I had a world of fun with it, and was privileged to meet and associate with some of the greatest people in the world through our local flying sessions. I sort of drifted away from the hobby a few years back for a number of reasons, but since I am about to retire, I want to get back into it.

"Now comes the bottom line. During the '50s and '60s, the hobby shops were filled with a rash of scale kits from Japan. Some were pretty good, others leaving a great deal to be desired. I have been half-heartedly trying to locate a source for the kits without much luck. Reading your column in the September issue of *MB* and seeing the pictures of Nathan Sturman sort of stirred me up a bit. At any rate, I was wondering if you knew of anyone importing kits like these, or if you might know of a source I could contact in Japan regarding them."

I was unable to provide Jack with an answer but I'm sure readers would have some ideas. Please write to Jack if you can help and send me a copy so I can pass the information along. Jack's address is 311 La Plata Road NW, Albuquerque, New Mexico 87107.

The *Orbiting Eagles* newsletter from Omaha, Nebraska, has a gem of an item from George Lieb. George offers some reasons why any control-line flier should attend contests:

1. To win contests. Actually, if this is the only reason you have to attend a contest, you might as well stay home.

2. To have fun! This is the main reason for doing anything. There is no sense in attending any contest unless you enjoy doing it. If you enjoy flying with friends, you will really enjoy contests.

3. To learn. Unless you already know everything there is to know, there are things to be learned from others at contests. Contests are the best place to share ideas.

4. To meet people. It ought to be obvious that contests are a great place to meet people with an interest in modeling, but some modelers don't seem to realize this.

5. To help support modeling activities. Contests are one of the few sources of money for clubs. Entering contests helps support the sponsoring club and all their activities.

The Vancouver (B.C.) Gas Model Club had a successful 45th version of their Internationals contest in September, with a good strong contingent of fliers on hand and a competent crew to handle the work.

The VGMC newsletter, the *Hot Head,* reveals that a true purple heart award goes to club stalwart Frank Boden, who was hard at work both at the field (mowing and painting circles) and at home (making combat streamers, sticks for balloon bust, etc.) while also working at his real job and spending time at the hospital where his wife, Jacquie, recently had undergone emergency heart surgery.

Here are the winners of the contest:

Advanced precision aerobatics, Dan Rutherford. Novice stunt, Henry Hajdik. Old-time stunt, Dick McConnell. Sport scale, Jim McCurrach. Profile Navy carrier, Bob Parker. Class I-II carrier, Bob Parker. .15 sport race, Ken Burton. Goodyear, Larry Bell. Northwest Sport Race, Marty Higgs. Balloon Burst, Dick McConnell. Fast combat, Greg Wornell.

Finally, in the "change of scenery" department, we have a note from Richard Weprin, of Clearlake, California, containing pictures of his fleet of very unusual "Python" stealth fighters. The pictures speak for themselves about Richard's creativeness in design.

"I started flying control-line about two years ago," Richard writes. "The last time I did this was 28 years ago when I was 15. At that time we were flying OK Cubs, Wen Macs, and McCoy .35s. Don't see much of them any more.

He started out making the planes as gliders, added .049 power and then went to PAW diesel engines.

"The PAW is a great engine," Richard says. "I must admit that at first I had extreme problems starting these engines but with a little patience and following instructions I can usually start them up in three or four flips of the prop.

"The 'Python' is constructed of a simple posterboard wing. It is reinforced with doublers and a balsa profile fuselage. The largest model is a 26-inch wingspan with a

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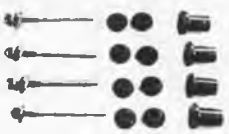

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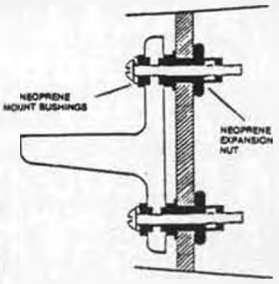

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PAW .19 engine using a 9x4 prop. This was my best flyer, extremely stable, good speed and glides in like a gull for landing."

Comments, photos, technical tips, contest reports and schedules and the like, always are welcome. Write John Thompson, 1520 Anthony Ave., Cottage Grove, Oregon 97424. •

Diesels .... *Continued from page 47*

His wife, Elisabeth, is the expert at the assembly of the needle valves, a task she has done for many years. Production has moved to an old red brick textile mill owned by their old friend, Peter Ridgeway, the last man to win the Gold Trophy (Britain's major C/L stunt contest) with a diesel-powered model (PAW, of course) in 1952, before imported American glow motors and larger airframes took over.

Like his father, son Tony Eifflaender is always "cooking up" engines for special events and, in 1988 won the British .049 C/L speed contest at 90.6 mph. But perhaps Tony's greatest achievement recently-and no doubt the most satisfying to his father—has been the recapture, several times, of the coveted stunt Gold Trophy, again with a PAW diesel. •

ARFs ..... *Continued from page 45*

something right, and you can bet I will continue to be loyal to their products as long as they remain in business. If you are new to R/C, buy yourself a Dremel drill and you'll wonder how you ever managed without one! They have some excellent pamphlets on their products, and you can get them by writing: Dremel, 4915 21st Street, Racine, Wisconsin 53406-9989.

ARFS IN ACTION

This month we focus our attention on a fine performing ARF being flown by Bud Lavagnino of Carlsbad, California. Bud adapted a little EZ Sportsman 25 to a .40 size engine, and this resulted in really outstanding performance. This diminutive model can do any stunt in the book, including an absolutely straight-up climb and sustained knife-edged flight! An early concern was that this airplane which was intended for a .25 engine might not stand up to the vibration and power of an O.S. .40 FP, but after hundreds of flights everything is holding together perfectly. Of course, something must be said for Bud's talented piloting, as his ability on the control sticks subjects the Sportsman 25 to a minimum of abuse. While this model is by no means a trainer, and is definitely not recommended for beginners, experienced pilots who wish to install a .40 size power plant in their EZ Sportsman 25 models need have no worries about overtaxing the airframe.

Bud is a real credit to the R/C flying fraternity. He works as a correctional officer with juvenile offenders, and one of his methods of straightening out these kids is to teach them how to fly radio-controlled models. I haven't yet run across any youngsters who are into R/C and criminal activity at the same time, and I think Bud is really on to something. He generously furnishes all the equipment and supplies needed for training, but he is confined to a rather small area for takeoffs and landings. He feels (as I do) that an old timer would really fill the bill for his training needs, but Bud just doesn't have the time to build one. If any of our readers has a large old timer just sitting around and gathering dust, this would be one of the most worthy uses for it that I can think of, the rehabilitation of kids in correctional institutions. To obtain Bud's phone number or address, just give me a call or drop me a note.

Speaking of giving yours truly a call, I would like to take this opportunity to proudly announce that "All About ARFs" now is equipped with its very own up-to-the-minute state of the art FAX machine

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We not only invest a great deal of time and money in product development, we also work to inform and educate modelers about the complexities of 1991 specifications and claims. We believe that knowledgeable, informed modelers will intelligently choose the best equipment available.

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which reposes right here on my desk in sunny California. It occurs to me that some of you sophisticated types out there would like to send me some news by FAX, so here's your chance to transmit any written material to me almost instantaneously. If any member of the hobby industry has any news release about new products related to ARFs, just send it right over the wire and It will receive my prompt and undivided attention. Please do not send me any offers to buy a time share! Anyway, my FAX number is (619) 726-6907, and it is available 24 hours a day, every day.

That does it for this month, now to get back to packing for my trip to England and France. I'll be there for a few weeks gathering the latest doings on ARFs in Europe. Art Steinberg, 2267 Alta Vista Dr., Vista, California 92084. Telephone (619) 726-6636. •

Jet Meet . . . *Continued from page 29*

nize ourselves into one cohesive body. Objectives are: A. Establish an organization for modelers at all levels of skill and involvement, with a common *interest* in jet (ducted-fan) aircraft. B. Achieve national recognition of a caliber experienced by other types of special interest modeling groups i.e., NMPRA-National Miniature Pylon Racing Assn., SEMPRA-Southeast Miniature Pylon Racing Assn., NSRCA-National Society of Radio Controlled Aerobatics, IMAA-International Miniature Aircraft Assn., etc. C. Address issues we have been saddled with . . . noise, safety, etc. D. Establish and maintain a neutral posture with regard to endorsement by manufacturers. E. Two-tiered membership; Charter Membership-receiving JPO membership number and recognition as a founding member or a standard membership which will have all rights and privileges but without a number. F. Through a newsletter, provide a calendar of scheduled events, manufacturer's advertisements and product updates and a roster of all registered fan fliers in this and other countries. G. Provide guidelines for new contests to help insure their success. H. With information accumulated from membership application, provide as a service to all interested industry the needs, concerns and statistics of the ducted fan modeler. I. Hats, patches, shirts, jackets, etc. J. Annual "Top Gun" award, and K. For those competition oriented; promote jet pattern, etc. Fee for charter membership is $50.00 (membership number will be issued). For standard membership: $25.00. According to Dave Tyson they have approximately sixty members to date, several of which are from overseas. If you are interested in becoming a member, or for more information, Dave can be reached at: 1200 Queen Elaine Drive, Casselberry, Florida 32707. Telephone (407) 695-6844. Jet Pilots Organization "Focused on the Future." •

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Lots of "experts" will say you shouldn't worry about looks when you choose a trainer. Easy for them to say.

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Kit includes engine mount, C.G. spinner, featherlight wheels, formed cowling and wheel fairings.

CARL GOLDBERG MODELS INC.

Electric .... *Continued from page 15*

to 100°C (boiling water) without degrading, this is less than for cobalt (150°), but still very respectable. No one should be running motors this hot anyway, if your motors are getting that hot, provide for cooling!

The Keller motors are coded for nominal voltage and wattage, i.e., a 22/9 motor is rated at 220 watts, 9 volts. These are nominal values, voltage (number of cells, since under load a cell is about one volt) can vary by about 30% up or down with no problems. All these motors have a strong 5 mm shaft, except for the 540, which has the standard 1/8 inch shaft common for all 540 motors. I would pick the 22/9 or 22/12 as a "hop up" motor for the Robbe Pitts S-1, or for any 540-type plane (05). Robbe has a complete chart for all the Keller motors in their catalog, the 22/9 can turn up to a 9.5x5 prop on 10 cells, the 22/12 can turn a 10x5 on 10 cells. The 22/5 would be suitable for faster flying planes, and can turn up to a 7x6 prop. All the motors are sealed to keep out dirt. Robbe offers a catalog for $6 which has much info on their motors and electric models, it is well worth the price. You do get a $4 refund certificate with the catalog. I am happy to see the Keller motors distributed by a large company, and you can bet I will be trying out some of those motors!

Harding Orren wrote in about a possible catastrophic problem with fusing, and I have to agree with him! He is flying with a Futaba Attack 4 system with the MCR-4A receiver with a built-in BEC. This system eliminates the receiver battery, which instead runs on the motor battery. Harding, like many of us, puts his fuse next to the battery, as shown in the diagram. If you are using a BEC, this means that if the fuse blows in the air, you have lost the radio control! The answer is to fuse between the motor and speed control, rather than between the battery and speed control. Now if a fuse blows, you still have the radio. This will probably result in a little less protection for the speed control, since it will have to absorb the initial current overload before the fuse does. However, most speed controls now can take a surge current of 40 amps or more, so you are not sacrificing very much protection. I rarely blow fuses in the air, and the few times it has happened has been due to an armature failing in the motor. Harding has blown some fuses using folding props, which may catch on a cowl or fuselage when unfolding. I am not using BECs in my planes, so I do not know how well this is working out. I am interested in any comments from readers! My impression is that a BEC that is used with a motor cutoff (the motor is turned off when voltage drops below a preset value) do fine. A BEC that has built in voltage boosting so that it can maintain voltage no matter what would also be OK. I would certainly not trust the type of BEC used in R/C cars, which has none of the above

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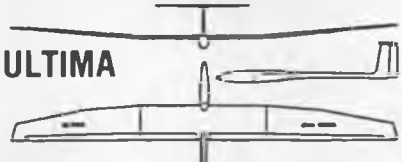

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features. Once the motor pack runs down, the car has no control, and for aircraft this would be an absolute no-no! Thank you, Harding, for bringing up the fusing problem. This will, I'm sure, save some planes.

Bill Kunert sent in photos of his Ace 4-20 and his Royal Air 40 T. The 4-20 has an Astro cobalt 15 with 14 Sanyo 900s, Astro gear drive, and a Zinger 12x6 prop. Static draw is 28 amps, the speed control is an Elden-Ken-24C. All up weight is 4 lbs. with Ace mini servos, Ace Silver Seven receiver, and a 250 mAH Radio Shack receiver pack. The plane is fully aerobatic and will practically fly out of your hand. Flights are 5-7 minutes with some throttling back. Bill did have reduced radio range problems until he bypassed the brushes to the motor case with .001 mfd capacitors. This is a good idea if you notice less range. Ground range before bypassing was 25 feet, with capacitors it is now 150 feet with the motor on. This is dependent on the type of speed control you have; some need this more than others. You can drill and tap a screw hole in the motor case (pick a spot away from magnets, brushes, and motor windings) or solder with a 40-watt pencil iron after sandpapering a spot. The diagram shows the capacitor arrangement. The Ace 4-20 makes a good electric, one of the fellows in my area flies one as an electric also, with great results.

Bill's Royal Air 40-T is a ready to fly available from Royal Air or hobby stores. I have the 40 S which flies well with an Astro 40 cobalt. These are well-made ARF planes, and quite suitable for electric, as they are light. Bill has an Astro 40 cobalt on 21 Sanyo 1200 SC cells, gear drive, and a Rev Up 13x6 prop. This draws 28 amps static. The speed control is a Jomar SC4 (it has no range problems, and does not need the bypass capacitors, probably because it has optical isolation). Flying weight is 7.5 lbs. with three Futaba S128 servos, an Ace Model 91 receiver, and a Radio Shack 250 mAH pack. The takeoff from grass is very quick and a 45° climb out is normal. It will loop from level flight, and it is a bit of a floater with power off, despite the weight. Longest flight is 12 minutes, and the usual times are 8-10 minutes. The only modification was removal of the former from the fuel tank area and removal of the front servo tray support. The servos are servo-taped to the fuselage sides, and it is converted to a tail dragger with a fixed tail wheel. Bill took the plane to the Midwest Electra Fly in July, and all doubts by others about an ARF converted to electric stopped after the first flight. Keith Shaw awarded it the "most impressive aircraft" on Sunday! Now that means a lot, as Keith is a leader in electric flight. Bill says the Royal 40-T is a quick and easy way to get started with a 40 electric. He feels that the keys to success are to put in a couple of extra cells for extra performance (use the gear box when doing this), prop for high current for good performance, and throttle back for good flight times. I agree with Bill, this is a very good approach. Bill also mentioned that the Radio Shack 4.8 volt pack, #23-173, at $10.95, is a good deal, and consistently checks out at 250 mAH on his Digipace. It is less than 2 ounces, and available at most Radio Shack stores. Thank you, Bill, for all the good information. For now, if you are ready to fly, fly electric! •

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Big Birds . . . *Continued from page 11*

weighs in at 28 pounds. She's mostly built-up, planked and fiberglassed and sprayed with K&B Superpoxy.

Ed has run taxi tests on land and water, but doesn't expect to test fly her until next spring.

A masterpiece like this Mariner leaves me speechless; all I can do is make "ooh and ah" sounds and feel inadequate.

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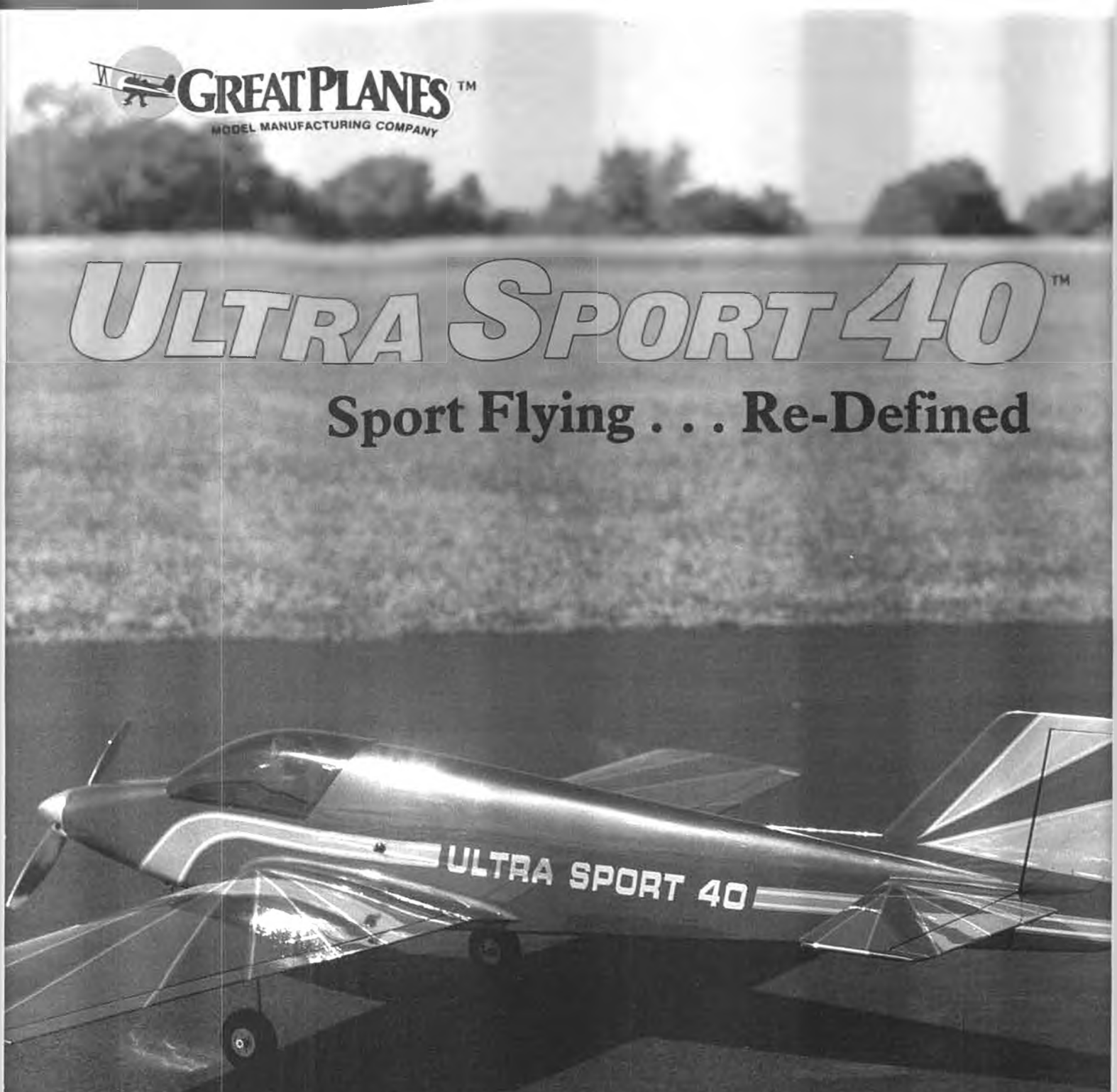

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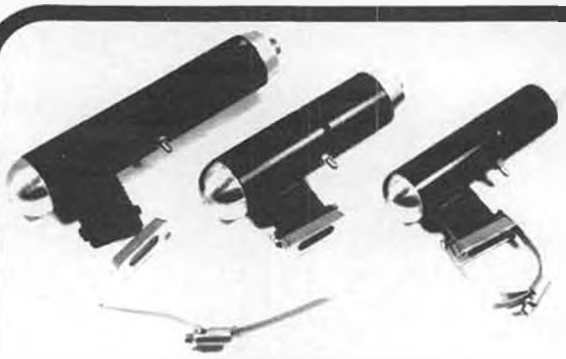

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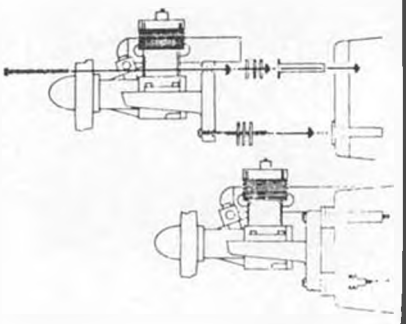

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Peanut .... *Continued from page 53*

about a quarter of an inch, except where the bends are sharp where the spacing needs to be tighter. Then the three layers are carefully wrapped around the pins, secured by several pins at the ends and other points as required, and the curves are fixed by bonding the layers together with thin cyano (Zap, Hot Stuff, Sig, or whatever). I put a drop of cyano on the wax paper that covers the plan and used a sharpened piece of 1/16-square to transfer minute amounts of cyano to the outline.

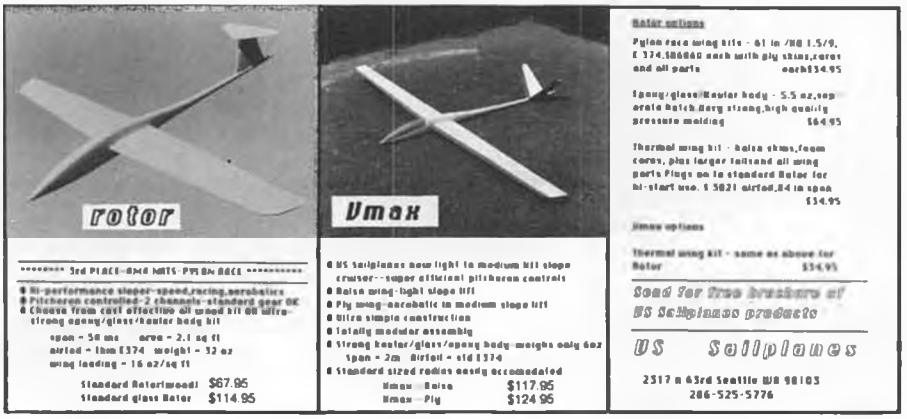
This outline making method works great and is almost quicker to do than to write about.

Construction of this model follows conventional small rubber model practice in almost all respects. There are a few more pieces than is usually the case but they are no different. The wing ribs change so little from one to the next that only the root rib, tip rib, and the method for making the intermediate ribs are shown. (I made all the ribs one evening in a motel when I was on a trip, and then, when I started assembling the wing I couldn't tell some of them apart.) It is probably best to cut all the ribs necessary to the size of the root ribs and then fit, shape, and notch them one by one on wing assembly. Small blocks of balsa are fitted into the wing structure at each of the points of bracing attachment. Lycra thread is used for bracing because it stretches, allowing disassembly of the wings from the fuselage without having to disconnect the bracing.

All the rest of the structure is conventional. Commercial plastic parts were used for the dummy cylinders, thrust bearing, and propeller. Dress snaps were used to simulate the cylinder heads and thin plastic tubing was used for the exhaust and intake piping.

Obviously, the model may be simplified without hurting in the scale judging and with some potential for longer flight times. Structurally, it does not need more than about half the wing ribs and tail ribs. It doesn't have to be capable of disassembly.

Flight trim required about an eighth of an inch of washout on both wings and a little nose ballast to bring the center of gravity forward to the position indicated on the side view. A single loop of 1/16 rubber will work for the motor. •



Hannan .... *Continued from page 49*

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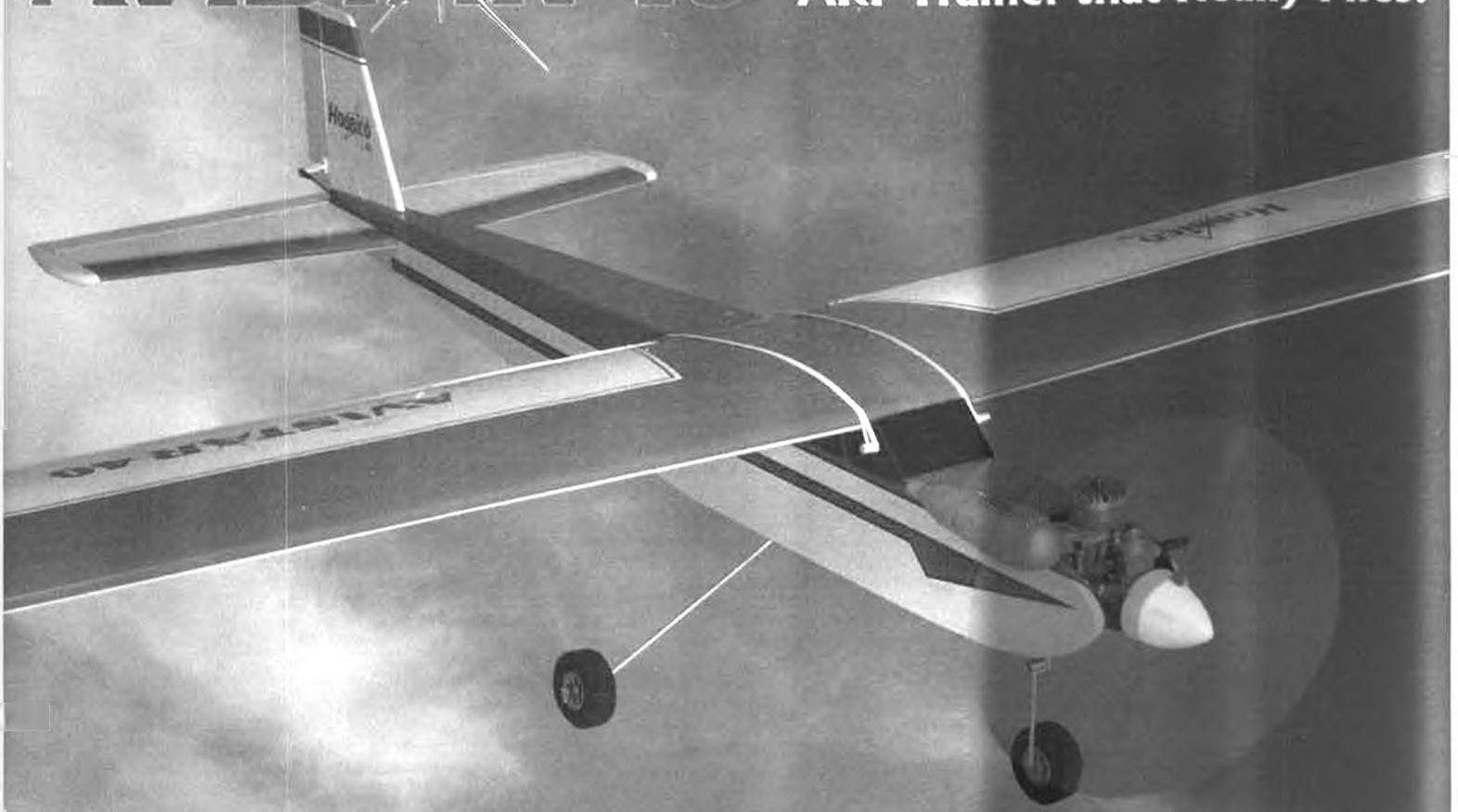

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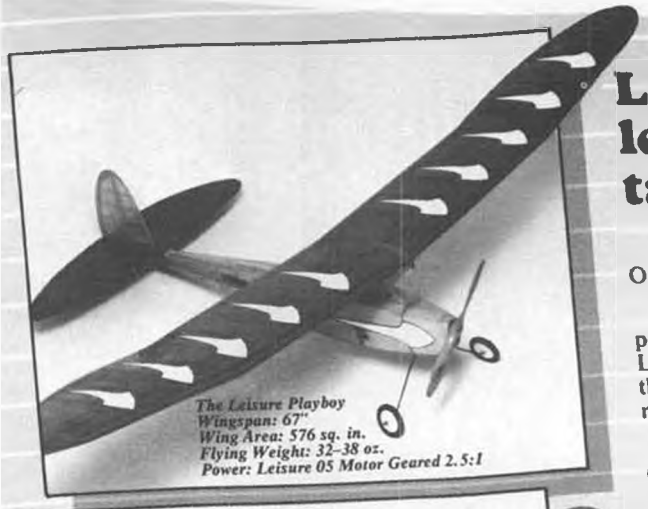
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ing portions authored by the late Robert Granville himself, photos of the builders and their aircraft (many from family albums), scale drawings by Harry Robinson, and much more. Author/modeler Henry Haffke devoted many years to collecting Gee Bee information and interviewing members of the Granville family in order to compile this volume.

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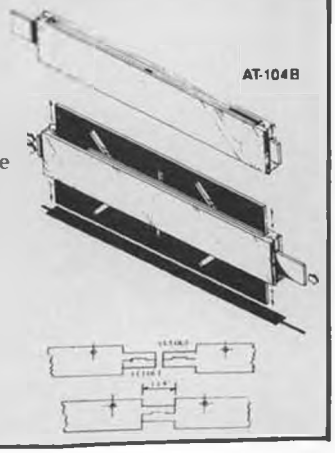

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S-Hawk . . . . . *Continued from page 18*

covered with wax paper. Get all the parts cut, sanded and organized. Without gluing, pin and set the basic wing on the plans. Shim under the trailing edge and ribs to help the undercamber shape, using 1/16 x 5/16 cap material. Tack glue this together with CA. At this point determine your wing configuration. If it's gull or poly cut the sections apart at the breakpoint. Then make up the dihedral braces, sand and fit them into the space between the spars. Sand the wing sections to fit each other, then tack the TE, LE and spar together.

With the wing formed add the leading edge sheeting, webbing, braces and center sheeting. Round the leading edge; it was made out of spruce so we could trim trees and bushes. Note, the wing tips look best in transparent covering films. The tips are slanted up on the gull and straight wings. On the poly or straight center poly wings you need the tips slanted down to prevent "dutch roll." Put the cap strip on top of the trailing edge, top and bottom. Soak caps in

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water to get a good bend, especially the bottom leading edge. Fiberglass the center section with one and one-half ounce glass 2" wide, top and bottom. On the aileron version use flexible Du-Bro Engine control cable with soldered ends for stiffness.

FUSELAGE

Glue 1/64 doubler ply to the 3/32 balsa sides. Glue the 3/0 triangular stock onto the fuse sides along with the pushrods. Bring pushrods out through the back and cut off flush to the outside of the fuselage. Clamp the halves, back to back and sand. Make up the wing; hold down formers with the dowel glued in. Glue all formers to one side of the fuse half. Shim under the nose and tail. Then glue on the other fuse half on top of this setup. Cover the top and bottom fuse halves with 3/32-length grain. Under the nose section use 3/16 cross—grain balsa. The length grain on the fuse sides will give you flexibility instead of brittleness. Rough in the nose block and glue it to the fuse. I hollowed mine and used the recess for possible nose weight. Now cut out finger launch hole and put in the tow hook plate with 6/32 blindnut.

STABS

Build these conventionally out of soft 3/16 balsa, lightening them if possible. Reinforce the horn areas with 1/64 ply. Join the elevators with 1/4 x 1/4 spruce in the center. I used the Robart 1/2 A hinges and Goldberg 1/2 A horns.

RADIO INSTALLATION

I used my trusty old Airtronics Championship radio with 401 servos, standard receiver and a 500 mAH battery pack. On my first Sparrow Hawk I built the wide version and could use a square battery pack forward. On the second and narrower bird I used a flat pack. If you need the weight add it in heavier battery packs. The extra mAH helps on longer flights. On the wider fuse I mounted the 401 servos side by side and under the wing. On the narrow fuse I mounted them tandem in front of the wing. Standard sized servos will fit in this plane. On the aileron version, mount the servo in the wing using flexible cable to 1/2 A horns.

COVERING

Transparent covering looks best, especially when you do the bird-like pinion-feather wing tips. I used Black Baron transparent for the first time and liked it. If you have a favorite symbol cut it into the vertical tail. The transparent film will show it off nicely. Add an eye to the front or the canopy for an extra bird-like feature.

FLYING

When reading most building articles I usually read "How it flew" and then go back to the boring stuff. I haven't read an article that didn't overrate the plane with BS that wasn't fabulous or incredible! So, I'll minimize the BS and try to give you a feeling for a 4-foot sport sloper.

First, it was designed for these purposes; 1) to fly in turbulent air; 2) to be simple to build, but to allow each builder to add his ideas; 3) to take standard servos; 4) to be hand-chucked; 5) to be big enough to be seen when thermalling; 6) to be exciting and provoke comment from the gallery.

If you're new to slope soaring and have some R/C flying experience this plane will be easy but you must remember to keep the plane moving. There is no prop blast to keep air going over the control surfaces. This slope soarer does not like long downwind moves; so plan landings with plenty of altitude and lots of down trim. With this in mind anyone can handle a Sparrow Hawk.

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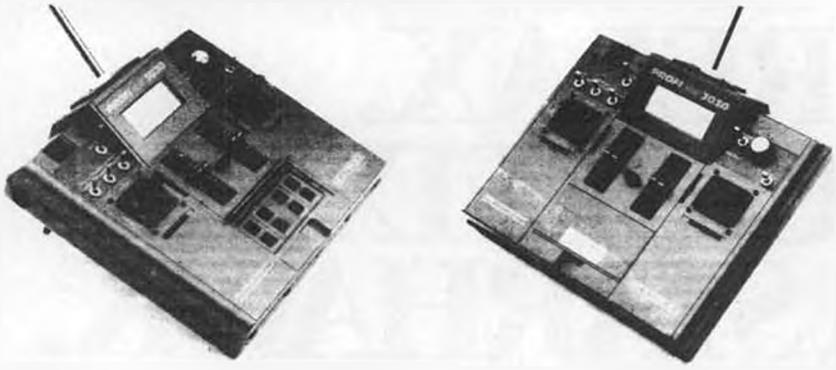

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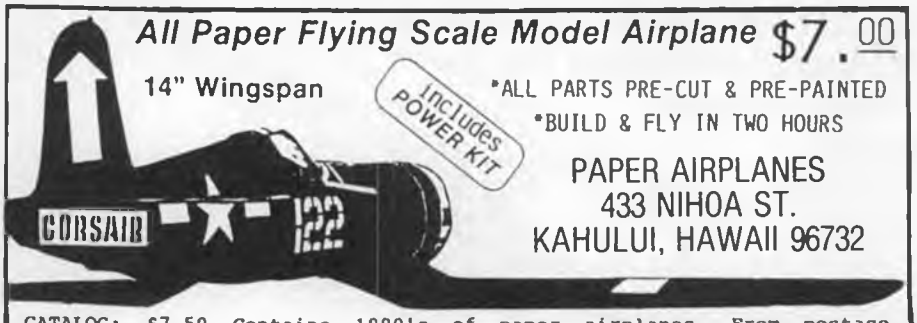

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control surfaces, start with plenty of rudder, 1" each way and normal to small elevator throw of 1/4" each way. I didn't have to add nose weight to either of my versions.

CONCLUSION

The Sparrow Hawk is able to answer the wind as quick and fiercely as its namesake.

The aileron version is just slightly more maneuverable but it's all in what you want to do. In the Fingerlakes of New York, we are not yet smashing into each other for amusement. We're too busy trying to survive the cold and turbulent air to do that. At the Hill we picked up lots of comments on the wingtips and gull configuration; mostly Auduboners that wanted to identify a new species.

But seriously, the thrill of flying a bird-like creature runs deep in our blood and you just have to build one to experience it! •

Free Flight *Continued from page 52*

also be flown without any gear at all. Single-bladed propeller does the pulling powered by eight strands of 3/16" T-56.

So, you think you know what it is, do you Bunky! Well, if so, drop a line to Bill Northrop at *Model Builder*, because if you have it right, you are the winner of a free, one-year subscription to my favorite model airplane magazine. All you have to do is be the first one with the right answer.

HIGH TECH PEE-WEE

One of the real selling points behind the development of the Pee Wee 30 event is easy construction and low cost. I have enjoyed flying this event as a kind of diversion from the "hot rod" events. I continue to have a long standing frustration with the Pee Wee engine, because these little beasts are a pain to keep running at peak performance. In fact, they seem to run differently from flight to flight almost without regard to the care that you give them. One constant that I have found is that if you don't take care with Pee Wees they will give you constant headaches. Previous articles in this column have given you tips to increase performance. For me, the best kind of care that can be given to Pee Wees is to keep them clean, to filter the fuel, and to regularly replace the gaskets and the reed.

However, Pee Wee competitors who wish to take a big leap forward in performance and don't really care too much about the expense can take advantage of another improvement.

". . . Larry Jenno and I (Phil McCary) are producing a limited quantity of the customized Pee Wee .020 that we used at the U.S. Free Flight Champs to win first and second in the Pee Wee 30 event. The machine work is done by our master machinist, Larry Jenno, and I do the peon work like assembly and fitting. The engine sports a T.D. 020 venturi and needle valve assembly attached to the intake tube of the reed valve body by a coupling. We use a three post bracket to hold the reed valve body to the crankcase which also serves as the mounting bracket. The engine comes with a three hole, tapped mounting fixture that fits behind the firewall. One must use a remote tank assembly because the original tank and intake tube have been machined off of the reed valve body. We use early model piston and cylinder assemblies as they seem to have a better fit. When we run out of the early model P and Cs, then we will be forced to use the later model stuff. So far, the engines will turn, on an average, 18,000 rpm on 40% nitro fuel with castor oil using a cut down and thinned Cox gray 4.5 x 2 propeller (cut to 4.25" x 2). The best engine we made turned 20,100 rpm on a 4.125 x 2 Cox grey prop with thinned blades. If any of you want these engines they are $65.00 each. Add $2.50 for postage. If you supply your own Pee Wee .020, we can customize it for $50.00 plus $2.50 for postage. If your engine does not have a super-good P and C combination, I would recommend buying one of the complete engines."

For some reason, it doesn't seem right to use "high tech" engines like Larry and Phil's in a low tech event such as Pee Wee 30, but if their modifications do solve the erratic running characteristics of the stock engine, then such a custom job will be worth it. Speaking of engine rpm, my stock Pee Wees, when they run correctly, will consistently exceed 20,000 rpm on a 4.25 x 2 Cox grey propeller on 50% fuel.

To place an order for one of Larry and Phil's modified Pee Wee engines, contact Phil McCary at 532 College Dr. #212, Hen-

derson, Nevada 89015.

AMA IS DUMPING FREE FLIGHT

You read it right! According to Tony Italiano, president of the National Free Flight Society, the AMA is 96% certain to hand over the responsibility for running next year's Free Flight Nationals in 1990 to the NFFS. The Nats would then be combined with the U.S. Outdoor Championships to be held in Lawrenceville, Illinois, October 1-5, 1990.

According to The *Flyoff*, newsletter of the Brooklyn Skycrapers, edited by Bob Hatschek, "That's the good and the bad news. The good news is that it should be an excellent contest—well run, well attended, and on a superb FF site. The bad news is that, by combining the FF Nats and the USOC, we're losing one major meet. Compounding that bad news is the late date, which essentially prevents participation by anyone involved in education (students or teachers) and many others who cannot take vacations beyond Labor Day. Further, proximity to the date of the US FF Team Selection Finals will additionally inhibit participation by many of the nation's top free flighters.

The dates had already been negotiated for the 1990 USOC with the Lawrenceville locals and were largely necessitated by assessment of crop damage at the 1989 USOC in June and the fact that corn will be planted next year instead of potatoes.

In this editor's view, the worst aspect of the combination is this: AMA is essentially shuffling off its own responsibility for holding a free flight meet of national stature. It's assumed that they'll be lending "moral" and financial support to NFFS, but Headquarters and the Executive Council are basically passing the FF buck. They don't like the flack they've been getting from free flighters for running several decades of very poor FF Nats, and they're just getting out from under. What they should be doing—and should have been doing for many years--is planning and executing a first-rate national free flight championships.

A further indication of AMA's 'official' attitude to free flight and its free flight membership is Pete Waters' article in the September issue of *Model Aviation* describing the 'National Model and Sport Aviation Center.' We have no argument with the stated objectives, but the proposed design is ludicrous in terms of accommodating free flight despite such statements in the article as the following: 'To serve as a national caliber flying site.' 'It will occasionally host the Nats as a complete package,' 'The committee has worked extensively with modelers to develop this plan, and preliminary copies have been sent to all AMA Special Interest Groups.'

Studying the landscape architect's plan, I cannot imagine that free flight was given more than a fleeting consideration—when someone, seeking to forestall FF bellyachers, ordered the draftsman to insert a half-dozen tiny (perhaps 300 ft. diameter) circles labeled 'free flight launch.' Free Flighters get no parking areas upwind of their launch areas and no retrieval trails on

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the downwind side. Rather, the free flighter is given a turbulence-generating windbreak of trees on the upwind side and more trees and buildings to hit on the downwind side.

Now, I am about as knowledgeable in landscape architecture as the AMA Executive Council is in free flight, but it would seem more logical to me for these purposes to put buildings along the edges and in the corners of this property, and to allow a narrow peripheral strip for parking. This would also allow spectators to drop in and depart very easily. And elimination of the peripheral trees would enhance their view as well as reducing the hazard of turbulence and potential downwind parking.

Dave Linstrum, who incidentally is a landscape architect, and Bob Meuser, are two prominent free flighters, among others, who have written letters of protest to the AMA bigwigs making points similar to the above. If you agree—or even if you disagree—your letters should probably go to Vince Mankowski at AMA HQ.

As an interesting sideline to all this, the *CIA Informer* recently reprinted newspaper reports of local opposition from the small town just south of Muncie, Indiana, that was the selection committee's first choice for the AMA's new home. Like Yogi said, "It ain't over till it's over."

WHAT DOES THE FUTURE HOLD FOR FREE FLIGHT IN THE TWENTY-FIRST CENTURY?

All of the above editorializing may prove to be irrelevant as we look ahead ten years. Although I don't believe I can predict the future any more than the next person, it is possible to make some predictions about what to expect based upon what is known now. For example, as all of us know, the availability of free flight sites at a reasonable distance, the age of our active free flighters, the infusion of younger fliers, and the health of the free flight organizations will play a part in our hobby's future. By the time you read this, I will have completed and mailed out to active free flight clubs, as listed in the AMA publication and other sources, a survey for your completion. The results of this survey will be developed into a report to the free flight community sometime during the first half of 1990 and will be

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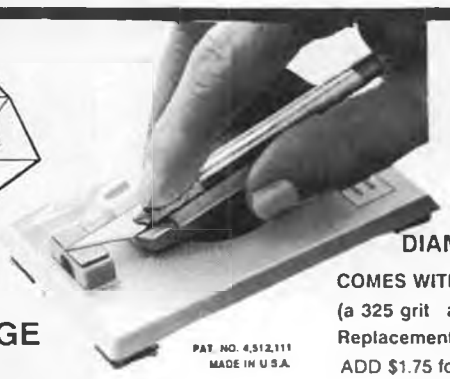

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published in this column or any other publication that will print it. If all of the free flight clubs and/or individuals will cooperate in completing this survey, then we should have a good picture of the current state of the free flight community. My task will be to take this information and make some projections about what we might expect the year 2000 to hold for all of us.

If you or your club has not received a copy of the survey by early January, 1990, please drop me a line, and I will send you one to complete.

Send your request to Bob Stalick, 5066 NW Piccadilly Circle, Albany, Oregon 97321.

THAT'S IT DEPARTMENT

Well, that just about wraps it up for another month. Hope you didn't mind the diversion from the usual fare. I'll be back in a month, in the meantime, if you are in a place where you can still fly in the outdoors, put one in a thermal for me. •

Floats ..... *Continued from page 27*

broaden the flight performance envelope. Power is an Astro Cobalt geared 25 motor, controlled by an Astro Model 200 proportional throttle. I have replaced the Sanyo 1200 SCR cells with SR 1250 Magnums,and the Tamiya connectors supplied with the system have been removed and Sermos connectors installed in their place. The radio remains the super-reliable Airtronics FM Vanguard. The use of 14 SR Magnum cells results in a weight reduction of ten ounces (this translates to over two ounces per square foot reduction in the wing loading), and the Sermos connectors provided a gain of several hundred rpm at the prop. The airplane as described (on wheels) weighs five pounds, eight ounces; this works out to a wing loading of 18.75 ounces per square foot. Using a thinned and undercambered Zinger 13/6-10 prop, scale taxi maneuvers and takeoffs from grass are effortless, and flights average between six and eight minutes. Aerobatics beyond the capability of the full scale aircraft (loops from level flight, Cuban eights, inverted flight) are easy, and the model must be flown at half throttle or less to perform at a believable scale speed.

The airplane as described above was put onto the floats shown in the photos and on the drawings. Total weight ready to float rose to seven pounds, two ounces. The airplane comes onto the step within thirty to forty feet, and on all but glassy smooth water is off cleanly within fifty to one hundred feet after planing. As is the case with the wheeled configuration, best scale cruising speed is achieved at around half throttle. The overall impression is one of convincingly scale-like operation. Though I have chosen not to do "unusual attitude" aerobatics in the float configuration, I have no doubt that the airplane would handle them. The Porterfield has also been flown off water with the heavier SCR battery pack; the extra performance inherent in these cells, easily makes up for the added weight.

Editorial considerations dictate that this be a discussion of the practicality of flying

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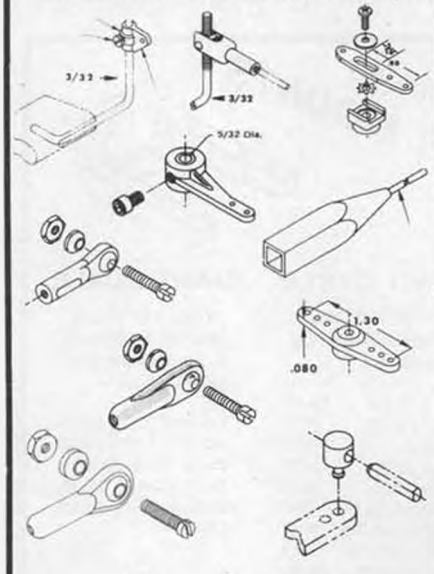

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electric airplanes on floats, and of the specifics of the Astro Porterfield conversion. There isn't room to discuss float flying technique in general. I will suggest that if you aren't an accomplished float pilot you might want to take a look at the excellent three part series Ed Westwood recently published on float flying in *Model Aviation*. There have been several good articles on float planes in *Model Builder*, and our own Mitch Poling has made many references to electric float flying in his Electric Power column. A point of interest is that Mitch favors flat-bottomed floats for electric models. Suction generated between the water and the lower portion of the float body is one factor that can prevent successful takeoffs. A V-bottom appears to increase the likelihood that floats will not break free easily, while a flat bottom often makes takeoffs easier. A V-bottom in full-scale use allows the float to ride much more smoothly in rough water and is necessary to prevent unacceptable transfer of shocks to the airplane and its passengers; the configuration has the same effect in model operations in addition to being desirable to us because it looks "scale." The Astro 25-powered Porterfield has the power to handle the "semi-scale" floats presented with no trouble.

The treatment of the lower hull edge, or chine,is another source of potential trouble with regard to hydrodynamic suction; the sharpest edge you can get between the float bottom and sides is what you want. A rounded corner is real trouble. A commercial line of plastic floats introduced many years ago with such a round chine worked very poorly and I suspect contributed in large part to the misconception that a floatplane requires a big increase in power over its wheeled counterpart to be able to get off the water.

The angle between the fore and aft underbody of the float, referred to as the rotation angle, is very important. This design uses an angle of twelve degrees, as recommended by Mitch, the idea being to allow the airplane greater freedom to rotate back on the floats when in the planing mode in order to place the wing at a sufficiently positive angle to insure enough lift to break free of the water. As electric airplanes may not have as much reserve power as their "wet power" counterparts, which commonly use an angle on the order of seven degrees, I have incorporated the greater angle. The depth of the step has also been increased somewhat over what you may be used to seeing, in order to help reduce suction on the after bottom surface. I mention these design concerns in order to provide you some guidelines in the event you choose to modify the float design I have provided. There is of course no reason to think that these particular floats must be used only on the Astro Porterfield. I see no reason that they should not work well with virtually any two-inch scale lightplane model or similar size sport models, regardless of power source.

Two interesting observations have been made that may be of value to other electric float modelers. As you may recall from the original Porterfield article, I mentioned having left the rear portion of the left main cabin window open to provide cooling air exit area and for access to switches and charging connections which were mounted inside for anticipated protection from spray. It happens in practice that the cooling air exiting through the open window completely prevents water from entering the cabin. I have *never* found any evidence of water inside the cabin.

I will mention at this point what may already be obvious to those of you who fly electric: the electronic throttle and motor battery cannot be waterproofed, although the rest of the airborne system may be if you so choose. The need to air cool the power system demands an "open" mounting. I'd suggest that you totally avoid salt water, fly carefully, and flush and force-dry your gear if you get it wet.

The second goodie may well apply to all electric floatplanes using geared motors. Using a wood prop, I was prepared to accept tip and leading edge erosion from contact with spray. In several months of active flying, the prop has been seen and heard to hit spray on nearly every flight. In some cases contact has been significant, as when taxiing crosswind to the beach in choppy water where it is necessary to use quite a bit of power to maintain heading. As I write this there is *no* discernible erosion of the original prop. My guess is that at

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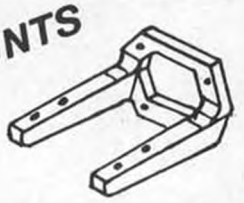

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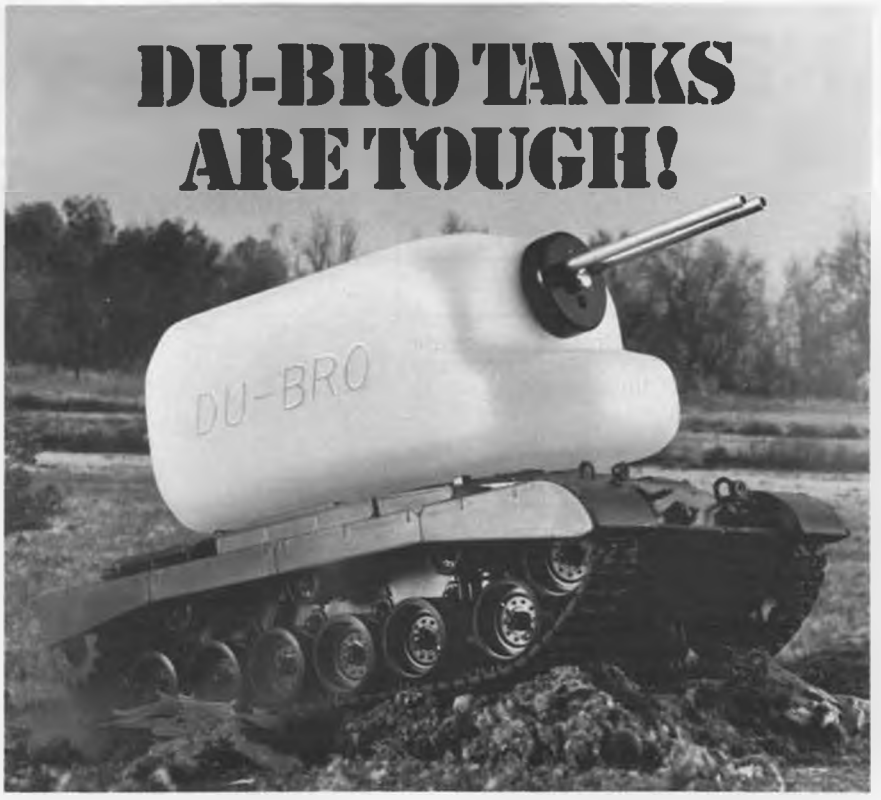
the low speeds at which we turn our propellers with geared electric systems (my prop runs at just under 6000 rpm static) they aren't hitting the water droplets fast enough to be damaged. I'd appreciate hearing from those of you who have been trying this sort of thing to learn what you've experienced.

I chose to build my floats using a traditional approach; balsa formers and a balsa keel are "egg crated" together, reinforced with chine strips (stringers), and covered with 1/64" plywood, which is in turn covered with two ounce fiberglass cloth. There is no reason why the outer plywood skin could not be replaced with firm 3/32" balsa. While the very thin plywood requires the stiffening of glass cloth and resin, balsa skins might well be surfaced using silk (or silkspan) and dope, or even plastic film. I'll detail the construction process of the floats as I built them, and let those of you who want to innovate take it from there.

Cut the keels and formers from medium-hard 1/8" balsa sheet. You don't need rock hard (heavy) wood, but do avoid mushy stuff that won't provide any stiffness. Note how the formers are slotted on top, and the keels on the bottom, to allow assembly. Build each float in turn over the top elevation on the plan, assembling upside down so that the flat upper surface lets you build a true structure. I used Hot Stuff Special T exclusively. Epoxy is needlessly heavy. Water-based glues are not acceptable for float construction. Install the four 3/16" sq. chine strips while each float is on the board. Bevel the chines and true the outer surfaces of the bottoms, then add the bottom sheet before removing the structure from the building board. Now you can sheet the tops. Add the 1/8" ply inserts for the strut brackets. Drill mounting holes for the bracket screws and install blind nuts. When the bracket installation is the way you want it, true up the sides of the framework and install the remainder of the skin. Do be sure to check alignment regularly while completing the skinning; once you close up the structure, it's guaranteed to stay the way you built it! Add the soft balsa nose/bow fairings and a 1/16" ply plate at the rear of the float on which you will mount your water rudder and sand the entire outer surface to finished contour. I used two-ounce glass cloth attached with Sig polyester resin over the 1/64" ply skin and achieved a smooth, rigid surface within acceptable weight limits. I would be just as comfortable with glass over 3/32" balsa. Dope and fabric or silkspan would be just as waterproof, but I doubt that it would afford the same resistance to puncture. I personally would not be comfortable with a plastic film, although it should work if you are aware that the seams may need regular resealing to remain waterproof.

I made my water rudder from a piece of K&S brass sheet soldered to a short length of 1/16" wire. This was captured between two wheel collars which were mounted to a small brass plate from "behind" (actually the front) with two very short 2-56 screws trimmed to thread into the collars without locking the shaft. The plate is itself screwed



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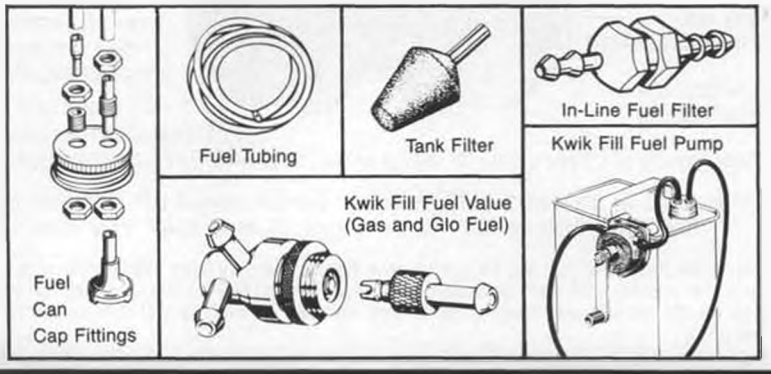

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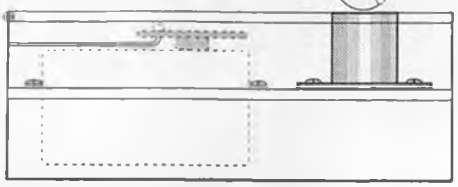

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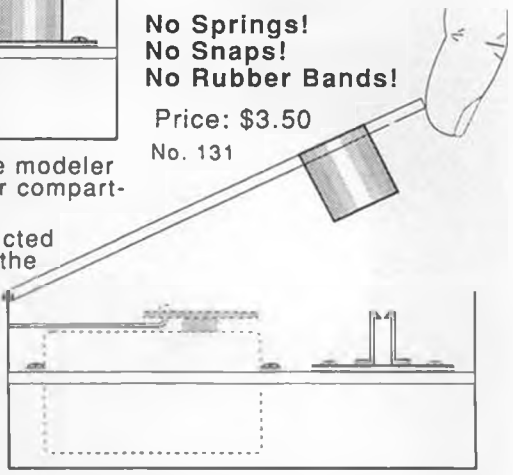

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to the ply reinforced transom (aft former) of tee chosen float. An extension of the 1/16" shaft accepts another wheel collar to which a brass sheet control horn has been soldered. I used small Proctor pulleys to run dual cables from the tailwheel steering horn on the rudder, down the rear float strut, and back to the water rudder horn. A push-pull linkage using concentric plastic tubing should work as well at the expense of looking less scale-like. My water rudder is on the small side in order to reduce weight and to minimize its effect while the airplane is running on the step. At the expense of having to use a moderate amount of power to force turns out of the wind when in displacement mode, it works just as intended.

Make up the mounting struts as shown. My float struts plug into 1/8" I.D. tubes at suitably reinforced points along the lower longeron (the front point being shared with the wheel landing gear assembly), and consequently the float struts are two-piece. If you choose to use a simpler external attachment, you can form the struts as single units. I'd suggest that you jig the floats in position on your work surface and assemble the struts using sheets of stiff cardboard or some other suitable material to hold the upper ends of the struts in position while the diagonal braces are fitted, wire wrapped and soldered. I used 1/16" x 1/2" aluminum bars from the local hardware store as cross braces, drilling them to fit under the rear attachment screw of each of the strut brackets. Adding these before soldering the struts will make the job easier. The critical factor in this operation is to shoot for an incidence angle of one degree positive between the lower surface of the wing and the tops of the floats. Although it's not difficult to make up a jig that will hold everything in the proper relationship, most of us find that the final job of wire bending and soldering leaves us with something other than the exact incidence required. Adding appropriate shims between the strut brackets and the float tops will allow you to adjust for the exact incidence you want. Be certain, when you are finished, that the floats lie absolutely square to one another and that you have the aforementioned minimum of one degree of positive incidence between floats and wing. Without this, you may find that you are unable to rotate the airplane far enough back on the floats while planing to position the wing at enough of a positive angle for takeoff.

Keep 'em accurate, keep 'em light, and go out and try electric float flying. About the only disadvantage I have found so far is that quiet power doesn't scare the local ducks, and I have to wait for them to paddle out of my takeoff path at their own speed before I get to fly! •

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Tech. Stuff *Continued from page 42*

knowledge of some of my readers, but many others require more basics than I give. There are no prerequisites for this course, so I will continue to try to be all things to all readers. I addressed the problem in our very first column in June of 1988, comparing MD&TS to a one-room school.

GLOW-PLUG NICAD TESTING

I recently graduated from using a power panel for glow plug glow juice, to the newer portable Ni-Starter (trade mark) type of unit, of which there are several different good brands available. Most of us have developed or adopted charging routines and ways of testing our transmitter and flight nicads, but the separate little glow starters are a new challenge. I, for one, don't like to recharge any of my Ni-Cds after every use, and I'm not afraid of "memory." More on that later.

I was once in charge of the design of the battery systems for two different guided missiles, so my level of expertise here is a bit higher than it is in some of the areas where this non-angel blindly treads.

To find out roughly how much charge remains in a cell or battery, we may measure its voltage. This doesn't work well for all types of primary and storage cells, but nickel cadmiums have a well-established voltage curve which is steep enough to be a pretty useful indicator of charge level. Actually the no-load voltage depends on the temperature and on the age of the cell, as well as on its degree of charge, but for our use these other effects are minor.

After much poring over the General Electric Nickel Cadmium Battery Application Handbook and doing some testing, I

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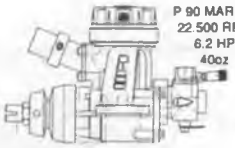

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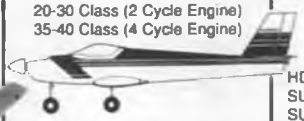

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have selected an end-point voltage which I am using successfully, and which I offer to you. Measure the open-circuit or no-load voltage of your glow starter cell with a digital voltmeter. If it is at 1.25 volts it is good for just a few more starts. Below that, the cell needs recharging. If you are going to be putting in a lot of flights tomorrow, 1.25 is too low. Then you better recharge if the cell shows less than 1.30 or 1.35 volts.

Notice we are talking about voltage to at least three figures of accuracy. A needle-type (D'Arsonval) voltmeter or multimeter isn't going to be accurate enough and it can't be read closely enough. Digital meters read to the closest hundredth or thousandth of a volt in the lower ranges, and are very accurate and repeatable. I once had an "expanded scale" voltmeter, but I don't consider them nearly as good as or as versatile as digital meters. If you have an Accu-Tach you have a digital voltmeter. Are you using it? In addition to an Accu-Tach I have an inexpensive Sears digital multimeter that measures to a thousand volts ac or dc, current to 200ma, and resistance to 20 meg ohms. Radio Shack also has good inexpensive ones.

Figure 1 shows the approximate no-load voltage for a good-condition nickel cadmium cell over its discharge range. The voltage is around 1.40 volts or greater immediately after charging, but it rather rapidly drops to around 1.30 volts after a little use. From there on the drop in voltage is fairly linear with use. That is, the no-load voltage indicates the remaining charge in the cell. As you can see, when the no-load voltage is down to 1.20, the cell is effectively discharged. In the example shown on the curve, if the no load voltage measures 1.31, we see that about 40% of the charge in the cell remains.

You will notice that I keep using the term "no-load voltage," which means the same as open-circuit voltage. Don't use the voltage which appears across the cell while it is lighting the glow plug. This "load" voltage would be considerably lower because of the voltage drop inside the cell due to its internal resistance.

On the other hand, the voltage during charge is considerably higher than the no-load voltage, because here the effect of the internal resistance adds to the no-load voltage instead of subtracts. Also, you must measure the no-load voltage when it is stable. It takes some minutes after use or after charging for the voltage to adjust to its steady-state value. Load-voltage testing of batteries is also common, and has some advantages, but the test I'm describing here is a no-load test.

You may also notice that I have used "approximate," "roughly," "fairly," and other weasel words. The procedure presented in the battery handbook for determining charge-remaining from a no-load voltage test also includes other factors, is considerably more complex, and I think more difficult than the average modeler would care for. I find the simple use of Fig. 1 very useful, but it is an approximation, so watch yourself. You may have to do some testing and establish different go/no-go voltages if you are operating at extremes of temperature for instance.

Measuring the no-load voltage of your glow starter cell is easy. Just lay one test lead pin against the metal shell of the socket and poke the other test lead pin into the center of the socket, being careful not to short it out against the shell. Most digital meters even sort out the polarity for you, so you don't need to worry about getting the right lead on the right terminal. Again I have addressed mostly our less experienced readers, but that's the way the crumbie cookies.

THE CARE AND FEEDING OF R/C NI-CDS

It has been a year and a half since I expounded on transmitter and receiver Ni-Cds care (see MD&TS for July 1987). It is time for a repeat, since we are on the subject of Ni-Cds anyway. Further, I have

some new poop for the group on "Memory"; but first:

NICAD STORAGE

According to the GE Nickel-Cadmium Battery Application Handbook (1986), "Nickel cadmium batteries can be stored in either the charged or discharged state." Some model columnists preach a different line, saying that you should always keep your nicads charged or they will deteriorate. I suspect that many such doomsayers are still thinking in terms of lead-acid batteries. Different chemistry makes it essential that lead batteries be kept charged.

Another explanation for the keep-Ni-Cds-charged advice is that, (quoting Al Alman) "discharged Ni-Cds are more apt to develop permanent shorts." The theory is that if a short forms in a fully charged cell, there may be enough energy in it to "zap" or fuse away the short and restore the cell. Could be, in some cases, but we can frequently zap away shorts by an externally-applied momentary shot of a few amperes charging current whether the short occurred when the battery was charged or discharged.

Let me again quote from the GE Handbook: "A primary cause of electrical shorts in the cell is degradation of the separator material. Degradation is cumulative. The rate of separator degradation is a function of the integral of cell temperature over time." In other words, if you really want to extend the life of your nicads, keep them in a cool place (down to freezing).

Quoting further: "If the cell voltage can be increased enough by high charge currents, the shunting current is sometimes of sufficient magnitude to burn off or clear a short, providing a brief extension of life." Note the word "brief." That cell will be living on borrowed time. I have zapped sick batteries successfully, but I'm not sure I want to risk my models that way very often.

OK, so GE says don't worry about keeping your Ni-Cds charged during storage. Also, don't wear them (and yourself) out by constantly deep cycling them. To quote again, "When a cell is fully exercised in every cycle the active materials in the electrodes are worked more, causing slight degradation to occur earlier than in the same cell undergoing less exercise."

NI-CD "MEMORY"

But you ask, "What about memory?" "It is a tempest in a teapot," we reply.

Our current bible, the GE Ni-Cd Handbook, says this (and much more) on the subject: "Memory-misnomer for 'voltage depression.' Cells exposed to overcharge for very extended periods of time, particularly at elevated temperatures, may develop a shortcoming called voltage depression. This depressed voltage effect is an electrically reversible condition and disappears when the cell is completely discharged and charged. It appears only on the first discharge following a very extended overcharge. Partway through the discharge (of a cell affected with voltage depression), the voltage will suddenly decrease about 150 mV per cell. This misleads the observer into believing that the discharge is at the knee of the normal discharge curve and erroneously concluding that the cell 'remembers' and delivers only the amount of capacity previously repetitively used. Instead, the phenomenon is actually related only to extended overcharging and (subsequent) incomplete discharging, not repetitive shallow cycling."

In other words, it is only long overcharging that is the culprit; and we don't really lose capacity on a cell which has "memory," but its voltage drops about 12% part way through the discharge. That is not nearly the problem that many of us had come to believe existed.

I'm very inclined to trust that Mr. General E. Lectric knows what his (and other manufacturers') Ni-Cd batteries do much better than some of us often-not-very-scientific modelers do. If any of you have any real data contrary to GE's, send it to me. I want facts: battery history, voltages, currents, temperatures, times and discharge curves on comparable tests. I won't bother to respond to inputs such as, "My plane seems to fly better when I recycle the battery."

ONE MAN'S METHOD

As a GE Handbook believer, my routine with flight and transmitter batteries is as follows: I let batteries which are not being used self-discharge naturally, and do not recharge them until I wish to use them again. I try not to charge a fully discharged battery for longer than 16 hours. I recharge partially-charged batteries for proportionally less time, and then only if I am going to need the full capacity of the bat-

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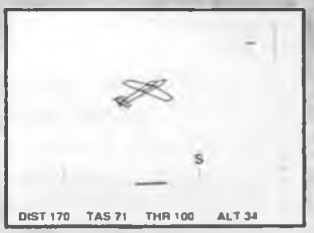

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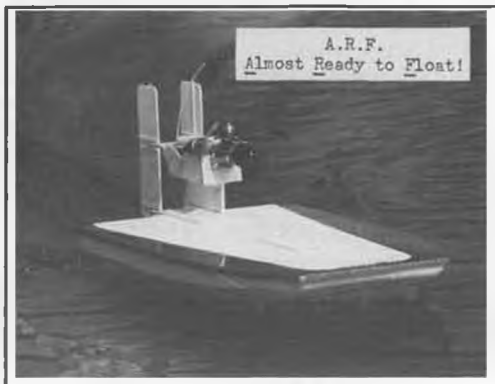

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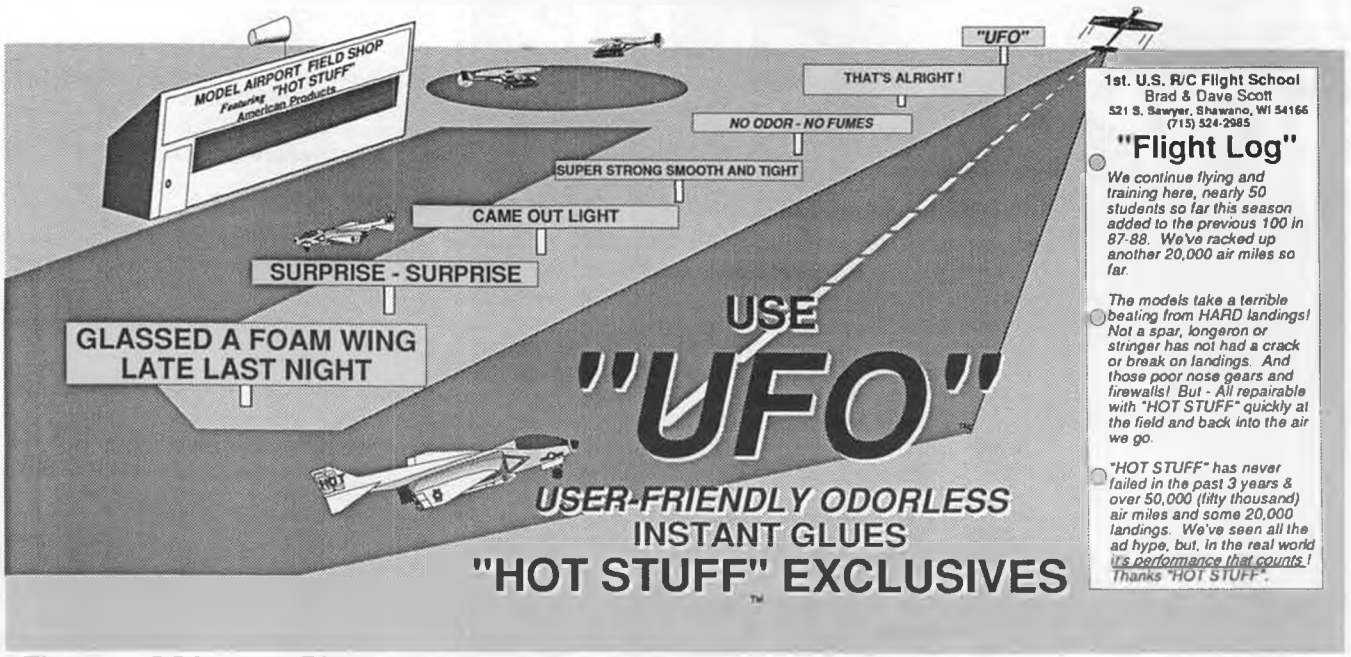

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I have covered, or worse, to remember in what issue I addressed a subject. I couldn't keep track of what I've written either, without the Table of Contents I'm keeping on MD&TS.

It looks like said T of C is just what some of you need to help us both save said time. I will send you a copy of the MD&TS Table of Contents to date for $2.00 postpaid. It is currently up to four pages and includes the *Model Builder* issue dates and all the subheadings I have used in the column. You may recall that two months ago I offered a complete set of MD&TS to date for $25.00 postpaid. That offer includes the Table of Contents as well as a cover. The cost is intentionally steep because I don't really want to be in the mail-order business and wish to discourage all but the seriously interested.

PARTING WORDS

"Biplane": What the pilot says to the plane as he bails out.

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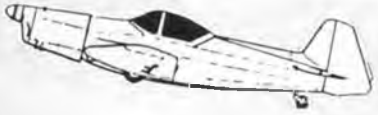

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Aerolympics *Continued from page 22*

Watching the Austrian master, one clearly sees maneuvers that are clean, precise, and within rules parameters. But that was generally true of most of the qualifiers. To me, the one thing that stood out was Prettner's ability to smoothly correct a minor maneuver error so that such correction is virtually undetectable. Hanno has errors in his pattern; no one has really turned a perfect score, but his ability to hide those errors with silky smooth corrections seems second to none.

It is interesting to note that his world championship airplane is an ARF (the second time Prettner has won with this machine)! This, of course, Hanno's own design EZ Sport Aviation Supra-Star. The airplane is quite conventional and straightforward, powered by an O.S. 60 longstroke, with control from a JR radio.

Wolfgang Matt's second-place airplane was Saphir, while third-placer, Ivan Kristensen, flew a Summit III. In fourth place

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Chip Hyde flew a Conquest. These airplanes are well-known and typical of the type being flown today. All were very quiet and showed typical sound reduction tricks, including long-stroke engines, coarse-pitch props and some form of soft mounting. Indeed, most airplanes flown at Tidewater were very quiet (in the 90 db range. One airplane came in at 85.5 db, flown by Quique Somenzini of Argentina to tenth place; and another at 86 db by Australian, Ed Edwards. Edwards airplane has unique soft mounts and sported a four-bladed propeller. Apparently the word has gotten around that effective mufflers coupled with a slower-revving, higher-pitch prop and isolation of the airframe from vibration all make for quiet operation. I was truly impressed by what I didn't hear at Fentress. If so much can be done in sound reduction by the pattern fliers without reducing performance, why can't that be done in other R/C power categories? Just asking!

DESIGN VARIATIONS

Even though the leaders flew, more or less, conventional designs, that is not to say there was no innovative design thinking at this year's world championships. Tony Frakowiak had won the Masters for top team place with a biplane and I anxiously looked forward to seeing this bird.

Although not the first bipe to be flown in FAI competition (Harold deBolt flew one many years ago), it certainly is different enough to turn heads. Called FYG-LEAF, the airplane was designed by Ken Bonnema, son of a true R/C pioneer. It carries 1100 square inches with a YS long-stroke 60 carrying its 8.75 built-up pounds. A carbon fiber prop was used. Tony credits the biplane as a major reason for his renewed interest in pattern competition. "It's fun again with this airplane," he said. Biplanes are known to have a strong rudder coupling into the roll mode that screws up maneuvers like the stall turn and point rolls. Tony pointed out that this was true of FYG-LEAF but the trim and mixing abilities of the new radios eliminated the problem. Frakowiak did well in the standings with a ninth-place finish, high enough to help the USA team to its win. Surprisingly enough, FYG-LEAF was not the only biplane. Tobias Schulz of the Federal Republic of Germany entered his biplane called Shamrock. Tobias was his own United Nations, hailing from Germany with an Irish-named airplane on Japanese power in Tidewater, Virginia. It's a small world!

Our third American team member, Dean Koger, also flew an unusual design with an equally unusual powerplant. This ship, dubbed Vortex II, was designed by Wayne Ulery and is a true in-line design (in this writer's opinion, the only way to go; remember the Eyeball). It is powered by a Webra 60 hooked to a 2.25:1 two-phase gear drive turning a 15/15 prop at about 7000 rpm. The combination gave the airplane nearly unlimited vertical performance. While possessing a weird sound, it was very quiet. I guess the "weird" sound came from the very large propeller pitch and the gearing. Vortex II weighed 9.5 pounds on 950 square inches.

The contest showed a balanced representation in engines with long-stroke 60s and four-stroke 120s leading in numbers. Virtually all competitors used the new computer radios that permit mixing and finite trim setups; obviously the way to go in this event. Whether the biplanes are the forerunners of future FAI designs remains to be seen. I felt most competitors tried to meet the rules in distance from the flight-lined turnaround points and maximum maneuver height. I do wonder, after watching many poor corners on square

maneuvers, why more competitors don't try maneuvering flaps ala U-Control stunt. Judging was as good as I've ever seen with few complaints heard by this writer. That is except for the occasional "How come Hanno always wins?" Reason: he scores more points! F3A competitors are surely in the fore of sound reduction; pylon and ducted-fan fliers please copy! One thing remains certain, FAI aerobatics is an event that will challenge anyone. And most of it was at Fentress in Tidewater! •

Electronics . . *Continued from page 30*

planes. In any event, he did not find help here.

Now on the subject of those "bootleg" operators whom Bob refers to. They exist in uncomfortable numbers. Unfortunately, they are aided and abetted by club and contest officials who allow them to fly on Six Meters knowing that they don't possess the proper credentials. Fellows, isn't it better all the way around that we police ourselves rather than have some government body, in the form of some unknowing uncaring official, doing so? Please help weed out illegals at your flying field or contest. After all, if you can abide by the rules, why shouldn't they?

SAME SUBJECT, DIFFERENT WRITER. One of the other EC readers who took time to write on the subject is Pete Holmes, KOVIZ, of McMinnville, Oregon. Pete pretty much echoes Bob's words up about, with the additional:

"Now for something completely different. 1) Does the AMA or anybody else care if the Ham's gear on Six Meters has a gold or silver--or for that matter, purple-sticker? 2) When I read the specs for the 'stickers' they always specify that the spectrum analyzer be set at 3KHz resolution bandwidth. I work in an EMC lab and took a look at our spectrum analyzers. We have two Tektronix S/As, a 496 and a 496P, and an HP (Hewlett Packard) 8566B. Only the HP can be set to 3 KHz resolution bandwidth. The Tek S/As will do 1 KHz or 10Khz - but not 3. Is AMA in cahoots with HP? Disclaimer: That's a joke, son!"

First, reference to Pete's 1) above: Yes and No. (How is that for a positive answer?) The situation varies depending on what part of the Six Meter band one is to fly on. On the original 53 MHz portion, with the frequencies at 100 KHz spacing, the problems that we are experiencing at 40 KHz simply do not exist, and narrowbanding or certification of transmitters on those frequencies is not required. Actually, a lot of the older Six Meter transmitters, while perfectly safe at the field, will not pass the narrow band test, regardless of what resolution bandwidth the spectrum analyzer is set for. More about that later.

If however, you plan to do your R/Cing on 50 MHz, with it's 40 KHz channel spacing, your transmitter must comply with and be properly "stickered"—with a gold one, there is not wide band silver and narrow band gold program here as there is on the 72 MHz band.

Normally, if the manufacturer of your equipment is at all concerned, your new 50 MHz transmitter will arrive with a gold sticker attached, as those channels and the sticker program came to be at pretty much the same time.

While on the subject of gold and silver stickers, the requirements state that they are to be dated with the day that the test was made. If yours isn't, it isn't legal, and shows a definite lack of concern by the maker. If your transmitter was tested at one of AMA's test stations, you will be OK, but if it was purchased with a sticker attached, it can easily be another matter. Why don't you go check yours just for the heck of it?

Now 2), in Pete's letter. First, for the "resolution bandwidth" of a spectrum analyzer is a sort of sensitivity setting, the range within which the display can be expected accurate in relation to accepted standards. It is true as stated that not all S/As are created equal—not all of them have the same numerical settings, and thus the information shown on the screen will vary from one type to another. Which has led to more than a small problem between the AMA and some members of the R/C industry who have not yet agreed on the proper settings to be used in the testing of R/C transmitters.

The actual settings under discussion are 3 KHz as Pete mentions, and 300 Hertz; values which are found on some S/As and not on others. Compounding the situation, in addition to the inflated egos and non-

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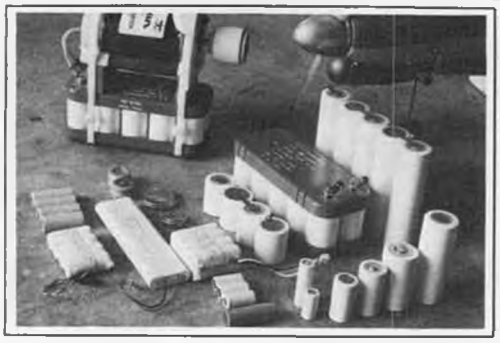

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technical opinions to be found amongst some members of the R/C manufacturer's community, is the fact that there is no direct correlation of the data obtained at one RBW (Resolution Band Width) to that obtained at another, and in some cases, a transmitter that meets the requirements under one set of test parameters will not do so at another. The AMA Frequency Committee has attempted to mediate this matter between the manufacturers, in at least one case meeting with a "my mind is made up, don't bother me with the facts" attitude. Anyway, they have published their requirements for transmitter testing at both 300 Hertz and 3 KHz, but whether or not they have been accepted by the R/C industry as a whole I do not know at this writing. Current information on the situation can be obtained from AMA Technical Director Bob Underwood.

The technicalities of the manner are simple, the only thing compounding it are people. In the meantime, don't be surprised if your transmitter carrying a factory-applied gold sticker qualifies only for a silver one at an AMA testing station—the RBWs used were different, with of course the maker using the one that most favored his equipment.

Life was so simple back when we all flew on 27.255—you flew and the other guy watched. Then he flew and you watched, and then you both talked about it for the next couple of hours.

SPECTRUM ANALYZER! The words have come to have almost household usage in R/C, and yet I am most certain that few of the people using the words the most know how to use one. Or have even seen and certainly don't own one. They are extremely expensive and way out of range for even the most dedicated experimenter. To keep the record clear, my personal workshop does not include one, though I have access to one in emergencies, meaning that I don't like to make a pest of myself more than is absolutely necessary.

Anyway, Joe Flyer now has something else to confuse him, and to make him feel inferior when the big boys talk so knowingly about S/As. Let's try to clarify the matter a little so that he can at least look knowledgeable.

Not easy, the S/A is an extremely complicated device, so much so that the untrained person will not be able to correctly set one up and definitely will not be able to correctly interpret what it is telling him. Anyway, the S/A is a combination receiver and oscilloscope. The receiver portion automatically scanning a selected frequency spectrum (RBW) at a preset rate, and the scope then displaying the results in an amplitude versus frequency planform.

An RF signal, any RF signal, does not stay to its intended frequency only, but spreads out becoming wider on both sides of the basic frequency. However, fortunately for all of us users of radio frequency energy, as it spreads out, it's amplitude (strength) diminishes, to a point to which it becomes inconsequential. Our intended use of an S/A is to measure that point; the frequency away from the assigned one, at which the signal has decayed to a level which will not cause interference to an adjoining channel.

In the case of the changing RBW mentioned earlier, 300 Hertz and 3 KHz will show a different signal amplitude at 10 KHz away from the operating frequency, and thus the resulting brouhaha. Which is right? Well, every manufacturer or importer has ready answers to that one, depending on how his equipment shines best. What you and I need to look at is not the politics and personalities—and sales figures, but the security of our airplanes. A transmitter that passes the test at one RBW and not at another is simply not as good (narrow band) as one which passes it at either setting.

CQ, CQ, CQ! for any late tuner-in'ers, yes, I do have a Ham ticket, but no, I am not active currently, except for R/C flying on six. I hold US call W1DBN, obtained during my first life in the USAF and not at all indicative of a New England background. (I'm a Texan!) I was also on the air from many DX locations; DL4, ZC4, ZL, KC4, YS, even a one only, as HU1P. After that, being one of the W6 horde held no interest and I have been QRT since coming here after hanging up the blue Air Force suit.

TACHOMETERS are under appreciated in my opinion, at least the analog types, but at least Bob Marin, of Matawan, New

Jersey, shares my opinions and writes:

"Your article on the March '86 issue of *MB* for modifying the Ace Tachmaster certainly proved worthwhile, enough so that Ace eventually came out with the Tachmaster II, which I have. Too bad they didn't go all the way and add the switch for the 3 bladed props. Could you please furnish instructions for this modification? I believe your original article had errors in the schematics.

"Second; I still have an 'Accutac' that I purchased in 1974 that I'm fond of, but as of late, it only works on the 0-3M, 0-6M and 0-30M ranges. The other 9 ranges seem to be shorted out in the rotary switch. I purchased the Accutac from BWT Systems/TNT Services in Columbus, Ohio, from Ed Tisdial. Are Garett White or Ed Tisdial still around? If so, is it possible to get this Accutac repaired and re-calibrated?

"Third; Royal Products came out later with a similar tachometer to the 'Accutac' named the 'ProTach.' Do you know if these are still available and where they may be purchased along with the current price?"

Bob, I like to refer to the Ace Tachmaster II as proof positive that manufacturers will listen to us if we have something worthwhile to tell them about their products. I realize that it is not always possible to provide them with detailed improvements such as I did in the case of the original Tachmaster, and some of the things we'd like to see are simply not possible for the price we are willing to pay for them, but let the manufacturers know about any ideas you may have for improving their products. Not all, but some will listen. Certainly Tom Runge at Ace R/C does.

The schematic did get slightly scrambled between me and the printer, and a large number of corrected versions were ultimately mailed out. The schematic does not include the three bladed prop mod, which is correctly described in the text and which could be incorporated in the Mark II version. Unless one does a lot of three-bladed prop flying, it might not really be worth the effort. Remember that any tachometer set up for normal two-bladed prop use can be accurately used for three bladers by simply taking 2/3rd of the reading.

About the BWT tach—I remember it, and even remember seeing one or two. But BWT itself is long gone, and I did not know the two gentlemen mentioned or their present whereabouts. If they are still with us possibly they will make themselves known. The problem described does not appear beyond correction, and you might check with the various independent service facilities to see if one of them would attempt the repairs.

In the meantime, if anyone out there has a schematic diagram for the BWT "Accutach," how about sending in a copy, it might help us get Bob's unit up and running properly.

I agree, Bob, the ProTach was a great tachometer. The parts count was too high by today's standards, but it had all the features needed, and I still use a homemade version of it every time I fly. No, it has not been in production for many years, and the last time I asked, the meters had become unable and a suitable replacement was not available. Too bad.

There are not many good tachs to chose from; digital is not the way to go for this particular application, as the numbers vary too rapidly and it takes more of an effort to read one accurately than it does an analog meter. The worse example are those built in to those transmitters that include some sort of a numerical display—holding your transmitter next to a revolving prop while you are watching a bunch of flickering numbers sure looks to me like an accident in the making.

As far as I know, there are currently two expanded scale tachometers being produced. One does not advertise at all, the other does so only in the NMPRA newsletter, both of which remind me as perfect examples of the story about the business man who refused to advertise, until the time came when he had to advertise that his business was for sale. The non-advertiser shows up at Toledo every year, and has made such an impression I can't even remember what he calls his instrument. The other one is called a "Fastach," and is available from Pegasus Electronics. It is built in a vinyl-clad aluminum case, with the meter recessed for protection and includes six expanded scales up to 31 thousand plus a 0-30 thousand rpm scale. Power requirements are a single nine volt battery.

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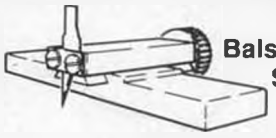

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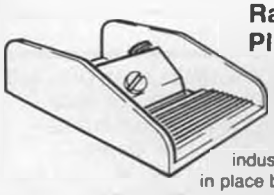

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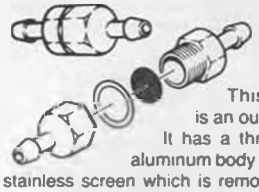

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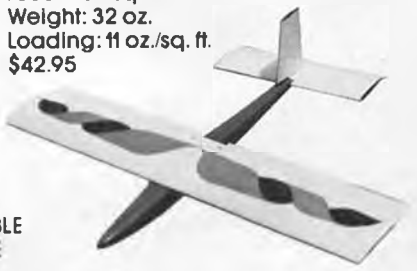

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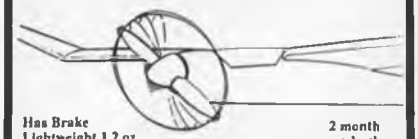

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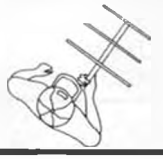

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PETE'S COMMENT about "that's a joke" points out that one can't be too careful about what he says or does anymore. Which reminds me of something I read recently, that if the number of lawyers per capita continues to increase at the rate it has in past years, by the year 2020, 100% of the population will be lawyers! Not anything to look forward to, is it? But there is some relief in sight, I also read that the SPCA has finally succeeded in eliminating all medical research on animals, but at the same time gained approval for it to be done on lawyers. . . . •

Soaring . . . . *Continued from page 25*

inches span and it was terrible (bad tip stall). In an exchange of letters with Michael Selig in which I discussed my experiences, he said tht the 3021 would suffer in performance if there was a sag in the covering aft of the wing high point. Short of building fully skinned wings, I don't know how one avoids the sag. Also, I read that many are having good results with the 3021. I don't believe that they are all using fully skinned wings, so I am puzzled.

The best performing two meter ship that I have is my "Strong Pierce Arrow." It is essentially stock except for a slightly lengthened fuselage and a sheeted leading edge with Paragon-sized spars (1/8 x 3/8) and one layer of .007 carbon on each main spar cap. This ship weighs 28 ounces.

At the 1989 Pasadena Spring Soaring Festival I was in first place after three rounds, and in fifth place after four rounds. I made the 15 minutes, but scored somewhat lower in landings than four other pilots. On the following day I made both the four-minute precision and the eight-minute duration, but missed both landings (dumb thumbs). I finished sixth, flying with four ounces of ballast. This design is over 15 years old, and to date I haven't been able to come up with anything better. There is probably a message here, but I stubbornly refuse to face it.

I am consoled, slightly, by the knowledge that there are a number of kits on the market which are highly touted that would not come close to satisfy my standards. Also, Jerry Krainock reminds me that he placed second at one of our Two Meter World Cups flying what he called the "Parts" (Parts of this Slobod glider, parts of that one. I was there. It flew great! By the way, the 2MWC was a multi-task contest which featured a well respected and popular format. There were four annual 2MWCs held, the last one in 1983. -wrf)

Jerry also set an AMA Class B Distance Record, and set a five-hour AMA Class B Duration Record with two meter ships of mine that I thought weren't good enough for kitting.

While this was going on, I was drawn (somewhat reluctantly) into electric R/C gliders. The electric Pierce Arrow was a pleasant surprise. Handling actually improved with the extra weight.

The Astro 15-powered ship came into existence because I still had two "SFVSF Club Laminar Rock Award" wings lying around and hated to see them idle. This ship was another pleasant surprise (I needed it too). Climb, glide and handling were fine. My only complaint being (and it was a minor one) that the glide was a little fast which made landings on our small field somewhat touchy. So, I dug out the old original Paragon wing which was a 100-incher and put it on. Climb was not affected and the glide was slowed. Handling again was excellent. At 10.5 oz./sq. ft. the wing loading was about right.

I had updated the electric Pierce Arrow with a hot, six-turn Astro cobalt motor, leaving the standard seven-turn cobalt available. Then I made an 88-inch scaled version of the 15 cobalt ship, put in the seven-turn and a 1200 mAH pack for more motor run and hoped that the climb would be acceptable.

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DEALER INQUIRIES WELCOME

The 88-incher turned out better than I expected. As an indication of its performance capability, I ran a self-imposed contest in which I set as a goal the following: one charge, how many three minute flights can I get. Landing before three minutes not allowed except for last flight. Anyhow, I got five three-minute flights. On two occasions I had to power-on a second time to make the three minutes.

The problem, if you can call it that, is that with today's electric technology it is so easy to make an electric sailplane fly for long periods of time that one can become bored.

While I don't advocate battleship construction, I can tell you that it is no longer necessary to make flimsey electric sailplanes. All of my current electric sailplanes have two-ounce fiberglass on their fuselages. As previously stated, the 15 ship weighs 65 ounces, and the 05 seven-turn weighs 56 ounces. No problem!

Need more proof? Last Sunday I put on an electric contest. Same rules as above. I flew my six-turn Pierce Arrow at 46.37 ounces (wing loading at 13.36 oz./sq. ft.). Most of my motor runs were 15 seconds. Climbs were to about 200 to 250 feet which normally would result in flights much less than three minutes, but I launched into lift wherever possible. Those who doubt that a Pierce Arrow at 13.36 oz./sq. ft. can thermal will be surprised to learn that I got in eight three-minute flights. I had to use a second power-on only once.

With all this attention paid to electric sailplanes, it would seem that this letter should be addressed to the electric column writer, but my casual readings of other columns indicates their primary interest is on models that fly with motor on most of the time. I don't think they are as tuned into soaring as you are.

I have enclosed several packages of photos with brief comments on the backs of some of them.

The T-tail model was an attempt to make a floater that would somewhat resemble a full scale sailplane. I also flew this model with a 116-inch polyhedral wing that used a Selig 2091 section. Initial flights with this wing were disappointing: tip stall prone and limited speed range. Turbulating the tip panels helped in turning, but the section shows no advantage over a flat bottomed section.

The modified Gemini was done in response to the size of the field we fly from (it's slightly larger than a football field), and our thermal conditions. Most launching is done with a half-size high start.

Not included, but worth mentioning is my attempt to make an improved Paragon. All proportions were maintained, but the stab was made full-flying. The two wings that were made used a 12% thick Eppler 205 and a modified Paragon section with Phillips entry added. Both had sheeted leading edges. Performance of the wings was so close that at times I couldn't remember, or determine by the way it flew, which wing was being used.

Although I do not try to build light, it seems that nearly all my sailplanes come in at 7.5 oz./sq. ft., and significant wind penetration is just not possible at this light loading. Except for the added strength for launching, the "Improved Paragon" showed no improvement over the original.

My latest sailplane uses the Eppler 193 and is a "V" dihedral aileron ship. The tip panels are plug-in. The ship uses full-span ailerons which are also mixed for spoilerons. With the tip panels removed, the span is 72 inches (ten inches at the root and eight at the tip). The tip panels are each 18.75 inches long and taper from eight inches to seven.

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The ship was designed for slope primarily, but hasn't been flown there yet. Flights at Pierce have been disappointing. Handling is poor. Hard to climb out in light lift. It's also possible that I just don't know how to fly an aileron ship. I've made several and have had poor luck with just about all of them except the 120-inch Bame sectioned ship that I made (and still have) about six years ago. I used four degrees per side dihedral. The ship weighs 72 ounces and flies very well. It's real fun on the slope.

As you can see, I've done nothing in the area of foam and fiberglass, nor multi-function. That type of ship would not be at home at our small field, and it is not the type of construction that I can produce commercially. Perhaps it is just as well. I have no desire to produce any new kits. (That's a loss for the rest of us, for sure. -wrf) *It's a lot of work. Besides, is there any doubt that there are enough kits of all types on the market already? . . . Regards, Ed.*

Well, when Ed does finally hit on the perfect new design, perhaps he can be persuaded to publish the plans in *Model Builder!* I'd be willing to bet that plan would be an instant best seller!

Thanks, Ed, for sharing your thoughts with us.

AIRFOIL OF THE MONTH: WORTMANN FX60-100

I've only seen one model (that I'm aware of) which used this airfoil. It was a model called an Eismann Camaro which was imported by Wilshire Models back in the early eighties. Designed for F3B flying, it had a pretty good winning record in Europe at that time.

I was in England in 1983 for the F3B World Champs when I got my first really good look at a Camaro with the FX60-100. The Camaro was Mark Smith's backup plane to his "Panic" primary plane. After the Champs were over, a group of us went north from York towards Scotland to do some slope flying. The slope was in the northern Moores area and ideal for soaring. If you have a collection of old *MBs* and want to know what the slope and the Camaro looked like, check out the cover of December, 1983!

I remember the Camaro having excellent speed range and fast top end. I also remember Don Edberg flying a Camaro at local F3B contests and doing quite well with it. It amazes me that the Wortmann FX60-100 didn't become more popular with scratchbuilding modelers.

TIME TO FLY!

If you have any questions that I could answer by phone, contact me between 7 p.m. and 9 p.m. Pacific Time at (714) 245-1702. Please direct all correspondence to 3610 Amberwood Ct., Lake Elsinore, California 92330. Thermals, Bill Forrey. •

Pylon ..... *Continued from page 41*

Round 10 was an eventful one for all of the U.S. Team members. Both Gary Hover and Dub Jett had cuts in their heats which, by FAI Rules, adds a 10% penalty to their heat times. Bruce Richmond received a no-start "zero"—the engine refusing to light. Bruce de Chastel of the Australian Team ran a good 74.2 to maintain his position.

By this time, the rest of the world would just have to sit back and watch the battle for "first" unfold as Dave Shadel firmly established his lead by running a new world record of 71.3!

But, hold on a second, there are still four other guys who can win this contest. All are within striking distance. No mistakes permitted now. Finally, the last day of the competition is upon us. Five days of little sleep and intense pressure are soon to end. (No "sling-off" on this day as Mr. Jett now has all the money!)

Jett, Richmond, Hover, and de Chastel all run quicker times than leader Shadel in Round 11. Nobody else is even remotely close now. The stage is set for the ultimate finale.

Shadel feels the heat as Jett, Richmond, and de Chastel fly before him in Round 12. Jett runs a 74 flat, Richmond a 74.9, and de Chastel a 76.6. In order to repeat as World Champion, Dave would need at least a 77.8. A look at the scores turns up what is almost impossible, or at least highly improbable. Jett and de Chastel are tied. After twelve rounds of intense competition they are tied right down to the "tenth of a second!" If Shadel failed in his attempt to go faster than 77.8 seconds, Jett and de Chastel would fly-off for first place.

Dave Shadel went to the starting line knowing exactly what he had to do—shades of 1987 in Australia where he won in the last round by just eight-tenths of a

second. On the line Dave appeared calm and ready to do what was needed. The aircraft were identified and the clock started. Sixty seconds to the drop of the flag. At 30 to go, Dave hooked up the glow plug battery and touched the starter to the spinner. Normally the engine would have started almost immediately, but Dave ground away on a dead engine as the seconds ticked by. At 10 seconds to go, the engine "coughed to life" and Dave ran for his position near the base line. The flag dropped and he was off. The flight seemed like just another Sunday drive, but still bested the needed time by 3.5 seconds. Much happiness at the starting line for Dave and caller, Jim Shinohara. The party had just begun. Back-to-back World Championships!

But it's not over yet as we still have to fly-off for second and third between Dub Jett of the USA and Bruce de Chastel of Australia. Since they were tied, it was decided that instead of flying for a time to determine their places, they would fly a "heads-up, racehorse start" for their finish positions.

Everyone anticipated a thrilling race as both Jett and de Chastel had been very fast in the competition. At a single drop of the starter's flag, they were off together, Jett rounding #1 pylon as de Chastel went long on the first lap. Down the backstretch into #2 with Jett in front. As Jett pulled tightly around the #3 pylon with de Chastel chasing him, suddenly de Chastel's aircraft rolled over and went in—the victim of wake turbulence—the dreaded "KAZE F—T!" Dub Jett cruised for nine more laps and an easy victory!

The U.S. Pylon Team had done it again and came very close to the 1-2-3-4 victory that they sought. In talking to Bruce de Chastel after the contest ended, he stated that his goal this time had been to split the U.S. Team. He felt that if he could succeed he would place well in the contest. How right he was.

Having observed the F-3D World Champs for the third time, you get a good picture of the progress of the rest of the world on winning performance. The Czech team had gone well in practice and we expected the 1985 World Champions Milos and Zdenek Malina to be very tough. After losing their number one aircraft, their back-up model was not nearly as fast or consistent. Four "zeros" put them out completely. Zdenek Hnizdil was clearly the most consistent of the Czechs and placed sixth. Jaroslav Danes was tenth to round out the Czech Team.

The third-place Japanese Team made great strides since 1987 under the direction of the team manager, Yoshiro Sato. Mr. Sato makes all of the fasteners used by the Honda Corporation to build automobiles. He had designed and built the engine that his son, Bobo, flew in the competition. Bobo was very fast and, with more piloting experience, will be a force to be reckoned with.

The Australian Team placed second. It was expected that they would field a strong team based on reports that we had received from "downunder." We expected their performance to be on par with the U.S. Team, but their only really bright spot was Bruce de Chastel.

West Germany fielded a team for the first time in 1989. Their models were constructed of all-composite materials much like the high-performance sailplanes they are famous for. They also had the best-looking callers!

The Belgian Team had lots of engine problems. All of their members, especially Ivan Cappuyns, are excellent pilots, but their performance did not reflect it.

Barry Lever of the United Kingdom started off well, but suffered motor burnout early on. He's been a consistent competitor in Europe and should ultimately do well in world competition.

We had the pleasure of meeting Austrian Ernst Waltschek. He and his wife are the owners of a winery. Ernst is an excellent competitor and very personable. He was the sole entry from Austria and placed ninth.

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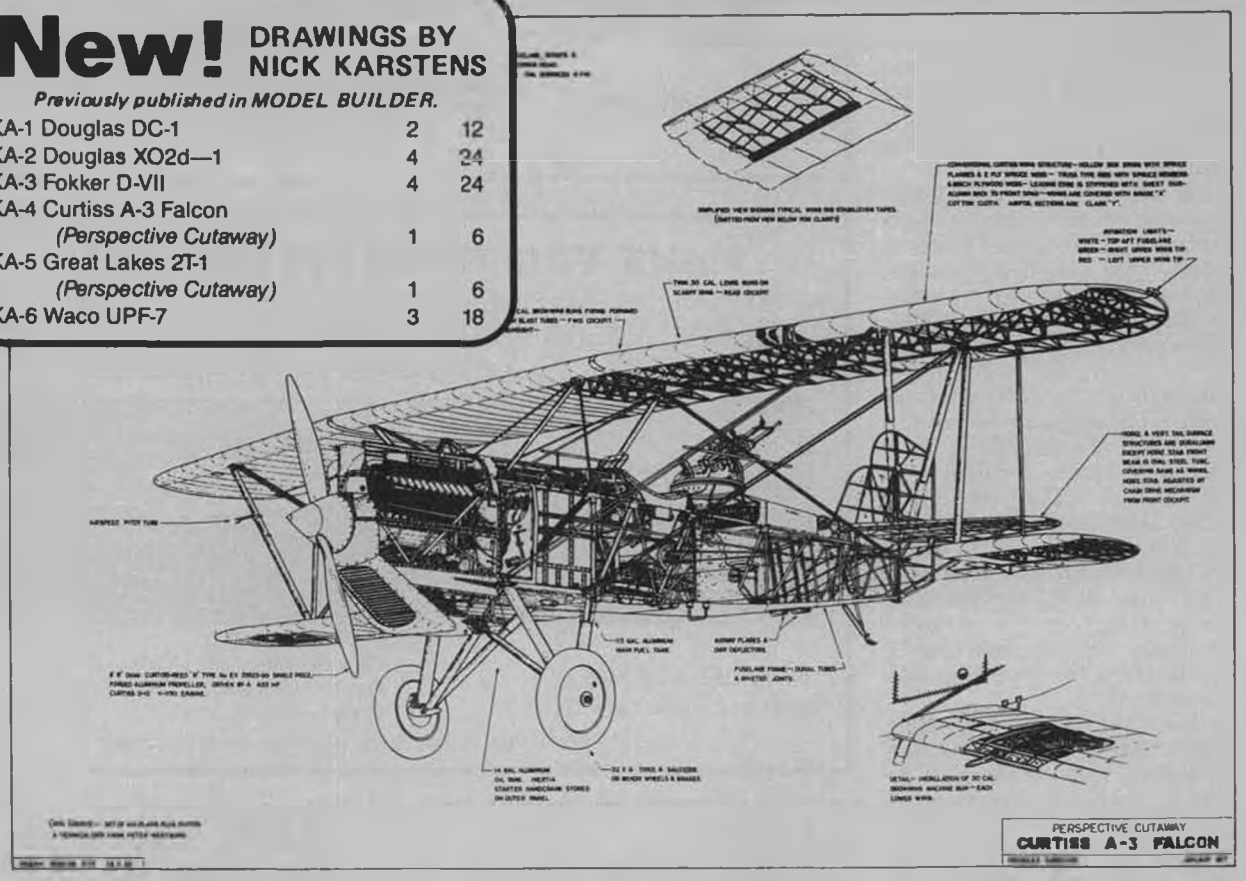

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The Canadian Team suffered from lack of practice and some radio problems. The highest-placing member of their team was Dave Kelly. His times were not too fast, but he flew every heat. He was the only flier, besides Jett and Shadel, to record no "zero" scores.

The Italian Team was also the victim of engine problems. Their best flier is Renzo Razzi, a veteran of the last two World Champs. Although not extremely fast, he was the only Italian to display consistent flights. He placed eleventh.

Roger Riedener, of Switzerland, was the lone Swiss flier. Although Roger did poorly, he was always smiling. He had only been to one other pylon race in his short career as an R/C flier. The hook was set and he'll be back!

Overall, the results were pretty much as expected. The U.S. team dominated the event with superior equipment and pilots. There were numerous models present from other countries which were as fast as the Americans, but none were flown as well, nor as consistently.

The equipment used by the world's racers varied widely. The top five places were captured by Supertigre Engines. Radio equipment was mostly Futaba or radios made by them under license.

The AMA is to be commended on operating a well-run contest, with the only possible exception being pre-contest publicity. A majority of people who we spoke with had no idea that an event of this magnitude was right in their "backyards." Local TV news provided some coverage which helped attract non-modeling spectators.

Sound has become a serious issue in aeromodeling. Pylon Racing is an obvious candidate for sound reduction, but then, sound is what racing is all about. Can you imagine going to the Indy 500 and watching silent racing? How about quiet, top-fuel dragsters? In those events, sound is an attraction. It's time that we began to promote aeromodeling rather than trying to silence ourselves into becoming invisible. We can be promoted into a spectator sport. Those who spectate can provide the funds that competitive aeromodeling needs to attain the status it deserves in the world of sport. It's time we started to move in that direction.

The U.S. Pylon Racing Team had a lot of industry support in achieving its lofty position. Numerous donations of money and equipment were received from Airtronics, Futaba, Great Planes Distributors, Mac's Products, Sig Manufacturing, SR Batteries, Sullivan Products, Supertigre, and several others. They share in the victory, and the U.S. Team extends their thanks once again.

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these transient phenomena are surpressed slightly; thus the pilot does not see a large and sudden change.

Last month we said that the purpose of the flybar on model helicopters is to augment the stability to make the model more stable longitudinally, and laterally. When there is a gust trying to perturb the model, or when the pilot inputs a cyclic command, the flybar will tend to oppose the perturbation. The flybar acts like a mechanical rate feedback system for helicopter's pitch and roll motions. Thus, the nose up or nose down phenomena are masked slightly by the flybar. For more details on the Bell stabilizer bar, please review last month's Chopper Chatter column.

Flybarless model helicopters like the Legend, Kavan Lockheed 286, Kobe Keko R-22, and Horizon are quite flyable because the main rotor blades are each weighted to at least 170 grams to help retard the blade's up and down flapping motion. You see, the heavier the blade, the more centrifugal force there is acting on the blade to keep it taut and level. This suppresses the blade from flapping readily. Furthermore, as your intuition tells you, heavier objects accelerate slower. Thus heavier blades flap slower, and it takes longer for the rotor disk to respond to your command and tilt. For a flybared helicopter, the flybar helps slow down the response to make the model more flyable. On a flybarless helicopter, it's the heavy blades that help slow down the response.

On calm days the flybarless head is so stable even beginners would not notice

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Choppers . . *Continued from page 13*

disk to flap back. This consequently leads to a nose-up effect. This phenomenon is called *Speed Stability* by helicopter engineers. The bottom line is, with a flybar

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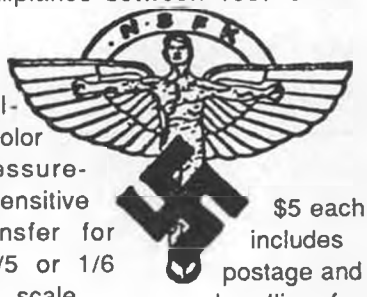

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any difference in hover. However, on days where the wind is greater than 10 mph, then the flybarless model requires more attention. The best way to describe the flybarless handling characteristics is to say it has a mild divergent characteristic which resembles exponential cyclic control feel. This means for small cyclic control inputs the model does not respond very quickly, but for large cyclic control inputs, the model would really do what you ask. For example, if you move the cyclic stick to the right and hold it there, the model would at first roll slowly to the right, then continues to roll faster and faster to the right. This is because without the Hiller control paddles it takes longer to tilt the rotor disc, because the cyclic control action comes only from the main rotor blades. And once the vehicle starts rolling, there is no stabilizer bar to impede its motion, while a flybared model would roll to the right at fairly constant roll rate. This is due to the paddles providing extra control power to help tilt the main rotor initially, thus there is a better transient response. And the final roll rate does not grow too big because the flybar then acts as a stabilizer bar to dampen the roll rate. As you can see the Bell-Hiller stabilizer bar is a really ingenious device that improves control and stability at the same time. Full-size helicopters do not require the flybar because their large size give them a longer reaction time constant, which simply means the pilot has more time to think and react.

I enjoy flying my Delta-3 flybarlbut I probably would not use it for competition on a windy day, but on calm days I might. If you have never flown a Legend before, then you might want to try one just to add it to your belt. The Legend is a state-of-the-art design. It gives that unique feel like as if you are piloting an on-the-edge high performance vehicle. It grooves, tracks very well in forward flight like a pattern plane, and it is very snappy. It definitely keeps you more on your toes simply because like a good pattern plane when you bank it to the right 20°, it stays banked at 20°. It does not snap out by itself (because there is no stabilizer bar to tell the model to return back to neutral). It does exactly what the pilot asks, and holds it there until a new command is received. In general, flybarless model helicopters are not for the lazy and inattentive pilots who usually put the model in a bank and wait for the model to level out by itself.

Does this mean the flybarless head is not desirable for beginners? I think there is always someone out there who has the natural reflex and prefers the points-there-stays-there style. These are the ones who like to correct any perturbation by themselves rather than depending on the model to drift back mellowly. I noticed that I concentrate more when I am flying the flybarless head (and crash less, too). I enjoy the pattern plane-like flying quality, but the model is less forgiving if I make a mistake, so I have to be on the ball. It certainly gets the adrenalin going. Probably the best bet if you are not sure is to buy the flybared Legend first, then you can always convert it to flybarless.

Another important point is the old flybared Prohead and Custom head come with a soft damper rubber. For flybarless operation, you *must* replace it with a hard damper rubber (#9543, about $1.00). The reason is that a flybarless helicopter depends on a stiff rotor-flapping characteristic to generate aerodynamic damping, to help stabilize the fuselage. Hard rubber makes the rotor head "stiffer." If you like adventure, just try install a soft rubber on your flybarless Legend, you will discover the model would buck like a bronco!

One distinct advantage of the flybarless Legend is that it performs excellent autorotations. Without the flybar, the main rotor head has less drag, thus the model can descend at a slower rate and still maintain constant rotor rpm. On one occasion a friend's Legend suffered a flameout and I had to take over the transmitter on very short notice. I was able to autorotate his Legend through a tree—chopped several branches but still had enough inertia to make a safe landing.

I have flown both a flybared (Prohead version), and a flybarless Legend in the past few months, and I am building a new Legend Elite. So, you can say that I have put some hours on the Legend. So, how does the Legend hold up to abuse? For normal use, the stock landing gear unit is plenty strong enough. Its light weight contributes to the helicopter's quick vertical performance. However, for beginners, who

frequently make hard landings, a training gear is strongly recommended to cushion the shock and prevent tipover. The .080-inch thick frames on the Legend are very strong. I have seen some nasty crashes, and the frames have all survived. Since the main rotor shaft is not that tall, it does not bend that easily in small mishaps, but the skids and struts usually become spaghetti. The belt-drive tail rotor worked flawlessly, except one time when the tension was set too low, which chewed up the small plastic pulley. Make sure that you check the belt tension regularly! The belt should be fairly taut; when you push on one side of the belt, it should depress by no more than 1/8-inch.

Legend's control system remains sloppless after many flights. This is because most of the bellcranks are supported on double ball bearings. The triple ball bearinged tail rotor blade holder is still my favorite part on this model. Combined with the high-speed tail rotor ratio system (tail:main = 4.75:1), the yaw response is assertive and precise. The relatively light weight of the model (about nine pounds) gives the model excellent vertical climb performance on any 60-size Schneurle engine. Hatori or MAS Magna pipes are probably the best exhaust combination for the 60-size Legend because they are very quiet and provides about 5 to 10% power boost. I get excellent performance on Red Max 10% nitro synthetic fuel.

Since the Legend review in the July '89 issue, all Legend kits are now supplied with longer tailbooms, belts, and main rotor blades. The larger rotor diameter improves hover and forward flight efficiency, gives slightly better top speed, and creates more inertia and lift for autorotation. To complement the longer tail, GMP now has wider chord, 2-1/4 inch, symmetrical, weighted long wooden blades (#9550LS). These weighted blades are nicely made by Tech Specialty. But the finishing on the blades could be better sanded. One nice feature about the Legend is the wood servo tray and the metal main rotor head come factory assembled, this saves building time. The factory assembled rotor head also eliminates assembling errors by modelers.

For an avid flier like me, the 10-minute fuel tank on the Legend is just too small! When you are having fun, you do not want to worry about fuel level, especially when the fuel tank is not as easy to see as on the Schluter helicopters. In this respect all Schluter helicopters get an A+ for easy sighting, and having a 20-minute fuel tank that is also located very near the vehicle cg, as pointed out by a fellow reader (Charles Leonard from Seattle), who says Hobby Lobby carries a 17.5 oz Graupner fuel tank that fits perfectly inside the Legend canopy. Call Hobby Lobby at (615) 373-1444 and order part number GR-237. It costs $9.20, and you can almost fly forever on that 17.5 ounce tank! I was recently told by GMP that new Legend kits will soon be supplied with a 25% larger fuel tank.

On one occasion I had the autorotation bearing lock up by itself. It means the one-way bearing can no longer spin freely. If this happens, just hold on tight to the plastic main rotor gear, and turn the main rotor head counterclockwise (when viewed from the top). This should loosen up the lock. If this problem persists, call GMP.

By the way, GMP now has the 416A plastic gear molded in the USA and it's even better than the old Japanese molded gear. The problem with the old Japanese molded gear is that the material is too soft, so the teeth tend to get chewed up. I was told by Mr. Gorham that he is now transitioning to have all the plastic parts molded in the USA for more consistent quality and better price.

The conclusion after all these flights is that the Legend is an easily maintained helicopter, and most of the machined parts fit well and are durable. The inline metal swashplate is one of the best available on the market. The flybarless version is definitely worth trying, especially for scale models like Jet Ranger, Bell 222 and Airwolf. But the very new flybared Legend Elite is the ultimate way to go. After all, three of the top seven World Champion finalists all flew Legend Elite.

I got to get back to work on my real helicopter research. Chat with you all next month. Remember folks, if you send me a self-addressed and stamped envelope, I will try to answer your helicopter questions within three days. Send the questions to

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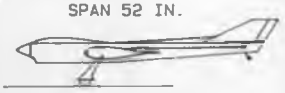

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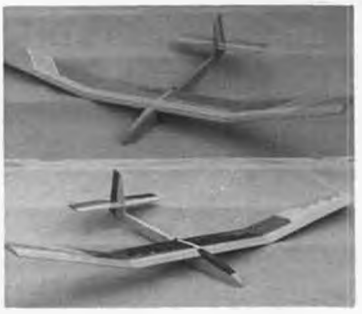

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Plug Sparks *Continued from page 39*

present: Good, Bert & John Pond, Ohlsson, and Taibi.

Those who were unable to attend were Lanzo (deceased), Gordon Light, Maxwell Bassett, Goldberg (deceased) , and Zaic (business). If we can get 50% to turn out each time, the SAM Hall of Fame Awards will truly become the most prestigious award given for long unselfish service to model aviation.

THURSDAY, OCTOBER 12

What can you say when the wind is practically nonexistent for the major portion of the flying time? October is the greatest time in the Nevada desert when the north wind does not spring up. These four days were simply fantastic.

Flying scale, especially the gas-powered event, drew a surprising number of excellent models. Photo No. 9 is an excellent example of what can be done with the old Comet planes. Jim Robinson built and flew this lovely O.S. .20-powered Curtiss Robin as originally designed by Joe Konefes for Comet Model Airplane Co.

Not to be outdone, Larry Clark in Photo No. 10 displays his well-built, double-size Earl Stahl design of the Rearwin Speedster. Like most flying scale designs, power was a Cox .049 which seems to be about the right power for four- to five-foot models.

Thursday was also an excellent day for the R/C Texaco Event. This writer was chagrined to find his near 30-minute flight by his Dallaire Sportster failed to place in the top five. The afternoon thermals and Lanzo Bombers gottum!

In the evening the Concours de Elegance event was held with an amazing turnout of excellently built models. This writer would have hated to judge the collection as there were just too many outstanding models. Eventually, Clarence Bull, of Eugene, Oregon was declared the winner with his silk and painted Henry Struck New Ruler. Winning was no fluke in any case here, as all models were required to make a flight to prove air worthiness.

FRIDAY, OCTOBER 13 (Lucky day?)

Seems like the boys never wear out as Friday was still hotly contested as ever. On the R/C side of things, a five man flyoff in the Old Timer Electric Limited Engine run was required at the close of the day. Even at that late time of the day, times ran from 8:11 to 6:23. Good time, *anytime!*

Flying scale is one of this writer's favorite events as it is with President Jim Adams. Jim produced a different one this time (what, no Fokker D-8?) by coming out with the Curtiss-Wright Junior as seen in Photo No. 11. This pusher was highly publicized by Casey Jones back in 1932. This writer hadn't seen a free flight version since then. Unfortunately, Jim had his troubles with spiral instability. One thing nice, he never broke a prop!

Mention of Joe Konefes and the Comet Curtiss Robin reminds us to run Photo No. 12 showing a Dietrich "Convertible" which appeared in the last Zaic Yearbook. This model was both a land and seaplane record holder.

Ed is not as well known as Joe Konefes due more to an accident of fate. Ed's design, the "Cloud Snooper" was scheduled for production by Aircraft Model Supply in 1940. When his brother Joe Konefes scored such an impressive victory at the 1941 Chicago Nationals with a 47-minute flight, the powers at Aircraft changed their minds and kitted the Buzzard Bombshell. This design proved to be an excellent seller and flyer. Ah, fame is just a hairbreadth away!

On with the photos! We run Photo No. 13 to show the versatility of Bud Romak, who gained considerable fame for his indoor flying. Bud is seen with a real good-looking Comet Sailplane, a very popular Carl Goldberg design. If you had any doubts about the field just look at the background! Maybe it was dry, but eat your heart out, you easterners who did not attend!

We must apologize for overlooking the Nostalgia Events run by Ralph Prey, as we received no results and worse yet, no photos. It is this writer's fond hope the Nostalgia Events will eventually be incor-

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porated in the SAM curricula. After all, there aren't a heckuva lot of modelers left who were actually modeling before WWII. Most fellows don't remember the real old timers too well, but can tell you about the Ramrods, Hogans, and Spacers that filled the post WWII skies. Something to think about, men!

In that line, Photo No. 14 is presented to show Larry Nigh of Cedar Rapids, Iowa with a recently regraded to old timer, Spearhead Jr. The design by Jerry Stoloff was formulated before 1942 but after WWII, Eagle Model Co. produced two Spearhead Kits, a Senior and Junior. This cabin model with a pylon force setup is a good flying stable model.

Well, that's enough yak about the 1989 SAM Champs. The wrapup was the SAM Awards Banquet which is always a fitting culmination of all old timer activities. The major portion of the action consisted of the plaque and perpetual trophy awards.

Don Bekins, who has been promoting the Ohlsson 23 event like mad, finally prevailed on Irwin Ohlsson to do the presentations.

It was only fitting that Ohlsson award the prizes for this event as the Ohlsson 23 was what Irwin called his "Bread and butter" engine. In those days, a production of 50,000 engines was looked upon as a tremendous output.

Again, let this writer congratulate Jim Adams, Larry Jenno, Phil McCary, Jim Perssons, Don Bekins, SAM 25, and a host of unnamed assistants. It was a great meet.

23rd SAM CHAMPS VIDEO

A copy of the SAM Champs as filmed by Art Grosheider and Art Hillis (hence, the name "Two Art Productions") was received shortly after the Champs. Those wishing a copy, send $25.00 plus $2.00 postage to: Art Grosheider, 2045 So. St. Paul, Denver, Colorado 80210. Having viewed the film, the writer can pronounce it a faithful representation of the flying, replete with good flying, poor takeoffs, crackups, and views of the more prominent modelers. The Arts took enough shots of everyone they could so if they missed you, it wasn't because they didn't try!

One interesting aspect of the models in flight was the reddish tinge surrounding the model; evidently the fine dust in the air. This in no way detracts from the film but is only offered as an explanation to the nit-pickers. Regardless, every club should have one in their library!

THE WRAP-UP

It remained for the "Texan Contingent" to prove what SAM is all about. Gerald "Jerry" Martin flew and won the Ohlsson Sideport Event. He then discovered he had

INDEX TO ADVERTISERS

Ace Radio Control	75
Aero Plans	74
Airdrome	72
Airtronics, Inc.	63
Al-Tech Products, Inc.	70
American Junior Aircraft Co.	84
American Sailplane Designs	62
Andes Hobbies	83
B & D Model Products	95
B & P Associates	92
Beemer R/C West Dist. Inc.	74
Blue Ridge Models	95
Byron Originals	76
Cannon Electronics	90
Carl Goldberg Models	64,65,89
Champion Model Products	58
Cheetah Models	94
Coverite	77
Cox Hobbies Inc.	43
Culpepper Models Inc.	90
Custom Electronics	97
Cygnet Software	59
DC Aviation	96
Dave Brown Products	85
Davey Systems Corp.	58
Davis Diesel	68
Dick Hanson Models	88
Doyiejet	100
Du-Bro Products	81
Edjer	76
F.A.I. Model Supply	96
Fabtronics	58
Fiberglass Master	78
Flyline Models	62
Fourmost Products	82
Futaba Corp. of America	Cover 3
G.M. Precision Products	84
Galaxie Model Co.	101
Garuda Gliders	74
Gilmer Hobby & Machine, Inc.	93
Gorham Model Products	31
Great Planes Model Mfg.	67
Gunfiter R/C Video Report	99
High Sky	94
Historic Aviation	1
Hobbico	69,79
Hobby Horn	62
Hobby Lobby	62
Hobby Supply South	84
IMS Atlanta	59
Indoor Model Supply	90
Innovative Models	66
J'Tec	61
JM Lupperger Plans	102
Jim Walston Retrieval Systems	94
Joe's Hobby Centers	106
John Pond O/T Plans	101
K & B Manufacturing	96
K & S Engineering	66
Kustom Kraftors	97
Leisure Electronics	70
Magic Flite Models	64
Major Decals	96
McDaniel R/C, Inc.	99
Micro-X Products	94
Midway Model Co.	92
Millcott Corporation	92
Model Builder Plans	106
Model Builder Products	107
Model Builder Subscriptions	104
Model Products Corp.	86
Model Rectifier Corp. (MRC)	Cover 4
Northwest Hobby Supply	71
Novak Electronics	86
O.S. Engines	69
P.A.W. Diesels	97
Paper Airplanes Intl.	74
Parma International	Cover 2
Peck-Polymers	84
Peter Westburg Scale Views	98
Pierce Aero Co.	100
R/C Model Cars Subscriptions	80
R.J.L. Industries	59
Radio Controlled Models (RAM)	61
Robart Manufacturing	60
Robinaire	85
Rocket City Specialties	77
Ron Charles & Associates	91
Rossi USA	77
Royal Products	19
Sabo Designs in Paper	64
Safety Plus	82
Satellite City	88
Sermos R/C Snap Connectors	65
Sheldon's Hobbies	75
Sid Morgan Vintage Plans	101
Sig Manufacturing Co. Inc.	4
Spirit Jets/MDM	60
Superior Props	106
Tatone Products Corp.	78
TEAM Inc.	97
Technopower II, Inc.	72
Teleflite Corporation	100
Thorpe Engineering Corp.	73
Tom Dixon	102
Top Flite Models, Inc.	90
Tri-City Soarers	91
Triton Models	100
Uber Skiver Knives	108
U.S. Boat & Ship Modeler Subscriptions	87
VL Products	102
VS Sailplanes	68
Victor Model Products	95
Walt Mooney Peanuts	105
Whitney Model Products	102
Williams Bros.	91
Windsor Propeller Co.	93
World Engines	3
Yellow Aircraft & Hobby Supply	70
Z-Planes	95

dropped his ballast weight and promptly disqualified himself. That is the Spirit of SAM!! •

Counter .... *Continued from page 9*

would boost the performance all the more.

Kit-wise, the Ultra Sport 40 is typical Great Planes—excellent wood, machine-cut parts, complete hardware, professionally drawn plans and a photo-illustrated instruction manual.

More information on the Ultra Sport 40 and a free catalog on the entire Great Planes line of kits and accessories can be had by writing and requesting same from Great Planes Model Mfg. Co., P.O. Box 788, Urbana, Illinois 61801.

* * *

An outfit called Scale Glider Components, located in Carlsbad, California, is offering a 1/4-scale kit of the sleek Glaser-Dirks DG-202 German-built racing sailplane. This model is designed primarily for high wind, high velocity slope soaring but has also shown the ability to soar in moderate thermal lift. No specs were supplied but since the full-size DG-202 is a 15-meter ship, the 1/4-scale model should be around 12-1/4 feet—big and fast, and you'll want to make sure you have a large open landing space available to get this beauty back down on the ground in one piece!

The $650 kit features a one-piece gel-coated fiberglass fuselage; presheeted wings with carbon fiber spar, joiner tubes and leading edges installed; clear canopy; and sheeted tail surfaces. An all-metal retractable landing gear mechanism (available in both 1/5- and 1/4-scale sizes) is offered as an option for $50.

Sound interesting? You can get more information directly from Scale Glider Components, 7034 Fern Place, Carlsbad, California 92009, or call (619)931-1438. •

Workbench . *Continued from page 7*

his article on "Wee R/C" in the November '89 issue.

All of the above leads up to the interesting letter we have just received from a subscriber in Viareggio, Italy. We hope Luigi Micheli doesn't mind if we reproduce parts of his letter as received. Although some of his translation to English may not be the best, it has special flavor, is readable, and a hell of a lot better written than we could do if we had to translate from English into Italian!

I am an Italian subscriber of MODEL BUILDER. This magazine, I must say, is the best of all American magazines (We love you, Luigi, and you have excellent taste!). *M.B. also, has the best technical Contributing Editors, the articles are very good in all fields (sections).*

Enclosed are some photos. Two are of a model Old Timer, published in M.B. July '87, named "Old Reliable." I have built two; the first exactly of plan. The second, more light. This model fly very well; flying time between 60 to 120 seconds. With this model I have done several Old Time competition, with good points, always.

In two more photos is a Model Old Time (also published in M.B.) the Wakefield Winner 1932 Gordon Light, but is different; is Radio Controlled on Rudder only. You know how difficult is to find the model

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after fly, if the field is small; and the model Free Flight some time go far, or in a field of maize (terrible!) or on a tree. We Old Timers Rubber Lovers we have lot of trouble for that. So, in 1988 at Bergamo's Old Timer Annual Meeting, the **First** *model in Italy with radio (only Rudder) appeared, made by Valter Ricco, a famous modeler from Padova (near Venice). That was the first model in Italy, powered by Rubber, that fly and return on field (not large field). So also I have built The Gordon Light with radio. Receiver Futaba FP-R102H, servo Micro Cannon and light battery (dismounted from 9-volt rechargeable battery, 7 elements, I took 4). Total weight: 58 grams total.*

I have flown for demonstration in Pavullo 1989 Old Timer Meeting (Pavullo is a little Airfield near Modena and Maranelli—the Town of Ferrari Racing Cars), if you have the Italian Magazine "MODELLISTICA" of October '89 (I do) *you will see the report. We have asked also to SAM Italia that for 1990 to enclose* (think he meant "include"), *like Gliders R.C. and Power R.C., also the category of RUBBER R.C. We think that is necessary because the legs of modelers (I am 64) are* **also** *Old Timer.* (Amen to that!) •

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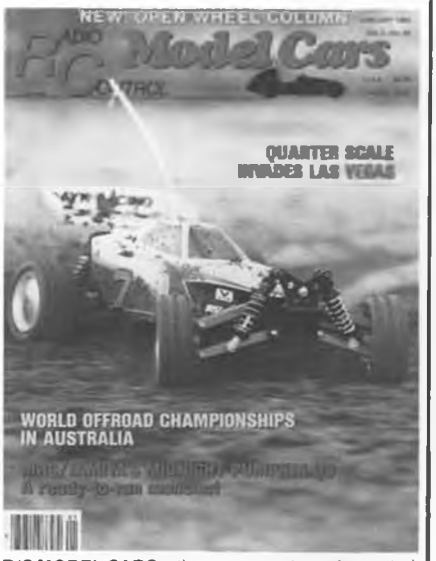

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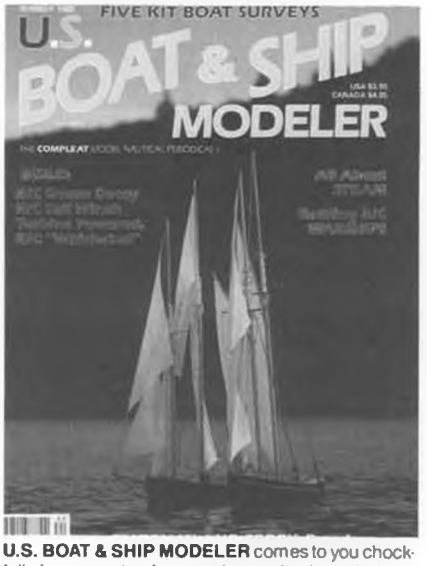

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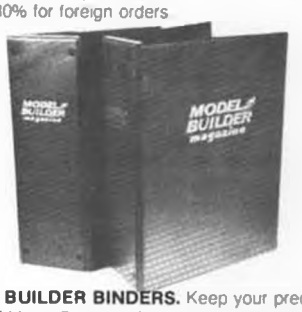

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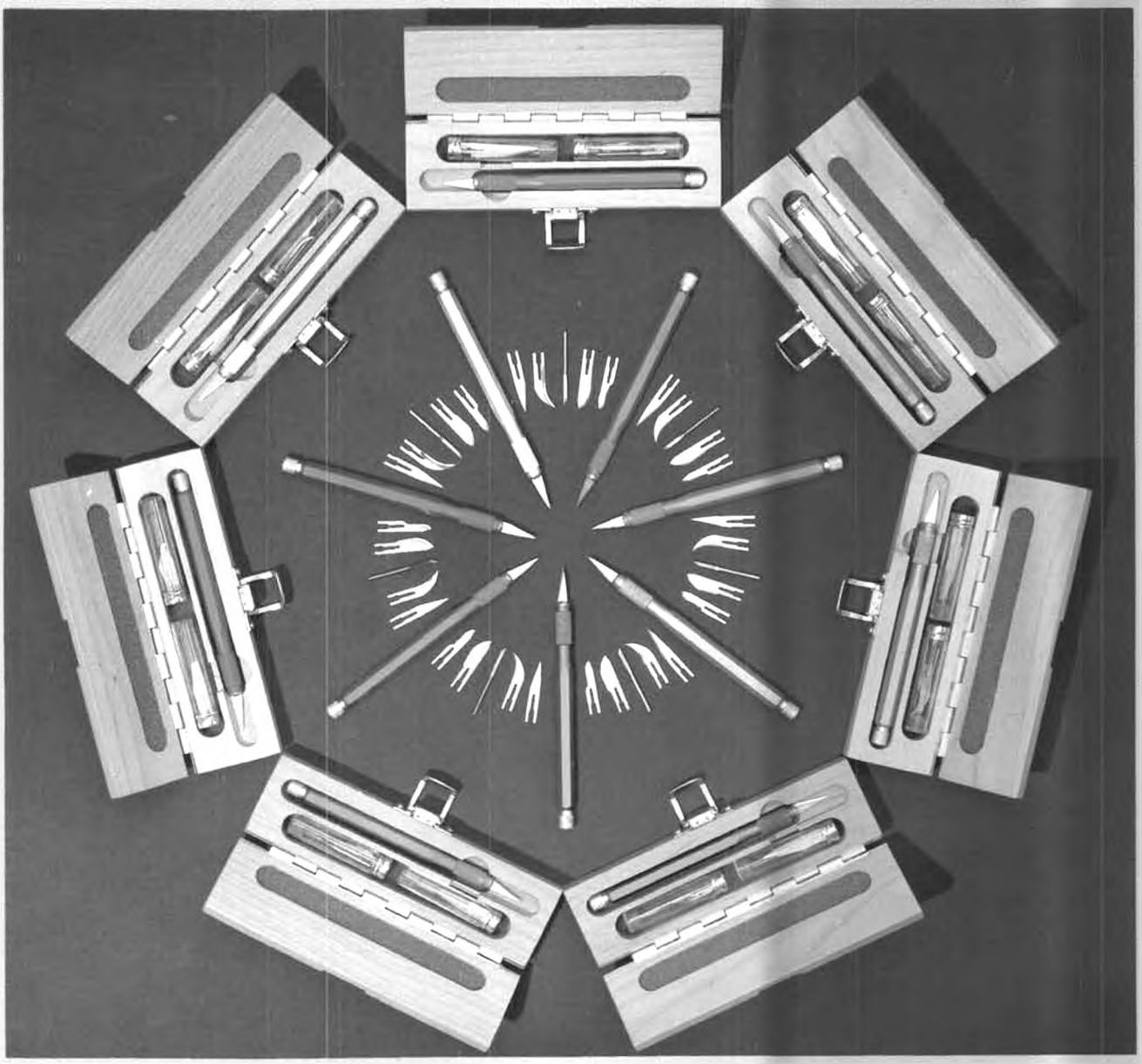

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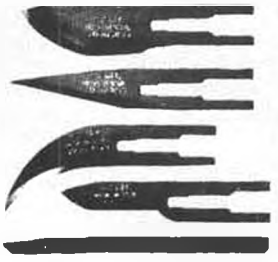

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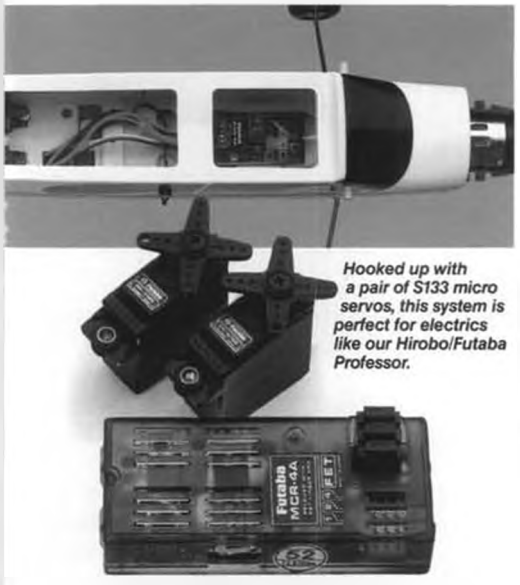

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