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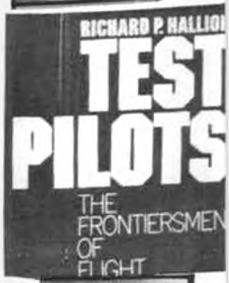

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JANUARY 1989

volume 19, number 204

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FEATURES

CONSTRUCTION

COVER: At the 1988 Reno Air Show, Jimmy Gist, from Grapevine, Texas, puts his SNJ-4 "Big Red" into a banking turn around a race pylon. Gist, a pilot and rancher when he's not racing planes, was one of more than 200 entrants on hand to celebrate the 25th Anniversary of this prestigious event. For more of Felix Vivas' spectacular photos, see page 16.

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West Side Hobby
2629 West Main Street
BLOOMINGTON
Hobbyland Inc
618 N Main St
CHICAGO
Stanton Hobby Shop
4734 N Milwaukee Ave
CRYSTAL LAKE
Frank's Games, Toys & Hobby
111 - 113 North Main St
PH 815-459-0247
EAST MOLINE
Tony's Hobby & Key
830 - 15 Ave
ELMHURST
Al's Hobby Shop
121 Addison
LOMBARD
G & D Hobbies
716 S Main St
OAKLAWN
Pat's Hobbies & Crafts
5730 W 95th Ph 424-6131
ROCKFORD
Rockford Hobbies Inc
619 So Rockford Ave
SPRINGFIELD
The Hobby House, Inc
3419 Chatham Road
TINLEY PARK
Orland Hobbies
16952 Oak Park Ave
PH 312-429 9911
WAUKEGAN
Lake County Hobbies
37832 N Sheridan Road
PH 312-662-4544
INDIANA
FORT WAYNE
Phil's Hobby Shop
1722 Lake Ave Ph 426-5056
RICHMOND
Radio Control Center
1408 So U St Ph 935-5060
IOWA
CEDAR RAPIDS
The Helicopter Shop
5771 Country Ln NE
COUNCIL BLUFFS
Bud's Hobbies & Crafts
133 W Broadway
DES MOINES
Hobby Haven
7872 Hickman Road
HOLSTEIN
Chuck's Lawn & Used Cars
520 East 2nd
LeMARS
Hobby Haven
Airport Entrance Hway 75 S
Ph 712-546-5060
MASON CITY
D n B R/C SUPPLY
201 So Vermont
REMBRANDT
Maple Arch Hobbies
R R 1 PH 286-5644
SERGEANT BLUFF
R/C Extras
Rte 1, Box 288 Ph 943-4102
SIOUX CITY
Tri-State R/C
3201 Viking Dr Ph 255-8190
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Spirit Lake HobbiCraft
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WATERLOO
Bob's R/C Supply
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R/C Hobby House
916 E Bremer Ave
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JUNCTION CITY
R/C Hobbies
115 W 7th St Ph 238-1877
KANSAS CITY
R/C Hobbies
5620 State Ave
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Miller's Bike & Hobby Shop
105 E Seventh
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Don's Hobby Shop
410 Hart
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Big Frank's Hobby Center
2268 N Amidon Ph 838-3011
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Hobby Towne
3112 College Drive - Suite A
BATON ROUGE
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9106 Airline Highway
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301 N Hwy 190 Suite E8
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Boy's World of Hobbies
Lapalco Square PH 392-6622
1545 Lapalco Blvd
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Mercury Hobbies Inc
Rt 6 Box 734A Ph 892-7204
METARIE
Hobby Hut Hobby Shop
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PH 504-733-4829
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1314 U.S. 165 North
PH 318-343-5554
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94 Front St
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RFD 1 Box 2260
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Riva Ridge Vassalboro
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6717 York Road
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Fox Chapel Hobbies
18709 Frederick Road
MIDDLETOWN
Larch Lane Hobbies
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Burlington Mall
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323 Turnpike St #9
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J & J Hobbies
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153 E Falmouth
EAST LONGMEADOW
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Fisher R/C
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Charlie Hobbies
40 Bank Row PH 773-3300
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Hobby City
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George's Hobby Shop
22 Merrimac Square
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Northshore Shopping Center
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Tony's Hobby Shop
90 Kimball Ave
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B & B Hobbies, Inc
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506 Riverside Dr Ph 964-8105
BATTLE CREEK
JT Hobby
825 Golden Ave
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Hussey's Hobbies
202 Lansing St Ph 543-4400
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Hobby Heaven
7 So Monroe Ph 278-5894
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Long's Aero & Hobby Shop
5812 W Saginaw Road
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Joe's Hobby Center
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EAST DETROIT
Joe's Hobby Center
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Joe's Hobby Center, Inc
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Craftsman's Cove & Tradingpost
5729 W Houghton Lake Dr
PH 517-422 5714
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Rider's Hobby Shop
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PH 517-485-0700
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Pierce RC Models
2119 S Summerton Rd
PONTIAC
RC Hobbies
921 Huron
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Joe's Hobby Centers Inc
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105 S Livernois
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Aerospace Models Ltd
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SAGINAW
Roger's Hobby Center
5658 State Ph 790-0080
Giant Shopping Center W
SAGINAW
Ted's Hobbies & Raceway
3270 Bay Road
PH 517-799-3800
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517 So Union PH 947-4946
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Henderson's Family Hobbies
2441 Auburn
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Prop Shop Hobbies
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Randolph Road PH 847 3973
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6416 Penn Ave S
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PH 419-738-2007
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Odessa TV Video Clinic
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Grandview & 42nd St
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Hudson's R/C
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3421 Memorial Drive
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PH 206-428 2750
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& Tool Store Ph 414-498-0208
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Vanguard sets the pace.

Vanguard sets the pace all other FM and PCM systems must follow. Designed with advanced features and a stylish high tech appearance, Vanguard is the first R/C system to offer *true* 1991 performance and capabilities, at a down to earth price.

Top quality Airtronics precision gimbals.

The economical Vanguard FM and PCM systems incorporate the same quality craftsmanship and state-of-the-art component technology of Airtronics' most sophisticated R/C systems.

Vanguard comes complete with High Quality Rechargeable NiCd Batteries and Servo Reversing on All Channels. Precision gimbals give Vanguard the responsive feel and critical control of our most advanced aircraft systems. Fully adjustable length and tension sticks provide modelers with extremely accurate control response.

Dual Rate elevator and aileron controls, and electronic trims for maximum aircraft performance are additional standard features offered on the VG6DR FM and VG6P PCM systems.

A Breakthrough in FM Technology

Trainer system. Available on Vanguard FM only.

Suitable for beginning and sport flyers, Vanguard is the first low-priced FM system to offer you total 1991 flight capability. Vanguard utilizes Airtronics' reliable Gold Label Super Narrow Band Dual Conversion Receiver for superior aircraft performance and control.

You get a clearer, more efficient signal that's less susceptible to specific types of interference, image frequency

and intermodulation problems. Vanguard gives you all the technological advantages of super narrow band FM operation at a price comparable to most AM systems.

Vanguard FM systems also incorporate a convenient Trainer system which allows any two Airtronics Trainer-equipped transmitters, coupled by a cable, to control the same airplane, for easier flight instruction.

A Competitively-Priced PCM

Vanguard PCM systems feature advanced component design, a Gold Label Super Narrow Band Dual Conversion Receiver, and the same sophisticated Pulse Code Modulation technology available in our higher priced R/C systems.

Airtronics' sophisticated microprocessor-based Pulse Code Modulation technology offers modelers all the advantages of virtual trouble-free operation.

Vanguard PCM systems feature a Transmitter Low Voltage Audio Alarm and a Fail/Safe mechanism that automatically resets control position, enabling you to fly through unexpected interference. A convenient PCM/PPM Switch gives you the ability to switch between Airtronics PCM or FM receivers for greater system flexibility.

The VG6P PCM system also incorporates Adjustable Low Throttle and Elevator Flap Mixing functions for enhanced flight control.

These high quality Vanguard PCM transmitters offer you unmatched system features and unsurpassed performance at an affordable price.

Vanguard PCM Receiver.

A True 1991 Receiver

All Vanguard FM and PCM systems feature Airtronics' Gold Label Super Narrow Band Dual Conversion Receiver. These state-of-the-art receivers give you all the advantages of superior image rejection, improved sensitivity, narrow bandwidth and maximum interference rejection.

Equipped with this compact, high performance Airtronics receiver, Vanguard is the first complete R/C system that meets or exceeds all the AMA specifications and guidelines for operation in 1991 and beyond.

Airtronics' Commitment to Quality

Vanguard series radios are fully compatible with all Airtronics' quality accessories, servos and radio systems. Airtronics is the only major R/C manufacturer that offers you full product compatibility.

All our FM and PCM servos and accessories have the same interchangeable plug types used on our reliable AM systems. Airtronics' state-of-the-art transmitters meet all AMA and RCMA Gold Sticker requirements and specifications. Our FM and PCM R/C systems meet and exceed all 1991 AMA guidelines, assuring you fully functional operation in 1991 and beyond.

At Airtronics we don't build obsolescence into our products. We stand behind our R/C technology and product line with a commitment to servicing what we sell, now and in the future. We back that commitment with a full one-year limited warranty on all our quality R/C systems.

Vanguard is Superior in Every Respect

Vanguard FM and PCM systems incorporate functional system design, high quality advanced technical features, and superior 1991 flight performance, at a competitive price.

If you're seriously thinking of buying a new R/C system, Airtronics' Vanguard is the only choice to make. In the race to 1991, Vanguard sets the pace.

AIRTRONICS INC

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At Airtronics, we want to be known as the best, not just the best known.

from Bill Northrop's workbench

Leo O'Reilly with his quarter-scale Laser 200 with an Enya VT 240, and an 18x10 propeller. Weight is 19 pounds. Seen at the Bicentennial Model Aircraft Pagent in Australia.

Ian Forrestor's 108-inch span Stinson R. Powered by an S. T. 2500 and an 18x10 prop. This big quarter-scale craft tips the scales at 23 pounds.

• Our good friend, Leo O'Reilly, from South Australia, came by RCMB's office in early October to visit while on business in the US. Leo is a retailer and distributor of model supplies in Australia, as well as an accomplished modeler in his own right. On this visit, he brought along some interesting photos of large scale R/C model aircraft that took part in the Bicentennial Model Aircraft Pageant, in Cheltenham. The South Australian Aeromodellers Association, working with the Australian Bicentennial Authority, performed a great PR act for the hobby at this pageant. It was conceived to present a history of Australian aviators and their aircraft, consequently, many of the models were designed and built specifically for this show.

A grant from the Bicentennial Authority made it possible to present this pageant and assemble modellers from all over Australia, as well as two current overseas aerobatic champions; Bertram Lossen from West Germany and Ivan Kristensen from Canada. We don't have space here to present all of the photos, but hope to show you more in the near future.

I GUESS YOU'RE RIGHT

I have just received a letter from Terry Rimert, of Baldwin, Florida. I won't quote all of Mr. Rimert's letter, but the part I am quoting is not taken out of context, I am just leaving out someone else's name about whom he says the same thing. "Like . . . .., you are a very enthusiastic model enthusiast, but, even though you built and flew free flight models, you never understood free flight, and were never a free flighter. You bailed out of free flight into R/C as soon as you could, like . . . .. did, because you never understood free flight, like . . . .. never did." Well, Mr. Rimert, I really believe you're right. I should have smartened up when only a month or two after selling the first subscriptions to *Model Builder*, sight unseen, at the 1971 Nationals, and even before the first issue appeared, I read in a club newsletter that this new magazine was being started up by an R/Cer, and would therefore probably be just another model mag that didn't have any free flight material in it.

In subsequent years, on up to the present, I have taken up a substantial amount of editorial space in the magazine on monthly columns such as "Free Flight," "Free Flight Scale," "Indoor," "Hannan's Hangar," "Insiders," "Plug Sparks," "Old Timer of the Month," and construction articles on Peanut Scale, Bostonian, Embryo, Pistachio Scale, Wakefields, Unlimiteds, A/1, A/2, A/3, FAI Power, Classes 1/2A, A, B, C, rubber scale, gas scale, CO2, World Champs reports, NFFS Champs reports, and all sorts of how-to stuff. And the dumb thing about all this is that advertising support is what keeps magazines in business, and the advertising support we have received from the free flight industry, which isn't much anyhow, has been about equal to point-you-know-what over infinity!

During all this time, in spite of advice to the contrary from people in the know-how of the publishing business, from well-meaning friends who point out the financial foolishness, and from my own deep-down awareness that I'm stubbornly hanging on to this belief that the basic hard core of the model aircraft hobby is free flight and therefore by damn I'm going to continue to support it as best I can, no matter what the consequences, I have done just that.

Then, Mr. Rimert, in return for my efforts and my beliefs, and also what I think are some personal and financial sacrifices, I get a letter like yours . . . Mr. Rimmert, you're right, I DON'T UNDERSTAND FREE FLIGHT! •

A Rutan Quicky by Geoff Burfield, powered by an S.T. 3000.

A 90 cc chainsaw engine pulls this 47-pound Ryan STA through the air with Mark Collins at the controls. Span is 118 inches.

• It's time once again to recognize those select few of our modeling peers who have achieved the unachievable, conquered the unconquerable, or just plain lucked out. The more or less annual presentation of the Jake Awards brings a little well earned fame to the ordinary modeler whose talent, dedication, and hard work have resulted in the extraordinary. Sadly, no cash or merchandise prizes accompany these awards, but if you all write in to Bill Northrop and complain, maybe he'll chip in a subscription or a set of Uber Skiver knives next year.

THE WAKEFIELD CERTIFICATE OF MERIT

This award recognizes achievement in any of the various rubber-powered events sanctioned by the AMA. This year's recipient is Mark Sprechlin, of Saratoga Springs, New York. Mark was stretching out a rubber bundle prior to winding it when he accidentally let go of it. It cracked the whip and snapped a nubile young thing in a pair of tight shorts on her derriere. She turned around to locate the source of the attack on her posterior and found an old gentleman standing behind and to her left. After informing him to keep his hands to himself, she slapped him a good one right in the chops. His false teeth flew out and landed on a Vultee Vigilante scale model. The old gentleman retrieved his teeth and headed for the first aid facility. When the Vultee owner returned, he found teeth marks in his fuselage and a poodle standing nearby. He put two and two together and punted the French pooch over the scorers' tent. The surprised animal landed in the back of Mark Sprechlin's Mercury station wagon and promptly deposited his opinion of the whole situation on the tailgate carpet.

Which all goes to show, as Mark pointed out at his award ceremony, that when it hits the fan, it's liable to land anywhere.

THE GENERAL DOOLITTLE CITATION

This award goes to the member of our armed forces who has done the most to foster model aviation at military installations. This year's winner is Lieutenant Junior Grade Samuel P. Livingstone who was stationed at the Patuxent River Naval Air Station in Maryland. Lt. Livingstone petitioned his commanding officer for permission and then started a model rocketry club at the Pax River installation. On the first anniversary of his appointment as president of the rocket club, Lt. Livingstone organized a launch demonstration for the brass. The show was a rousing success. Damage was limited to two F-18s, a P-3 Orion, and the sinking of the Commodore's Buick. Lt. Livingstone, or "Stumpy" as he is now called, has since been reassigned to sea duty and at last report was busy organizing an R/C dive bomber club aboard the carrier Lexington.

ADVICE FOR THE PROPWORN
—By Jake

STUPID AIRPLANE TRICKS

This award singles out the most bizarre deviation from the accepted model airplane norm in any given year. The award invariable goes to a fun-fly participant or show team member for some aeronautical oddity such as a flying doghouse or flying lawn mower. This year is no exception. The winner is "Colonel" Jimmie Ray Carlisle, president and lead pilot of the Cuyahoga Cloud Clobberers Show Team, of Cleveland, Ohio. Col. Jimmie's team puts on a spectacular display of aerial skill and daring-do that culminates in a finale to beat all finales. In addition to the customary bombing of the outhouse with the poor soul inside, there is a formation fly-by of the team's novelty aircraft. Passing majestically over the field at 50 feet of altitude in a five-aircraft vee, the formation includes a flying Weber barbecue kettle, a flying Saab trunk lid, a flying pizza with garlic and anchovies, and a flying tanning booth. Leading the way, at the point of the vee, is Col. Jimmie's flying sushi bar. The Colonel won this year's award not solely for the uniqueness of his show craft, but also for his special show-ending maneuver where he rolls the sushi bar to inverted and drops Ginsu knives on the crowd. Bravo!

THE SMALLEST IDENTIFIABLE PIECE AWARD

Fun-flys have a tendency to display morbid bad taste by presenting a "Best Crash" prize. Well, never let it be said that this column has to take a back seat to anybody when it comes to bad taste. So, starting this year, the best crash nationwide will be recognized by the Smallest Identifiable Piece Award. The inaugural winner is Austin W. Lomax, of Sweetwater, Oklahoma. Mr. Lomax gained the honor at the expense of the loss of his beloved Ryan-STA. The sleek and beautiful sport plane had been his pride and joy for the six years prior

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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.

• Here's a book for rubber-power enthusiasts and beginners that is sure to be a hit. *Rubber-Powered Model Airplanes* is a basic handbook with features on building stick and tissue and sheet-balsa models that *fly*. With many illustrations and photos detailing construction, trimming and flying hints, *Rubber-Power* will be of invaluable help to the fledgling modeler, and can be instructive for those of us who think we know it all. The 168 pages of this paperback delight are chock full of useful information, so get yourself a copy! It, along with *Night Fighter*, a hard-bound book covering the history of airborne night fighting since 1914, are available from Zenith Aviation Books, Box 2MB, Osceola, Wisconsin 54020. *Night Fighter*, by Anthony Robinson, contains over 135 photos, plus numerous line drawings, tracing the development of night fighting techniques in the aviation world. Write to Zenith Aviation for their free catalog, and tell them you read about it in *Model Builder*.

• • •

They call this rocket "awesome," and one look will tell you why. The Big Ben from MRC stands over four feet tall, but weighs only 1.75 ounces. Any engines from A8-2 to C6-5 will lift this bird to incredible altitudes, and engines snap in and out of the quick-change mount so you can be launching and relaunching as often as you wish. A 12-inch parachute will return your Big Ben to the recovery crew safely. The long length of the Big Ben makes it easy to track during the boost phase and easier to spot during descent. Check it out at your nearest MRC

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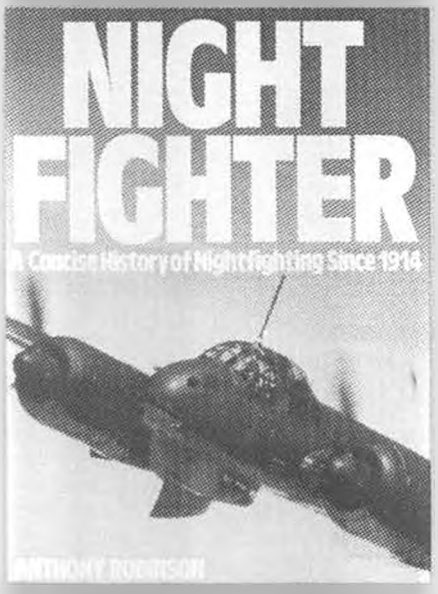
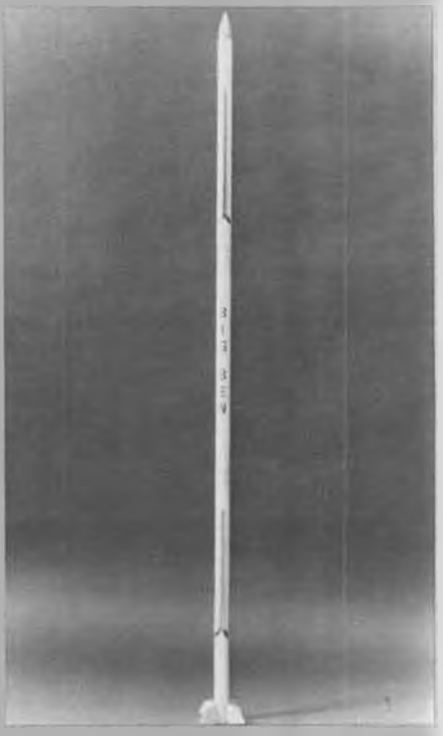
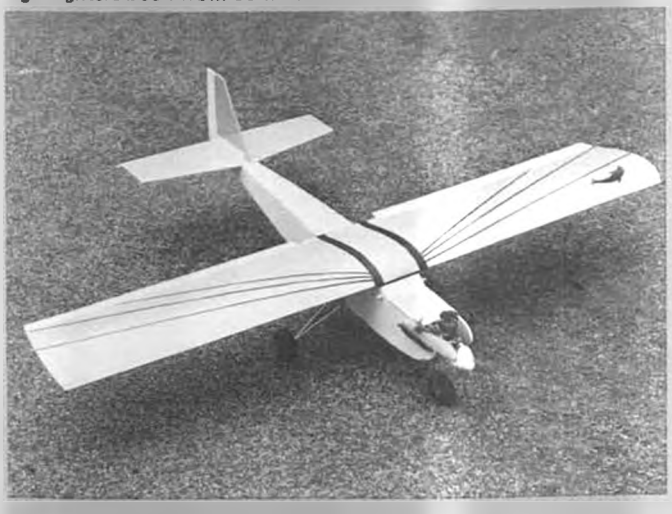


Nightfighters book from Zenith.

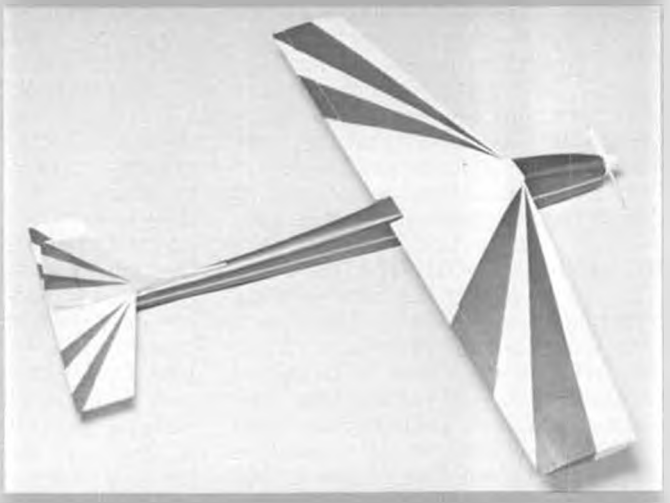
Rubber Power handbook from Zenith Books.



Big Ben rocket from MRC.



Cambridge Models' Dolphin Super RTF trainer.



Great Planes Model Distributors' Electrostreak electric flying model.

MODEL DESIGN & TECHNICAL STUFF

By FRANCIS REYNOLDS

• Now, where were we? Oh, yes, last month the epoxy had begun to set up before the fiberglass job was done. At times like that one thinks seriously about taking up stamp collecting instead. Remember Murphy's Law, "If something can go wrong, it will." Estimate how long the fiberglassing job should take you, then mix an epoxy that will take at least four times that long to set. Another word of wisdom from one who has learned the hard way. Always mix twice as much epoxy as you think you will need. To have to take time out in the middle of a job to mix more epoxy is also most frustrating, and it has never, in my experience, led to a better quality job. By "fiberglassing job," I don't mean fiberglassing the whole airplane. That will normally be broken up into many small efforts and resin batches over a period of days. But even each little partial glassing job will take time.

EPOXY SELECTION

I'm saying that the 5-minute, 15-minute, and even 30-minute epoxies are too fast for the larger fiberglassing jobs, so use longer-curing stuff. It is available in lots of places and in lots of brands. Boat fiberglass stores have it and so do some art stores, craft shops, and paint stores. The brand I'm using now is "EnviroTex 1 to 1 Polymer Coating." It doesn't say epoxy on the label, but it is. It is available in several sizes of plastic bottles, and I have seen it in several different stores. It sets overnight, but all epoxy resins, including the 5- to 30-minute ones, take a number of days to thoroughly polymerize and reach their maximum stiffness, hardness, and strength. Therefore, don't fly your new plane the day after the last epoxy work. On the other hand, it is much easier to cut or sand off any excess epoxy while it is still soft. The gummy stuff will load up your sandpaper, but sandpaper is cheaper than sanding time.

EPOXY THINNING

As far as strength goes, I haven't found an unsatisfactory epoxy in 1-to-1 mixes, but you will find that some are more viscous than others. When using epoxy as a glue, viscosity helps keep the stuff from running off the joint before it sets; but in fiberglassing, using a brush, the viscosity and stickiness of the epoxy resin may cause the brush to drag the cloth out of its proper position. This little problem is easily solved by diluting the epoxy mix with alcohol to reduce its viscosity. Any type of alcohol will do, ethyl, methyl, or isopropyl, provided the water content is low. If you have it to mix fuel, use your methanol, otherwise the cheapest source is a paint store, where methyl alcohol is sold as a solvent and shellac thinner.

Do not, I repeat, *do not* use lacquer thinner, acetone, or MEK to thin epoxy for fiberglassing over foam. These active solvents would promptly dissolve your lovely foam core! The alcohols won't attack any foam.

How much you need to thin the epoxy depends on how viscous the mix is to start with and upon the weight of the glass cloth you are using, the thinnest cloth requiring the thinnest mix. You will learn by experience, but a good starting point is two parts resin mix and one part alcohol. Pour in a little alcohol, mix it up, and see how viscous it is. If still too "thick," add a little more. Don't worry about the alcohol weakening the cured epoxy; it doesn't, according to my own tests, provided you are working on the usual open surfaces where the alcohol can evaporate as the resin cures. The thinned mix does have a little longer pot life than an unthinned mix of the same epoxy, however.

Also, according to my tests, thinned epoxy takes a lot longer to completely cure, maybe five times as long! Incidentally, if you are in a rush, you can cure epoxy five or ten times faster if you provide a little heat. Any temperature above room temperature will help, but the hotter it is the faster it will cure. Overnight at 150 degrees Fahrenheit will completely cure even thinned epoxy. But beware! Above 200 Fahrenheit will soften and destroy the foam under the epoxy. If you use heat, feel around for hot spots that may ruin the part.

You will probably need to thin the epoxy if you are brushing it on, but squeegeeing on the epoxy is a different story. In using that method, viscosity in the mix is actually an advantage. Thin for brushing only. More about these two glassing methods later.

With all the tips and warnings I am handing out, it is obvious that these new model building materials and methods do take a little study and experience. Look at it this way, most of us have been learning how to work with balsa for years. We can't expect to change over to new materials without any problems. This old dog, however, is most interested in learning new tricks in modeling,

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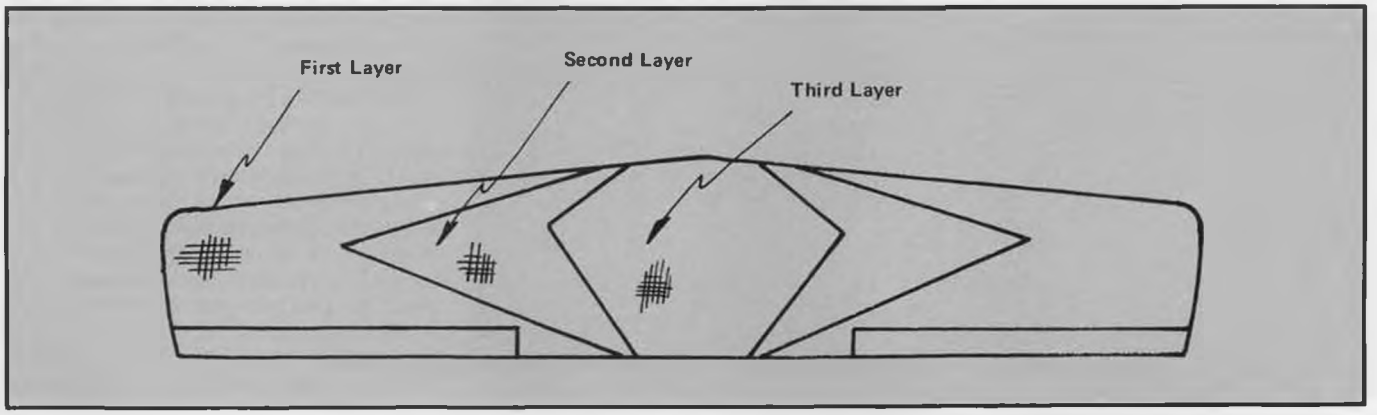
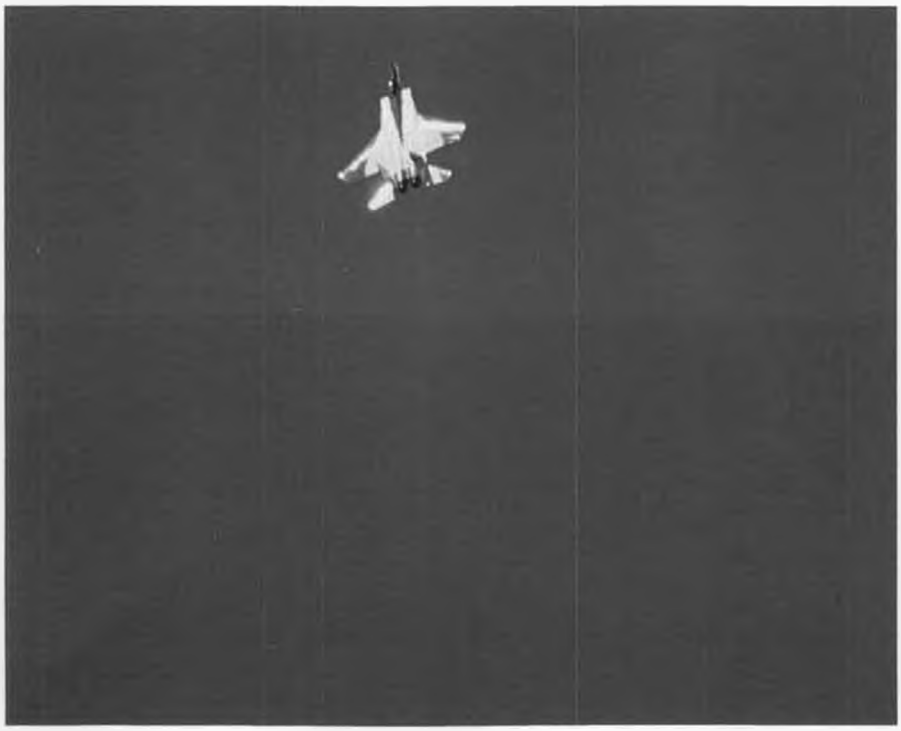


The author steps into the art and science of epoxy-fiberglass construction techniques this month. See text for details.

Southwest Fan Fly

By MARK FRANKEL. . .Just about everyone who is anyone in the fan jet department showed up at Fort Worth for the Southwest Fan Fly. Emphasis this year was on high-performance aircraft rather than scale.

• The trend toward non-scale, performance jets was clearly evident at Copeland Field near Fort Worth, Texas, during the weekend of September 24 and 25. More than half of the models present were of the Violett Sportshark-Cook Starfire-Byron Bullet variety. These are highly aerobatic models, optimized for maximum performance. They routinely exceed 150 mph in unaccelerated level flight. The level of pilot proficiency at this Fan Fly was superb; I didn't witness any accidents due to pilot error, and the sky was filled with jet models for most of the weekend.



Ron Ables' huge F-15 shows its stuff with a vertical climb.

Bob Violett, of Bob Violett Models, 1373 Citrus Road, Winter Springs, Florida 32708, (407)365-5869, had so many examples of his designs present that it was difficult to capture them in my camera lens when they assembled for a group picture on Saturday. The Sportshark, Aggressor, and Viper series are becoming the standard of the high-performance jets. Bob's new K.B.V. .80 engine will certainly further the reputation of these clean aircraft.

Tom Cook, of Jet Model Products, 304 Silvertop, Raymore, Missouri 64083, (816)331-0356, put on several impressive displays with his Starfire II. If memory serves me correctly, the Starfire started the entire jet performance movement in the early 1980s when Tom flew the prototype at a Byron Fan Fly. The Starfire's speed, vertical performance, and grace revealed the true potential of Tom's then-new Dynamax fan. All of this performance was achieved with lateral inlets and no cheater hole; a radical departure from the model jet inlet systems of that period. Tom's new Starfire features construction improvements and aerodynamic enhancements, but the real news is a new fuel flow valve and tuned pipe. The fuel valve, which is mounted at a remote location from the engine, permits precise mixture adjustments by servo while the aircraft

Harry Wood's well-designed Northrop X-4 Bantam. This model proved to be a very stable tailless aircraft.

Three Fairchild Republic aircraft. From left: F-105 Thunderchief, the A-10 Thunderbolt II, and the F-84F Thunderstreak.

Two of George Miller's custom R/C models. Foreground is an F-4J Phantom, and in back is an F-8 Crusader.

Bob Violett with his newest Aggressor painted in a scheme similar to the "Bad Boys" in Top Gun.

is in flight. The tuned pipe must be heard to be believed. The noise footprint from the Starfire II is so diminished that during high-speed fly-bys the O.S. .77 was clearly quieter than anything in the air. Tom also announced that he is selling his Dynamax fan for $80 for a limited time. This represents one of the best bargains in ducted fan equipment.

Steve Korney, of Hurricane Fans, 14835 Halcourt Avenue, Norwalk, California 90650, (213)864-8891, appeared with his Cobra design powered by a Rossi .90 with an original eight-bladed fan. Steve's Hurricane fans are available in various diameters and blade densities; however, the six-inch, eight-bladed fan really caught my attention. This fan system is particularly well suited to the Rossi's output of more then five horsepower. Steve's Cobra, which is substantially larger than a Sportshark or Starfire, demonstrated surprising speed and vertical ability for its mass. I suspect that Steve's fan has excellent potential for large scale jets. I plan to use one in an upcoming 1/7-scale F4D Skyray.

While the majority of models at the Fan Fly were non-scale, high-performance types, there was a significant number of scale replicas present. Byron Originals, P. O. Box 279, Ida Grove, Iowa 51445, (712) 365-3165, was well represented with F-16s, MIG-15s, and a particularly handsome Kfir by Tom Perry, of Converse, Texas. Tom painted his Kfir in the colors of the F-21, a variant used by the U.S. Navy adversary squadrons for fighter tactics training.

The largest scale model at the Fan Fly was a Byron F-15 Eagle built and flown by Ron Ables, of Lewisville, Texas. This model was test-flown at last year's event. Ron has become very comfortable with the aircraft during the past year. He flew frequently during the weekend, demonstrating the aircraft's smoothness and realism. The Eagle's flawless landings with its dorsal speed brake deployed was a guaranteed crowd-pleaser.

While it didn't fly, Bob Violett displayed one of his pre-production F-86F Sabres. Bob expects to release this kit shortly, and it should be a huge success. In fact, the Sabre was the original project for the Viojett fan system. Bob intended to design an *exact* scale F-86 with an accurate inlet and jet exhaust, eliminating the use of a cheater hole. This model has been under development

Ron Ables with his Byron Originals F-15 Eagle. Probably the largest model at the Fan Fly, it was most frequently flown twin-powered by two O.S. 77s, with Byrofans.

Dennis and Lynda Crooks with a spectacular Yellow Aircraft replica of the Grumman F-14 Tomcat.

for at least eight years, and like all Violett products it will be of impeccable quality and performance.

Other scale airframes that were displayed but not flown include Lynn McCauley's new Lockheed F-104 (a previous example crashed last year when a leading edge flap failed to retract during climb out). Mike Kulczyk, of Austin, Texas, displayed a nearly complete F-105 Thunderchief, and Ed Couch, of Fort Worth, Texas, exhibited his new A-10 Thunderbolt II. Ed also showed an immaculate F-84F Thunderstreak built from Lynn McCauley's plans and molds.

George Miller, of Custom R/C Aircraft, 1140 Civic Center Drive, Rohnert Park, California 94928, (707)584-9446, flew an example of his new Chance Vought F-8 Crusader. Col. Bob Thacker flew an F-4 Phantom, which is also kitted by Custom

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Steve Korney's Cobra powered by his original Hurricane fan with a Rossi .90.

Lynn McCauley's original design stealth fighter. Model has had five test flights, but was not stable enough to risk in front of the crowd.

Bob Violett with his new F-86F. This is an exact scale model featuring an accurate outline. Inlet and exhaust areas are correct also.

The 1/9th scale Grumman F-14 Tomcat soon to be marketed by Yellow Aircraft. It is powered by twin Dynamax fans with O.S. 77 engines.

Vernon Montgomery, Clinton, Mississippi, with a colorful Violett Viper.

Tom Cook with his high-performance Starfire II. This model featured a new tuned pipe that was surprisingly quiet.

Lynn McCauley with his new F-104 using Dynamax power. This model will fly as soon as it gets some paint.

R E N O

AIR RACES

By FELIX VIVAS. . .The 25th Anniversary of the National Championship Air Races was captured by our ace photographer on the scene.

• The 25th Reno National Championship Air Races, September 15 through 18, 1988, was a milestone for the supporters, participants, and fans. The Silver Anniversary proved to be a pure delight to the record 150,700 air-racing fans attending the four days of fast-paced air-show acts and racing.

Lyle Shelton of Dallas, Texas, overcoming a Saturday "mayday" emergency landing in his Grumman F8F white and copper Rare Bear, flew a blistering out-in-front pace Gold Sunday final to win the unlimited championship at 456.821 mph.

Fellow Dallas sportsman Alan Preston trying for three Gold wins (Unlimited, Formula One, Biplane) got two out of three by winning Sunday's Gold Formula One in his #44 Sitting Duck at 240.748 mph and smoothly leading the way to win the Biplane Gold in his #00 "Top Cat" at 205.918 mph.

The AT-6s as always were exciting because of their "wingtip-to-wingtip-on-the-deck" pylon duels in their colorfully painted steeds. Eddie Van Fossen, of Bakersfield, California, repeated his last year win by taking the Gold again in his SNJ #27 Miss TNT at 229.759 mph.

Last year we discovered Robert Yancey from Klamath Falls, Oregon, while covering the 1987 races. He introduced one of the two Russian YAK II fighters and, as a novice unlimited pilot on a "lean shoestring" budget, got a few laps experience flying his YAK at that race.

This year, Bob, still on a very restricted budget, gave a very stirring, fan-pleasing exhibition of the spirit of Reno Championship air racing in his very clean, gleaming YAK II with an R-2800 CB under a snug chrome cowl. His smooth, strong, competitive flying coupled with being the underdog endeared him to the majority of the knowledgeable racing fans. From sweating out getting bumped up to the last minute of qualifications, he made the field and flew his way into the final Silver Unlimited race on Sunday finishing fourth.


Big Red
5
5

Doug Kempf, of Redlands, California zips by in his Smith Mini-Plane. When not racing, Doug is an airline pilot.

A Pitts Special, flown by farmer/rancher Wes Selvidge, of Buttonwillow, California.

The other YAK II highly modified and putting out a lot more horses than Yancey's mount, flown by Skip Holm, proved to be somewhat dicey to fly needing more rudder area, hence sat out this year's races sitting in the pit area.

Another recent new unlimited aircraft eagerly awaited to be seen in action was John Dilley's Vendetta, a P-51 fuselage mated to a Lear Jet wing with a Lear horizontal stabilizer and Piper landing gear, but during the whole four days sat in the pit with a sick engine.

The Formula Ones best represent new inventive approaches to better performance, mainly using composites. Bob Drew, of Los Gatos, California, is a good example. Going to a composite wing this year with his Friberg Electric Special he saved 45 pounds, which in an approximate 500-pound aircraft does add performance.

James Miller's #14 Pushy Cat and Errol Robertson's #73 Puffin both are Miller Specials which are pusher T-tailed designed and really move.

A diminutive Formula One plane, powered by a Continental 100 hp engine. Pilot is unknown.

A much talked about and anticipated new unlimited race for 1989's Reno Races is

Ralph Twombly, a pilot from Wellsville, New York, with his AT-6 Miss Behavin'.

Burt Rutan's new design being built at Scaled Composites, his company in Mojave, California, called the Pond Racer. It's a twin boom, twin-tailed project powered by two supercharged Nissan factory

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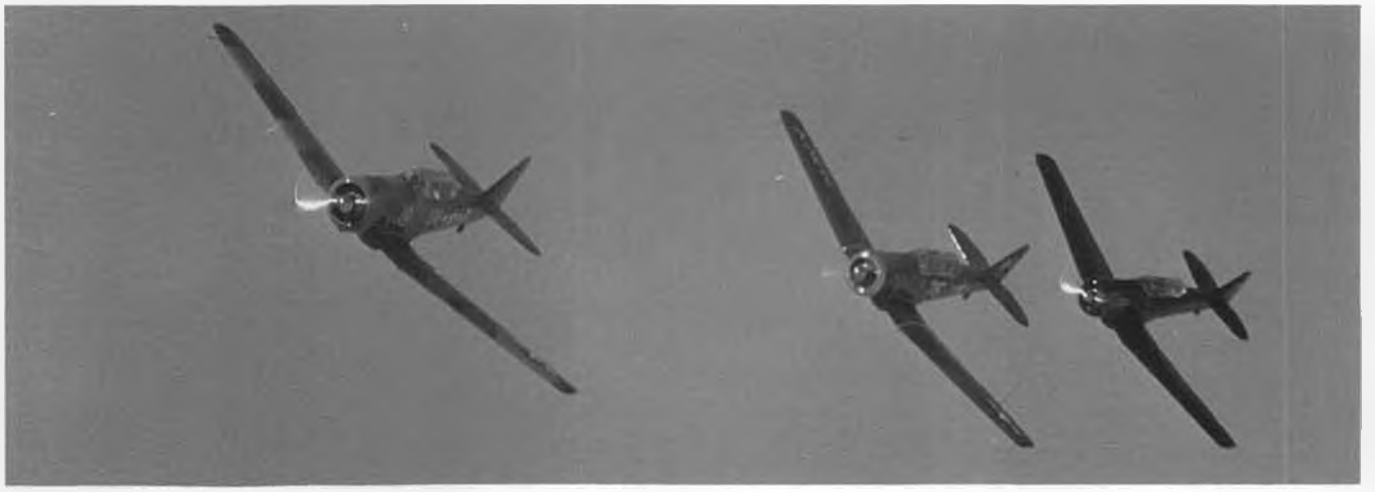
A Russian Yak, modified for air racing.

The winner! Lyle Shelton in his Grumman F8F-2 Rare Bear. Lyle is from Dallas.



Three AT-6s bank on their way around a race pylon in the Unlimited event.

The Pitts Special biplane is the most popular type of biplane entered at Reno. This one, piloted by machinist Roger Rourke from Cuyama Valley, California, is numbered and named "Eight Ball."

BUILD A
Daydream Biplane

By BOB BENJAMIN. . .Our famous cover artist did a bit of daydreaming one day, and the result was this exquisite sport scale biplane, a fine flyer with the Saito 65 installed. Construction is detailed here.

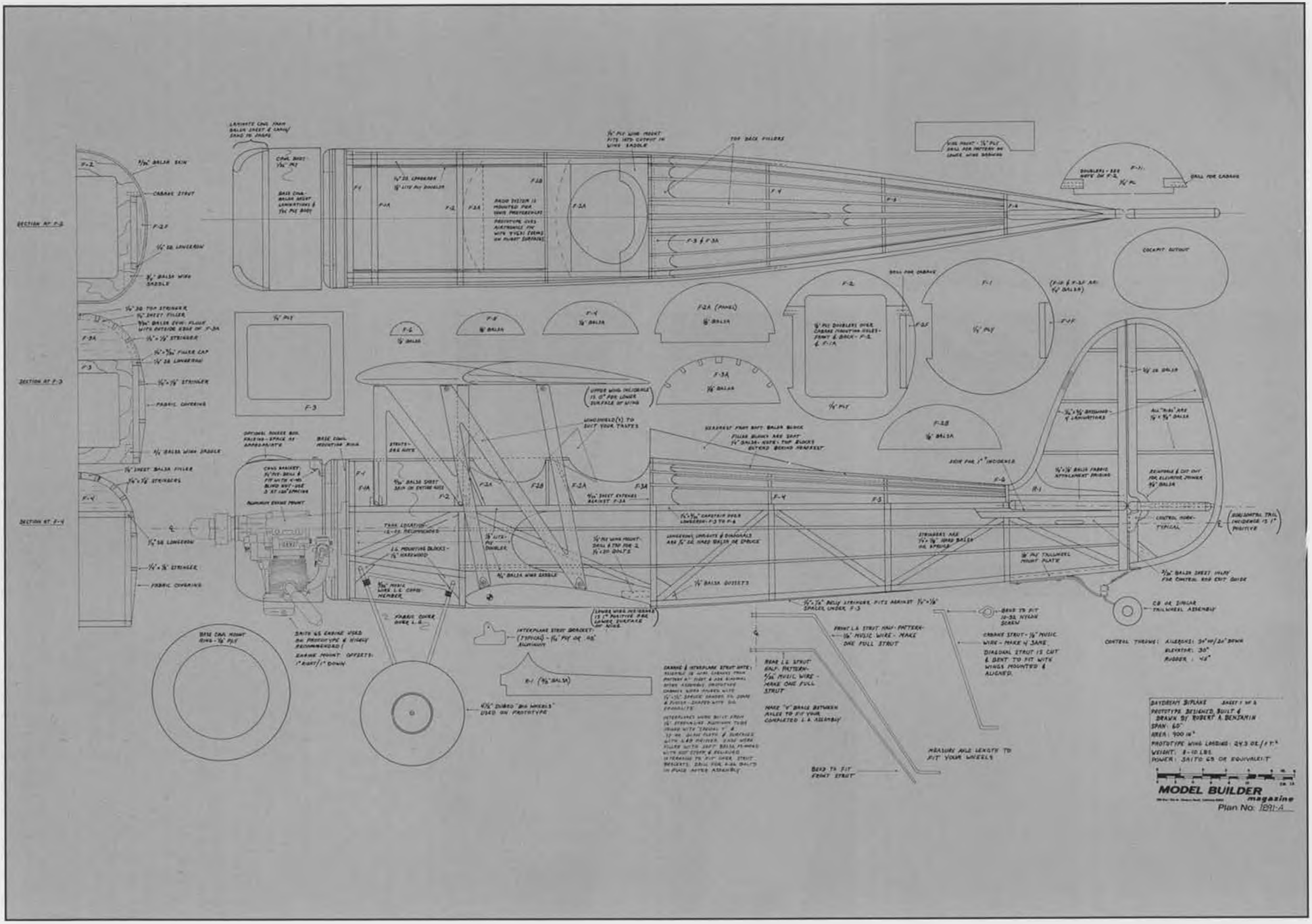
• Here's a true story about how one out-of-the-ordinary model airplane design came to be. About three years ago as of the time of this writing I was spending part of a sunny late spring morning taking a walk along one of the rural roads near my home. The current *Model Builder* cover painting under way in my studio was giving me fits, and I needed some time away from it to get the next steps sorted out. As those of you who have been here know, a sunny spring morning in Western Washington is a big deal, so it wasn't hard to play hookey!

When I finally did get to the drafting table after the neglected cover painting had been finished and shipped off to Bill Northrop, what started to take shape on my paper was a fairly simple two-winger that would have flown on a four-stroke .45. Sometimes, though, I have trouble letting things stay simple, and the first images got a little bigger and a radial configuration sorta grew into place, until I realized that I had come up with a suitable airframe for the Big Bore Five Technopower engine that had been waiting patiently in its box for too long. The result was an airplane with a span of just over 60 inches, which makes it "legal" for IMAA "Big Bird" events, and which can be described as a "could-be-scale" combination of features from DeHavilland, Great Lakes, and Waco designs that I like. Most of the people who see it for the first time think it's a Waco. You ask, "Why would I go to the trouble of building such an involved airplane if it's not scale?" Because I wanted to. It's my daydream. As a matter of fact, this design would make a good scale trainer, if you will, in that it is complex enough to require the kind of involvement that would be required to build a "real" scale airplane, and to inspire a little respect at flight time, but is in fact not at all tricky to fly. The best part of this sort of project is that you can let the airplane become whatever you want; I'm waiting to see who will finish one up as a pseudo-fighter in '30s Army colors!

It does look scale up there; flying the Daydream is a daydream in itself. Flights are satisfying and completely enjoyable.

The Daydream first flew with the Technopower 5 and, in fact, took first place in the "Sport Biplane" category at the 1987 Northwest Model Expo at Puyallup in that configuration. It has flown many times with the radial, which produces enough power to fly the airplane quiet realistically. The Big Bore 5, when fully broken in, gave performance in the air on a 14-6 prop very close to what I subsequently got from an O.S. FS 61 four-stroke. The decision to remove the radial was based on two considerations. Although the Technopower is remarkably easy to start and flies the plane well, there are a number of details of construction and operation on the engine with which I'm not comfortable for frequent, long-term flying. This is not a criticism of Technopower, but rather a comment on the state of development of model four-stroke radials at the time these engines were developed. The other factor was the immediate request by Bill Northrop for the article you are now reading. I didn't feel that a Technopower-powered airplane would be the sort of project that a lot of modelers would want to get

The Daydream bipe with the Saito 65 installed. This model took First Place at Puyallup in the Sport Biplane category, back in 1987.

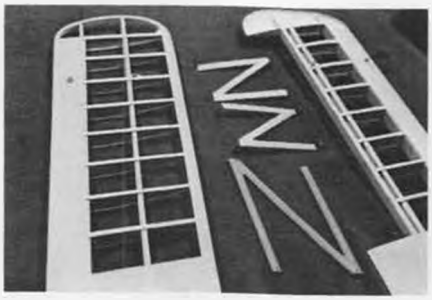

DAYDREAM BIPLANE
PROTOTYPE DESIGNED, BUILT & DRAWN BY ROBERT A. BENJAMIN
SPAN: 60"
AREA: 900 in²
PROTOTYPE WING LOADING: 24.3 OZ/FT²
WEIGHT: 8-10 LBS.
POWER: SAITO 65 OR EQUIVALENT
MODEL BUILDER magazine
Plan No: 1891-A

Upper wing structure on the board.

Lower wing prior to adding dihedral. Ailerons are in place.

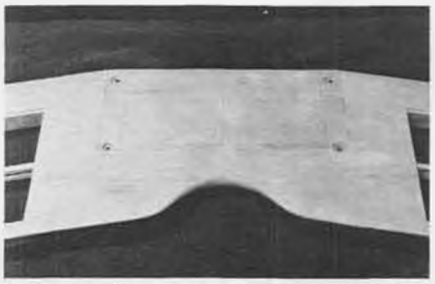
Forming a wingtip bow using cardboard form.

Wingtip bows ready for cleaning and trimming to finished length.



Wings and struts ready for covering.

Lower wing saddle and landing gear in place.



Bottom surface of upper wing showing cabane attach screw holes.

Cockpit cutouts with cabanes in place. Note filler blocks between stringers.

Flying wire attachment at interplane strut. Aluminum tab is free floating.

Little extra goodies that make plane special.

Note 90-degree reversing bellcrank for reliable link to throttle. Glow heater switch box seen here in center.

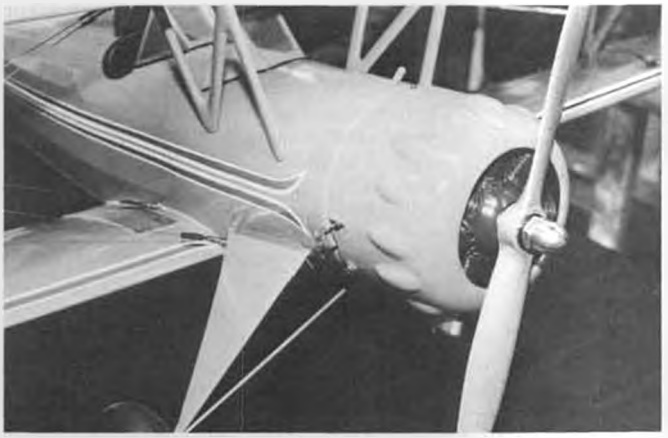
Tail from above showing faired fabric fillet covering as described in text.

involved in, so I began a "retrofit" to present the Daydream as a practical design for an off-the-shelf four-stroke single. The result, after a little over a year of fine-tuning, is what you see here.

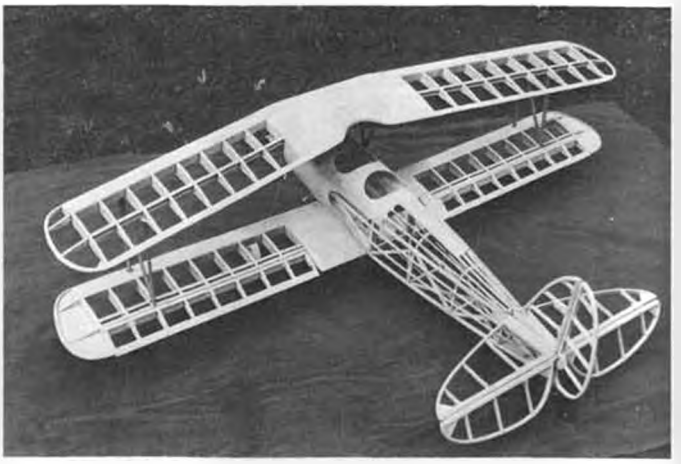
The Daydream as I'm now flying her is well matched to the Saito 65 four-stroke engine. I own several of these engines, have flown several more, and strongly recommend that you use one yourself should you build a Daydream. I have yet to find a mid-size model four-stroke that offers a better combination of excellent power output, docile handling characteristics, and reasonable price than the Saito 65. I'll go a bit further in discussing power options for this airplane. You don't need an .80 or .90. Period. The airplane is designed d loops without hitting the high end throttle stop. Once you have yours trimmed and are comfortable with her, you'll find that she likes to be flown low and slow and will make a fine "close-in" airshow or demo machine. The flat-bottomed airfoil means that you will have to work a little at outside maneuvers, but will return the favor by giving you very dependable low-speed handling. My airplane spins *very* fast and tight, but recovers readily, so don't be afraid of her if yours is balanced and riggedd loops without hitting the high end throttle stop. Once you have yours trimmed and are comfortable with her, you'll find that she likes to be flown low and slow and will make a fine "close-in" airshow or demo machine. The flat-bottomed airfoil means that you will have to work a little at outside maneuvers, but will return the favor by giving you very dependable low-speed handling. My airplane spins *very* fast and tight, but recovers readily, so don't be afraid of her if yours is balanced and rigged per the plans.

I suspect that an attempt to build a really light Daydream (mine has a "show" finish that cost me a pound or so) would result in an eight-pound airplane. I'd seriously recommend dyed, clear doped silk, or perhaps Micafilm, if you want to go this route. If you do build a lightweight model, you might want to try a Saito 50 (and send me pictures!).

Although I have written a couple of construction articles providing involved instructions for low-time builders, this isn't going to be one of them. If you haven't built an airplane from plans before, this isn't the one to start with. Moreover, the Daydream is not a beginning flier's airplane. Although she is undemanding to fly once trimmed, there is just too much there for her to work as a trainer. If you can handle a model like a Sky Tiger or one of the Sportster series, well, you should have no trouble with the Daydream. If you can't, *wait*, and enjoy airplanes like the Daydream when you are ready. I'd define ready as being able to do all the basic aerobatic maneuvers safely with an airplane like the ones just mentioned and to be able to do three good



Cowl in place showing engine control; lower wire at rear is the needle valve, other is choke control.



The whole model ready for covering and painting.

touch-and-goes on three successive passes. Think about that last one; it's a good measure of real flying ability.

Let's build! If you're with me at this point, I'll assume that you know how to pick good balsa wood. Use medium to hard wood for all primary structure and pick light stuff for all the outside sheets. I strongly recommend 3/4-ounce fiberglass put on with Hot Stuff to reinforce all the sheeted areas of the fuselage and both wings out beyond the center sections. Keep the wood light and let the high-tech stuff provide the rigidity. I'll recommend Hot Stuff Special T for all construction. The heavier body of Special T lets you put it exactly where you want it; you can then get a controlled cure using Hot Shot or Kick It.

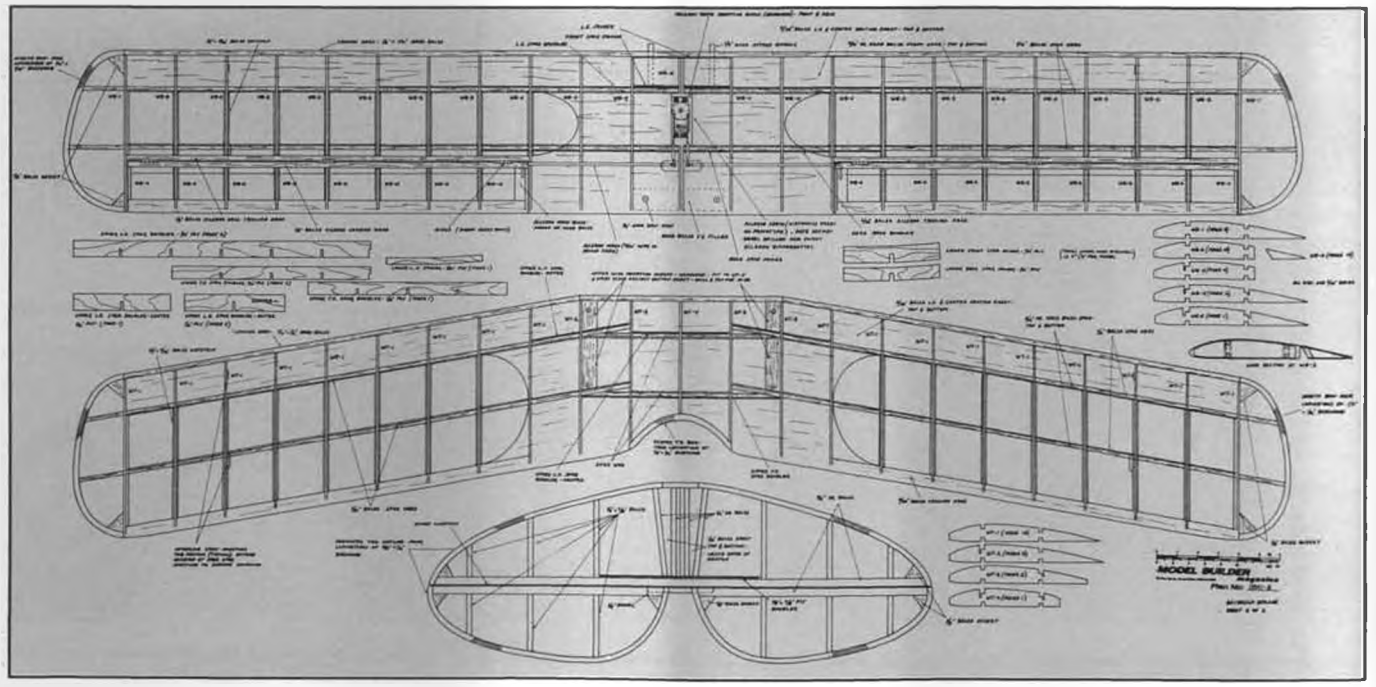
TAIL SURFACES

The horizontal and vertical tail surfaces are both built flat on the board. We are simulating welded steel tube structure here, so there is no taper or airfoil to reproduce. Build the horizontal tail and elevator by laminating the outlines first. If you can get a long enough piece of wood, you can do the stab and elevator on each side in one piece. I used both heavy cardboard forms and later forming blocks pinned to the plan over plastic wrap and laminated the outlines with bass strips that had been sprayed with warm water and wiped dry.

Final inspection from the offiser in charge.

When your laminates have set up, remove them from the plan, trim to exact lengths, and sand absolutely flat top and bottom.

Continued on page 94



Simply Scale

BY STEVE GRAY

• The IMAA Festival of Giants was held this year at St. Clairsville, Ohio, August 25 through 28, 1988. The event, to me, seemed to be a good place to go to see some good scale models flown. The IMAA Festival is perhaps the largest gathering of radio-controlled model aircraft in the world, and the registrations this year topped the 269 mark. The IMAA Festival was hosted by the International Miniature Aircraft Association. This is an association which has been formed by modelers dedicated to building and flying giant R/C models. The giant R/C models at the festival were comprised mainly of scale or semi-scale subjects. This was a four-day event which was held at Alderman Airport in St. Clairsville, Ohio. The facility was ideal for such a gathering. The entire airport was at the disposal of the IMAA. The pits were set up along the runway and with the number of entries, stretched along most of its length. Canopies were as many as four deep in spots. Camping was permitted right on the facility, and the place was packed with motor homes, trailers, and tents.

The festival is an annual event and is held in a different location each year. It is a non-competitive type of gathering where modelers bring their planes to display and/or fly for the enjoyment of others. For many, most of the day was spent looking over the models and chewing the fat with their fellow modelers. With the number of entries, it was not the place to get in a lot of flying. The lineups for next in line to fly on a given flight line were sometimes 20 fliers long. This could mean a wait of several hours to get your turn to fly. I guess it can't be helped though, and the long wait to fly is actually some measure of success. There were very few times on Friday and Saturday that there were fewer than five planes in the air at one time. I really felt sorry for those brave men at the transmitter impound who took the constant verbal abuse from fliers who had waited so long to fly. When they got their turn, they were corralled into a flight box from which they could not leave, or it would screw up the whole 3 I.M. plan. Once they got permission to take off, they were told by their flight line marshal in which direction they could fly and how high and how long. Upon landing they had to clear their plane quickly from the runway or risk a collision with a model coming in for a landing deadstick. It was surprising how many of us after all that would rush over to put our name on the list for another try six hours later.

Perhaps this type of event is too big, but it must be pointed out that this type of gathering is very indicative of what the average modeler is doing out there. While there were many beautiful scale models on display and flown, the pits were full of Robin Hoods, Ace 4-120s, and other fun-fly big planes which were not scale. Many Cubs and Lasers were also flown by modelers who had traveled from far and near to be a part of the festival. There were no prizes or trophies. There was just a sense of belonging to a great hobby/sport which gives each one of us so much enjoyment.

The IMAA Festival's location for 1989 was not yet confirmed as of this writing, but there was some talk of Odessa, Texas. If anyone would like further information about the IMAA or next year's festival, they can

Jack More's Heath Parasol was powered by his own homemade .90 4-stroke engine.

Seen at the IMAA Giant Festival: a beautiful Gypsy Moth by Merrit Aimmerman, complete to the last detail. Flies with his own Cirrus 4-cylinder 4-stroke engine.

Aimmerman's Gypsy Moth. This is his second Gypsy model.

Closeup of detail on Merrit Aimmerman's exquisite Gypsy Moth. Beautiful work!

Northrop Gamma by Jack Cole and Pat Corderman from Colorado Springs. An all-fiberglass model, it weighs 18 pounds with an O.S. 108 engine. This plane will soon be kitted by Jack.

contact Robert A. Blaney, Secretary, 14 Parkview Rd., Long Valley, New Jersey 07853.

This month I would like to talk about transmitters and the fact that we are not all using those two big sticks in the middle as much or as properly as we could. There are several ways to set up the average two-stick transmitter. The most common ways to set them up are described as Modes I, II, and III. Mode I is the traditional way to set up a transmitter for pattern flying. When we say a two-stick transmitter is Mode I, we mean that the right-hand stick will be set up to control throttle and aileron and that the left stick will be set up to control rudder and elevator. This means that for precise aerobatics, we are splitting the control of the elevator from the control of the ailerons. They are on opposite sticks and, therefore, when you control the elevator you will not inadvertently bump the aileron controls. Likewise, when you are controlling the ailerons, you will not mistakenly lean on the elevator.

Fliers of Mode I insist that it is more precise to split these two major control functions. While there is merit to this, it must be realized that it has its drawbacks. First of all, most radio systems are not easily obtained as Mode I from the manufacturer. They must often be special-ordered or converted at extra cost. With many of our more complicated transmitters, conversion is not easy to do, as it must be completely rewired so that mixing functions and dual rates will work properly. Another drawback is that fewer and fewer modelers are flying on Mode I. This means that there will be fewer people around to train the newcomer to fly Mode I.

This F7F-3 Tigercat by Ed Sheldon and Bob Antonelle of CBA models is to be a kit soon. Powered by two S.T. 2500s, the 'cat's span is 97 inches.

Mode II, or Single Stick Mode, is the most popular mode to fly. Almost all radios come this way from the manufacturer. This means that elevator and aileron are located on the right stick while throttle and rudder are located on the left stick. This mode is claimed to be the most natural way to fly, as the right stick simulates a joystick in a full-size plane and does most of the major controlling. Its apparent drawback is what Mode I claims to be its strong point. With most of the controlling done on the right stick, it is assumed that while controlling one function it is possible to inadvertently bump the other control and create an unwanted response.

Mode III finally is an easy way of taking a transmitter which is set up for Mode II and splitting the controls as for Mode I. This means that the right stick will control elevator and rudder and that the left stick will control aileron and throttle. Sometimes factory modifications will not have to be done

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Wendell Hostetler's Lockheed Sirius on floats. It had vintage wheels hidden in floats which allowed takeoffs from runway. Good flyer.

Claude McCullough's Waco with trike gear. This model flew just as good as it looks.

ELECTRIC POWER

By MITCH POLING

The unusual aluminum/air battery. See text.

• We will take a break from motor theory this month, and take a look at batteries, reader ideas, and new products.

While we are all waiting for that magic breakthrough in batteries, there are some ideas that are worth looking at. The "aluminum battery" is one, and, with some work, I think it will have a market. Aluminum is made by the Hall process, which runs a huge electric current though a molten mixture of bauxite and cryolite to plate out the aluminum. This hints that the reverse, where the aluminum is one plate of a battery, should work well. In fact, it does, and there is a battery marketed now that uses aluminum as a plate. The company that makes it is Alupower, Inc., Bernardsville, New Jersey 07924. I bought my battery from Edmunds Scientific. It is billed as a "Reserve Light One," and is actually two cells in series connected to a light bulb. It is a very clever battery. The other plate is an air cell. This is just an empty chamber with porous walls that let oxygen diffuse through to meet the electrolyte. The reaction is oxygen plus aluminum plus water go to aluminum hydroxide. The battery is not rechargeable, it is "one shot," but in reality it is a very simple matter to replace the aluminum plate. You might be able to just buy aluminum foil wrap and then fly all day! Well, not quite, because the battery is not high power. The voltage per cell is about 1.2 volts, and the current delivery is small, about 250 ma. The internal resistance is high. This may be due to the air membrane. I do not know how quickly oxygen can diffuse through it. Another problem is the product: aluminum hydroxide. This is mildly caustic, but not a health hazard unless you use it for hand soap! However, it looks like Jello, it is thick and gooey, and it is at least part of the reason, I think, for the low current delivery. Electrolyte flow through this stuff is probably pretty slow, which, in turn, limits the current in the wire.

The battery is quite light; it is made of plastic, aluminum, and air, so it should be! If the current delivery problem could be beaten, it would have an excellent power-to-weight ratio. It certainly has duration; I ran the light all night (12 hours) and the aluminum plate still had all its original thickness, though it was pitted. It can be reused easily; just pull the aluminum and air plates out of the water/salt solution, clean them, and let them dry. The electrolyte is just water and table salt, by the way. The instructions say that the light will run for 12 hours before the electrolyte gets too thick, and the aluminum plates will last for 48 hours of running. The aluminum plate is 1-5/8 x 3-1/2 x 3/64 inches. The two plates plus air chamber plus light bulb are 2.75 ounces, the outside container brings the weight to 5.5 ounces. It generates 2.4 volts, 250 ma. This would be 12 Ah in 48 hours. A 12 Ah nickel-cadmium pack putting out 2.4 volts would weigh about 30 ounces, about four times heavier than the aluminum air battery. So, do we have a breakthrough, four times more flying? Not yet, the aluminum air cell needs quite a bit more engineering to solve the low current problem and the gelling of the electrolyte. If you want to play with one of these, send to Edmunds Scientific. I saw their advertisement in *Popular Science*, unfortunately I have misplaced the address, but they advertise nearly every month.

Ben Almojuela sent a lot of good information about his Sig Skybolt powered by an Astro cobalt 60. Here is what he says:

"I chose to build the Skybolt because I had flown several gas-powered ones and found that they were easy to fly, handled well on the ground, and looked good in the air. Also, there is a special thrill about flying a biplane that just isn't equalled by a monoplane. I used the Sig plans, but completely revised the structure to make it lighter. The wing structure was almost entirely 1/16-inch balsa, including built-up ailerons from 1/16-inch balsa. The ailerons turned out to be even stiffer than solid ailerons. Fuselage sides were 1/8-inch balsa with 1/16-inch sheet for the curved top and bottom. The tail surfaces were 1/4-inch solid sheet for stiffness (no flutter).

"The wings have 3/4 inch more chord and 2 inches more span than the Sig plans, for 900 sq. in. instead of the 790 sq. in. for the original Sig plane. All-up flying weight is 8 pounds, for a wing loading of 20.5 oz./sq. ft., the same as the gas Skybolt at 7 pounds, which is ideal. You cannot see that the wings are modified unless you have a standard Skybolt right next to it.

"When I received my Astro cobalt 50 in the mail, I realized that electric flight motors could no longer be considered toys. This monster weighed 1-1/4 pounds and was capable of major damage if not used properly! I had not realized it comes with four brushes, not two, so I would guess it could handle 40 amps, but I have never

Ben Almojuela and his Sig Skybolt, powered by an Astro 60.

driven it that hard.

"I've only used 24-cell packs for power, although Astro says it can run on 28. As installed in the plane, direct drive with a speed controller, fuse, and 24 sub C cells, it turns a Rev Up 12x8 at 10,000 rpm, a Zinger 12x9 at 9600 rpm, and a Graupner 13x8 at 7800 rpm. The best flight prop was the Graupner, even though it turned slower. Full power flights were 3-1/2 to 4 minutes with either of the two 1200 packs I have. One was made of Sanyo cells from various packs of different ancestries; the other was made of four cheapie six-cell Sanyo packs I got from Indy R/C.

"I used 14-gauge automotive wiring and 1/4-inch spade lug connectors, all from Shucks Auto Supply. The motor came with #16 wire and mini Molex plugs, which I did not use. However, on the last day of flying (see below) I changed to Jomar #12 'Killer' wire and Sermos connectors plus the Graupner prop. All this resulted in a definite improvement in performance, but I don't know how much was due to each change.

"I used a Jomar SC-4 speed control, and later I added a 30-amp fuse and arming switch after I 'smoked' the SC-4 when I plugged in the power pack (*No fuse, no arming switch! Ouch! MP*) with the prop pinned down in the grass. The fuse has never blown since I added it, so I guess I have never pulled more than 30 amps through the motor.

"I used Goldberg Ultracote to cover the plane. It is nice to work with, but rather heavy for smaller electrics. The red and white color scheme is the same as Norm Tobison's full-scale Skybolt. The radio was a standard Futaba four-channel; landing gear was the standard aluminum Hallco with 2-1/2-inch JZ plastic wheels, which are very light.

"The first flight was at the 1987 Hawks Electric Fly-In, and it flew well on a 24-cell 800 mAh pack made of 12 cells of my own plus 12 borrowed from Bernard Cawley. Later on I installed the 1200 packs and have flown it that way ever since.

"The plane is a dream to fly. Rolls even have the slight barrel-like motion characteristic of biplanes. It loops well, snap rolls and spins are very controllable, and landings and takeoffs are easy. It impresses the gas fliers, even those who have to have thrust ratios exceeding one!

"I usually use the plane for fun flying and demonstrations, but I did enter a couple of AMA Sport Aerobatics competitions and did fairly well. The limitation on my scores was due to the pilot, not the plane. I haven't flown an eight-pound plane for quite a few years, and it took some re-education to get 'back in the groove' with an airplane that has a lot more momentum than my three-pound Prairie Bird!

"Unfortunately, a year after the first flight I had an accident during the 1988 Hawks Fly-In. I flew a square loop, but all I got was a figure 9! I suspect an elevator servo or radio failure. As in every hard crash, the battery found its way to the front of the plane and wiped out the speed controller. The

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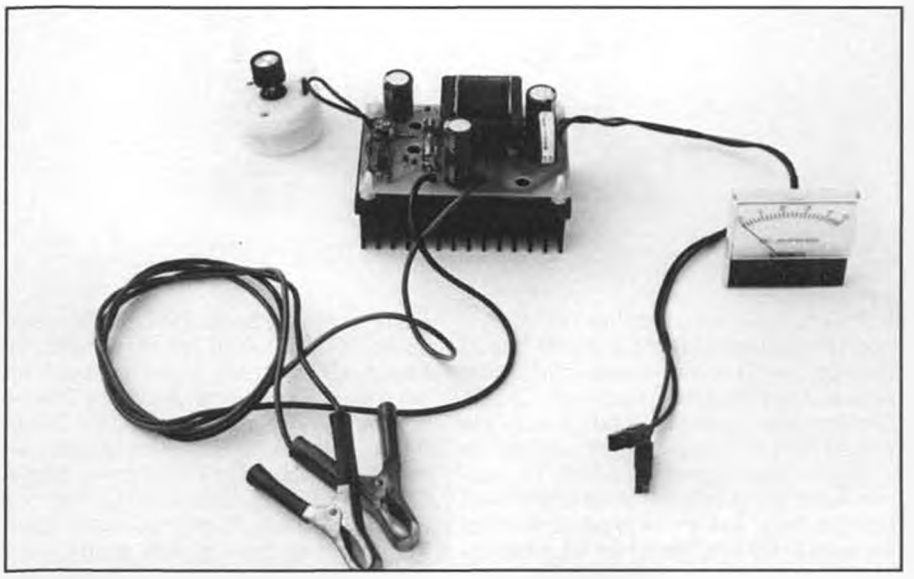
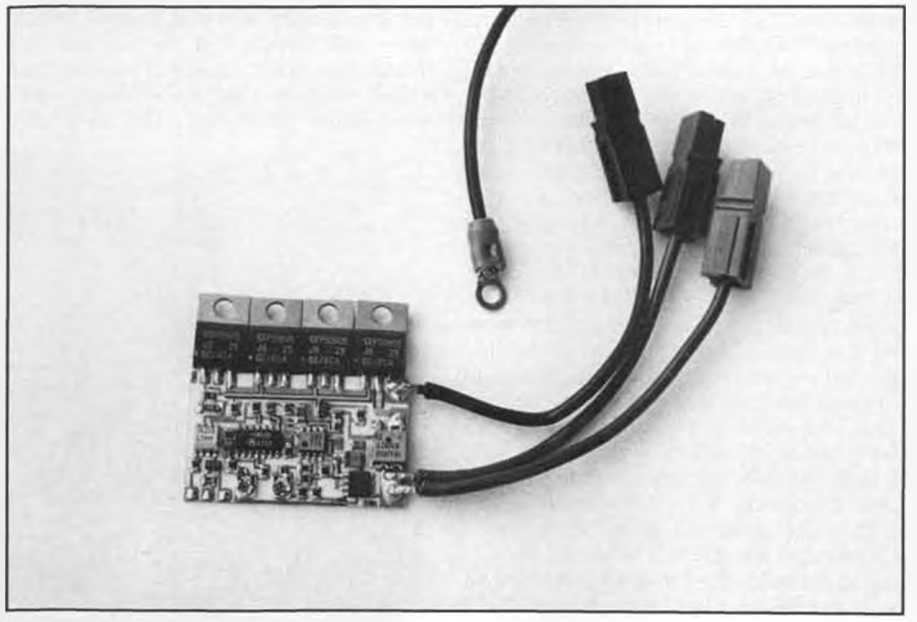
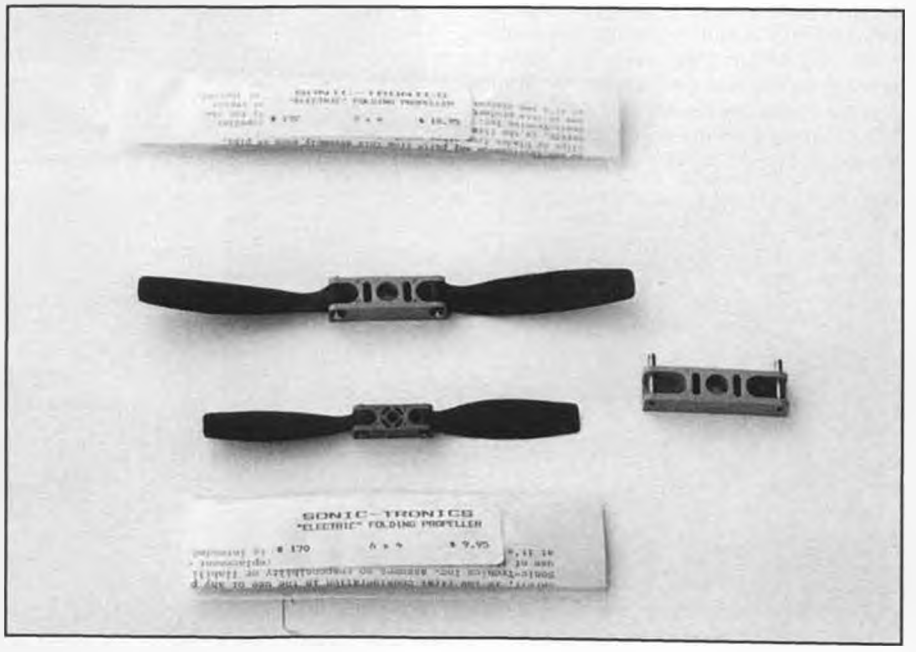


The new Jomar charger that will take care of charging up to 28 cells.



Jomar's SM-4 electronic throttle.



The new folding props from Sonic-Tronics, for electric models.

ALL ABOUT ARFS

By ART STEINBERG

• It was a beautiful and balmy Friday afternoon in southern California, and as I stood there on the dirt runway deeply inhaling the fresh air blowing in from the ocean, Charlie Onstott drove up in a cloud of dust. He parked his car alongside mine and we exchanged greetings, after which he proceeded to unload the attractive little model from the back seat. He next rubber-banded the wing to the fuselage while I checked my camera to see that all was in order. I was really impressed with the sleek, handsome appearance of the diminutive electric-powered ARF, and as I took a series of still photographs, I knew that I could count on an appealing picture for my next column.

It all began only a week before when I received a kit of Futaba's latest offering, the Hirobo Professor. The model had the standard sport-trainer configuration, a cabin-type fuselage sporting a high wing with a flat bottom airfoil. All this was supported by a tail dragger configuration landing gear. All structural parts were beautifully packaged, and all that was necessary was to assemble the two halves of the wing and glue the tail feathers to the fuselage. About all that was left to do was to attach the landing gear and install the electronics. Pushrods were pre-made and were of just the right length. Already mounted in the fuselage was a Mabuchi RS540SH electric motor with a 3:1 reduction gear. I telephoned Charlie and asked him if he would be willing to assemble the Professor and test-fly it with me. Without hesitation, he graciously agreed to take on the job, and the next day he dropped by to pick up the kit. After he devoted only about two hours to assembly, I was informed that the model was ready for testing, so we arranged a meeting the following Friday afternoon.

As I completed my preflight shots of the Professor, I gave Charlie the signal that I was ready for him to begin. He held the model above his head with his right hand, the transmitter in his left, faced due west into what had by now become a strong 20-knot breeze, and switched on the power. The little Mabuchi motor hummed quietly, and with a graceful and practiced forward throw he had the model airborne and climbing at a 45-degree angle. It continued gaining altitude, its wings holding rock steady, seeming entirely oblivious to the strong head wind. At about 200 feet, Charlie brought her into a right turn and leveled off. We were both surprised at the way this little model responded so smartly to every command. Next he tried a few loops, which were easily performed. The diminutive Professor objected to doing even the most rudimentary barrel roll, and it really drew the line at inverted flight. Charlie cut the throttle and brought her down low to do a few slow passes for the camera. These completed, he proceeded to climb back up to about 300 feet. We took turns flying in big lazy circles, turning the motor off and on intermittently. After nearly nine minutes of alternating between power-on and gliding, the six-cell 7.2-volt Ni-Cds were pretty well drained, so Charlie set her up in a nice flat approach and brought her in for a slick and gentle touchdown. He then put the Professor on a field charger, which was plugged into his dashboard cigarette lighter, and twelve minutes later we had a fully recharged battery. Next, even though the instruction book recommended only hand launches, I decided we just had to attempt an R.O.G. takeoff. We were a bit apprehensive about trying this on dirt, but we figured we had nothing to lose. Again, with Charlie at the controls, he aimed her straight upwind and turned the power on. The Professor tracked straight ahead, lifting her tail off the ground at about 20 feet, and by 35 feet into the takeoff run she was off the ground and climbing just as smoothly as from a

Bell P-39 Aircobra by Sure Flite and its proud owner, Mark Silzle. An easy-handling scale ARF.

As the Professor makes a low pass for the camera, one can sense its solid flying ability.

Futaba's Professor at bay, batteries charged, ready for its next flight.

hand launch. This flight was a repetition of the first, and even lasted a minute longer, much to our surprise.

As for the vital statistics: wingspan is 49 inches; flying weight was 2 pounds, 14 ounces; and wing loading came out to 16.1 ounces per square foot. The manufacturer lists the ready-to-fly weight as only two pounds, so I don't know exactly where our extra weight came from. We did use mini-servos as recommended, so we were at a loss in accounting for the extra 14 ounces. However, I subsequently arrived at a plausible explanation for most of the weight discrepancy. During testing of the factory prototype, the Futaba people must have used their new S33 servos, each of which weighs only 0.6 ounce! (See *Model Builder* October 1988 for a detailed report by Eloy Marez on this remarkable micro-servo.) Furthermore, Futaba has a tiny receiver which incorporates a built-in variable speed controller, and this was almost certainly installed in the prototype for an additional saving of weight. In any event, the Professor handled the load very nicely. Instead of the recommended motor controller, Charlie installed a simple servo-operated on/off switch. He did this because he felt that proportional speed control is rather unnecessary in a novice-type electric-powered model of this size, where you really need all the power you can get. He felt that a beginner would be unlikely to purchase a motor control amplifier for his first simple electric model anyway, because of the relatively high cost.

We finally reached a number of conclusions about the Hirobo Professor. The kit is quite complete, goes together easily and quickly, and the parts fit is excellent. As in many Japanese kits, the directions leave something to be desired, but diagrams are self-explanatory and assembly should go smoothly even for a beginner. Any modeler who purchases this or any other electric-powered airplane should keep in mind that a substantial investment in additional electronic equipment will be required. In this case the motor is supplied, but the flight battery and charger must be purchased separately, and they are not inexpensive. However, once these components are acquired, they will last indefinitely.

While a larger airplane is much more preferable for training purposes, the inherent flying stability and smooth, slow responses of this model would certainly permit basic R/C flight instruction. Nevertheless, the real purpose of the Professor is to serve as a good introductory model for electric flight, and not as a trainer for a novice R/C pilot. On the other hand, its small size allows it to be carried around easily in any vehicle, always ready for a quiet flight in almost any reasonably sized open area. The color scheme is a brilliant red and white, making it highly visible at most distances. Both Charlie and I found it to be a lot of fun, and we enthusiastically recommend the Professor to anyone interested in getting a foothold in the exciting field of electric R/C flight.

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Art and Gary Steinberg inspect their favorite Unlimited P-51, the Dago Red.

Quarter-scale Knight Twister by Don Fairbanks sits alongside its full-scale counterpart at Reno.

Number One son congratulates his idol Bob Hoover on completion of an outstanding flight demonstration at the Reno Air Races.

PLUG SPARKS

By JOHN POND

• As mentioned in the previous issue, we are proud to present the comments by the original co-designer and builder of the Miss America, Carl Schmaedig, retired and now living at 313 Sutton Circle, Apt. 127, Daytona Beach, Florida 32014.

Some background is in order (although it has been written in this column before) in that this free flight gas design was originated by Frank Zaic based on Carl's original nine-foot design that appeared in 1936 issues of *Model Craftsman*.

When Frank Zaic was approached by Johnny Frisoli of Scientific Model Airplane Co. to produce a design for a gas model kit, Carl carried the ball on this by constructing the first Miss America.

According to Carl, they were under considerable pressure to get this design into a production basis. So when Carl completed the model, they took it to the nearest available site. Although designed for a Brown Jr., a Baby Cyclone engine was employed. This proved to be their undoing.

In those days, shutoff timers were unheard of and engine runs were limited to the amount of fuel put in the gas tank. Carl and John reasoned they would use a hypodermic needle body as a tank so as to carefully meter the fuel.

Alas! The best plans of men and mice always go astray. They had not made allowances for the superior economy of the Baby Cyclone, which would run two to three times as long on the same fuel.

The boys gassed up the new model (after a few test glides and "guesstimates" on the trim) and fired up the engine. One could not ask for a better performance, as the model took off flawlessly, banked gently to the left, and proceeded to climb into the blue. With the amazing economy of the Baby Cyclone, the model was soon a speck, never to be seen again.

This caused considerable consternation to Frank and Carl. Another model was immediately built and presented to John Frisoli as a completed project without a single test flight!

The design was immediately kitted and proved to be the most successful gas model kit of all time, a tribute to Zaic and Schmaedig who made no further changes. What for? The first model dramatically demonstrated how it could fly.

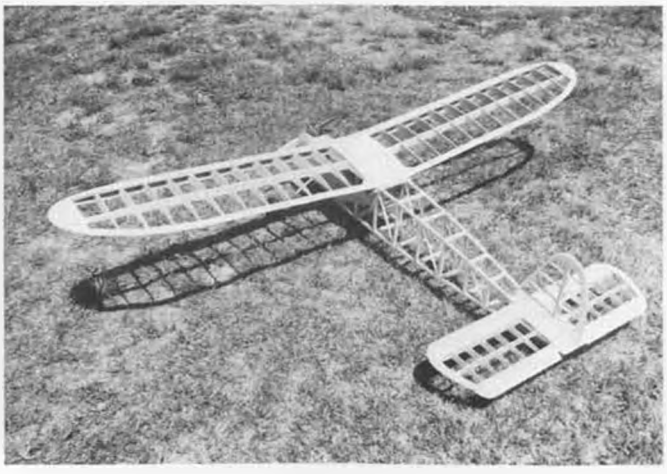
For this reason, when Carl decided to build another Miss America (50 years later), this writer asked for Carl's observations and opinions on the performance of the "new" Miss America. Of course, 50 years makes an old man out of you in a hurry, so the model built was radio-controlled. One simply cannot chase models anymore like we did when we were 21. In any respect, let's hear what Schmaedig has to say about his "Grand Old Lady" with no disrespect meant to the term "old." "I had to wait quite some time as the winds would not subside although the heat of 90 degrees F did not. Finally, one early morning on July 15, I took the Miss A for some flights and she proceeded to give us some interesting lessons.

"Weight was 4-3/4 pounds complete with Airtronics radio with three servos (rudder, elevator, and engine control) utilizing a Saito 45 four-cycle. Remarkably, the model was the same weight as the original." To get a good idea of what the original model looked like, Photo No. 1 shows Carl with an orange and grey colored Miss America.

1. Carl Schmaedig and his third Miss America built 50 years after the first two prototypes.

2. Excellent closeup of No. 3 Miss America with gray dope and orange trim.

3. The moment of truth! The first takeoff, straight as a die!

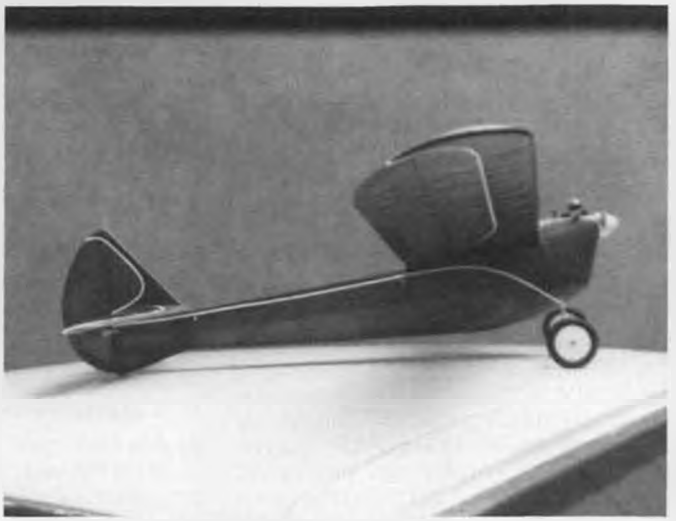


4. Schmaedig did a beautiful job of framing the Miss America with original-type framing methods.

5. Flat Tire Myers, SAM 49. Read the text for his unlucky saga.

6. A pair of red hot rubber modelers, Ernie and Jack Phelps, both of SAM 56, Wichita, Kansas.

7. Another SAM 56 busy modeler, Dan Smith, with his fleet of gas models on display.



8. A Schumacher Candid scaled for 1/2A Texaco by Mort Ross.

9. Walt Eggert coaxes his Brown Jr. in his original Eaglet design.

"My first concern was the location of the landing gear. Being well forward, would it taxi properly and end up by ground looping all over the place (a malady induced by incorrect placement of landing gear) with the gear at least nine inches ahead of the CG?" Photo No. 2 shows very clearly the forward location of the landing gear (to protect those precious hand-carved propellers). Note the use of Trexler wheels still being produced after all these years.

"Surprise! No problem! With a wheelbase as long as the fuselage, there was no problem, as there was plenty of weight on the tail wheel. The steering turned out to be rock solid and precise. The Trexler air wheels and her soft-sprung gear completely ignored the bumps, grass tufts, holes, and undulations that cause many a broken prop in the regular pattern models. The prop on Miss A rode high and dry without raising any dust, sand, or dirt.

"Lining the model on the runway, the engine throttle was opened up and Miss A proceeded straight down the runway. Since Miss A was a free flight design, I decided to use the radio *only* for correction, if needed. She was quickly airborne in an easy left-hand turn and surprising steep climb." Photo No. 3 shows what Carl is talking about.

"No elevator control was given. In retrospect, it wouldn't have changed anything, as the tailwheel remained on the ground during the takeoff with all parts leaving the ground simultaneously. The angle of climb was the same as the takeoff. No rudder corrections were given as generally required by tail draggers.

"As in most free flights, the takeoff results in a zoom, so I was looking carefully for a stall. At about 50 feet, the rate of climb slowed, dropped the nose, and then settled into that nice free flight climbing left turn. The old girl was showing me that all I had to do was to bring her back to the runway.

"The wash out, built into the rounded wing, was creating a semi-symmetrical sec-

10. Cliff Silva, now of Fallon, Nevada, likes them big: here's a Mike Roll 13-foot model.

11. Seen at Goulbourn, NSW, Lonel James flew this nice Shereshaw Champion. Photo: Abell.

An Atom Minor Mk III, machined up from castings by Bruce Abell. Turns 5,000 rpm with 14x5 prop.

12. A small part of the old timers that turned out for the SAM meet at Goulbourn, Australia.

tion that did its thing; no stall." (No tip stalls.)

"Throttle response was most gratifying; at full throttle, a 40- to 45-degree slow steady climb. Low throttle gave level flight and very low throttle resulted in a very slow descent.

"Response to rudder was predictable, much like a glider. Biggest surprise was a 40-degree roll was necessary to get the nose to drop. No trace of that old debbil spiral dive. Another surprise was when heading downwind, a considerable amount of rudder had to be applied to make a spiral dive to the runway. Nice turn, no dive! Took lots of down elevator to lose that last hundred feet. Some difference from a pattern ship!

"Landing was almost laughable, as low throttle did practically nothing to lose altitude. Finally cut the throttle entirely with a resulting flat glide that noticed a few thermal bumps and gained altitude. Only rudder was used and two 500-foot circles were a result before coming in.

"I could have used down elevator, but I wanted to maintain as much of the free flight character as I could. So I resisted the temptation to flare the model and let it come down hard on that springy landing gear. Did it bounce!

"I regard the landing gear as a pogo stick in slow motion. No damage to the model or propeller. All subsequent flights were much the same. The problem is that the Miss A is light and quickly affected by crosswinds. This requires careful alignment in taking off and landing." As can be seen in Photo No. 4, Carl did a beautiful job in framing the Miss America. Total all-up weight is only 4-3/4 pounds, which indicates a floater glide.

Back to Carl again:

"To say the least, I was delighted with the performance and only regret Frank Zaic did not see his design doing its thing. Frank didn't know it, but he designed an excellent R/C Trainer. The model is extremely easy to fly and is a superb trainer. Just wait until Frank sees the videotapes taken of the flights.

"I just can't seem to keep Miss America models around the house. This #3 model has been given to the AMA Museum. One of these days, I am going to build one just for me." Now how about that? This writer has been after Carl for a long time and is simply delighted things worked out so well.

ENGINE OF THE MONTH

This month's engine is through the courtesy of George Finato, well-known diesel engine collector. What else would be more appropriate than to obtain the Mark II version of the Drone from George?

As previously reported in the February 1981 issue of *Model Builder*, the first Drone was produced by the Drone Engineering Co. as designed by Leon Shulman. One can see the influence of the French Micron engine, as Leon did spend a considerable amount of time during World War II in France.

Initially, the engine was quite successful winning control line stunt events. Shulman did a fine job of promoting the diesel engine.

Inevitably, the competition started to catch up in the form of the glow engine. In response to this, Shulman redesigned his engine to include many new features, such as ball bearing crankshaft, heavier mounting lugs, removable front bearing plate, and a replaceable bolt stud to hold the propeller to the shaft.

A novel and clever new design of the cylinder head provided a recess fit over the cylinder liner. This was Shulman's answer to most of the requests for a variable compression head. Although limited in compression ratios, one could still make changes to compensate for climatic changes and different fuel combinations of ether, kerosene, and oil.

The basic compression of the Drone was 18-1/2 to 1 (same as the MK I); however, the weight was increased by a 1/4 ounce to 9-3/4 ounces. Other features that were retained was the .297 cu. in. displacement derived from a stroke of 7/8 inch and bore of 21/32 inch. Performance of the new engine, as indicated by strobatic tests made by the Flying Aces gang, gave 6,200 rpm with a standard 11-inch, 10-pitch Drone propeller, 9,700 rpm using a 9-6 prop, and 6,000 rpm with a large 14-6 prop. For those who like top figures, 12,500 rpm was obtained using an 8-ounce flywheel.

One of the desirable features of the Drone engine for control line stunt was the engine's ability to maintain constant rpm with a large prop throughout the maneuvers. This is the very thing that Duke Fox

14. Australian O/T columnist, Colin Borthwick, wins the Queensland State Champs Texaco trophy.

15. Des Slattery's smile belies the pain of having been cracked by the Cox engine in his Banshee.

was able to perfect in his Fox 29 glow engine. When the Fox engine hit the market, all other Class B engines used in the C/L Stunt event were displaced; ironically by the very thing that sold the Drone, a constant source of power throughout stunts.

The MK II Ball Bearing Drone was later succeeded by an engine fitted with a variable compression head. When this did not increase sales, a glow head model was offered in 1950. However, by that time, K&B Torpedo was firmly entrenched in free flight, while the "only" engine in stunt was the Fox 29. Hence, it is no great surprise to see these same engines (modified over the years) maintain their superiority.

Another contributing factor was the lack of diesel fuels (only two companies produced this) while a myriad variety of glow fuel was offered. Modelers, like any other shoppers, always take the item which is the most readily accessible at the dealer's shop, and performance is much more easily attained.

Interestingly enough, about the time the Drone started losing popularity, so did all the other diesel engines being produced in the United States.

FIFTY YEARS AGO, I WAS. . . .

Received a most interesting letter of C. N. (Nick Rankin) whom this writer met at the Reno West Coast SAM Champs. Nick thoroughly enjoyed himself there; hence, the reason for this letter. Nick had this to say:

"The Plug Sparks column in *Model Builder* is always interesting to read, as it deals with fellows modeling 50 years ago. In Kentucky during the depression, we were too poor and too far back in the "sticks" for me to have seen a model, let alone an engine.

"In 1941 I saw my first engine. A good friend of mine had a Baby Cyclone in a Cleveland Cloudster. Unfortunately, he never flew the model. So the first model I saw fly was a free flight powered by an Atom 09. This I witnessed in the summer of 1946 in Kentucky after I got out of the service.

"Later that year I bought an Ohlsson 23 and built a Megow Ranger. It flew great! I was hooked and have been flying those 'damn toys' ever since. (The 'damn toys' was my father's appellation.)

"About the only claim to fame I have in the modeling game is I flew and lost a Ringmaster (control line) over the side of the Aircraft U.S.S. Kearsarge (CV-33). (I had signed up for another hitch in the Navy.) This occurred about 600 miles west of Pearl Harbor. The Kearsarge was doing about 30 knots with a following wind of 30 knots, giving practically calm weather on the flight deck. Both lines broke and the last I saw of my green head Torpedo 35 and the Ringmaster was floating aft. No chance to recover that one!

"Two or three years later, I found a witness to this incident when I met Cliff Wierick, who had run the hobby shop in that 'rust bucket.' Cliff told me that I really chewed him out for selling poor lines. I had forgotten but, knowing myself, Cliff was probably right.

"I have been out of the Navy since November, 1954, and have been married for 36 years. My wife doesn't care too much for models or modeling (*Join the club, Nick. jp*), but I would say she is reconciled to a guy that does models.

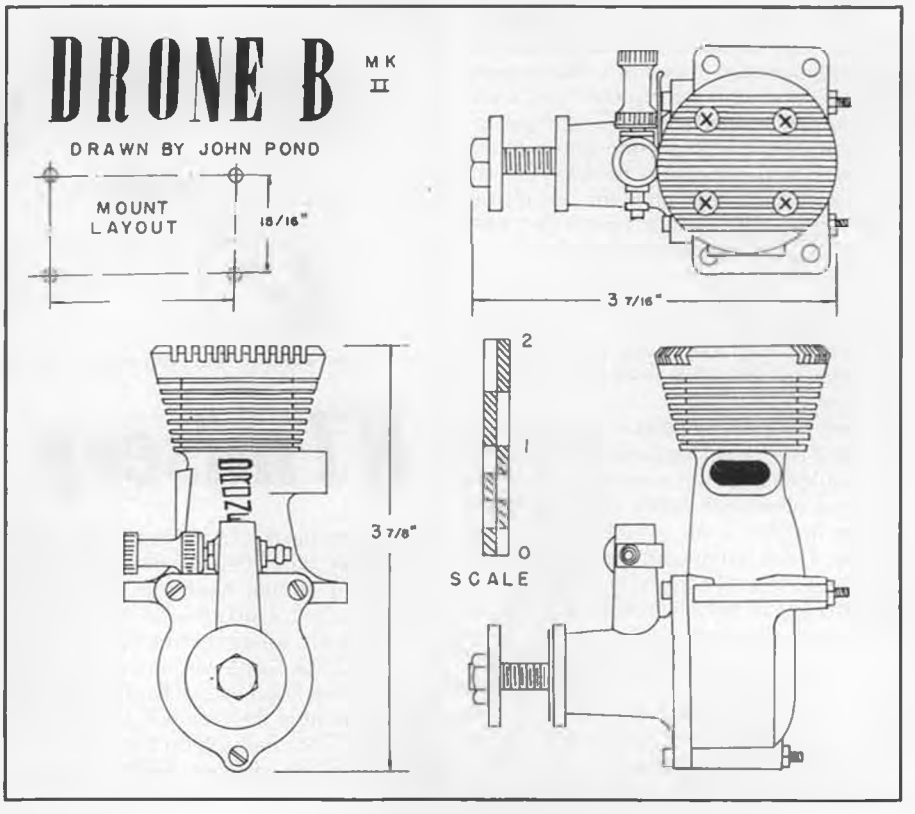
"I have joined SAM and I am a member of SAM 8. This old timer game has really gotten me into modeling. This phase of flying is a great way to go! Have a cold beer on me." (Now how did he know of my penchant?)

"FLAT-TIRE MYERS"

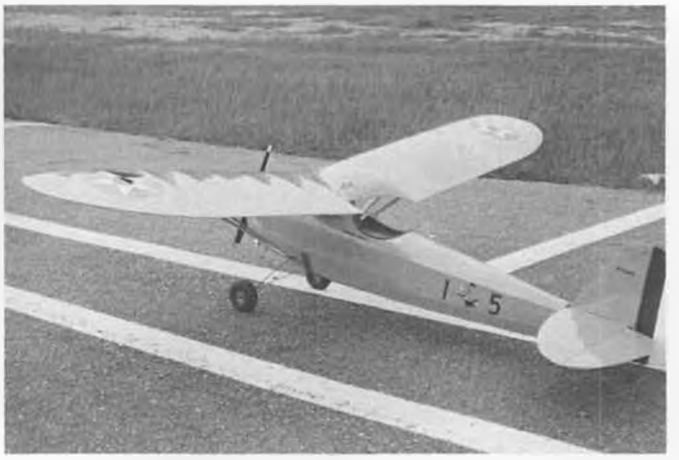
Even the title has a euphonious ring to it, but the tale of woe by Ken Myers certainly emphasizes Murphy's Law, "If it can go wrong, it will." Our saga begins with Myers making the long trip from Los Angeles to Marysville in Northern California (a mere 486 miles!). Photo No. 5 is not the most flattering of Ken Myers but after the trouble he had you would be hollering too. Let's hear what Ken had to say about this king-size debacle. (This fore shortened account taken from SAM 49 newsletter.)

"When packing a car, make a checklist (*This writer finds them invaluable. jp*) and then use it! Upon arriving at Marysville, I found I had left every blasted transmitter home!

"Well, thanks to Nick Nicholau, who offered any model to fly; John Pond, who insisted I use his transmitter and airborne



17. Two Italian old timers by Arve Mozzarini, 1949 Dindi, and an 8-foot Moar, Brown Jr. powered.



16. Nice blue and yellow Moyer Cloud Cruiser by Les McKay.

unit from his back-up model; and Don Bekins, for his 'Dial-A-Crash' Transmitter that had to be watched, as some of the servo actions were reversed.

"Saturday was a great day with no wind. To assure myself everything was in order, I tested my 1/2A engine. The engine backfired three times and flew into my face. Enough of this!

"Electric Texaco started out really well with a max 15-minute flight on only a 90-second motor run! Hot dog! Second flight: a 4-minute motor run with barely the same time in the glide; blew it, got a third. Didn't do much the rest of the day's events, so why enumerate the difficulties?

"Sunday was another lovely day, so I set up camp to do battle. The first flight of the Limited Engine Run Electric Event was a max. Got this event wired! Second flight was a ground loop, destroying the spur gear of the reduction unit. Thanks to Jack Alten, who is a one-man repair station for electrics on the field, I was quickly repaired and airborne.

"Now what? Something was definitely wrong with all the weird maneuvers the model proceeded to perform. Finally shutting off the motor, five minutes later, I was able to put the model down in one piece.

"Examination showed the entire motor assembly had come loose from the firewall and had wound itself up in the connecting wires to the microswitch. How it ever held is one of the 'unsolved mysteries.'

"Third flight, still in contention, let the model go and the prop and hub assembly promptly flew off. That was it. No more gear assemblies available. I was an also-ran in the other events with further misadventures too numerous to print.

"Ever have premonitions of impending disaster? After what happened on the return trip on Monday, I am a believer. Someone told me about Sal Taibi's recent accident where he blew a tire and rolled his 1958 Chevy. I was completely overcome with helplessness until a friend of mine gave me a quartz crystal he had mined. I was assured this would change my luck.

"The feeling of disaster still lingered as I started for Los Angeles. With only 150 miles gone, the 1951 Mercury began to shake violently. Slow down to 50 and the oscillations decrease. At the next rest area, I pulled over and I took the car out of gear. The left front tire exploded! Imagine what would have happened on the road if the tire blew up then.

"I changed the tire and found the spare was low on air (plan ahead!), so I borrowed a foot pump and limped into the town of Kettleman. The attendant changed the tire and checked the air in the right front. The valve stem fell off in his hand! What the heck, I felt better with two new front tires.

"Something was not right. Only 12 miles down the road, the left rear tire blew. Okay, mounted the spare which had been fixed. The tire lug wrench broke.

"After a three-hour wait in the desert, the CHP showed up and called a tow truck. Upon arriving, the tow truck driver refused to tow my 'low rider.'

"What to do? It cost $50 to borrow his lug wrench and mount the spare. I prepared to drive slowly to the next station 15 miles down the road. Can you believe it, the right rear tire blew. I was towed into the next town at 22:00 (that's 10:00 p.m. for you landlubbers).

"Somewhere in the desert between Kettleman and Lost Hills on Hwy. 5, there is a pretty quartz crystal lying in the desert just waiting for some *lucky* soul to find it. That will be a story for someone else."

SAM ACTIVITIES

SAM 56

The WHAM (Wichita Historical Airplane Modelers), SAM 56, well represented by Ernie Linn, editor of *SAM 56 Sez*, sent in quite a few photos taken by Dan Walton at their June 4 and 5 fun-fly.

The rubber events are quite popular in the Wichita area mainly due to the efforts of Ernie. Worth noting is the announcement of the WHAM Second Annual features three rubber events out of ten while the Glue Dobbers meet being held in conjunction will feature two out of eight. With better rubber being made available, interest in rubber power has picked up considerably.

Photo No. 6 shows what we mean with Ernie Linn holding his original Kansas

Continued on page 70

Jim Robinson's Li'l Misery, this month's Old Timer.

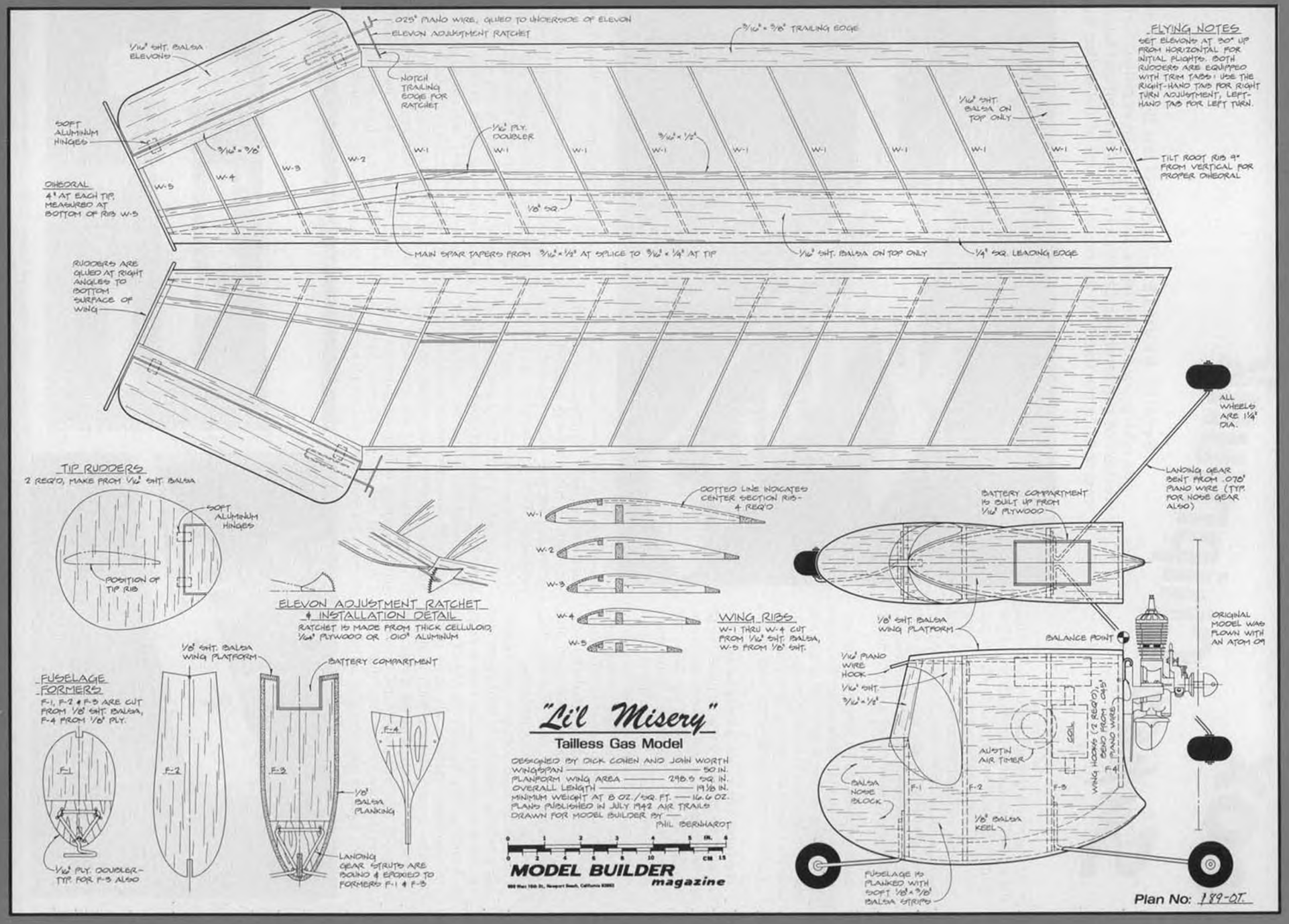
li'l misery

Design by: Dick Cohen & John Worth
Text by: Bill Northrop
Plan by: Phil Bernhardt

• We just met this Old Timer of the Month, in person, only a few weeks ago. It was at the 22nd annual Northrop Flying Wing contest at Taft, California, Sunday, October 3rd. Actually, we met two of them. One was built by Dick Lyons, of Camarillo, and the other by Jim Robinson, of Pasa Robles. Both modelers were there to "kill two birds," as the SCIFS Annual was on the same weekend, both Saturday and Sunday, so it was only natural to enter the flying wing power event with Old Timer wings!

The model, "Li'l Misery," was published in the July 1942 issue of *Air Trails* and was credited to co-authors Dick Cohen and John Worth. . .yes, it's the same John Worth. The 50-inch span model was designed for the Atom engine, and a Cox Baby

Continued on page 75


.025" PIANO WIRE, GLUED TO UNDERSIDE OF ELEVON
ELEVON ADJUSTMENT RATCHET
3/16" x 3/8" TRAILING EDGE
1/16" SHT. BALSA ELEVONS
NOTCH TRAILING EDGE FOR RATCHET
SOFT ALUMINUM HINGES
3/16" x 3/8"
1/16" PLY. DOUBLER
3/16" x 1/2"
1/16" SHT. BALSA ON TOP ONLY
TILT ROOT RIB 9° FROM VERTICAL FOR PROPER DIHEDRAL
W-1
W-2
W-3
W-4
W-5
DIHEDRAL
4" AT EACH TIP, MEASURED AT BOTTOM OF RIB W-5
1/8" SQ.
MAIN SPAR TAPERS FROM 3/16" x 1/2" AT SPLICE TO 3/16" x 1/4" AT TIP
1/16" SHT. BALSA ON TOP ONLY
1/4" SQ. LEADING EDGE
RUDDERS ARE GLUED AT RIGHT ANGLES TO BOTTOM SURFACE OF WING
ALL WHEELS ARE 1 1/4" DIA.
LANDING GEAR BENT FROM .070" PIANO WIRE (TIP FOR NOSE GEAR ALSO)
TIP RUDDERS
2 REQ'D, MAKE FROM 1/16" SHT. BALSA
SOFT ALUMINUM HINGES
POSITION OF TIP RIB
ELEVON ADJUSTMENT RATCHET & INSTALLATION DETAIL
RATCHET IS MADE FROM THICK CELLULOID, 1/64" PLYWOOD OR .010" ALUMINUM
DOTTED LINE INDICATES CENTER SECTION RIB - 4 REQ'D
W-1
W-2
W-3
W-4
W-5
WING RIBS
W-1 THRU W-4 CUT FROM 1/16" SHT. BALSA, W-5 FROM 1/8" SHT.
BATTERY COMPARTMENT IS BUILT UP FROM 1/16" PLYWOOD
1/8" SHT. BALSA WING PLATFORM
BALANCE POINT
ORIGINAL MODEL WAS FLOWN WITH AN ATOM 09
1/16" PIANO WIRE HOOK
1/16" SHT.
3/16" x 1/8"
AUSTIN AIR TIMER
BALSA NOSE BLOCK
1/8" BALSA KEEL
WING HOOKS (2 REQ'D), BEND FROM .045" PIANO WIRE
F-1
F-2
F-3
F-4
FUSELAGE IS PLANKED WITH SOFT 1/8" x 3/8" BALSA STRIPS
FUSELAGE FORMERS
F-1, F-2 & F-3 ARE CUT FROM 1/8" SHT. BALSA, F-4 FROM 1/16" PLY.
1/8" SHT. BALSA WING PLATFORM
BATTERY COMPARTMENT
1/8" BALSA PLANKING
LANDING GEAR STRUTS ARE BOUND & EPOXIED TO FORMERS F-1 & F-3
1/16" PLY. DOUBLER - TYP. FOR F-3 ALSO
FLYING NOTES
SET ELEVONS AT 30° UP FROM HORIZONTAL FOR INITIAL FLIGHTS. BOTH RUDDERS ARE EQUIPPED WITH TRIM TABS: USE THE RIGHT-HAND TAB FOR RIGHT TURN ADJUSTMENT, LEFT-HAND TAB FOR LEFT TURN.
"Li'l Misery"
Tailless Gas Model
DESIGNED BY DICK COHEN AND JOHN WORTH
WINGSPAN — 50 IN.
PLANFORM WING AREA — 298.5 SQ. IN.
OVERALL LENGTH — 19 3/8 IN.
MINIMUM WEIGHT AT 8 OZ./SQ. FT. — 16.6 OZ.
PLANS PUBLISHED IN JULY 1942 AIR TRAILS
DRAWN FOR MODEL BUILDER BY — PHIL BERNHARDT
MODEL BUILDER magazine
Plan No: 189-OT.

COX Super Chipmunk

By MIKE KEVILLE. . .As control line flying continues its resurgence in popularity, here comes an excellent-flying version of the aerobatic Chipmunk. This foam-winged beauty responds to the touch of the novice as well as the skilled flier.

• As you may have noticed, control line flying is making a strong comeback across the country. Several "cottage industry" firms, and one major manufacturer, currently produce sport and competition kits of excellent quality. Cox Hobbies, Inc., long-noted for their ready-to-fly C/L and R/C designs, now offers this .049-powered Super Chipmunk, a foam-winged stunt trainer spanning 30-1/2 inches.

Back in the mid-70s, they tried this approach with similar designs and materials, but for some reason those never caught on and were dropped from their product line. With the current increase in control line activity, this re-engineered version may do the trick.

The Super Chipmunk is a step beyond the toy store image, for it's a genuine *flying* machine. Cox advises that the model is not intended for first-time fliers, but rather for those having ". . .successful experience with beginner planes." (We might question that, feeling that this design is, in fact, *easier* to fly than most of the lower-priced, overweight, and skittish "trainers" so often seen in the hands of beginners.) Needless to say, the more advanced/expert fliers will also enjoy putting this one through The Pattern—as we will illustrate below.

This reporter is *far* from being an "expert" (pause here for a chorus of loud agreement from local modelers) but *can* read instructions and stumble through the AMA Precision Aerobatics pattern, although many judges fail to recognize it as such. A phone call from WCN, requesting the review, was followed by a UPS delivery from Cox, and a chat with their John Elliot. (Yep, that's "Big John," for those of you who also go back a few years!) John was very clear with his request that we don't "whitewash" this product with a rubber-stamp approval, but rather that we give an honest and candid evaluation. With that in mind, be advised that: *What you read is what you get.*

The model is attractively packaged in a large and brightly decorated carton. Bearing in mind that it may be purchased by those with no experience whatsoever, a by-the-book assembly was mandatory (actually, it won't go together any *other* way). Assembly consists of four steps, using a well-illustrated set of instructions. Steps 5 through 20 deal with preparation for flight and actual flying, and are likewise very thorough.

All components are securely packaged. Protected by a sturdy cardboard cradle is the molded plastic fuselage, with integral stabilizer/elevators and bellcrank/pushrod assembly. The molded foam wing, featuring a symmetrical airfoil, is likewise well-protected. Two poly bags contain all other components, including a plastic flying handle, a spool of Dacron flying line, and a really slick little Stunt tank. As with any kit, all parts were laid out on the workbench and inventoried prior to assembly.

We purposely did not break-in, or even

The components of the Chipmunk by Cox, all laid out for inspection.

The lower nose piece hold downs. Engine is the venerable Cox .049; prop is a black Cox 6-3 with a soft spinner.

test-run, the engine (Cox .049, Cat. No. 00021926) at home, as potential users of this product are unlikely to do so, and we wanted to anticipate their (assumed) experience level. The engine comes equipped with a Cox black 6-3 prop and a soft spinner.

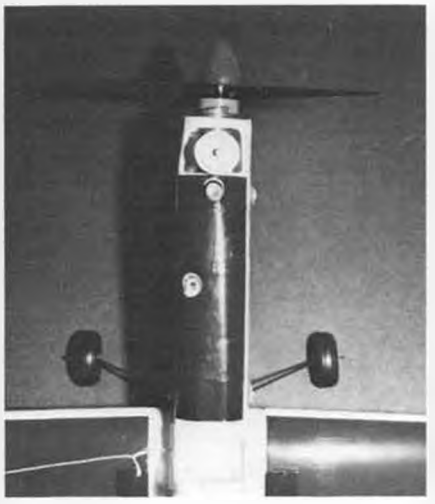
Assembly took us 12 minutes; attaching the press-on trim colors, about 20. (That's just *our* pace. We know a certain combat flier who could probably assemble a dozen of these on his lunch break.) Anyone who can read, or interpret illustrations, won't spend much time on assembly; the instruction sheet is that clear, and rates an "A+." No adhesives are required. All components are held in place with rubber bands, screws, or they simply snap into place. Some minor flashing was removed from the edges using a sanding stick and 220-grit paper, then all plastic parts were washed in a mild solution of lukewarm dish soap and water to remove any residual mold release and allowed to dry. The engine and tank are connected with a length of fuel tubing (supplied). These are inserted into the fuselage shell as a unit and covered by the lower nose piece, which is held in place with rubber bands. As supplied, our length of fuel tubing was too long and would kink when enclosed. We removed about 7/8 inch and it fit perfectly. To Cox's credit, it's always better to have too much of *any* material in a kit; however, we've suggested they include a note about trimming this to length ("Why won't my engine run, Mister?"). We also suggest a careful cleaning/washing of the plastic tank. Half-A's, especially reed-valves, take a dim view of any amount of foreign matter. The tank, incidentally, is worth noting: correctly vented for stunt, it is of ample capacity and *may* become a hot-selling item on its own. Also commendable is the built-in engine offset to help maintain line tension.

The one-piece foam wing is installed next. A plastic leadout guide is inserted, then the wing is placed into the fuselage "saddle" and covered with the fairing provided, being fastened with three screws, the longest of which also secures the bellcrank/pushrod assembly in the fuselage. As mentioned, the wing has a symmetrical airfoil. It's not a thick section but is adequate and won't produce as much drag as a thicker section—critical on small models. There are some minor protrusions on the surface, probably from the molding process, that we removed with light sanding. This was to help the press-on decorations adhere better, but primarily to round the LE completely and (hopefully) decrease the stall speed.

Next, the wire landing gear is snapped in place. This is supplied with lightweight plastic wheels installed. Then the vertical fin, with built-in rudder offset, is installed, and the markings applied to the fuselage, fin, and wing. Following careful application on the frame trim, the canopy is snapped into place, and the model is ready to fly.

The completed aircraft presents a striking attractiveness to spectators. One youngster was heard to say that it looks "rad," which (for those of you who may have been in Outer Mongolia the past two years) implies an extreme degree of acceptance.

Author's daughter, Karen displays the completed model.



Note engine offset for proper CL flying.

Paul Walker, Nats Stunt winner and FAI team member, putting the Chipmunk through an outside loop.

Mike Fox tunes the easy-starting .049 at Whittier Narrows during a test session.

One departure from the recommended sequence was to apply the press-on decorations before assembly. It seemed much easier to position them correctly on the individual pieces, especially the vertical fin, which is an exact fit around the rudder offset and the elevator-joiner piece. To help seal and preserve the markings, we applied a sealer of thin polyurethane to all edges. Then it was off to Whittier Narrows for flight testing.

For this evaluation, we used the dacron flying lines and plastic handle supplied with the model. The engine started on the first flip, using its spring starter. Peak ground rpm, on Cox sport fuel, was 12,100. Inverted, this fell to 11,600. These figures should increase as the engine gets more running time. Takeoffs were smooth. New fliers should have no problem, for it tracks steady in level flight. We tried a few mild maneuvers: inside and outside loops, lazy eights, and inverted flight. Being somewhat nose-heavy, the plane needed to be flown in wide maneuvers, otherwise it tended to stall and mush. We felt that it could use a bit more power, but that may have just been the new and tight engine. We pancaked it into the asphalt a couple of times with no damage. It's tough!

The model turned better inside than outside, yawed somewhat on square corners, but was very forgiving and easy to control, and tracked the same when upright or inverted.

For the "acid test" we turned the handle over to Nationals Stunt winner and USA-FAI Team member, Paul Walker, who proceeded to take off and fly most of the AMA pattern, although to be fair, it should be noted that he could probably score 500 points flying a drill press. He had to *work* at it, owing perhaps to the amount of power available, but he *did* manage such things as horizontal square eights and outside square loops. We then departed from procedure a bit and refueled with 40-percent nitro fuel, which perked-up performance considerably. Paul was obviously enjoying it (as was the "audience," which includes stunt expert Tom Warden and the racing team of Mike Fox/Don Repp), for he asked for several

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Control Line

BY JOHN THOMPSON

• The mail received by this column seems to parallel what I've been hearing from people involved in the manufacture and sale of products for use by control line fliers: Control line as a hobby is enjoying a new, exciting period of growth.

My mail almost daily brings notes from fliers in various corners of the United States and abroad as well, some of whom have discovered, after flying alone for some time, that there are others in their area.

Having just returned from a contest myself, I also continue to be encouraged by the number of new faces, and of old ones returning to the flying field.

This prompts me to repeat something said in this space before: Check your local hobby shop and the contest calendar published by the Academy of Model Aeronautics. You may find that there are people flying in your area that you never knew about.

I make this observation with one eye on a two-inch thick folder of mail that has piled up in the past few weeks. That means it's time to open some of those fascinating letters and pass them along in the interest of spreading the word about CL from one point on our big circle to another.

MAILBAG

On top of the stack is a letter from Peter Harrison of Victoria, Australia, with a report on some activities of the Control Line Aircraft Modelers Inc. club (CLAM). Peter also sends along a couple of copies of their detailed and excellent newsletter, *Circle Torque*. True to the promise on the cover, it includes club news, articles, building hints, and contest rules.

I found the club name interesting because it is similar to one of the Pacific Northwest's clubs, one of which I was a charter member in 1976, the North Coast Control Line Aero Modelers' Society (CLAMS) of Astoria, Oregon. I don't know if there's the same connection in the case of the Australia group, but in Astoria the acronym was a tipoff to one of the more sought-after seafood delicacies of the local beaches. The club for a time had a "mascot" in the form of a "flying clam." But on to some excerpts from Peter Harrison's letter:

"I hope you enjoy reading our club magazine, *Circle Torque*. I am the new editor and enclose No. 1 and 2 of Vol. 15.

Lee Hoffman's first gas model, circa 1937, a Stanzel Tiger Shark, powered by an Ohlsson .19.

Lee's Tiger Shark with the landing gear moved to the rear, and converted from whip control to U-control. Also about 1937.

The 1937 Ohlsson 23 showing the tank mounting and M&M wheels.

The Stenzel Shark with an Ohlsson .60, converted to dual line control. Wingspan is 24 inches.

The Stenzel Tiger Shark repainted in 1940 to reflect the wartime conditions. Estimated air time, 20 hours.

"Being a newcomer into active modeling, my friends tell me that there has been a newsletter in existence for much longer than 15 years; they think at least 20 to 25 years or so.

"Control Line modeling in Australia, of course, dates back much further than that. There are much better qualified people around than me who can speak with authority of the early days in Australia.

"Our club, Control Line Aircraft Modelers, Inc., is very active in Melbourne. All classes are flown in competition, in local, state and national, and occasionally international level competitions.

"Our flying field is located on the local light aircraft airport, Moorabbin Airport, an attractive and popular site graciously provided by the Federal Department of Transport.

"We do not run a clubhouse; our overheads are kept to a minimum to keep the sport attractive to those who may not have a large disposable income to spend on converting perfectly good balsa wood and aluminum into match sticks and paperweights; e.g., people like me.

"Models I am building at present include a Gordon Burford Taipan 1.5cc diesel-powered 'Jitterbug' for the Knox Vintage comp, as well as a Supertigre 'Genesis 46' for myself and a PAW 1.5S 'Mini Goodyear—Mike Argander Special' for my 12-year-old boy.

"The main CL clubs near me are: Knox Model Aircraft Club (KMAC), Peter Rowland, Editor (KMAC News), 12 Yorkshire St., Blackburn, 3130 Victoria, Australia, and Frankstrom & District Model Aero Club (FADMAC), c/o Graeme Wilson, P. O. Box 298, Seaford 3198, Victoria, Australia.

"There are, of course, several other clubs around Melbourne, and all if not the greater majority are members of the VMAA, Victorian Model Aircraft Association, and are through this body members of MAAA, the Model Aircraft Association of Australia.

"The above clubs are solely CL clubs; however, there is a very strong Model Railways of the Sky fraternity active here. (We can spend enough cash with models that only go 70-feet high.)

"I recently traveled to Sydney and was a participant in Big Art Adamisin's 'Down Under Stunt Clinic' held just before the New South Wales State Champs. Big Art was very popular and was able to encourage us to try harder to improve our stunt flying. There were some marked improvements by the time the actual competition started. . . .

". . .We are especially interested in en-

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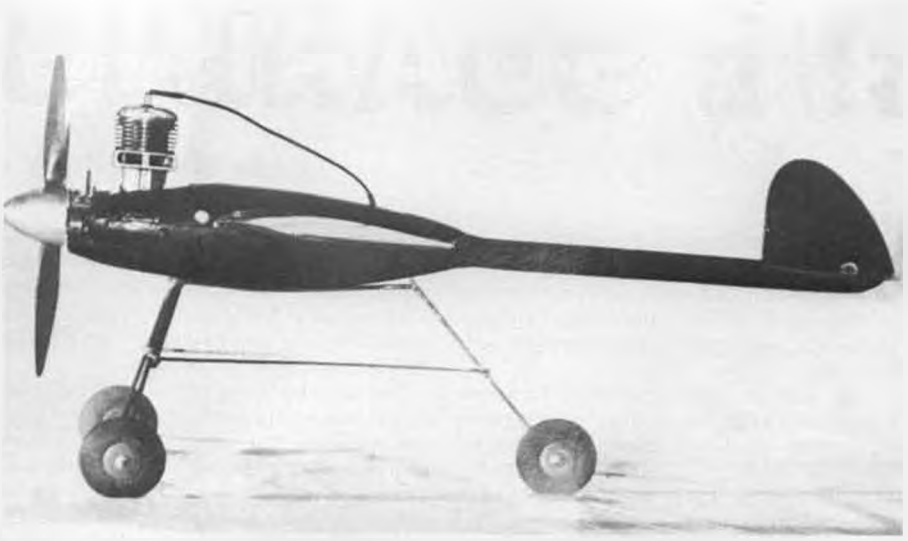


Frank Bowman sent this photo of his dad Charles' ignition speed plane. Date is mid-40s, but engine and top speed are unknown.

Charles Bowman's restored Pete from the mid-40s-50s. Engine is not identified.

The Buzz Bomb, an original, Cyclone-powered model by Charles Bowman. Also mid-40s.

A McCoy .60 ignition engine converted to glow to power this speed ship. Best recorded speed was 129.03 mph.

A Dooling .29-powered model, best recorded speed was 126.76 mph.

R/C SOARING

By BILL FORREY

• Big disappointment for purist sailplane modelers! This writer was able to search out and locate only *one* really *new* sailplane kit at this year's RCHTA-sponsored Chicago show. He saw quite a few motorgliders, however.

This year it seems that manufacturers have gone R&D happy in the electric power movement. Guillow's, Goldberg Models, Midwest Products, Great Planes Model Manufacturing, Easy Built Models, EZ Sports Aviation, Top Flite Models, Parma International, World Engines, Kyosho, and Davey Systems all had new electrics in their booths. Some were scale models, some were sport models, and a few were motorgliders. It's obvious that these companies perceive electrics as a real and growing market. Perhaps this is partly due to the loss of power flying fields to noise complaints, a problem not shared by the two silent flight cousins, sailplanes, and electric aircraft.

Related to the subject of this column, "R/C Soaring," are the electric motorgliders. These are models which require the use of a motor and a propeller to provide thrust for launching the aircraft. (Propellers are things you use for epoxy sticks and letter openers, right?) Traditional gliders are towed into the air on the end of long tow lines either by hand, by winch, or by some kind of elastic cord. Purists, I suppose, always hand-tow, which is difficult to do alone. Small groups or lone eagles usually hi-start. In club flying, the electric winch is preferred. With the exception of slope gliders, motorgliders are the easiest of all sailplanes to launch.

ROBBE MODEL SPORT

Hanging high above the Robbe booth was the most unique-looking sport model of the whole show, the Vampire. This model is highly prefabricated, with factory-trimmed wing panels that have the servo wells precut. Also included are machined ailerons, steel wing joiners, bell cranks, horns, clevises, and towhook. Wingspan is 10.5 feet; weight, 59.5 ounces.

The Vampire is big. Although the display model wasn't finished yet (having no control surfaces), the Vampire design is supposed to have elevons, landing flaps, and motor control (four channels). There are no stabilizing vertical or horizontal surfaces, and there is only a slight bulge where a fuselage would be.

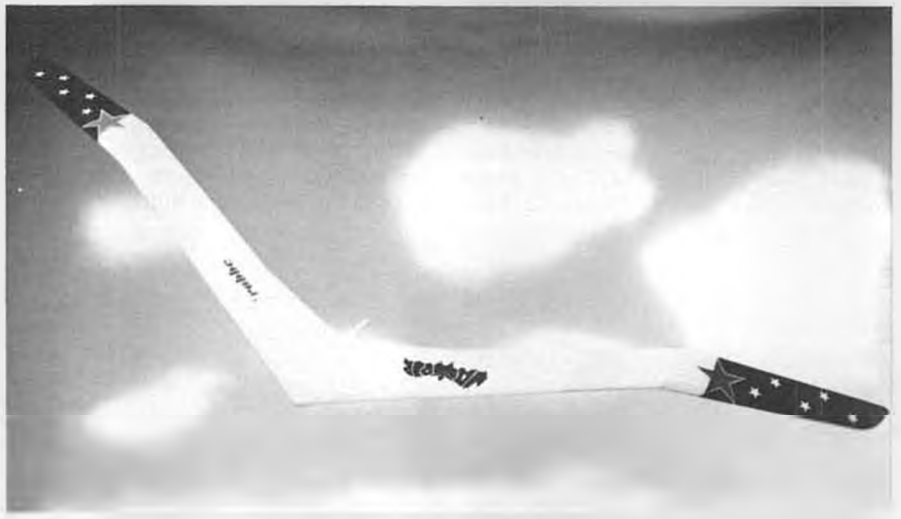
According to Robbe representatives at the booth, the electric power pod is an option. The model can be flown as strictly sailplane if desired.

Stay tuned, see your local Robbe dealer, or contact Robbe directly if you wish more info. Their address is: Robbe Model sport, 180 Township Line Road, Belle Mead, New Jersey 08502, or call (201) 359-2115. Remember, you saw it in *Model Builder.*

TOP FLIGHT MODELS

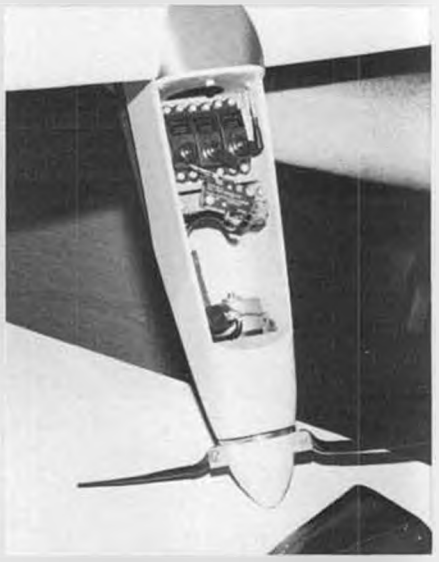
Scott Christensen, head R&D wiz at Top Flite and world's leading authority on MonoKote application, has done it again! It appears that modelers went a little nuts over his little Astro Flight cobalt 035-powered Phasoar motorglider at the Toledo Show this spring. I know I did. Well, that little gem is going to have an 05-size big brother sometime this coming spring.

Unveiled at the show was Scott's unnamed prototype two-meter electric, which, for the time being, has been given the code name "Fred." It looks right, just like the Phasoar. It has a perfectly angled polyhedral wing, Eppler 214 airfoil (an excellent choice), and an all-moving stab. It has a removable belly pod which houses the motor Ni-Cds. With this feature it is not necessary to remove the model's wing to get the battery pack out for charging or changing. One half turn on a special screw releases the pod/hatch and the whole thing



Robbe's new Vampire, a highly prefabricated sport model. See text.

Scott Christensen of Top Flite Models with the Project Fred 2-meter electric motorglider due to become a kit this spring. Based on the Phasoar motorglider seen below in photo.



Inside the fuselage of the Project Fred. Lots of room for servos or speed controllers. Astro Challenger 05 direct drive motor and Airtronics radio gear shown.

slides back and out.

The "Fred" project is currently undergoing cost analysis, so prices aren't known at press time. Check back with me in the IMS show report in a few months for details.

KYOSHO

The Kyosho Express is a nifty little Japanese ARF motorglider. It's new. It's small. It's electric. It's scale-like. It resembles the Kyosho Valencia except for its tricycle landing gear. And because there was no literature available for it at the show, I know very little about it. Contact your local Kyosho dealer for details, or write the importer, Great Planes Model Distributors, P.O. Box 4021, Champaign, Illinois 61820.

EZ SPORTS AVIATION

As detailed here a few months ago in the Toledo report, the EZ Elec. 1800 from Global Hobby Distributors was also shown in Chicago. Here is a large, powerful ARF motorglider that is different from your typical import. At altitude, the Elec. 1800's 530 square inches of wing area over its 73-inch span is really easy to see. It has a powerful, high current, seven-cell motor with an all-metal gear box and a glass nylon folding prop with spinner. At 50 ounces, this combination really climbs out in a hurry. In 45 seconds you are at 300 to 400 feet and ready to glide.

Now available through dealers or mail order companies, the Elec. 1800 runs about $179. It is 90 percent ready to fly right out of the box and comes with everything except battery, speed controller or micro switch, and a radio.

COMPOSIT AIRCRAFT ENGINEERING & SUPPLY

This company doesn't make model sailplane kits. It produces tool kits and materials for making model sailplanes. If you ever scratchbuild, or are even thinking about it, give these products a close look.

At three different times I took three photos in this booth. What Composit sells is a vacuum pump system for vacuum bagging foam core wings. It is difficult to photograph. Everything is white. What you see is (I believe) the best photo of the three.

Noal Rossow and Dave Mroz are partners in this operation. They've found a tool which is inexpensive, ingenious, and indispensable for the scratchbuilder. They call it the "Sucker Kit" and believe it or not, that name is a trademark.

The Sucker Kit includes a manual vacuum pump, lots of vacuum tubing, one free bag for your first few jobs, and an instruction booklet on how to do it. It'll run you $49.95, but that's a whole lot cheaper and simpler than assembling or creating your own system from surplus parts (like I did).

In case you are wondering how long the system will hold a vacuum, let me answer, "That depends." It is a manual system. If your bag leaks, you'll be squeezing the hand pump all night to keep up the vacuum. That's what you want to avoid. If you use a thick poly bag, if the bag has no holes, if you seal the edges of the bag with a good plastic caulk, then you should be able to hold the vacuum overnight without further attention. Even with a very slow leak you could start out with one-half atmospheric pressure (about seven pounds per square inch), then lose five or six pounds per square inch of pressure and still have one or two pounds per square inch left

Paul Carlson of Off the Ground Models shows current AMA Nats winner Brian Agnew the features of his high performance unlimited ship, the Quasoar.

Noal Rossow, Composit Aircraft Engineering with the Sucker kit, a low-cost vacuum bag system for composite wing building.

The new Kyosho Express electric motorglider from Japan. Looks similar to the Valencia but with trike gear.

Woody Blanchard and his well-known Volkswagon motorglider. Keith Shaw's planes are in the background.

Super Stars of R/C: Leon Kincaid, Brian Agnew, and Terry Edmonds.

Terry Edmonds holds his Io 2-meter with his Unlimited Callisto and fellow LSF buddy Jack Hiner standing by.

Alex Vella and his new Ultima from Bob Sealy Quality Fiberglass. Alex couldn't say enough good things about the model.

Don Goughnor and his Swag 134-inch Unlimited ship. Has 1120 sq. in., Eppler 214 wing, NACA 0009 stab, weighs 70 oz.

Hottest flier on the East Coast? Louis "Josh" Glabb is ESL's season champ in the expert class. First in '86, second in '87, first again in '88. Plane is mini Windsong.

Stretched Gemini built by Bob Champine and flown by Fred Gregg. Has Selig S4233 airfoil and 1140 sq. in. wing area.

Beautiful 1/6-scale Krick kit of the German Reiher glider. Anthony Quesada is the builder and flier. Has fun entering duration meets!

Tony Matyi was Saturday's winner at the CASA meet and 2-day overall high scorer at CASA's Unlimited contest. Ship looks like a Larry Jolly Meteor.

Tony Matyi was Saturday's winner and two-day overall high scorer at the CASA Unlimited contest. Ship looks like a Meteor.

to squeeze it all together. On a 600-square inch panel, that's still the equivalent of 1200 pounds of "stuff" pressing in on both sides of your foam cores! It will bond just fine.

The other neat stuff these guys had were some really thin (1/80 inch) wood veneers. They showed African mahogany and white birch in 4 x 4-foot rolls. Eight-foot lengths are also available, but were not shown. What is interesting about these rolls is that unlike some materials (obechi comes to mind), these have a fibrous, synthetic (?) paper backing bonded to them which prevents the thin grain from splitting. It works very well. At $37.50 per 16 sq. ft. for the birch, and $39.50 for the mahogany, the price is up there. Wing skins like these are beautiful, but they cost.

If you want a source for those clean, gapless aluminum knuckle hinges you see on the expensive German super ships, then Composit is it. For the 60-inch kit you pay $12.95 and get enough hardware to do a 120-inch hinge. For the 33-inch kit you pay $7.95 and get enough hardware to do 66 inches of hinge. Kits include nylon bushing material, and two aluminum alloy arrow

Walter Panknin and his unusual American Birdie. Has a toy baseball bat for a fuselage, and toilet tank ball for a head!

A little more serious Walter and his two-meter Alcedo original design. V-tail has elevator only, wing has ailerons only.

shafts with .343 OD and .317 ID.

If you need 14-mil mylar for wet lay-up of fiberglass or other composite materials that come out mirror smooth, Composit has it. Reusable. Comes in 50-inch wide rolls, six bucks per running foot.

Finally, if you want to see how foam core model wing building is done, Composit has a video tape coming up next April for $24.95, if you can wait that long.

Composit gives you a 30-day, no risk, 100-percent money back guarantee on your order; P.O. Box 866, Lapeer, Michigan 48446. Shipping, add 10 percent ($2.50 min., $6.00 max.).

CULPEPPER MODELS, INC.

Although this company did not have a booth at Chicago, it was there represented by its head honcho, Mel Culpepper. Mel had with him one production run kit of the Chuperosa, a 1.5-meter glider for hand launch, slope, or hi start.

I mentioned this model a couple of months ago. There are two things which make the Chuperosa design stand out from the crowd right away. The first thing is its truss structure tail boom. I got a chance to handle a partially framed up Chuperosa fuselage at the show. The cross pieces were not yet glued in to hold the two sides together. Yet in spite of not being finished, it had a very torsionally stiff tail boom. The second thing you notice about it is its foam core wing and Eppler 214 airfoil. The modeler may select the Selig 4061 airfoil if desired as a no extra cost option. Hmmm, it all makes you start thinking about the things you could do with one of these kits and a vacuum pump from Composit.

The Chuperosa kit is pure quality. All the pieces you need to build the kit are there plus all the hardware. Covering material and adhesives are all that you'll need to finish the project. The Chuperosa comes in two versions, polyhedral wing or aileron wing.

Their pamphlet says, "Culpepper Models' philosophy is to produce high quality kits of superior performance sailplanes by well-known designers in this field. Look for future developments." By that he means: be looking for Terry Edmonds's Callisto, Unlimited Callisto, and Io competition ships in the near future. Culpepper Models is teaming up with some excellent designers in the soaring field. Russell Shaw and LeRoy Satterlee's Chuperosa was just the start.

Terry Luckenback was Sunday's Expert Class winner at the CASA meet for Unlimited Class Sailplanes.

Unidentifed winner of the Sportsman Class at the CASA meet for Unlimiteds.

OFF THE GROUND MODELS

Paul Carlson and company had more R/C gliders on display than any other exhibitor. He had three: the well-known Prodigy, the beginner's Skyhawk, and the new Quasoar. Now in full production, the Quasoar is available for immediate delivery.

The Quasoar can be built in two versions, Standard Class (100-inch) or Unlimited Class (123-inch). The Quasoar's main claim to fame design-wise is its high-performance foam core wings with Selig S4061 airfoil. With this 9.6-percent thick, computer-designed, wind tunnel tested section, the Quasoar can float with the best floaters yet make tracks with the best Unlimiteds. The large flaps reflex upwards for speed and drop down for thermalling or landing.

The kit features a one-piece epoxy fiberglass fuselage, clear canopy, foam core wings, carbon fiber laminates, "accufit" machine cut and sanded wood parts, and all the accessories needed to build the model. The price is a pretty good deal at $149.95. Contact Paul at P.O. Box 518, Old Highway 50 East, Lawrenceville, Illinois 62439.

SUPER STARS OF SOARING

No, this was not a commercial booth, it was a double hallway of the best-known modelers and the models that made them famous. Sponsored by the AMA, this invitational event was to give everyone the opportunity to speak with a panel of experts and champions in specific fields within the hobby. To quote Jeff Troy of AMA, "From pioneers of radio control to the latest competition winners, this will be a virtual 'Who's Who' of radio control." From the field of soaring there were: the latest Nats winner, Brian Agnew, who recently won the Lee Renaud Trophy for highest combined score from three classes, the Hi Johnson Trophy for single highest score, and the Dan Pruss Trophy for highest scoring Nats team; former repeat world record holding cross country pilot and LSF Level V pilot Jack Hiner; former Nats winner and noted designer Leon Kincaid; and Terry Edmonds, noted designer and 1988 Nats second-place finisher in Unlimited and Standard Classes. Nearby were two more sailplane super stars, former Nats winner and LSF Level V pilot Larry Jolly (helicopter booth)

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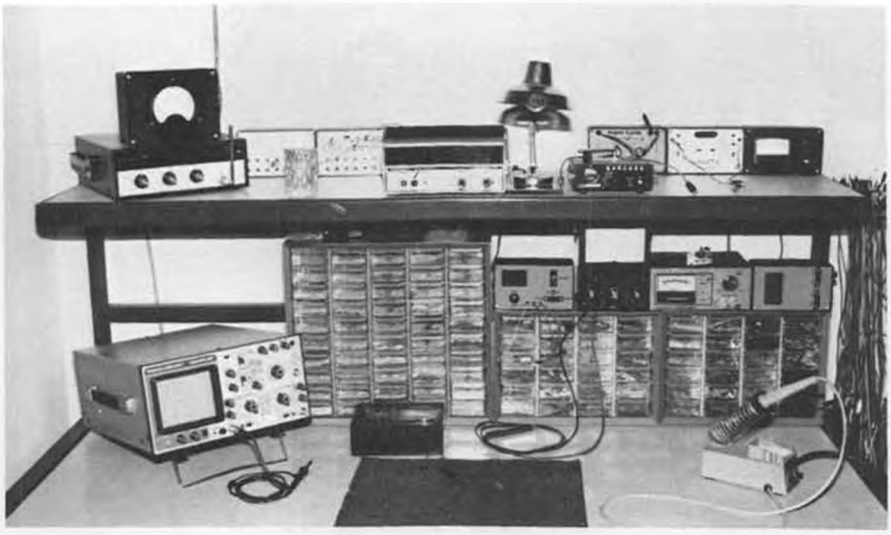


Electronics Corner

By ELOY MAREZ

• 1989! Can you believe it? Sure do wish they'd apply some of that "high-tech" stuff to slowing things down; maybe we'd all get more of that delayed building and flying done. Always around this time of the year I start totaling up scores, always a revealing thing to do. Of interest here, at least to me but maybe to some of you, is that my first *MB* article appeared *sixteen* years ago, in January 1973; all about a contest I attended down in Mexico. Electronics Corner started in December '81 and is now in its *eighth* year. Article number 300 appeared some time in '88. Wish I'd kept count of my mail, that would be an interesting figure also. Anyway, thanks to all of you who offered your support and your contributions through all these years; I couldn't have done it without you, and that's a fact.

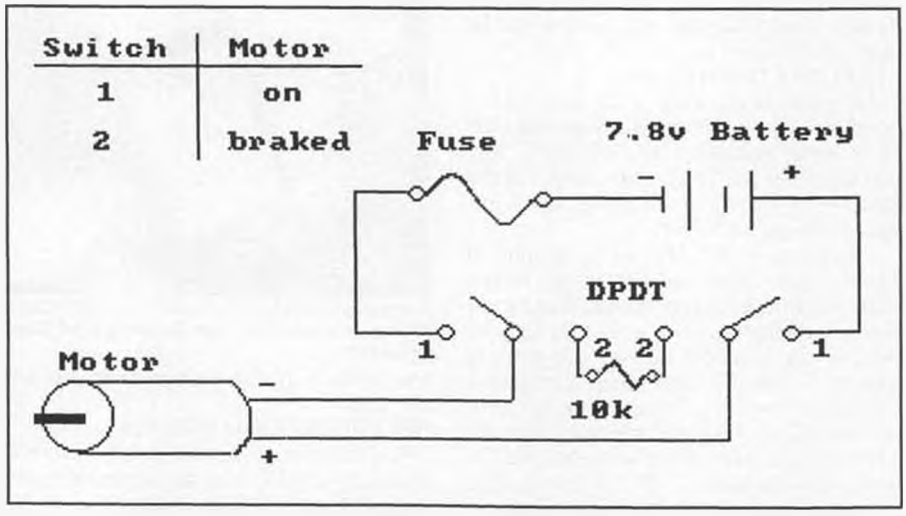
On the subject of articles, there was one in the November issue of *RCM* that is worth keeping in mind, as the subject is one that we all need sooner or later. It is entitled "Numbers and Letters for Model Markings" and is credited to the "*RCM* Staff." The article shows you how to draw and apply those necessary trimmings and is definitely aimed at those of us who are not airbrush artists but do want custom markings. The examples show AMA markings: AMA 1995; and NMPRA numbers: 22B, among other interesting photos. Anyway, keep it in mind for the next time you have a need for such.

THE Shuttle went off a few days ago, as this is being written. Wasn't it fantastic? And isn't it great to be back in the game again? Our first EC blast-off for this month is Tim Orr, of West Hills, California, who writes:

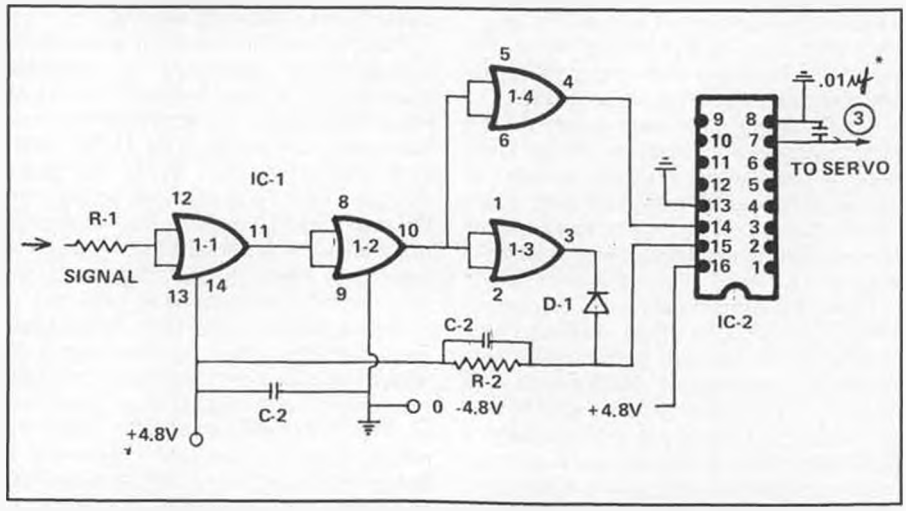
'I read your column in the April issue of *Model Builder*. I was especially interested about speed controllers and the use of MOSFETs. Reading that speed controllers use variable resistors to give proportional braking, I was wondering if you thought the following idea had merit for use in applications not requiring proportional control; i.e., electric-powered sailplanes.

"I thought one could use an OPOT switch to control motor on-off as well as providing a means for propeller braking to stop a folding prop from windmilling after motor cutoff. To such an end, I designed the following (*enclosed—em*) circuit." Keeping the prop from windmilling is a definite requirement, and on some designs, such as the electric-powered glider with a nose-mounted engine, the need to stop the propeller horizontally for landing is also important. A lot of different methods have evolved, and Tim's will definitely work in both cases, though stopping the prop in a horizontal position is a matter of luck and will require several attempts. I have one suggestion and one "I'm not sure," but first, let's review the theory of this rather simple circuit.

First off, braking in the electric-powered model, be it a car or as in this case, a prop-driven airplane, is not the more common automotive-type mechanical friction device that most of us are more familiar with. In this case, the stopping of the electric motor is done with a type of electrodynamic brake, which is possible because when voltage is removed from the



Electric-powered airplane motor brake system suggested by Tim Orr. See text for discussion and suggested modifications



Multi-channel decoder designed to upgrade the operation of two-channel receivers. Easily constructed from Radio Shack parts.

motor, and it is coasting freely, it is no longer a motor but has become an electrical generator. Right—at that time, as no voltage is applied to it, the magnetic processes have reversed in the motor and instead of consuming electricity, it is now producing it. The motor-turned-generator is not greatly efficient for this purpose, as different factors influence the design of a pure generator. But the motor is actually producing a small amount of pulsating DC power, and will continue to do so until its own internal resistance and inertia do their thing and cause the motor to coast to a slow stop.

As Tim states, we can cause the motor to stop by connecting a resistor in series with it; an electrical load which will absorb and dissipate the small amount of power available very fast or very slow, depending on our needs and the size of the resistor. Here is where the "I'm not sure" comes in!

As those of you who have any experience at all with the resistor-type of speed controls as used in cars know, braking action is obtained by switching a turn or two of the resistor across the motor. Its measured resistance is in fractions of an ohm. Somewhat similarly, in the electronic speed control, one or two MOSFETs are switched across the motor in the brake mode. In practice they provide a smoother and more controllable braking action than the resistor, but do so in a manner similar to the resistor, allowing current to flow through them and thus slowing down the motor. Here too, the in-circuit resistance is very small, lower in fact than that of the fixed resistor.

There is a difference, of course, in that the R/C car requires faster braking action than what the airplane motor will, and, though I have not actually tried it, I fear that the 10K resistor shown might not slow the motor down fast enough, especially when you are trying to "blip" it into a horizontal prop position. In any event, the choice of a resistor value is going to be dependent on a lot of things. The motor, the speed at which it is turning at the time the braking action is called for, the size of the prop will make a difference as will just how fast you want it to stop. The bottom line is that for your particular set of conditions, you will have to play with the resistor values until you come up with what gets you the desired results. The only guidance I can give you is that the lower the resistance, the greater the braking action.

Additionally, the circuit can be simplified somewhat to use a Single Pole Double Pole switch, as it is not absolutely necessary to disconnect both ends of the circuit. To that effect, everything on the left side of the resistor—the negative lead, wire from the motor, and the resistor itself—can be connected together. Switching just the motor positive lead between the battery and the resistor will give the required results.

ANOTHER READER CIRCUIT, an interesting one comes from Dick Stone, who places himself in Talmo, Georgia, with a "(USA)" after. We sure don't want to confuse it the Talmoga anywhere else, do we? Of his idea, Dick writes:

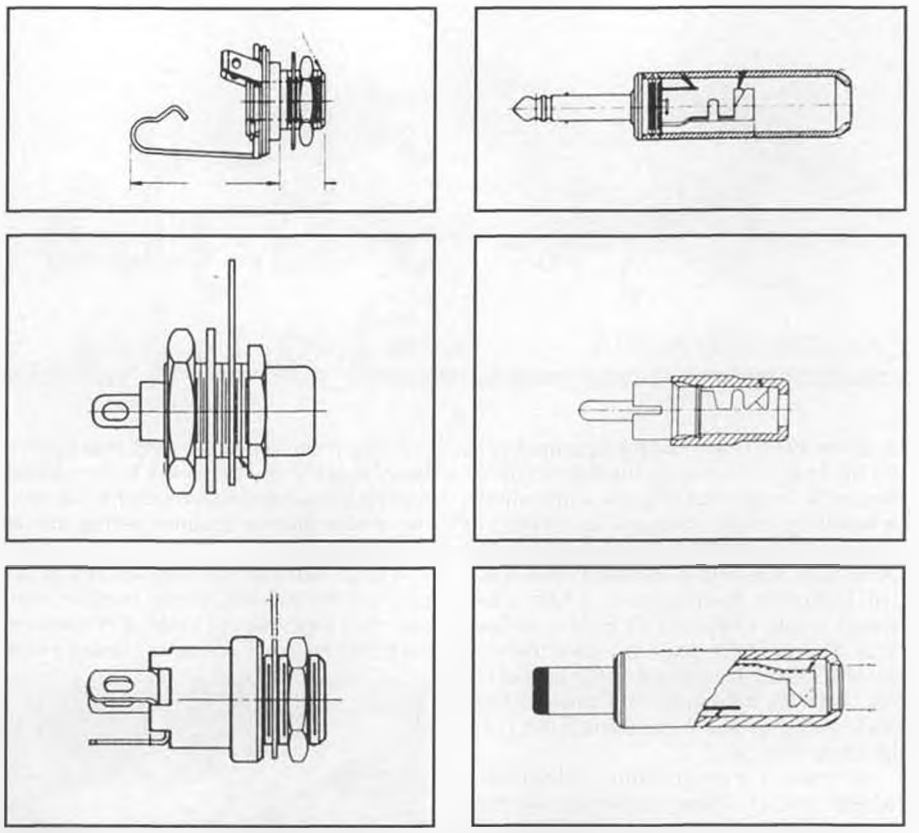
"What is it? A seven-channel decoder! What's new about it (vs. a 74C04/74C164)?

"1. Far less complex. 2. Low parts count, about half of a typical decoder. 3. Low cost, about $3.50. 4. All parts are locally available at Radio Shack. 5. Small, 1 x 1.25 inches (*board—em*) and can easily hold all parts. 6. It works!

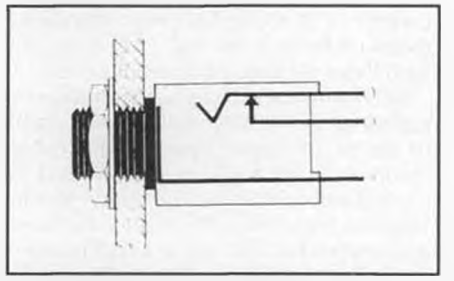
"What can you do with it?

"Upgrade your two-channel receiver to a seven-channel. It is very easy on those receivers using a 4013 decoder. Just pick up the data signal from Pin 11, and battery leads. You will find this decoder an easy way to get that extra channel for motor control. Note: R1 and C2 are not required with all receivers." Now I have no idea how many receiver designs there are out in R/C-land using a 4013 IC as a decoder, though this circuit should work with any other decoder IC by just picking up the signal to it and bringing it instead to Dick's circuit. As for R1, it is there to reduce the input signal from the previous stage if necessary. If possible, measure the amplitude at the input of the original decoder IC and include or omit R1 to get the closest value to the original signal. C2 is a filter across the positive supply voltage, and it is a good idea to include it in all cases.

It is probably worth mentioning that in all receivers the real design work and cost goes toward getting that first channel. From then on, adding more channels is simple and inexpensive, and often involves only the selection of the proper IC. In other words, all of the RF, crystal oscillator, IF, and audio circuits are exactly the same in a two-channel receiver as they are in the seven. Actually, a number of commercial receiver designs differ only in the connectors with which they are furnished, often being seven-channel units with less connectors installed.



Commercially available sockets and plugs found or recommended for use in R/C equipment and models, shown as pairs with socket and mating plug.



Socket above shows internal contacts often used to switch a circuit as plug is inserted.

One of the side effects of all this new narrow band frequency plan that we are in the midst of learning to live with is that it will kill a lot of this tinkering that some of us have been enjoying for so long. No, I am not against progress, and while there is a lot of enjoyment to be obtained from seeing your electronics working properly on the workbench, if it is R/C equipment, to me it is just a bunch of components and wires until I see it flying. Anyway though we will in most cases have to stay away from anything that changes receiver and/or transmitter bandwidths or stability, there will be other areas for the Dick Stones of R/C to enjoy.

As for the decoder, the circuit values, including Radio Shack part numbers, are as follows:

C-1	.1 uf	272-1053
C-2	22uf	272-1437
D-1	1N4148	276-1101
IC-1	4001	276-2401
IC-2	4017	276-2417
R-1	1K	271-1321
R-2	47K	271-1342

The .01 capacitor marked * from pin 7 to

Continued on page 92

Free Flight Scale

By FERNANDO RAMOS

• Since 1979, I have had the opportunity to fly my Marquart Charger biplane or my '49 Bellanca Cruisair to Oshkosh. I have always referred to these sojourns as "flying to Mecca!" Since 1978, when the first Flying Aces Nats was held at Willow Grove Naval Air Station in Pennsylvania, I have alternated it with Oshkosh. It's hard to believe that 10 years have gone by since the very first FAC Nats. This year was the end of the FAC Nats VI, held again in Geneseo, New York, and as far as I'm concerned, this is the absolute Mecca.

Geneseo is a quaint little college town where S.U.N.Y. (State University of New York) is located, and about one-half mile from the college campus is the Geneseo airport. These two locations are the site of preference of all the FACers in attendance; therefore the last two FAC Nats have been held there. I'll give more specifics later.

Bill Noonan and I have always traveled together for this contest, but Bill was unable to attend this year. Instead, Tom Arnold (editor of *Scale Staffel* newsletter) and the incomparable Walt Mooney and I traveled together. Fortunately, the flight to Rochester was uneventful. Tom got us a station wagon from Rent-a-Wreck. We really needed something larger, since both Tom and I had large modeling boxes and suitcases. Walt, on the other hand, had two peanut models in a briefcase and his week's worth of clothes in a bag not much larger than a camera bag. As it turned out, the wagon worked just fine.

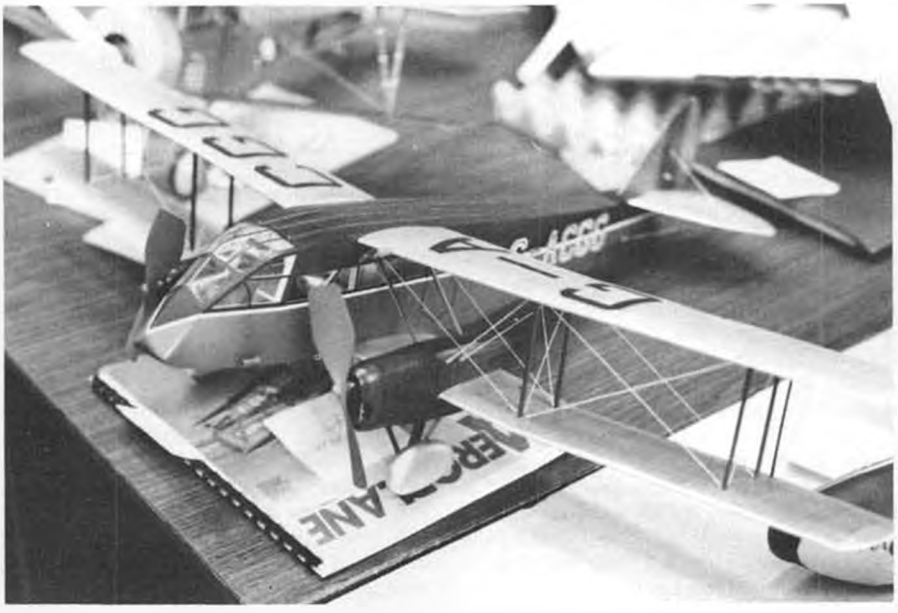
We actually arrived a day early, and I thought we would have to check into a motel for the night. Tom suggested that we try the dorms at S.U.N.Y. and see if they would let us in a day early. They did. This campus facility is one of the many positive aspects of the FAC Nats. They provided us rooms and two meals a day (with good food), and the college staff was very friendly and cooperative.

After we checked in, we found that the Washington Maxecutters were already there. This most outstanding club took on the responsibility of hosting this year's Nats, which is a tremendous amount of work. Allan Schanzel (editor of their excellent newsletter) was C.D. Bill Caresa is president of the club, and one of the many things Bill did to make this contest a success was to hand-color every FAC badge given to each contestant! Dan Srull, Tom Schmidt, Tom Arnold, Bill Caresa, and I talked into the wee hours of the morning.

Friday morning we all went into town to have breakfast and then back to the campus to prepare our models for judging that evening, and to greet old friends as they arrived on the scene.

A large banquet hall was utilized to display all the models, while another room was used for the actual judging. No one was prepared for what was to occur this Friday

Bob Wetherell with his twin CO_2-powered DH-84 Dragon. Winner of the Earl Stahl trophy for the second straight year!



Another look at Bob Wetherell's exquisite, clean and quiet CO_2-powered DeHavilland Dragon.

Shades of the Red Baron! The final round of the WWI Mass Launch event.

Mike Midkiff's Nakajima C6M1.

Don Srull and Dave Rees, tough as they come, judge the models.

Walt Eggert and his fine Cessna Airmaster.

Don Srull and Tom Schmitt with Don's 1911 Voisin hydroplane, winner of the FAC Rubber Scale competition.

Mac McJunkin demonstrates his CO_2 "jet-"powered Bell X-1 as the Perfesser looks on at right.

A jumbo Feisler Storch by Paul Gaertner.

evening. There were about 300 F/F scale models on display, and everyone was in awe at the grandiose sight, especially the judges! The quality of the models was first-rate, with many being exceptional. It was truly mind-boggling seeing the different kinds of models. No Lacys or Fikes here. Many multi-winged and multi-engined rubber-powered models were in the competition. Don Srull blew the socks off of many by submitting an electric-powered Dornier DOX using 6 motors and 12 props for flying. The judging started at 7 p.m. and didn't end until after midnight! Incidentally, there were close to 400 models because the mass launch events did not have to be scrutinized as closely as the other events.

Saturday morning, everyone was up early for breakfast so that the last final bit of tweaking could be accomplished before any official flights were taken. The Geneseo airport is at least a square mile of grass surrounded by wheat on two sides. Mecca? You bet! You'd be hard-pressed to find a comparable field. I remember the same kind of weather two years ago. Who cares? It is still a great place to fly models.

I won't bore you with my sad state of affairs, and that is that both the heat and humidity proved too much for my diesel-powered Sopwith Triplane. I simply couldn't get enough power to sustain any kind of flight. In my couple of hours of trying in the middle a wheat field, I found out what dehydration can be all about. And great thanks to Pres Brunning and Jack Moses for sharing their cold water.

That evening, everyone attended the banquet, and after a very good buffet dinner, door prizes were given out and awards for the day's winner were also distributed. Earl Stahl was given an opportunity to assess this year's Nats, and like the rest of us, he couldn't believe the caliber of the models. Bob Weatherall of San Diego, California, won the Earl Stahl Perpetual Trophy for the second time in a row. This trophy is given for the model which most typifies the spirit

of the FAC. Bob's model was a magnificent twin-powered CO_2 DeHavilland Dragon. Hearing those two engines in sync was quite something else. Unfortunately, I didn't get to see it fly.

Sunday brought another full day of flying with the mass launches taking most of the day. Don Srull had a willing 12 year-old boy retrieving after each launch. After one long trudge, Don looked at the youngster and said, "I want you to have this model for helping me out." The boy was elated. Allan Schanzel said to Don, "What are you doing? There's still one more heat!" Don had to explain to the boy his mistake and that the boy could have the model back after this last flight. Guess what? Yep, it flew out of sight! (Don gave the boy another model.)

When all of the flying was officially over, Don Srull was the champion again. He had been Grand Champ four or five times out of six. He is one tough competitor.

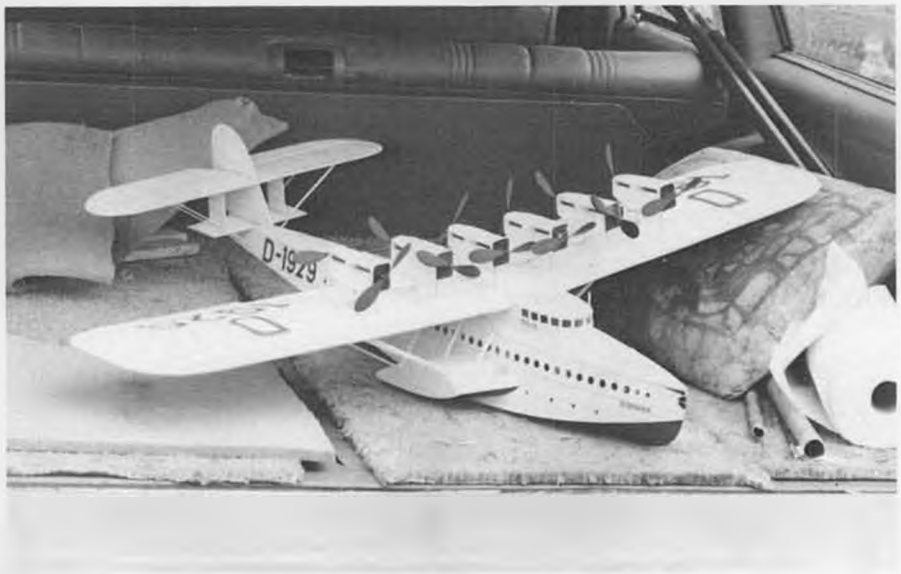
In addition to all of the flying, there was so much going on that it would be difficult to cover it all. There is so much fellowship, and above everything else, everyone is having a grand time. Unlike too many Scale R/C contests that I have observed, the FACers are enjoying their sport with models costing a few dollars instead of hundreds plus!

Monday morning brought sadness, as modelers exchanged farewells. It will be another two years before we see each other again.

This isn't the end of the story; I'll finish it next month. However, I do want to close by making a few comments. There were 122 official entries, the highest ever. California was fairly well represented. Bob Weatherall, Tom Arnold, Walt Mooney from San Diego, Mac McJunkin, Bill and Phyllis Warner (who didn't compete; they came as reporters), and myself. The FAC Nats is too big now for just Saturday and Sunday flying. Suggestions have been made to have those events that do not require judging to fly on Friday while judging takes place during the

Pres Bruning and his Fiat biplane.

Mark Fineman and his Savoia Marchetti 92.



Don Srull's justly famous electric-powered DO-X.

Pres Bruning and the beautiful Albatross C-3.

Author's underpowered(09 diesel) Sopwith Triplane.

Mike Midkiff in foreground with his DH-5, ready for the mass launch.

Mark launching his Marchetti.

Dave Smith's Fairchild 24 away on a good flight in the Golden Age Mass Launch.

Fineman's fabulous Savoia Marchetti jumbo rubber flying overhead.

Don Srull prepares to launch his Voisin Hydroplane.

day. That would make the flying for Saturday and Sunday less hectic and even more enjoyable.

Both the college and the Geneseo airport want us back in 1990. There is no guarantee on the weather, but the site makes it worth the gamble. I can't say enough about this event. The people and the models make the FAC Nats Mecca! •

The author shows a bit of concern over his Sopwith's lack of ooomph!

the INSIDERS

INDOOR FLYING REPORT

By DAVE "VTO" LINSTRUM

• Last month we mentioned the excellent NFFS "Inside Story" article by five-time World Champion and AMA Hall of Fame member Jim Richmond. This month we are happy to feature his "Insider's Workshop" that produces those fabulous F1D microfilm models! See the photo and then read this from the NFFS Sympo Report by Jim:

'My workshop is a spare bedroom where I have a desk, a table, and numerous storage cabinets and shelves. This room also has a large closet for storing model boxes, supplies, and microfilm frames. My microfilm is made every two years on the large 60- by 40-inch table using rolled newspapers around the edge and an old shower curtain to form the tank. Rodemsky microfilm solution has been used ever since it became available; maybe 15 years. I store the microfilm on frames in a 30-inch long trunk. The frames are made to fit and are spaced apart by guide rails glued in the ends of the trunk. The desk is my 'workbench' and is painted a light color so wing and stab designs can be drawn on it. I use the wall above the desk as a bulletin board and have items of interest pinned up, like new design ideas, rules, photos, clippings, a thermometer, and a mirror arranged so I can see the TV without turning my head!"

OBSCURE AIRCRAFT THREE-VIEW

We have a nice detailed drawing for you (courtesy of *Aeromodeller*, that fine British mag) and this snippet about the 1917 Junkers D1 monoplane:

"Professor Hugo Junkers of Aachen University, Germany, was one of aviation's outstanding pioneers. By 1910 he had developed a thick airfoil, making it possible to design a cantilever structure, dispensing with external bracing used on all contemporary airplanes. Owing to other pressures, these ideas did not see realization in the form of a finished plane until the J1 of 1916. From this prototype, the Junkers Co. persisted with all-metal monoplanes (except J4), a formula which was not adopted by the majority of the world's aircraft manufacturers until 20 years later. The production aircraft were given the designation J7." The Obscure Aircraft is one of the few that has not been modeled by Walt Mooney! We suggest you consider CO_2 power, with a "quick change" pack for the engine and tank as shown in Walt's "Avro Spider" article, May 1988 *MB*. The new small electric motors would also work fine, as would rubber power if you keep the tail very light.

HINT OF THE MONTH

Way back in the very first "Insiders" column (July 1987) our HOTM was to bag your models for commercial airline travel—in a box and hanging bag. Now we repeat that "bag it" advice for lubing your rubber motors. If you use liquid lube (rather than spray Armor-All), then put a few drops in a sandwich bag, put your freshly tied motor in, and rub the lube on between your palms. The lube will uniformly coat the motor, staying off your hands. Remove motor and install. Dispose of the "lube bag" at the end of the flying season. This HOTM was by C.A. Sotich.

Dick Obarski, Sun City Center's resident expert, with his canard Bostonian variant, the Halcyon II.

WHERE FUN TAKES OFF

Joan Hannan, shopkeeper at Hannan's Runway, is right on the tarmac at Hannan's Hangar. Her latest catalog (send a buck to Runway, Box A, Escondido, California 92025) shows you where *fun* takes off! It offers over 70 fine aviation publications, rubber stamps, note cards, plans, rubber and small goodies. It is a veritable cornucopia of fine quality material for the reader and builder. 'Insiders" will particularly enjoy the Zaic Yearbooks, *Peanuts & Pistachios* books (Bill Hannan), and *Dan Jordan Sky Soldier.* A special issue of *Air Wars 1919-1939*, by A. C. Anson (No. 8), has great three-views. The seven Peanut plans by Ulysses Alvarez of Uruguay are of obscure yet eminently flyable aircraft. Get your Hannan catalog today; tell Joan that "Insiders" sent you. Enjoy your fun!

The following article appeared in a recent issue of Doc Martin's *excellent and well worth subscribing to* "Hangar Pilot." It's by Butch Hadland, a renowned British rubber scale flier, and it describes his approach to trimming various kinds of scale ships. I'm not equipped to argue the validity of his approach; however, I think it's very important to note that he has a system for making his aircraft fly. Most of us, I think (and I'm the worst of all!), tend to react to what our aircraft do, rarely do we come to the flying site with an idea of what a given design is likely to do and how we will approach the problem of trimming it for flight. By the way, subscribe to Doc's luminary, lucid, luscious compendium of carefully collated aeronautical erudition by sending a ten-spot to: Dr. John Martin, Editor, "The Hangar Pilot," 2180 Tigertail Ave., Miami, Florida 33133.

INDOOR TRIM by Butch Hadland

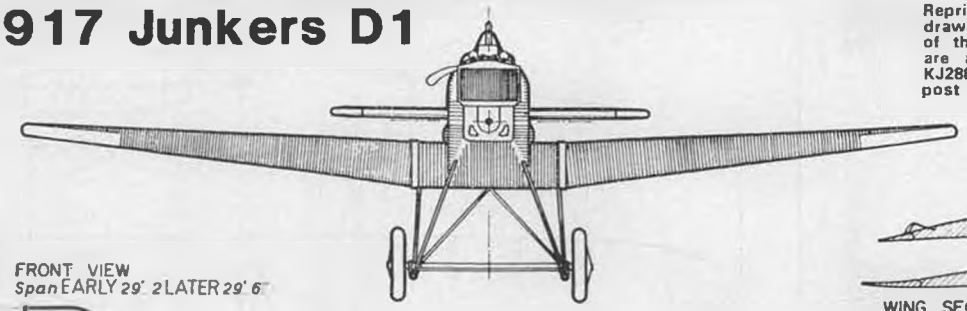
My indoor flying models have always

Champions made here! Insiders workshop used by Five-Time Indoor World Champion Jim Richmond to create his F1D microfilm ships. Jim's headquarters are in Carmel, Indiana.

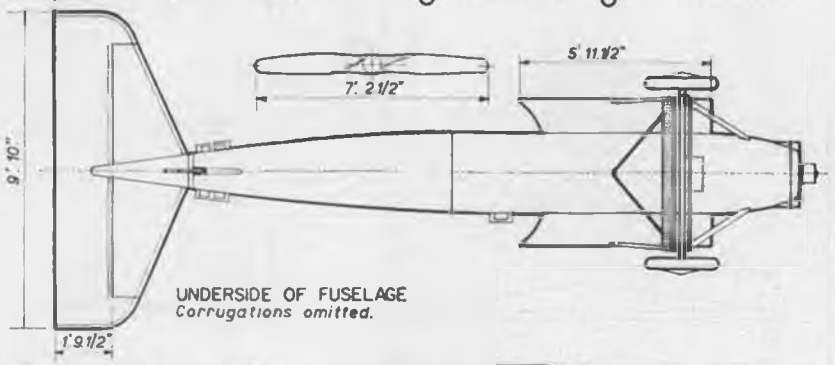
Insiders OBSCURE AIRCRAFT

1917 Junkers D1

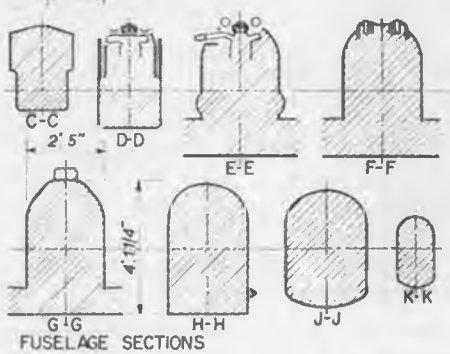
Reprints of this 1/72nd scale drawing and dye-line prints of the 1/36th scale original are available as plan pack KJ2880 price 2/6d. plus 6d. post from Aeromodeller Plans Service.



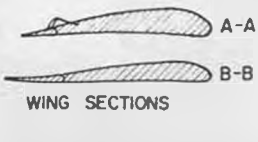
FRONT VIEW
Span EARLY 29' 2 LATER 29' 6"



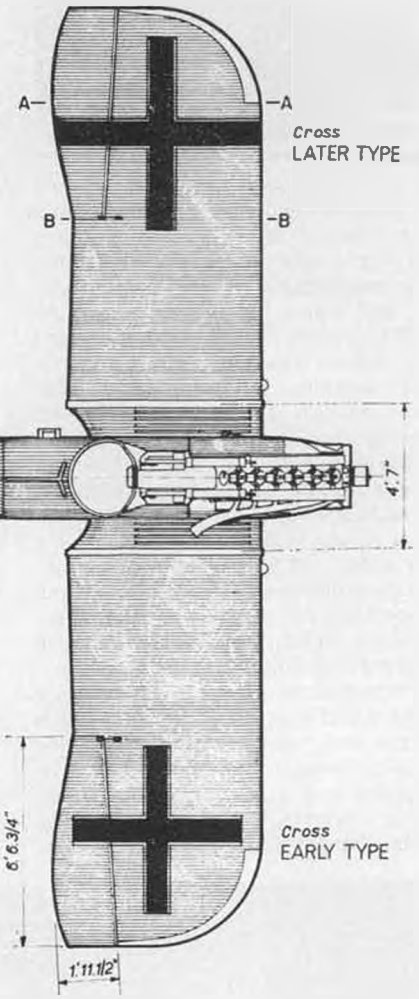
UNDERSIDE OF FUSELAGE
Corrugations omitted.

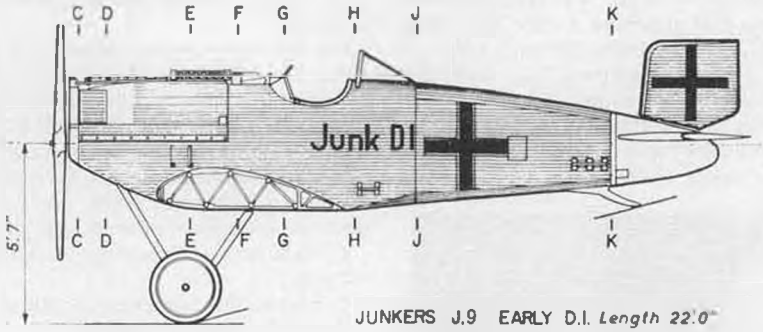


FUSELAGE SECTIONS



WING SECTIONS

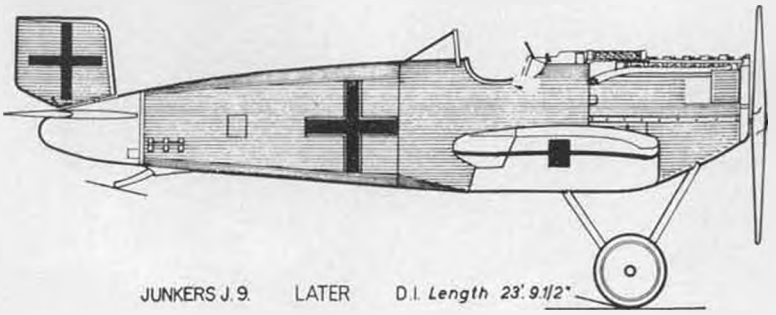




JUNKERS J.9 EARLY D.I. *Length 22' 0"*

COLOUR SCHEME:-
FUSELAGE - CHOCOLATE BROWN WITH WHITE UNDERSURFACES. "JUNK DI" IN BLACK WAS PAINTED ON BEFORE THE BROWN, BUT SHOWED THROUGH.
TAILPLANE - BROWN ABOVE, WHITE BELOW. AT LEAST ONE J1 HAD AN ALL WHITE TAILPLANE.
RUDDER - WHITE.
WINGS - PALE GREEN WITH IRREGULAR PATCHES OF LIGHT MAUVE. WHITE UNDERSURFACES

NOTES:-
DIHEDRAL WAS ADJUSTABLE.
CORRUGATIONS 1¼" PITCH



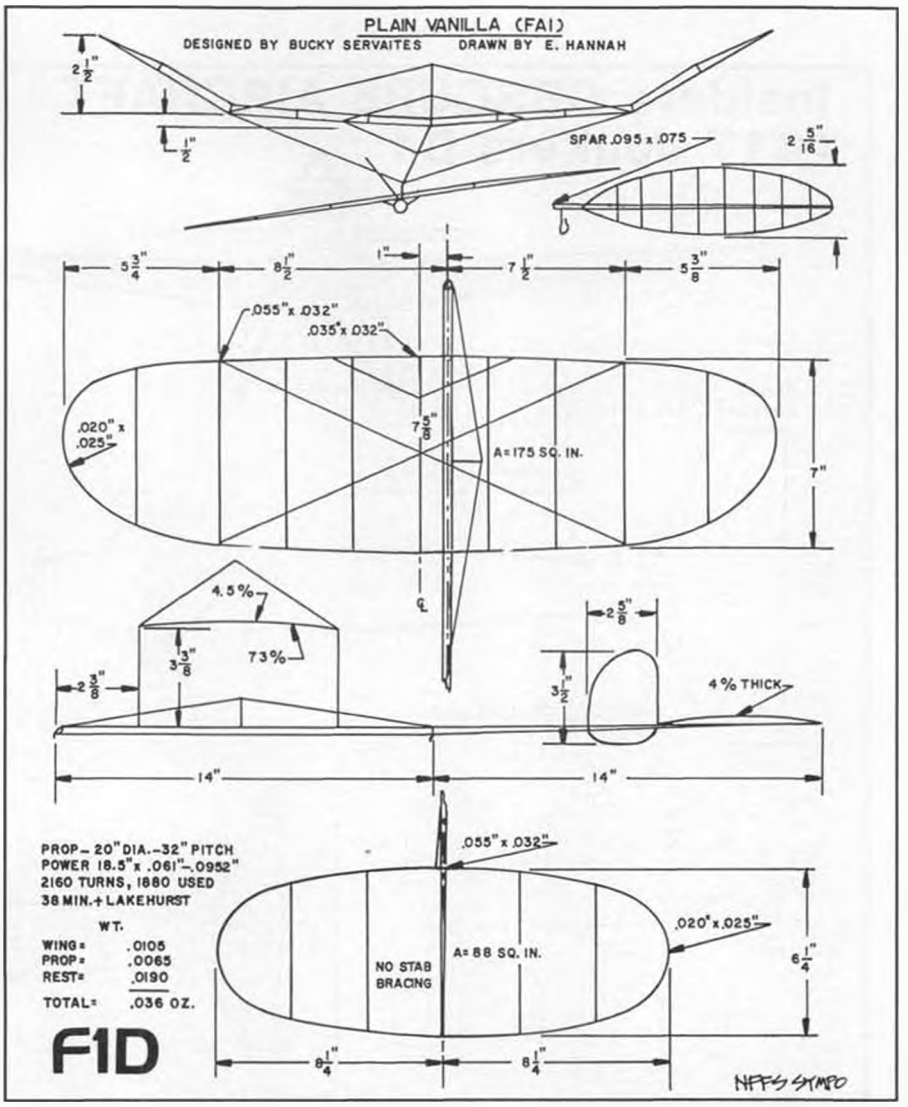
JUNKERS J.9. LATER D.I. *Length 23' 9 1/2"*

Aero Modeller

JUNKERS D.I.

Drawn by IAN R. STAIR. THANKS TO PETER L. GRAY FOR INFORMATION

Walt Van Gorder admires Manhattan design "Pieces" built from plans by Plenny Bates.



been very successful in the past, mainly due, I think, to my previous free flight duration experience. Other contributing factors are flying competitively in the United States, membership in the Flying Aces Club, and letters to and fro across the "pond" to my bosom pal Doc Martin, of the Miami Indoor Modelers Association. Of course, watching and listening to other scale modelers is also a superb pastime for furthering one's information and experience libraries. I should stress that the following is my way of trimming and flying. You may have other ideas, but I can guarantee that my way will get your models flying satisfactorily, and that's what it's all about.

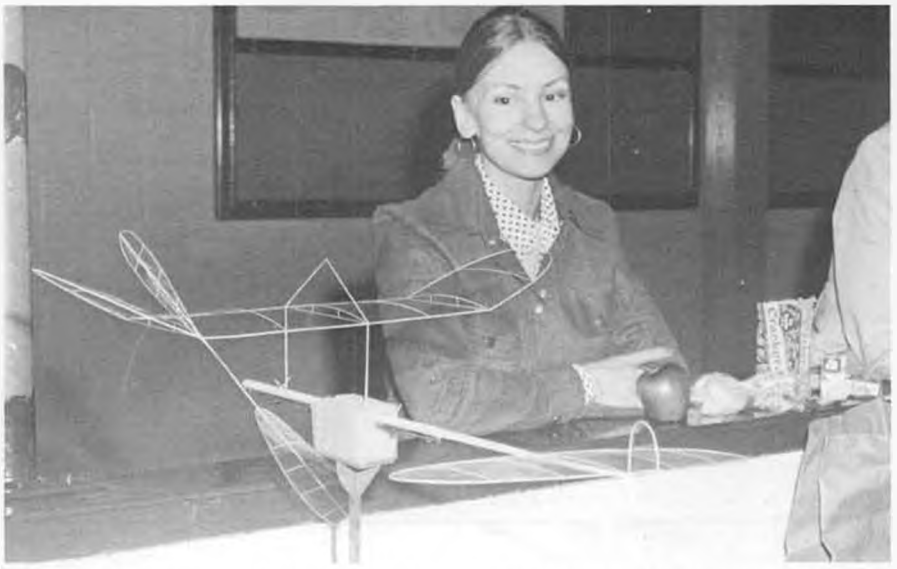
The main difference between indoor and outdoor flying is that indoor we don't glide! The whole flight is "power on," although toward the end of the flight the propeller is in a "no man's land" condition; that is to say that thrust and drag just about cancel each other out, so a "powered glide" may be the correct phraseology. Another factor to be considered is that in calm indoor conditions the model does not become unstabilized by changes in air speed, as can happen outdoors with gust and general turbulence, so that generally a scale-sized stab will suffice. To overcome the small-stab syndrome, I usually locate my CGs much farther forward than usual. This effectively lengthens the tail moment and makes the stab more effective. I use this technique on all my models, both rubber and CO_2 and have found it to be safe and pretty well foolproof.

My high-wing types (rubber) are flown either left or right, depending on the type of competition entered! If the model is to be judged for SMAE flight (the British AMA), then I fly right. This involves a straight takeoff, and as the torque dies off, the model settles into a right-hand cruise and eventual descent. The model's trim is as follows:

1. Slight wash-in (one degree), right-hand wingtip.
2. Two- to three-degree downthrust.
3. Two to three right rudder.
4. Slight up-elevator to counter item six.
5. Corresponding washout, left-hand wingtip.
6. CG position approximately 10 to 15 percent from L.E.

Incidentally, most of my models are built with separate rudders and elevators. The weight penalty is negligible, but the control that can be effected on the model is immeasurable. I don't like cellotape or masking tape trim-tabs. Flying high-wing models left is very exciting. Takeoff is usually followed by a very tight left-hand turn, gradually widening out until the model assumes circles of wall-banging proportions; okay outdoors, but frowned upon indoors. Fly high-wing models to the right!

Continued next month.



Sister Donna admires Tom Sova's delicate F1D microfilm model in foam wind-down stand.

PZL ORLIK

By WALT MOONEY. . .The perfesser of Peanuts is back with a new delight: a fine model of the Polish Orlik, or Eaglet. With a high wing loading and low aspect ratio wing, this design is well-suited to a Peanut version.

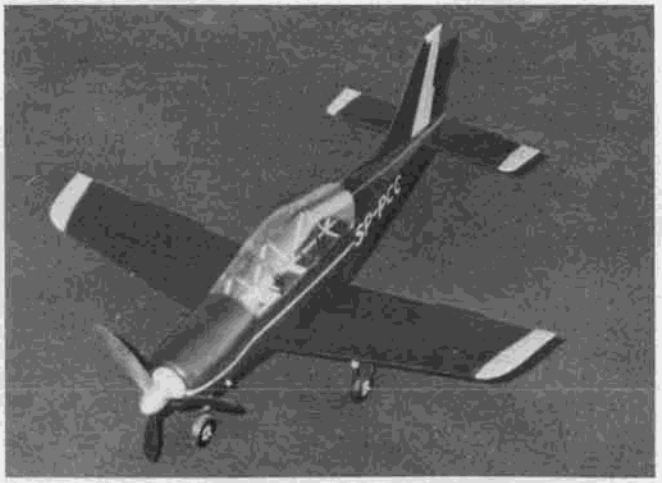
• This is a model of the newest airplane to come out of the famous Polish PZL aircraft firm. It is a piston-engined trainer designed to fly like a jet but to cost like a reciprocating-engined aircraft. To do this, the airplane was designed with a high wing loading and a low aspect ratio wing. This makes it a good subject for a Peanut scale subject because with the 13-inch span limit, the model is still a rather large Peanut with a lot of wing area. In addition, the model has a longer than usual nose, making it easier to balance, even with a rather long rubber motor. The Orlik, or Eaglet in English, makes up into a very pretty model.

With the exception of a few specific structural innovations, which will be covered in detail, the structural buildup of the model Eaglet follows conventional practice, which has been covered innumerable times in the past and does not need to be covered once again. It is assumed that the main fuselage structure, the wings, and the basic flat tail assemblies are easily understood and follow familiar procedures for construction.

The tail spars are additions, external to the basic flat assemblies, to give this small model a semblance of airfoil sections on the tail and increase dramatically their resistance to warping. On the model in the photos they are basswood (although hard balsa would probably work as well) and are added to each side of the tail structures after they are removed from the building board.

Continued on page 66

Construction of this sleek little Peanut is simple; Walt says conventional building techniques will produce a flyable model in no time.



Canopy can by stretched or vacuum-formed. Walt scavenged a canopy from Golden Age Repro's P-51 kit.

3/32 SQ. LEADING EDGE.

1/16TH SQ. FRONT SPAR

1/16TH X 1/8 MAIN SPAR

LEFT WING

1/16TH SHEET TIP

HARD BALSA BLOCK MAIN GEAR MOUNT

GUSSET

1/16TH X 1/8TH TRAILING EDGE

COWL IS A CARVED AND HOLLOWED BLOCK WITH A LAMINATED FRONT FACE.

ROOT RIB IS 1/16TH SHEET, OTHERS ARE 1/32ND.

RIGHT WING

LEAN ROOT RIB TOWARDS TIP FOR DIHEDRAL

GUSSET

1/32ND SHEET TAB

CANOPY FRAMES ARE 1/64TH PLYWOOD

ALL STRUCTURE IS BALSA UNLESS OTHERWISE NOTED.

REAR MOTOR PEG

BODY TOP VIEW

ALL MAIN VERTICAL TAIL STRUCTURE IS 1/16TH THICK, SPARS ARE EXTERNAL 1/32ND X 1/16TH THICK BASSWOOD

HORIZONTAL TAIL IS MADE IN THE SAME MANNER.

1/32ND SHEET TAB

1/32ND SHEET

TOP

1/32ND SHEET BALSA

SIDE VIEW

HALF FRONT VIEW

NOTE DIHEDRAL ANGLE

HORIZONTAL TAIL

SPAR

1/32ND SHEET

NOSE GEAR MOUNTING BLOCK.

LANDING GEAR IS OPTIONAL, KEEP IT LIGHT, USE BALSA WHEELS AND 1/32ND SHEET WELL COVERS.

Walt Mooney 12-7-86

PZL "ORLIK"

"It may be doubted whether any invention that man's glorious, patient, invincible persistence has given to humanity has ever so deeply stirred imagination as his discovery of the art of mechanical flight."

• This month's rather long-winded lead-in quotation is from *An Epitome of the Work of the Aeronautic Society* of New York, 1908-1909.

NEW AERO THEME STAMPS

A pleasant change from politicians are some new offerings from the U.S. Post Office, which feature aircraft and aviators. A 36-cent stamp features a portrait of Igor Sikorsky and the VS-300 helicopter and two new 25-cent stamps concern explorers; one depicting Richard E. Byrd and a Fokker trimotor, the other shows Lincoln Ellsworth and his ski-mounted Northrop Gamma.

CATALINA RETURNS HOME

A consolidated PBY Catalina has recently been installed in the courtyard of the San Diego Aerospace Museum. Originally constructed in San Diego some 40 years ago, the craft first served with the Navy in the Pacific, and later was operated by the Coast Guard. Next, in civilian hands, it was featured in a movie "The Devil at Four O'clock," and was flown around the world by members of the Thomas Kendall family before being retired in 1977 and donated to the museum.

During 1986 it was repainted for the 75th Anniversary of Naval Aviation celebration, then returned to General Dynamics Convair to be restored by volunteers including some who may have built it in the first place! Finally, the Catalina was trucked to the San Diego Museum under police escort, assembled, and hoisted to an altitude of about 80 feet by crane, thus making its last "flight" over the wall into its final resting place.

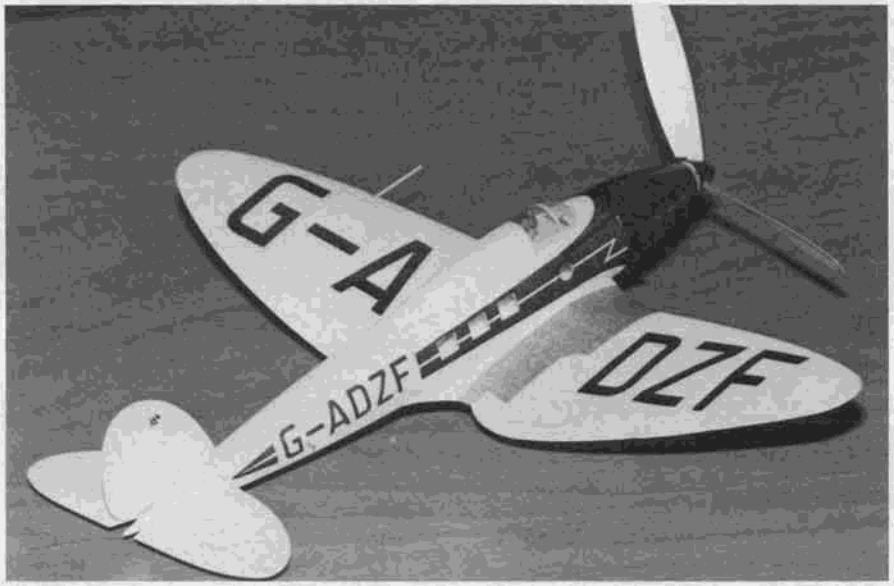
FAC NATS TO EAA?

Our alphabet soup of acronyms can be translated as follows: The Flying Aces Nationals have been invited by the Experimental Aircraft Association to Oshkosh, Wisconsin. The suggestion was advanced to Bill Warner by Carl Swickley, Director of the EAA Museum, who also sponsor an Antique Auto Weekend, Kite Fly, R/C Fun-Fly, and a Plastic Model Contest. Sounds like fun!

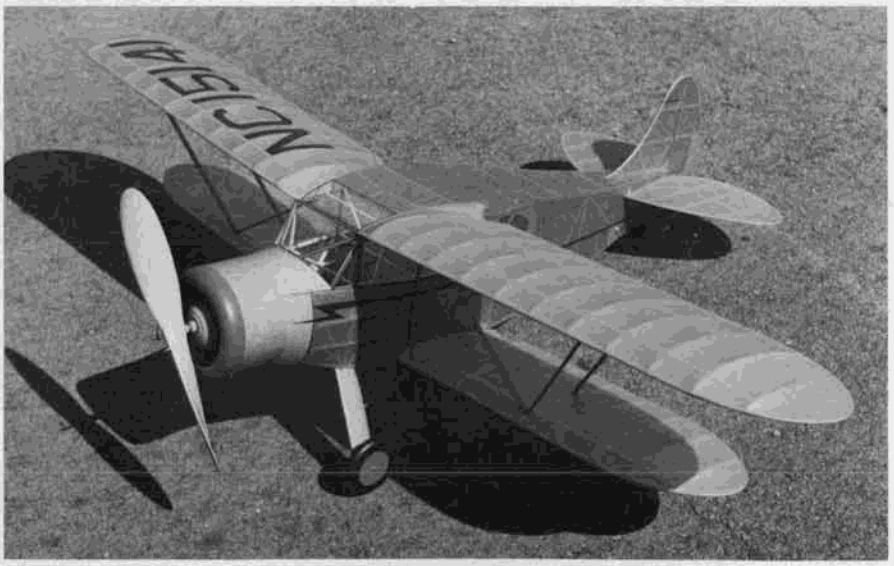
ABOUT THAT AMLA ROG

More acronyms. These are referring to the Airplane Model League of America Rise-Off-Ground model discussed in earlier columns. According to Robert A. Lockwood, of

Fernand Van Hauwaert, Contest Director of the Flemalle, Belgium indoor contest, with his Peanut Renard R-17. Photo: Alfery.



Antonin Alfery's Heinkel 70G foam Peanut placed third in the Flemalle, Belgium. Photo: Pavel Jelinek.



Walt Winberg, of Canada built this exceptionally neat 50-inch span Waco Cabin from modified Megow kit plans.

Napa, California, memories of the model are bound to vary, since there were two different versions. Apparently the earliest type had piano wire landing gear, while the later ones featured bamboo struts to reduce weight. This may account for the differences in building skills required as well as the variation in performance recalled by readers.

SO NOW YOU KNOW

According to San Diego Aerospace Museum Curator Ed Leiser, the French word "aileron," meaning "little wing," was coined by one of the Farman brothers.

NFFS ANNOUNCEMENTS

Tony Italiano has been busy this year! The National Free Flight Society has been more active than ever before managing contests, honoring modelers, and encouraging technical progress.

SYMPO 88, recently published, documents many of these activities in fascinating fashion with articles, drawings, and photographs. Among the subjects are "Slotted Wingtips on Soaring Birds and Models," "Computation of Low-speed Airfoil Lift and Drag Characteristics," "The Cylinder of the CO_2 Motor," "A Reversible Helicopter," "Aluminum Wing Skins," "How to Find a Thermal by Using the Streamer," and much more.

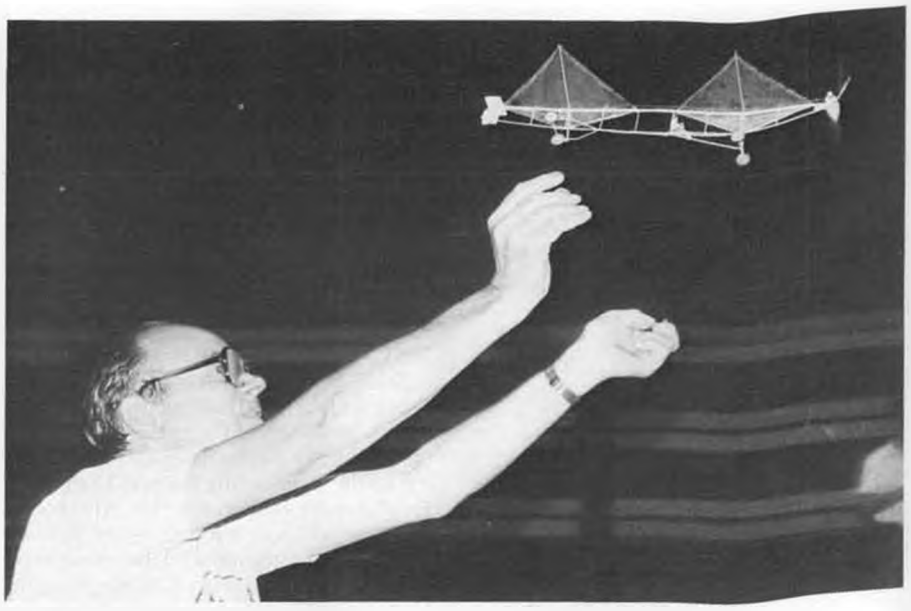
Also presented are the NFFS Hall of Fame Honoraries, the 10 top Models of the Year, and a sprinkling of cartoons. The 152-page *SYMPO 88* is available for $15 plus $2 postage by surface mail to anywhere in the world. Order from NFFS Book Store, Fred Terzian, 4858 Moorpark Avenue, San Jose, California 95129.

SYMPO 89

The NFFS crew is already hard at work rounding up material for the 1989 Symposium, and has issued a call for papers. Anyone wishing to contribute articles should contact editor George Zenakis, 1288 Oak Knoll Dr., San Jose, California 95129, or managing editor John Oldenkamp, 3331 Adams Ave., San Diego, California 92116.

Nominations are also being accepted for the 1989 Free Flight Hall of Fame awards, which should be forwarded to Tony Italiano, 1655 Revere Drive, Brookfield, Wisconsin 53005.

And finally, suggestions are solicited for the "10 Models of the Year," which should be described to Charles Dorsett, 2645 San Benito Dr., Walnut Creek, California 94598.



Benno Sabel launches his unusual 1909 Windham tandem-winged Pistachio. Photo: Alfery.

Three-year-old Naomi Sturman helps her father Nathan fly this fine Easy Built Monocoupe.

CHARITY CONTEST

Larrie Schaeffer reports that the Cheyenne, Wyoming, High Plains Drifters and the Denver, Colorado, Magnificent Mountain Men raised $240 for the *Make A*

Continued on page 83

Dean McGinnes' tiny 1911 Caudron Pistachio rests atop Rod Spanier's Travel Air 4000.

Meticulously detailed Vickers Vildebeest by master modeler Ken Hamilton spans 30-3/4 inches. A long-term project reflecting every hour invested. Photo: Alaback.

Free Flight

By BOB STALICK

Clarence Bull's A.J. Walker Fireball done up as a free flighter, powered by an O&R .23. Fireball is a steady, fast flyer.

• Holy Moly, Captain Marvel! Shazam! It's the January 1989 issue of *Model Builder* already. What will the new year bring? What can we look forward to this year in the world of free flight? Might be quite a bit, as I see it. How about these:

The AMA will decide that it will pick a Nats location based upon the adequacy of the free flight site.

The recently selected FAI F/F team will have practiced together and will place first in all three events at the World Champs.

The Pirelli people will discover that their main market for rubber is the free flight modeler and come out with a product that outperforms any previous rubber ever made.

New free flight sites will be proffered to clubs around the USA due to a change in federal law which allows landowners a tax write off for such use.

Free flight newsletter editors will receive excellently written and copy ready materials on time for publication.

The *Model Builder* Free Flight column will be written so that it is always challenging, informative, readable, and entertaining.

I guess we can all dream this time of the year. I know I do, and I hope you do too. Maybe some of these thoughts will actually come true in 1989. Want to place some bets?

JANUARY MYSTERY MODEL

This month's Mystery Model takes us back in time to the 80-gram Wakefield motor to a time before carbon fiber and Hot Stuff and to a time when most ships, like this one, were built up from sticks and covered with tissue. So, from out of the past comes the Mystery Model for January, a ship that has a balsa landing skid that takes up the shock of landing by breaking off. A ship that features an earlier version of the Montreal prop stop.

So, what is it, you ask? Well, that's for you to find out. If you think you know, drop a card or letter in the mail directly to Bill Northrop at *Model Builder*. Include your name and address. Winner receives a free, one-year subscription to *Model Builder*. Be the first on your block!

JANUARY DARNED GOOD AIRFOIL

This was *the* airfoil to use back in the late 1960s and early 1970s if you were flying FAI Power (now called F1C). The section was named for the model design that was burning up the skies during the period: the Eros. For the more mature FAI flier who recalls this period, you should remember the changes that occurred with the scene, especially in California. First, George Albright's High Society, a derivation of the Spacer, dominated the winner's circle. Then the JAI FAI, a derivation of the High Society, was followed by a series of designs that further refined the basic concept. Then came the rear fin phenomenon and elliptical swept-back surfaces. The best of the bunch, and certainly the most attractive, to these eyes, was the Eros.

I am not sure who is credited with the Eros design. It has some of the touches that you expect from Craig Cusick, but I know that the late Chuck Broadhurst as well as Doug Galbreath flew the ship for a number of years.

This airfoil is a flat-bottomed fast section. If you are interested in getting high rapidly, regardless of the power event you are flying, this is the one for you. A thin (six-percent or so), flat-bottomed stab section will do the trick to balance the back end of the model for you. Balance point for the model should be in the neighborhood of 70 percent if the stab area is close to 25 percent.

The upraised and sharp nose entry (Phillips entry) adds to the speed of the section at the sacrifice of some stability, but it is not so critical as to be a major problem from my experience.

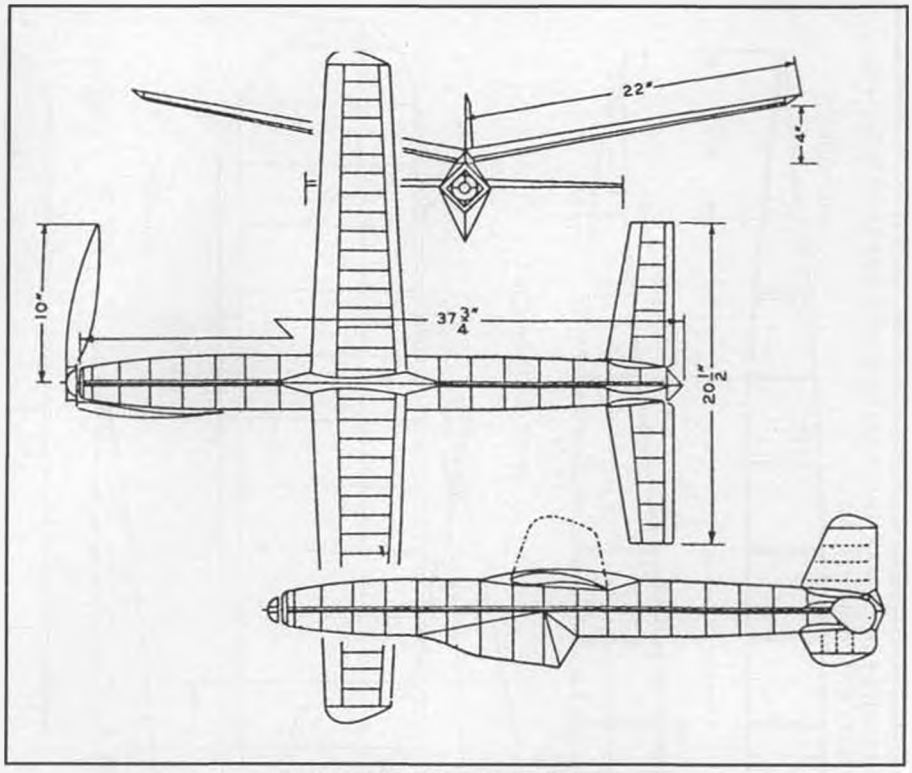
I like this section and have used it on a number of my powered free flight models, including FAI Power. Try it yourself!

THREE-VIEW OF THE MONTH—THE ORIGINAL GOLLYWOCK

I know, this three-view should be contained in John Pond's column, but with all of the information that I have collected on the Gollywock, it seemed worthwhile to include it right here in the Free Flight column. As I have found out, the Gollywock that you see here is the original design in the form

Greg Davis, Vancouver, won First Place in Nostalgia with this 8 Ball model. Ship is powered by a Space Hopper.

Bruce Augustus and his Thermic 72, with tissue on the wing and stab, silk on fuselage.



JANUARY MYSTERY MODEL

that it was originally published in *Air Trails*. This Gollywock features bent bamboo tips on both the wing and stab tips and a sub rudder on the fuselage.

Later versions of the Gollywock, including the Midwest kits, had carved sheet balsa tips, and large tip plates on the rectangular stab. Some versions even had a sheeted leading edge for the wing airfoil. What makes this month's three-view the original version, as well, is the actual wing chord is 4-3/4 inches, and the actual stab chord is 3-1/2 inches. The *Air Trails* article, referred to earlier, incorrectly provided these dimensions.

For the curious, the Midwest kits were produced for many years and were still on the market in the early 1970s. This longevity is a tribute to the excellence of the Wally Simmers's design. In fact, I would suspect that if you were to look into the crannies of the older shops around the country, you could still find a kit or two. However, these kits were not of the original model.

Although the Gollywock is an unbelievably simple model, it is a fine performer even today. Some omissions from the three-view will help you build this ship with even fewer difficulties. Here are some tips:

1. Dethermalizer. The model should be built to accept a d.t. system. Since the space directly in front of the stab mount is left uncovered, a pop-up stab d.t. can be fitted easily.

2. The top fin should be fitted between two stab ribs to make it more secure. To do so, cut an additional stab rib and glue it along with the designated center stab rib just on either side of the stab centerline. Leave a 3/32-inch space between these two ribs (see tip #3 below).

3. Fin and subfin. In my opinion, the top fin and the subfin should be made of 3/32-inch balsa to minimize warpage. To minimize hangar rash and other dings and dents, I would also outline the fin and subfin with a thin strip of basswood.

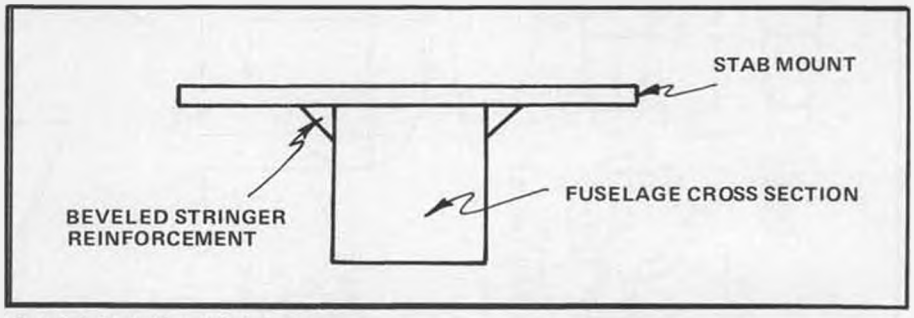
4. Subfin location. The subfin is mounted directly under the stab on the bottom of the fuselage.

5. Fuselage Sheeting. Although it doesn't indicate on the three-view, the fuselage sheeting at the nose and rubber anchor positions is of 1/16-inch sheet. This sheeting is on both sides, as well as the top and bottom of the fuselage.

6. Center of gravity. As is usually the case with most older designs, the center of gravity is not specified. 70 percent is the most commonly accepted location for the CG.

7. Incidence. The three-view does not show any incidence for the model. The original, as well as later versions, has a 1/8-inch square incidence block glued to the wing spar bottom after covering. This is essentially a strip of 1/8-inch square balsa strip that is just over 1-3/4 inches long. This lifts the leading edge of the wing and provides the necessary incidence.

8. Holding the wing in place. The wing on the original is held in place by long rub-



Sketch 1. Stab Mount Reinforcement.

DGA—Eros Section

Sta	0	.0125	.0250	.0500	.0750	.1000	.1500	.2000	.2500	.3000	.4000	.5000	.6000	.7000	.8000	.9000	1.000
Upr	.0169	—	.0303	.0418	.0507	.0578	.0685	.0755	—	.0800	.0790	.0720	.0620	.0498	.0356	.0196	.0030
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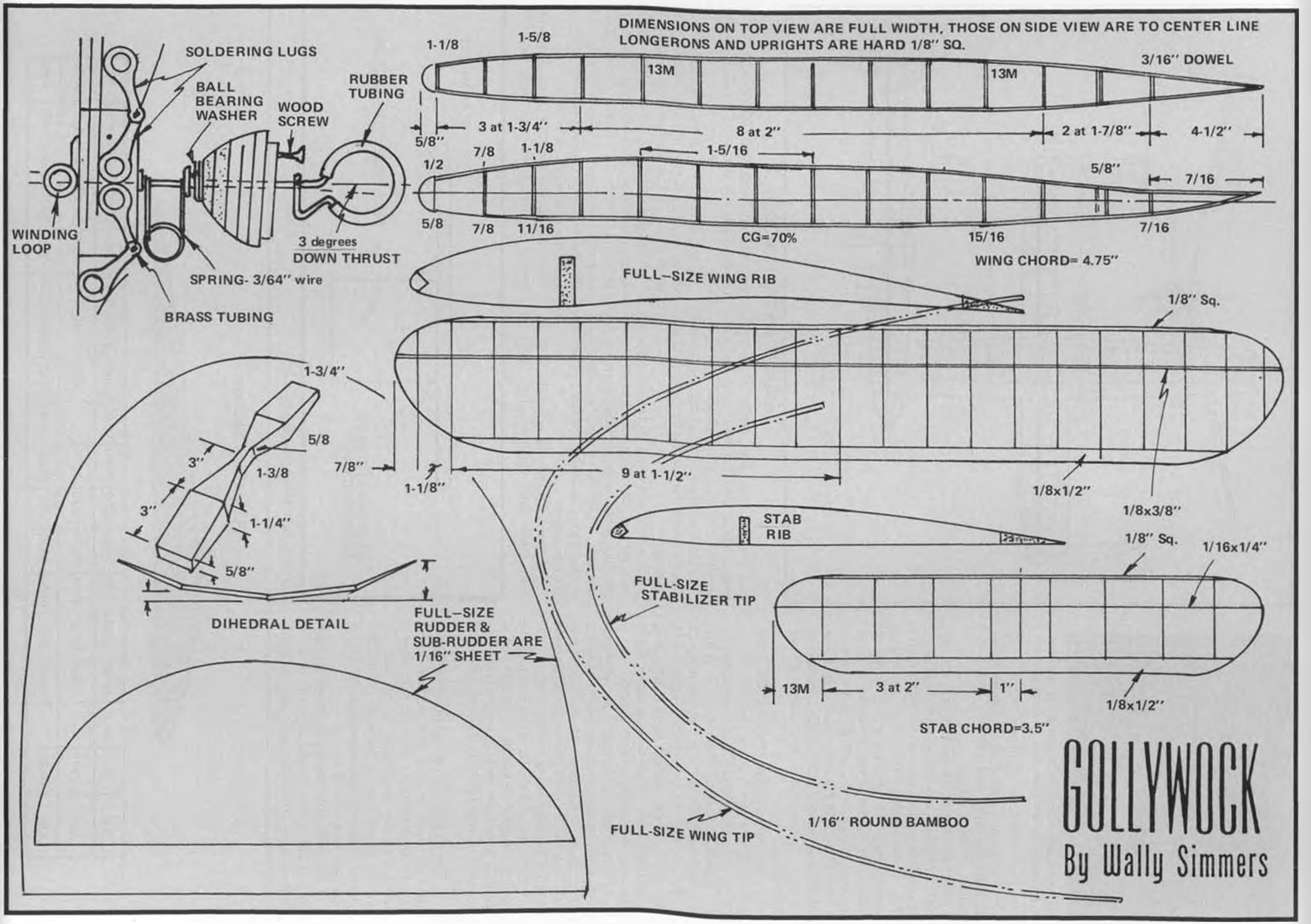

DIMENSIONS ON TOP VIEW ARE FULL WIDTH, THOSE ON SIDE VIEW ARE TO CENTER LINE
LONGERONS AND UPRIGHTS ARE HARD 1/8" SQ.
SOLDERING LUGS
BALL BEARING WASHER
WOOD SCREW
RUBBER TUBING
WINDING LOOP
3 degrees DOWN THRUST
SPRING- 3/64" wire
BRASS TUBING
1-1/8
1-5/8
13M
13M
3/16" DOWEL
5/8"
3 at 1-3/4"
8 at 2"
2 at 1-7/8"
4-1/2"
1/2
7/8
1-1/8
1-5/16
5/8"
7/16
5/8
7/8
11/16
CG=70%
15/16
7/16
WING CHORD= 4.75"
FULL-SIZE WING RIB
1/8" Sq.
1-3/4"
5/8
3"
1-3/8
7/8"
1-1/8"
9 at 1-1/2"
1/8x1/2"
1/8x3/8"
3"
1-1/4"
5/8"
DIHEDRAL DETAIL
STAB RIB
1/8" Sq.
1/16x1/4"
FULL-SIZE STABILIZER TIP
FULL-SIZE RUDDER & SUB-RUDDER ARE 1/16" SHEET
13M
3 at 2"
1"
1/8x1/2"
STAB CHORD=3.5"
1/16" ROUND BAMBOO
FULL-SIZE WING TIP
GOLLYWOCK
By Wally Simmers

ber bands which wrap around the fuselage.

9. Adjusting for flight. The adjustment for flight is quite simple. The wing is either slid forward or back to obtain the correct climb and glide. Once determined, a pen mark or other indicator should be drawn directly on the fuselage so that the location can be found on subsequent flights. Other adjustments include the built-in downthrust indicated on the plan. Since the model flies to the right under power, some right thrust may be necessary. Glide is either to the right or the left, and stab tilt can be used to accomplish this trim.

10. Power. The ship can be powered with varying amounts of rubber strip. Six strands of 3/16-inch will provide a docile flying model. Higher performance can be had by increasing the number of strands of rubber. Simmers suggests 16 strands of 3/16-inch rubber (this seems to be too much to me, but then the quality of the rubber in 1942 was not high). I believe that John Lenderman uses 12 strands of 3/16-inch FAI Rubber, and his ship gets plenty high.

I am sure that the Gollywock will be a model that you can build in a week and take out the following weekend to fly competitively. It is simple to build and to fly. I recommend it as a good design for beginners, regardless of how old you are. It has worked well for beginners and experts alike since 1942. Forty-seven years is a long time for a model to be popular, and the Gollywock is such a model. It is a tribute to Simmers's designing skills. I wish to express my thanks to Phil Hainer Sr. for his assistance in the research for the Gollywock.

Mark Sexton and his Teacher's Pet P-30 wait for the next thermal. The P-30, an English design, is a consistently good flyer.

Marlin Mixon at the Silents Please meet in Oregon. Marlin's model is the Midwest kit version of the Gollywock, a close cousin to this month's three-view. Marlin took 1st with this model in the rubber combo event.

John Lenderman's original Gollywock in the winding stooge. Note the differences between this ship and Marlin's, above. Elliptical stab tips and subfin are giveaways.

1989 NFFS SYMPOSIUM—CALL FOR PAPERS

Anthony Italiano, President of the National Free Flight Society, announces that the 1989 Symposium is now being planned. Any modeler who would like to contribute to the 1989 version should contact either George Xenakis, Editor, at 1288 Oak Knoll Dr., San Jose, California 95129, or John Oldenkamp, Managing Editor, at 3331 Adams Ave., San Diego, California 92116.

If you have a model design that you believe deserves commendation as one of the Ten Models of the Year, then direct your nominations to Charles Dorsett, 2645 San Benito Dr., Walnut Creek, California 94598.

And finally, if you would like to nominate an outstanding free flighter to the NFFS Hall of Fame, contact Anthony Italiano, 1655 Revere Dr., Brookfield, Wisconsin 53005.

Now, here's the kicker: nominations and outlines of the papers for this 1989 Symposium are due no later than December 30, 1988. Time is already fleeting, so get to it.

1988 NFFS SYMPOSIUM—A FIRST-CLASS PUBLICATION

If you haven't picked up your copy of the 1988 NFFS Symposium, then you need to do so. It is one of the finest of the Symposium reports that has been produced in the over 20 years of effort. Sal Fruciano, editor, should be very pleased. Now you can participate as well; $14 plus $2 postage will get you yours. Order from Fred Terzian, 4858 Moorpark Ave., San Jose, California 95129. If you are not an NFFS member, add a dollar to the price. If you are an overseas free flighter, then the postage goes up.

A bibliography of all of the first 20 volumes of the Symposium is also available from Fred Terzian for $9 postage paid. This bibliography includes citations of:

1. All Sympo articles published in Volumes 1 through 20.
2. All Sympo Model of the Year selections.
3. All references included in the above two listings.

Now, if you don't want a paper copy, Jim Wilson has taken the time to produce the complete bibliography on floppy disk. This

Continued on page 65

Lenderman's Gollywock has been flown for many years, as the patched areas indicate. John says that he built the model from scratch in one day, took it to a contest and placed 1st!

RAMBLIN' AROUND AUSTRALIA

By STU RICHMOND. . .It looks like the ol' Rambler is going to hang around New Zealand for a while; this month he gets a ride in a real, full-scale DH 82A Tiger Moth for a look at the country from the air.

• A bunch of five-hour-sleep nights in Australia pretty well wiped me out. When I arrived in New Zealand my hosts, Bill Cooksey and his charming wife Elizabeth, allowed me to gradually come back up to full throttle before sightseeing and more travel began. Their son Billy lives in Taupo in the middle of the thermal geyser area, and Billy and the locals are very active modelers with a nice infield of a horse training race track from which they fly. Sheep graze *there too*, so you really had to watch your step lest you slip 'n' slide in/on sheep-dip, ya know; more sheep than people in New Zealand.

Getting to Taupo was an old-world-type experience. Five to six hours was the estimated one-way travel time through rugged scenic beauty similar to Maui, Hawaii. The small bus stopped everywhere for everything; we rode it from Gisborne only as far as Rotorua where son Billy met us. But at Rotorua, along the mirror lake, there were Tiger Moths at the airport. Tiger Moths are to the rest of the free world what Piper Cubs are to Americans. But only about 125 of these old biplanes exist, and they are considered national archives by most countries. Sales are controlled and export is prohibited. These two Tiger Moths were available for sightseeing. Whatinell, it's only model fund money. It was decided that Stu was going aloft for one of life's great thrills: an open cockpit ride in an antique biplane!

Photo 1: This is DeHaviland DH 82A Tiger Moth registration ZKBRL with host Bill Cooksey on the right telling me I ought to take a flight. His son Billy finally convinced me.

Photo 2: I just loved having these two lovely New Zealand ladies dress me in flight gear. It wasn't expected and was much enjoyed!

Photo 3: Here's *MB*'s combination of the Great Waldo Pepper, Walter Mitty, and Ramblin' Stu Richmond high over New Zealand in a Tiger Moth.

Photo 4: If it weren't for the head fins showing you'd swear Guy Clapshaw's model Spit was the real thing. Guy is a pilot with Air New Zealand airlines based in Auckland.

Photo 5: Billy Cooksey taxis for takeoff from the infield of the local horse race track. Billy's Zero A6 uses a Kraft system, Rhom Airs, and an O.S. .61 two-cycle.

Photo 6: You have to watch where you kneel to take model pictures in New Zealand as you can bet the sheep were there ahead of you! This is Dawson Harris's Fly Baby being fired up. He uses an O.S. .80 four-stroker. Model supplies are unbelievably expensive in this country. In one hobby shop I saw small bottles of dope closed with corks. *Corks*, like I remember from almost 50 years ago! We sure are lucky in the USA. New Zealand modelers did seem to pay less for O.S. engines and many items from the orient.

Photo 7: We were invited to visit Dawson Harris's workshop and accepted. Dawson was completing a large green/white scale Citabria that looked strangely familiar to me. I'd sent to Bill Cooksey a color photo of a friend's full-size Citabria from Bob White airport in Zellwood, Florida, and the photo was being used by Dawson as simple fun-scale documentation; small world! Dawson flew Corsairs and Hurricanes in WWII.

Photo 8: Bruce Pike and his son Robert were at the infield flying this simple Cox Babe Bee .049-powered U-control trainer. It would sure be nice to see more U-control flying here in the USA with the youngsters learning modeling skills. Maybe if cobalt 05 motors and insulated control lines with rechargeable belt-mounted battery packs were promoted we'd see a resurgence in the USA of this entry-level fun.

After this visit with the Taupo Model Aero Club in New Zealand it was time to start moving on towards Melbourne, Australia, and home. New Zealand is a tiny country of 3 million people and 1100 modelers. There are few hobby shops and no national model publication. But the model builders there enjoy their activities with tremendous enthusiasm. Before I left, my host, Bill Cooksey, had painstakingly photocopied a 1946-7 British book entitled *Model Diesels* and had it bound for me. It's the same book that started Gordon Burford into model engine building after WWII. It's now a treasure in my library and a constant reminder of the friendships built in New Zealand through model airplanes. Next month we ramble through Melbourne a bit. •

Photo 1.

Photo 2.

Photo 4.

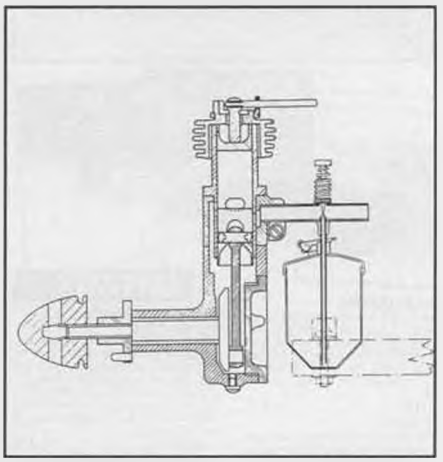
Photo 3.

Photo 5.

Photo 6.

Photo 7.

Photo 8.



The extreme simplicity of the Dyno 1 is apparent from this drawing. Careful inspection of the various points in the design afford a lesson in the elimination of nonessentials. In spite of its apparent lack of ornamentation the aesthetic whole is pleasing, while suck items as a drain plug--seldom seen on any of its imitators-are rightly retained. (From Model Diesels, on the Swiss Dyno, world's first production model diesel engine.)

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Free Flight. . . . *Continued from page 61*

disk is produced as a data disk for Appleworks, so anyone who has a computer that can run this software (as mine can) can run the bibliography. Jim is selling the bibliography postage paid to anyone in the USA for $20. It'll be $25 for anyone in the rest of the world.

SAL TAIBI ONE MORE TIME

As quoted from time to time in this column over the past year or so, Jorge Triana taped an interview with Sal Taibi at the 1987 Nats. This interview had been carried in the *Minneapolis Modeler Newsletter* in six installments. I have selected excerpts that seemed to be universal in interest to free flighters who read *Model Builder.* The last excerpt follows:

"Q: How did the idea come about for the configuration of the Spacer?" "Sal: Just what struck me at the moment when I was working. You start to put lines on paper and you try to think what you want. You see, the basic tail moment is always the same. The tail moment from the center of the wing to the center of the tail is always half the wingspan. Always! It's a good rule of thumb. Now, you can stretch it an inch, you can shorten it an inch, but that's where you start. And the elevator is always 33 percent of the wing, and the rudder is always 4 to 5 percent (of the wing area). You've got these figures in your mind, and then you decide what you want to build. At that time I liked the low pylons because they had a lot of speed in power and they didn't need any downthrust. So I decided, well, I'm going to go with a low pylon, and I built the pylon. I think the pylon on the AB Spacer is about 2-1/2 inches above the body. And then I just thought of putting lines in and fairing it in and looking at it. You know, that looks good, this looks good, and then you build one and fly it.

"The original Spacer had a much thicker elevator, and it would zero out occasionally. In fact, I zeroed the same airplane twice in one day just to find out if it was the tail. I thinned the tail down, and that took care of all the problems."

HORNET, WASP, AND ATWOOD NEEDLE VALVES AVAILABLE

Are you one of those guys with a pack of Hornet engines, some old Wasps, and a few Atwood Signatures or Shrieks that you can't fly in Nostalgia because the needle valve broke? Is that you, bunky? Well, never fear, I have a source for these parts just for you.

Phil Hâiner Sr., of Flite Rite Models, is producing replicas of these hard-to-find parts. They are made, as were the originals, of hard brass stock and are tapered exactly as the originals. The fit is guaranteed to be perfect. Now, I should point out that what you will get is a copy of the original without the spring or the spray bar; just the needle itself.

Still interested? Here is what you do: Send a letter to Phil Hainer at 10412 S.E. 228th, Kent, Washington 98031, include $2.50 for each needle, specify which engine the needles are for, and enclose a large, self-addressed, stamped envelope. Allow at least one week for delivery. Maximum order is three needles.

Phil will package the requested needles in appropriate packing and return them to you in your addressed and stamped envelope.

TWO SIZES OF 1/2A RAMRODS?

I ran into a strange phenomenon at our last free flight contest. Two contestants, Mark Sexton and Bruce Kimball, were waiting together for some good air. Each was holding his 1/2A RamRod, and, as I looked

carefully, it appeared to me that Mark's was smaller. Indeed, Bruce and Mark agreed the two models were of different size. Mark's was constructed from the Berkeley/Sig kit plans, and Bruce's was constructed from the plans in *Model Airplane News* by Ron St. Jean.

So, which one is the right one? Bruce says his has a 250-square inch wing projected. Mark's is 250 square inches flat. Now, there's a puzzler. Maybe someone out there reading this can fill in the details about this minor difference. Or maybe it's time to call on the rules makers. I think we should just forget it and consider that both of them are eligible.

MORE TIPS FROM TERRY

From the pages of the *Satellite*, once more a listing of super free flight tips from Terry Thorkildsen:

Tip #1: To get the most life out of your pacifier, blow it up first with no fuel in it. When it pouches to one side looking like a hernia, squeeze it so that it stretches the material out all around, and the hernia will no longer be the weak point.

Tip #2: To avoid a failure in your stab mount, put a beveled piece of stringer material at the joint to help beef it up. This is especially important if you just glue the platform on top of the planking since it will invariably break there. See sketch elsewhere in this issue.

Tip #3: This tip comes from Dan Keegan. To avoid excessive glue joints when gluing your ribs to the leading or trailing edges, keep a cotton swab handy. Then when the CA glue puddles on the waxed paper, you can wick it off into the cotton swab before the joint becomes solid. This is especially helpful on smaller models where every bit of weight saving helps. Dan said he started this when he built a peanut model as a break from his usual bigger gas models.

Tip #4: Instead of guessing where your timer should be set at for the max engine run, put a small black line at the appropriate mark using butyrate-type dope so it is permanent. A pencil mark will get you by in a pinch but will smear off with the slightest abuse. I set my timers beyond the mark and launch as it runs through the mark. This gives you a pretty accurate time, and you get to make sure your timer is moving before you launch. I also make marks for the appropriate flyoff flights with the reduced engine runs; then you are ready if you are running up a good string of maxes.

Tip #5: If you are going to fly in the heat of summer at Taft or any other hot spot, then go prepared with ice water or Gatorade that you can take a shot of between flights to cool down. A good block-out to prevent nasty sunburns is also advisable. The chair that my timer sits in also has an umbrella attached to shade the timer while he helps time my model. Marion Keegan can attest to its effectiveness at the Orbiteer's Annual. If you feel you have just had too much sun, then cool down in the shade and take it easy.

THE END AGAIN

That's about it for this month. I hope you have a happy holiday season and plan some challenging winter projects. I'll share mine with you during the upcoming months. In the meantime, catch a thermal for me. •

Peanut. . . . . *Continued from page 53*

The cowling for the engine of the Orlik has compound curves as shown on the top and side views, which are a little difficult to model with sheet balsa as is so often done with more commonly shaped cowls for radial engines. Because it is commonplace to find it necessary to add nose ballast on a Peanut (especially the way mine turn out; *heavy*), a hollowed block balsa cowl was made for the model in the photos. Carve the external shape on the block first, and then hollow the inside before adding the front end, which is laminated from three circles of 1/16 sheet and one ring of 3/32 sheet at the very front. Cement the layers of balsa to-

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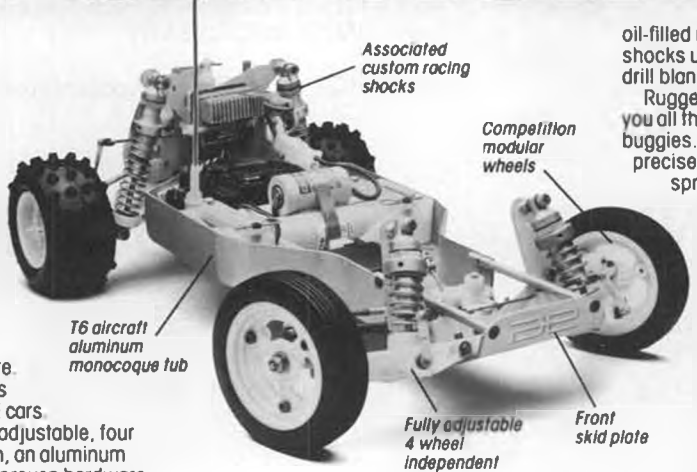

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gether with the grain aligned in different directions for maximum stiffness. A small Williams Bros. plastic thrust bearing is used.

The canopy can be formed as a single piece if desired, but the Polish engineer who designed them was very clever and did it in such a way that the fixed front and the most aft part of the canopy are flat wrapped and so can be simply wrapped around. This also allows the canopy frames to be made out of straight, parallel-sided pieces before they are bent to the canopy contour. As a consequence, we can make them out of a straight, parallel-sided piece also. The ones on the model in the photos were made from strips cut from a piece of 1/64-thick three-ply with grain of the outer plys going across the width of the strips. Make the strips longer than necessary and cut one end to the proper angle for attachment to the upper longeron as shown in the side view. Now cement it to the longeron, flush with the outer side. When this is completely set, bend it around to the other longeron until it has the correct curve and height in the center of the airplane and is properly located in the fore and aft direction on the second longeron, then mark the cutoff angle. Cut the strip as marked and cement it to the second longeron. Make sure that the attachment of the canopy frame is flush with the outer side of the fuselage and vertical with respect to the airplane at its point of attachment in terms of the front view. Of course, both frames lean in the side view; the front one leans forward and the aft one leans back.

The center part of the canopy has a compound curve and needs to be formed over a pattern. It can either be stretched or vacuum-formed. Which way it was done on the model is unknown because the Golden Age Reproductions kit for the P-51 has canopies for both the "B" and the "D" model P-51. Both canopies were left over because an "A" was put together. *And* the center portion of the "D" canopy fits the Peanut Orlik. Thin music wire and balsa details were used to construct the landing gear details, and they were made to plug into mounting blocks so that the model could be flown with the gear "retracted." The doors were stuck on with rubber cement for easy removal.

This model did not fly right off the drawing board, but required quite a few trimming flights. It tended to spiral dive to the right in the glide. As more and more left turn was adjusted into the glide trim, more and more right thrust was required for the powered portion of the flight. Luckily, the Polish designers saw fit to have external tabs on all the control surfaces, so flight trimming is simplified. •

Plug Sparks. . . *Continued from page 34*

Wakefield and Jack Phelps posing with an Ed Lidgard "Hi-Ho," a stick-cabin combo. Incidentally, Jack won the stick event at the Seguin AFB SAM Champs last year.

Dan Smith, seen in Photo No. 7, is a prolific builder and flier as can be seen by his stable of fliers; TD 020 powered Stratostreak, 1/2A Texaco R/C Peerless Panther, a Telco CO_2-powered Rambler, and an electric powered MK II Comet Clipper. Dan comes to have fun!

EASTERN ECHOES

Just received a series of photos from Mort Ross of Morristown, New Jersey. Most, unfortunately, did not have the "dropped" camera properly repaired, as the shutter was partially frozen giving a light leak that fogged the film.

However, we had picked up a few of the better ones, one of these being Photo No. 8 showing a reduced version of Dick Schumacher's "Candid" to be used in the 1/2A Texaco Event. Mort also reports the SAM 15 SPOT contest was a great success with a lovely 80-degree day and sunny skies.

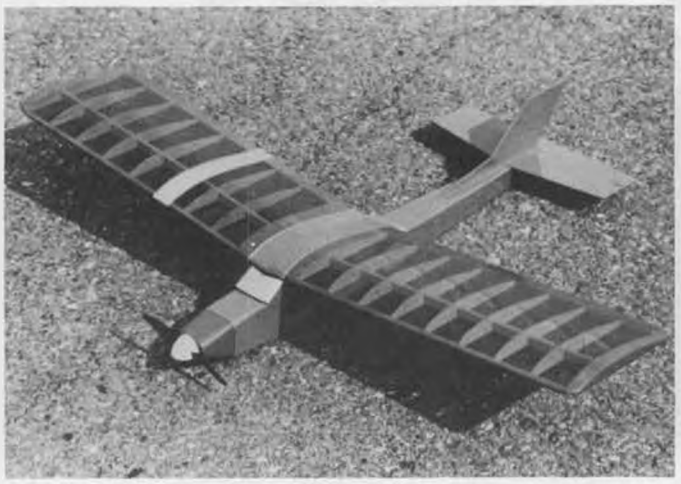
Following this September 11 contest at Bridgewater, Mort also attended the SAM 66 contest at Delaware City. Another great day and great bunch of fellows. Photo No. 9 shows one of the great guys, Walt Eggert with his original 1936 gas design, the "Eaglet" powered by a Brown Jr. Also seen is one of Walt's kitted designs, the Soaring Eagle A (produced by Megow Models). This model has turned out to be a beautiful 1/2A Texaco design.

Ross also sent results as follows:

1/2A Texaco: 1. Jack Van Dusen, Foo-2-U-2; 2. Art Peterse, Swoose; and 3. Walt Eggert, Soaring Eagle.

Fuel Allotment: 1. Dan Schneider, Bomber; 2. George Murphy, Dallaire; and

ELECTRIC POWERED AIRPLANE KITS



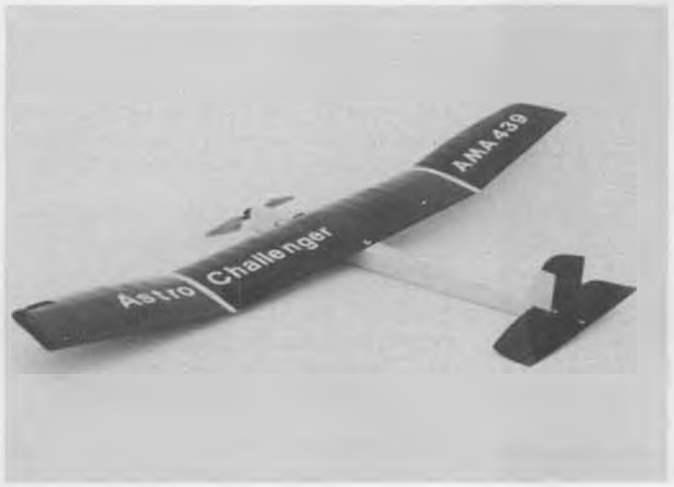
THE ASTRO SPORT

The Astro Sport is a cute little high wing sport trainer that is specially designed for schoolyard fun. Install the Astro Cobalt 020 Motor and you have a gentle and forgiving trainer that is very easy to fly. Install the more powerful Astro Cobalt 035 and it becomes a real schoolyard show-off doing snappy rolls, loops, and other schoolyard maneuvers. The kit contains all machine cut and sanded parts and is super easy to build. Wing Span 37 inches; Wing Area 292 sq. in.; Eppler-195, Flying Weight 22 to 28 ounces. **Kit # 1019 ..... $ 39.95**

PARTENAVIA P-68 VICTOR TWIN

Our popular PARTENAVIA P-68 kit has been comnpletely redesigned for the Astro Cobalt 05 Motor. The airfoil section has been changed to the Eppler-195 for improved aerobatic performance. The P-68 has always been a popular model at our electric contests, and in fact an Astro Cobalt 05 powered P-68 won first place in aerobatics at the 87 EAA Electric Championships. The deluxe kit features all machine cut and sanded balsa parts. Wing Span 50 inches, Wing Area 400 Sq.In., Flying weight 4.5 lbs.

Kit # 1013.....$89.95



THE ASTRO CHALLENGER NATS WINNER

Bob Boucher's Astro Challenger won the 84 Reno Nats its first time out and has been winning electric sailplane contests all over the country ever since. Powered by an Astro Cobalt 05 Geared Motor turning a 12 inch folding propeller, the Challenger climbs almost out of sight in 45 seconds, and can repeat this climb three or four times on a single battery charge. The distinctive wing planform with elliptical tips maximizes aerodynamic efficiency and minimizes tip stalls. It's gentle and forgiving nature make it perfect for beginners too. Kit features all machine cut and sanded balsa parts. Wing Span 72 inches, Wing Area 612 sq.inches, Airfoil Eppler 193 Flying weight 39 ounces. **Kit#1020..... $ 49.95**

THE PORTERFIELD COLLEGIATE

The Porterfield Collegiate makes a great sport scale electric model. It's gentle and forgiving nature make it perfect for beginners, but at the same time it can be quite responsive in skilled hands. The large wing and light wing loading lets the Porterfield climb steeply to and land short. Just what you need for flying in your neighborhood park or schoolyard. Beginners to R/C should install the Astro Cobalt 15 Geared Motor. More experienced flyers can install the Astro Cobalt 25 geared motor for very realistic scale like maneuvers. Wing Span 69.5 inches, Wing Area 690 sq inches, Airfoil Eppler 193, Flying Weight 4 to 5 lbs.

Kit # 1018 .....$ 79.95

ASTRO FLIGHT INC

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3. Walt Geary, Zipper.

Ross puts in a plug for Walt Geary as the best all-around guy; a fine model builder and flier and always helpful and cheerful. In short, a real pleasure to associate for flying meets.

USFF OLD TIMERS

Bruce Augustus sent in several interesting pictures taken at the U.S. Free Flight Champs featuring Cliff Silva. The most remarkable thing of the large models Cliff flies is that all starting and flying is done in a wheel chair.

Photo No. 10 shows Cliff with his 13-foot Mike Roll Berryloid Winner of 1937. Cliff has to rely on a helper to launch the model and in this case good friend Jimmy does the honors.

Cliff has moved from his ranch in Livermore Valley to Fallon, Nevada. Lots of free flight space out there!

SAM AUSTRALIA

Bruce Abell, 17 Ferguson St., Cessnock, N.S.W. 2325, Australia, writes to announce the first Aeromodeling Veterans Gathering to be held on May 20 and 21, 1989, in the Hunter Valley, 100 miles north of Sydney (still in New South Wales).

The purpose of this "gathering" is to invite many of those modelers involved in the early halcyon days of aeromodeling. Overseas visitors will be billeted at the Hunter Valley Club where informality and enjoyment are the only guidelines. For the benefit of those not competing and spouses, conducted tours of the vineyards and wineries are offered.

The schedule will consist of free flight, control line, and radio control models, all on the same field at the same time. The "pot hunters" can have their fill that day!

An awards dinner will be held on Saturday evening with the weekend concluding with a Sunday evening barbecue. For further information, write to Bruce Abell at the above address.

Bruce, who is tremendously active in the Old Timer activity, sends in a few photos showing the local action. Photo No. 11 was taken at Goulbourn, N.S.W. Lionel Joines is

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Make-Up & Hair: Vince Faucy

responsible for the beautifully finished Shereshaw Champion, a design that appeared in the April 1937 issue of *Flying Aces*.

To show the intense interest in old timers, Photo No. 12 shows only a portion of the entries at Goulbourn. Seen in the pic are a Lanzo R/C Stick, Lanzo RC-1, Dallaire, Buccaneer, Champion, Cadet, and a few others unidentified. Note most of the models are "biggies." Besides all his model building and flying, Bruce has found time to machine up an "Atom Minor" MK III (as seen in Photo No. 13). This Edgar Westbury design was made from a set of castings Abell was lucky to obtain. The completed engine tested out at 5,000 rpm using a 14 dia. x 5 in. pitch propeller.

The engine is scheduled for installation in a Rockateer. Should be an interesting combination.

MORE SAM AUSTRALIA

Colin Borthwick, who will probably be this writer's host when he visits Queensland in January 1989 for the MAAA Nats, sends a few interesting photos of the Queensland State Champs.

Photo No. 14 shows Borthwick receiving the Texaco Trophy from Major Farris of the USAF; this meet being held at Amberly AFB, the venue for the 1989 Nationals.

Looking on are Les Parker and Des Slattery. Colin, for those uninformed readers, writes a column for the Australian model magazine, *Air Borne*. The column, "For Old Timers Sakes" has had two or three columnists, but seems to have finally settled down with Borthwick.

Photo No. 15 should be captioned "Smile, it only hurts for a while," as Des Slattery had just received a nasty crack from the Cox 049 on a cold day. That one smarted! The model being used for 1/2A Texaco is the Leon Shulman-designed Banshee. This design became very popular in England right after the war. Most all "original" designs at this time reflect the Shulman influence.

SCALING REVISITED

Received a most interesting letter from Ross Thompson, 21201 NE 58th St., Space 47, Vancouver, Washington 98662, who writes to say it is easier when scaling to remember if you divide the area you want by the area you have, then take square root of the answer. For example: 400/800 = .5 and the square root of .5 = .707.

This requires only two entries and is easier to remember. Ross also says to watch your rounding off figures. A good example of that is .707 x .707 x 800 = 400, but .7 x .7 x 800 = 382. This could be important in an event such as the Ohlsson 23 Event, which requires a minimum of 450 square inches.

In addition, Ross says beware of scaling up small three-views, as the distortion can be fierce at times. Ross says he had 37-inch w/s plans enlarged and found one side panel 3/8 inch less than the other. Check your originals carefully. Models don't fly too good this way!

READERS WRITE

Received several photos from Lin McKay, 523 E. Leake St., Clinton, Mississippi 39056, who sent in one really good-looking shot of his Moyer Cloud Cruiser dolled out in National Guard Air Force colors, blue fuselage with yellow wings and tails.

This can be seen in Photo No. 16 on the local R/C runway. The other photo, which we were unable to use, showed the model coming in for a nice landing. Unfortunately, the photo was taken too far away and would not show in a reduced photo.

SAM ITALIA

Simply can't resist using photos sent in by Cesare de Robertes of Rome, Italy. Photo No. 17 shows two models by the old master Arve Mozzarini. At the left is seen the 1949 design called "Dindi" (note wing in dethermalizer position) and on the right, Arve's fabulous "Moar," a design of 8-foot wingspan and Brown Jr. power. Both models display that meticulous Italian craftsmanship.

THE WRAP-UP

Back to obituaries this month, as SAM has lost several good supporters of the movement.

First off, the latest SAM 35 publication in their lead article announce the passing of Vic Dubery. As an early member of SAM 35, he was the SAM 35 Chairman during 1982 to 1984 during which time Vic was instrumental in creating many of the procedures now taken for granted.

Vic is well remembered by this columnist for his stories of model building aboard the British Naval ships. The story was written about ten years back but did show an inventive genius for modeling with practically all model materials nonexistent.

Dubery was extremely active in most all phases of free flight, particularly rubber-

powered models. His work in advancing the cause of old timer flying was outstanding with numerous demonstrations of various aircraft. Like all of us, Vic wanted to build a model of every full-size aircraft he had flown.

Alas, this was not to be, as with all of us, he ran out of time. To put it succinctly, Dubery was a totally aviation person.

We also received notice from Karen Brannon, 2220 Mariposa, Casper, Wyoming 82604, informing Don Bekins that Charles W. (Chuck) Brannon, Jr., had died at the young age of 58 on June 15, 1988.

Chuck was very active in modeling, competing, organizing, and serving in various administrative positions including a sting as Associate VP for District 9 of AMA.

Brannon will be best remembered for his work in founding SAM 46 and his profound interest in old timer model activity. Sam 46 members are going to miss the tremendous interest Chuck had in Antique Class models. •

Old Timer. . . . . *Continued from page 34*

Bee has just the right conservative power to fly the model. Both Dick and Jim recommend about one notch above cruise setting on the needle; Jim uses a 6 x 3 prop, and Dick uses an 8 x 4, no side thrust, and just a little bit of down. The flaps are set at about 30 degrees up. Dick used 1/32 ply for the notched trim holders, while Jim held the tabs in place with pins through the rudders. Turns are made by bending only the tab on the rudder that is to be on the inside of the turn. The principle is similar to that used on the full-size Northrop wings; it's drag that produces the turn. It might even be possible that the trim tab on the inside rudder could be bent in either direction, just so it provides the drag needed to hold that wing back, pulling the aircraft in the desired direction! That's not gospel, but try it and see.

In producing the full-size drawing, Phil Bernhardt noted that the magazine drawing had some inaccuracies. For instance, the fuselage pod was drawn minus the strip planking, yet the nose block was shown flush with the first bulkhead. And the 1/16 sheet around the cockpit is shown as set in between the bulkheads. No allowance was made for the 1/8-inch planking! Oh well, Phil has taken care of that, along with a few other things. •

Simply Scale . . *Continued from page 25*

on the transmitter, but if the transmitter is more complicated, it may still have to be modified in order to maintain the usefulness of some of the mixing and dual rates. Mode III fliers are the minority.

For scale modeling, I am here to defend the Mode II or single-stick method of flying, but at the same time I am here to chastise many Mode II fliers for the way they fly. Let me explain. I, myself, fly Mode II. Having the right stick set up for a joystick control gives me a real feel for the model. As I have gained experience in flying, I have found that the one drawback cited for Mode II is not valid. The drawback cited is that of the

problem of inadvertent aileron control inputs while controlling the elevator and vice versa. Anyone who is a good Mode II flier, or Mode I flier for that matter, knows that if he is a good flier there are no inadvertent control inputs. A good flier will not let the springs in the sticks level his plane. He will be in full control at all times in all axis. A good flier could disconnect the springs in his transmitter sticks and his flying would not be significantly affected. For example, when looping, the elevator is not the only control used.

It is necessary to use all four control inputs and both sticks to do a simple loop. While the elevator is the primary control, all of the other controls come into play in producing a good loop. Especially with a slow-flying model it is important to fly around the loop using the ailerons to keep the wings level, the rudder to maintain the correct heading, and the throttle to maintain a constant speed and prevent overstressing the model while the elevator input is adjusted to make the loop round. The simple pull up and wait routine doesn't cut it for making a good realistic loop. The model must be flown around the loop with great care and concentration.

A problem Mode II fliers have is often a lazy left hand. They do not use the rudder and throttle control enough. Many seem to think that you use the left hand to taxi and the right to fly. You will find, however, that the more accomplished Mode II flier will use both sticks equally in the air and on the ground. Taxiing a high-wing taildragger crosswind is an example of a situation where both hands will be busy. While the left controls speed and direction, the right will keep the correct amount of pressure on the tailwheel with elevator and will use the ailerons to keep the wind from flipping the model over. As with full-size aircraft, the ailerons are important in taxiing safely.

Of course, during all maneuvers it is important to use the rudder to maintain the correct airspeed. If you do not concentrate on using that left stick as well as the right to fly, you will not be able to accomplish realistic flight with most models.

No matter which mode you fly, you must remember to use both sticks effectively for realistic flight. It is also important to develop a feel for the effect of all the controls.

Mixing functions that are found on many of today's transmitters do not help you to develop a feel for the controls. Many fliers use rudder mixing in an effort to eliminate the need to coordinate rudder with aileron control. The use of mixing does not coordinate rudder with aileron, it just adds it. There is a distinct and noticeable difference between adding rudder and coordinating your turns. To truly coordinate your controls to make a good turn you may find that from the time you initiate your turn with aileron you will require varying amounts of rudder and aileron inputs which can actually be opposite in direction at times in order to accomplish a smooth banked turn. This cross controlling is necessary to offset the effects of turbulence. If simple rudder mix is employed, the ability to properly cross control is inhibited. The result is the quality of the turn will suffer.

Rudder mix also has a detrimental effect on straight and level flight. As the ailerons are used to keep the wings level, the coupled rudder will cause some yaw and make the tail wobble. Realism is diminished.

Similar problems can be described with other forms of mixing. They have not yet invented a transmitter that can sense what a model is doing the way you can. Make sure you do the flying and not the transmitter. It may take some practice, but the results will be noticeably better in the long run. •

Chipmunk . . . *Continued from page 37*

refuels in succession. We suggested to Paul that he take one to Kiev as a backup ship—this is being written prior to the World Champs—and the look on his face indicated he nearly considered it!

Lots of laughs, applause, and suggestions from the crowd that we (you guessed it) hold a one-design stunt contest with a few of these models. The Super Chipmunk puts a lot of *fun* back into flying sessions; overall, we'd rate its flying ability, in stock form, as a "B+." What would we *change* on the stock design? Well, (a) move the leadout guide forward about 3/8 inch, or make it adjusta-

ble, and use less rudder offset to help reduce hinging in the square corners; (b) shorten the nose about one inch; (c) add 1/4 to 1/2 ounce outboard tip weight. Please bear in mind that we're purposely being "picky" here because we were *asked* to be. As supplied, the model is the best flier in the Cox C/L group, and they're to be commended for recognizing the need for a genuine C/L stunt trainer.

Very noteworthy is the inclusion of a customer service "Hot Line" phone number on the carton. Customer feedback is encouraged. Also enclosed is an excellent pamphlet on maneuvering, including diagrams and descriptions of the entire AMA Precision Aerobatics pattern. An added bonus is that the carton makes an ideal storage box for balsa or rolled plans!

The model comes with a 90-day warranty, exclusive of the glowhead (natch'), crash damage, and obvious misuse. Retail price is ". . . in the $45 range," possibly less at the discount stores, et al.

As you may have gathered by now, we highly recommend the Cox Super Chipmunk for those seeking a quick and inexpensive way to begin learning the Control Line Precision Aerobatics pattern. •

Electric . . . . . *Continued from page 27*

1/4-inch motor shaft was bent slightly, but, amazingly enough, the Graupner prop did not break. The nose of the plane was about six inches deep into the earth. The entire nose section was pulverized, but, believe it or not, it is rebuildable. And that is what I intend to do!" Thanks, Ben, for the very complete report. I think this gives everyone a "feel" for what is involved in building the 40- to 60-size planes from gas kits. Most of us that do so (I am one) use the gas kit parts for templates and "build electric." In a 40-size plane this will save at least a pound, and in the 60-size, about 1-1/2 pounds. Most of the savings come from using smaller dimensions for the wood and eliminating structure that is there for absorbing the hammer blows of internal combustion engines. Some of the savings come from using lighter wood, but that is probably only about 20 percent or less of the total weight saved. Economy in structure and wood size do most of it. If you build using full-scale philosophy, you will have a light plane. If you build with the "carve it out of a log" philosophy which dominates most designs, it will be heavy. If you do build right, figure that your 40 electric will be 1/2 to 1 pound more than the gas plane, and the 60 will be 1 to 1-1/2 pounds more than the gas plane. This is not a serious weight penalty, and the performance is very good, equal to four-cycle or better, and equal to most sport-flying glow-engined planes. I recommend the 40 to 60 electrics to any of us who have to fly at fields where the 40 and larger gas planes dominate. You can "mix it up" with the rest of them and not get run over! One kit that is pretty good "as is" is the Warlord kitted by Bridi. Have fun!

I mentioned the new surface mount throttles by Jomar last month; here is a photo of the SM-4. I should have shot this photo at an angle, then you could see how flat this throttle is. It will handle 6 to 28 cells and is 27 grams (less than an ounce) with leads. The SM-4 is $85. The SM-5 weighs 20 grams, handles up to 7 cells, and is $70. The next photo shows the boost charger that is now available from Jomar. This charger will charge up to 28 cells at about 3 amps, up to 24 cells at 4 amps. You can buy it as a kit for $95 or assembled for $120. This is a very fair price, particularly the kit, for a charger like this. All the electronics and the timer are included for this price; the ammeter is not. It is easily added on with in-line connectors by the modeler. There are very few chargers that can charge 28 cells and not all that many that can charge 24 cells. It will make an excellent match for the Astro and 60 systems. I look forward to using mine.

The charger uses a 15-minute timer. I think Jomar will be coming out with a peak detector add-on later. The charger operates on a 12-volt car battery, supplies 50 volts DC with no load, and will hold that at up to 4 amps. The charger will get hot when charging packs larger than 24 cells, so Jomar recommends a cooling fan in those cases.

Several months ago I mentioned the Flittermouse, a very neat plane kitted by Mole Power Controls (England). I got a very nice set of brochures on the Mole products from Stuart Pearce, of Hobby House, 40 Holgate St., Barrie, Ontario, L4N 2T7 Canada, phone (705)726-6208. These include the MT-08 failsafe, which shuts down throttle in case of R/C failure, chargers in several models to cover everything from 7-cell to 30-cell packs, electronic on-off and speed

controls, and the Flittermouse! The Flittermouse has a 57-inch span and looks just right for float flying with a cobalt 5 or 15. All these are sold by Hobby House. Since Hobby House is in Canada, an SASE will not work for US citizens, so I suggest you include a dollar bill to cover the expense of mailing price lists and descriptions. Prices were not included in the brochures I received. Hobby House also sells the Keller cobalt motors, Geist cobalt motors, and the Ungar cobalt motors. These can be hard to find, so here is a source!

Sonic Tronics is a well-known name in modeling; they are now marketing folding propellers for direct-drive electrics. These are the props that were designed by Tom Kerr of K&W. I received some samples and I am impressed. I have not flown them yet, but several readers have reported that they work very well. They go a long way towards solving three problems in one swoop, which is always good! First, they help keep motor shafts from bending when the plane nose hits the ground. Just one motor saved this way will repay the cost of the prop at least twice over. Second, you will get more flight time because you do not have those blades sticking out creating high drag when you go back to idle or off. Third, the prop itself should last much longer, since it can fold instead of break in a bad landing. My impression of the blade design is that they should be quite efficient. I like the hub design too; it is very light and strong. The blades cannot fold forward, again, very good, since that can cause serious vibration. In all it looks very good. The prices are: $9.95 for the 6x4 prop and $10.95 for the 7x4 and 8x4 props. You can also buy a special hub for $6.50 that ads 3/8 inch diameter and 1/2 inch more pitch to fine tune your system. As said, one motor shaft saved more than justifies buying a folding prop. Well, for now, Merry Christmas and a Happy New Year, may it be electric! •

ARFS. . . . . *Continued from page 29*

ULTRACOTE REVISITED

In a foregoing column, I discussed the use of Carl Goldberg's Ultracote on the Vector, a ready-to-cover model which is also distributed by the same firm. Now that we have logged a couple of hundred flights on the Vector (perhaps I'm cheating a bit, as I tend to count every touch and go as a complete flight), I feel I can give a more accurate evaluation of this covering material. First, the claims made by the manufacturer are entirely true in every respect, something which is difficult to say about many products. Ultracote is virtually sag proof, completely impervious to fuel, and tough as the dickens. On one memorable flight, something glitched my radio badly, control was lost, and down she came. At about ten feet of altitude the glitching stopped and I regained control, just in time to level out and reduce the angle of impact with the ground. Aside from a broken prop and a slightly bent nosegear, there were absolutely no scratches or tears in the Ultracote. As a matter of fact, the entire airframe was completely undamaged, attesting to the fact that this prefabricated airplane is built sturdily. All the Ultracote seams are still sealed and holding good as new, and constant sitting in the hot sun has not produced any fading. As previously mentioned, Ultracote is not a high gloss material but is somewhat flat in appearance. Though others may disagree, this looks far more realistic to me. Ultracote is a really fine product; it has my unconditional seal of approval, so don't hesitate to give it a try.

As for the Vector itself, it has proved to be a great little sport plane, now that we have set a substantial degree of throw into the ailerons. True to my initial impression, it makes an excellent transition model from a basic trainer to something with a good deal more zip and performance. Of course, its rugged construction and exceptionally easy repairability are among its most outstanding features.

TIP OF THE MONTH

Nobody likes to see scuffing on a wingtip, especially on an ARF. Nevertheless, this is really unavoidable, as even the best of us occasionally drop a wing on landing or takeoff. Should a plastic shrink covering get scuffed, you can always patch it in a few minutes with a sealing iron and a piece of covering. However, if you happen to be flying an ARF with solid plastic wingtips, you sometimes have to live with scuff marks, as repairing them is usually more trouble than it is worth. Runway rash can often be removed from ABS-type plastic by gently ap-

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plying a quick swipe of acetone to the area with your fingertip. Your finger should be heavily coated with the solvent, and the application must be made smoothly and quickly, and *one time only*! Don't move your finger back and forth, just move it in one direction in a straight line. If more applications are required, wait until the previous one is completely dry, at least 10 or 15 minutes. Actual punctures in ABS plastic can be repaired by making a paste out of plastic scraps dissolved in acetone, but this is a whole new subject we will cover at some future time. Buck Faure, my pattern flying buddy from Encinitas, California, told me that the way he copes with this problem is to prevent it from happening in the first place. To do this, just slip into your local paint or hardware store and buy a roll of clear vinyl tape. Put a layer or two on the bottom of each wingtip, and your troubles are over. The vinyl is super strong and protective, and it can be replaced as often as necessary. Many thanks to Buck for sharing this worthwhile tip.

ARFS IN ACTION

It is outside the realm of possibility for anyone to personally test every ARF on the market, nor even to be entirely familiar with all the ARFs available today. So I do just what you would do. When I see someone with an interesting ARF I haven't evaluated myself, I strike up a conversation and ask what he thinks of his airplane. From time to time I intend to recount some of these discussions in this column, and this month I would like to tell you about Mark Silzle of Costa Mesa, California, and his Bell P-39 Aircobra by Sure Flite Enterprises. Mark has put a lot of flights on this all-foam ARF model, and he has nothing but praise for it. He applied a scale-type paint job and installed a Saito .45 four-stroke engine. He really likes this engine/plane combination because there is plenty of power and the sound is so realistic. Furthermore, the tricycle gear is really easy to handle on the ground, and it makes taking off a simple task. All maneuvers, including rolls and snaps, are tight, and the model seems to have no bad flight habits. Landings are slow and require no great skill, so Mark feels this quick-to-assemble model is ideal for the intermediate pilot who wants to try standoff scale and is somewhat lacking in taildragger experience.

1988 RENO NATIONAL AIR RACES

Having just returned from one of the most memorable aviation experiences available in the entire world, I just couldn't resist including a few of my observations. This year commemorated the 25th anniversary of the Reno National Air Races, and they were held on four days, September 15 thru 18, at Stead Airfield, about 10 miles outside of Reno, Nevada. As usual, four classes of racing were scheduled; Biplanes, Formula One, AT-6, and Unlimited. Racing heats were interspersed daily with various flying exhibitions. These included the Air Force Thunderbirds, military parachute drops, novel helicopter performances, and an almost unending series of stunt demonstrations by various aircraft including Stearmans, Pitts, gliders, and a P-38 that could bring tears of joy to your eyes. As always, Bob Hoover, the undisputed leader of American stunt flying, showed up with three aircraft and went on to prove that his ability to thrill a crowd is as good as ever.

As a model airplane enthusiast, I was most interested in going directly into the pits to get a really close-up look at the famous aircraft and their intrepid pilots. Nothing could compare to the excitement of walking right up to Alan Preston's "Dago Red" P-51 and actually touching it! As a Mustang fan, I was in ecstasy as I came upon Bill "Tiger" Destefani's 1987 un-

limited record-setting "Strega," John Dilley's "Vendetta," and Ron Smythe's "Miss America," with its unmistakably patriotic color scheme. Add to these a Corsair, an F8F-2 Bearcat, a number of British Sea Furies, and a couple of Yaks, and the spectators were in warbird heaven. I will never forget John Sandberg's fabulous "Tsunami," an unbelievably sleek aircraft, which appears to be a highly modified P-51, but is actually a look-alike built from the ground up. It was fascinating to see these planes literally torn down and rebuilt between heats, with parts strewn all over the place and ground crews frantically working at top speed.

Though the flying continued at a continuously frenetic pace, I nevertheless found time to stroll among the vendors and view some of the interesting exhibits in the display areas. It was here I stumbled across the booth manned by the Reno Radio Control Club. These enterprising fellows were raffling off a number of ready-to-fly R/C models, and they seemed to be doing a land office business, with customers lining up to buy tickets. Many other interested race fans stopped by to take a closer look at the models and to ask questions. All this proved to be an excellent public relations affair, as well as a club moneymaker.

Parked next to a full-sized "Knight Twister" was a quarter-scale miniature of the original. This model was constructed by Don Fairbanks and was a static display not intended for flying. Don told me that after 18 years of competition, the full-sized Twister was going to be retired. It will be placed on exhibit in the EAA museum at the conclusion of this year's races.

I hope that each of my readers can someday have the opportunity to attend the Reno National Air Races. It's something you will remember always. Thanks again for being with us this month, and, as always, your comments are always welcome and appreciated. Contact me at 2267 Alta Vista Drive, Vista, California 92084; (619) 726-6636. •

R/C Soar. . . . . *Continued from page 43*

and Woody Blanchard (electric power booth). My apologies to all in this list whose many accomplishments I have probably just glossed over!

EAST COAST NEWS

Rich Border of Keansburg, New Jersey, sends us some photos of some of the action from his part of the country. Let it never be said that *Model Builder* only has West Coast stuff in it! Thanks, Rich, for the input!

Basically, the photos were taken at two contests this summer. The first was the Capital Area Soaring Association's (CASA) Unlimited Class contest flown on September 10 and 11, and the second was the Long Island Silent Flyers (LISF) Two Meter Class contest held September 17 and 18.

Because most of the information sent with the photos will fit in caption space, this write up will be kept short.

Fred Gregg flies a Stretch Gemini built by a fellow modeler, Bob Champine. Fred finished the model and added "swiper tips" to its wings made out of blue foam and Solarfilm (Hobby Shack Flite-Kote). He says the stalls are now very soft, almost a straight ahead mush. Fred also added a boundary layer "trip strip" at the 20-percent chord point all along the wing. Three layers of .007 x .125-inch trim tape made up the trip. He reports that the wing now makes more lift than before and requires a couple of clicks of down trim.

Anthony Quesada flew a 1/6-scale Reiher scale glider from a Krick kit (available from Hobby Lobby) in the CASA contest. It wasn't competitive and wasn't meant to be, but it was a lot of fun. Anthony likes the model well enough to begin building a 1/4-scale version of it from blown-up Krick kit plans.

Irving Wolk took a Top Flite Metrick kit and modified just about everything that could be modified. His project features a shortened nose (by one inch), a new T-tail, an Eppler 193 airfoil for the wing, a one-inch increase of polyhedral at the tips, and a 90 percent switch to contest-grade wood. With a Thermal Sniffler aboard, the model weighs 34 ounces. Well done Irving!

Walter Panknin of the LISF took a "Fat Bat" kids' plastic baseball bat, a toilet tank float, a pair of arrow shafts, and the good old Clark Y airfoil section, put them all together and designed a very comic R/C bird. He calls it the "American Birdie." Although it hadn't been flown when the picture was taken, Rich tells us that Walter has something similar which flies quite well. Let's hope Rich doesn't mean the next sail-

plane. . . .

Walter also flies a design he calls the Alcedo. The Alcedo is a bird in Germany which likes to dive straight down. Walter's Alcedo two-meter sailplane features a homemade molded fiberglass fuselage, a wing with a Ritz 12-3 airfoil, ailerons, and V-tail with elevator function only.

LEAGUE OF SILENT FLIGHT

The LSF is a nonprofit, national organization devoted to the promotion and advancement of the sport of R/C model sailplane flying. It has a program for personal goal setting and recognition of skills that is widely regarded in the USA as the standard by which a person's flying abilities are judged. They are known as Levels. Usually represented by Roman numerals, Levels I, II, III, IV, and V are each progressively harder to attain and require more and more dedication and discipline to achieve. These levels were established in the late sixties and even today are recognized as being challenging and rewarding to those who strive for the top. Membership is limited to those aspirants who have achieved Level I.

LSF President Bob Steele recently sent me a press release. It is self-explanatory, so here it is:

"The League of Silent Flight has reached two significant milestones in 1988. The first has been long anticipated, the second is something of a shocker.

"Mal Pring of Valley View, South Australia, has become the sixty-second member to achieve Level V status. Perhaps more significant is the fact that he is the first person not residing in the continental USA to accomplish this goal!

"Mal has been working on his Level V tasks since October of 1982. The final task to be completed was the eight-hour slope duration done at a place called Anstey's Hill on January 15, 1988.

"I feel sure that Mal Prings's achievement will give a solid boost to the LSF movement in Australia, and indeed to the rest of the world. LSF after all is not just an American organization, it is truly worldwide.

"The second LSF milestone is just as unique and probably not as widely anticipated. Most people, on completion of the Level V tasks, breathe a deep sigh of relief that their quest is finally over, and they can become ordinary sailplane pilots again. Not Bob Champine of Newport News, Virginia. He decided to do it all over again, starting with Level I.

"First he signed up with LSF as Bob Champine. On the second sign up he used his full name, Robert A. Champine and received his second LSF number. This was necessary in order to track his accomplishments on the computer. He then proceeded to work on his Level I tasks again! (Remember those spot landings in Levels I & II?)

"Level I was completed on January 31, 1985, and Level II on February 16, 1985. Apparently he liked cold weather as well as spot landings! Level III was finished for the second time on September 22, 1985, and he then went on to Level IV. Not unexpectedly, this took until August 23, 1986, nearly a year.

"Achieving Level V twice took two years, being completed on August 13, 1988. Bob Champine, who has many firsts to his credit in both full-scale and model aviation, thus adds another first to his list: he is the first Double Level V.

"LSF is proud to have people like Mal Pring and Bob Champine as members with their determination and love for the sport of R/C Soaring. We are also pleased that the tasks formulated twenty years ago in California are still found to be so challenging today by people all over the world." Now for a mini account of Bob's last goal on the road to Double Level V, here is a report stolen from the Tidewater Model Soaring Society's newsletter, Colin Britcher, editor. "CHAMPINE GETS LEVEL 10!!!

"After sinking like a brick from launch, the much travelled and frequently bashed 'Stretched Gemini' started to climb just the other side of I-664. Within ten minutes or so, it was 'specked out' in a good-looking cloud over the Mercedes plant, which happened to be down wind. A crowd began to assemble with a feeling that today might be the day. A little further into the flight, Bob decided that he was getting too high and too far down wind, so spoilers were deployed to shed a couple hundred feet and the model was brought up wind, back towards the field, straight under another good-looking cloud forming over the Mercedes plant. That turned out to be the story of the whole flight. A perfect 'thermal street' just seemed to form right over the field and stretch away straight down wind. The model was never below 1500 feet for two hours, spoilers were used frequently, and the two hours finished with the model still climbing strongly.

"All this means that our very own Bob Champine, who may not have been the first to complete Level V (*He was 34th. bf*), is the very first person in the world to do it twice!" Thank you Bob Steele and TMSS for the news, and congrats to Mal and Bob on their achievements. For info on becoming an LSF

member, contact Bob Steele at 10173 St. Joe Road, Fort Wayne, Indiana 46835.

TIME TO BUILD A GLIDER

With the building season in full swing, it's time for everyone to get back to the workbench and get cracking (and sawing, and sanding, etc.). I hope Santa Claus treats you well this Christmas and that your projects are all coming along fine.

My Christmas came a little early this year. On September 27 at 8:49 p.m., my wife Kathy and I were given a second son, Andrew William. He was born six weeks prematurely, but weighed 5 pounds, 14 ounces and measured 18.5 inches long. After a week and a half in the Neonatal ICU, Andy came home in great shape. . . . Just had to crow a little! Thermals, Bill Forrey, 3610 Amberwood Ct., Lake Elsinore, California 92330, (714) 245-1702. •

Hannan. . . . . . *Continued from page 57*

Wish Foundation during the Rocky Mountain Free Flight Championships, representing model builders from five states. It is hoped to continue this charitable fundraising on an annual basis.

NOW THERE'S A PRIZE!

According to *Blue Ribbon of the Air*, by Henry Serrano Villard, Louis Paulhan won his 1902 Voisin biplane as a prize in a *model* airplane contest! Since it did not include an engine, Paulhan borrowed money to buy a Gnome rotary for it.

MODEL SUPPLIES ARE WHERE YOU FIND THEM

Tom Matterfis, of Clearwater, Florida, obtains model building materials from uncommon sources. Many "good old days" designs were constructed from reed, but when did you last see any in a hobby shop? Tom suggests the basket weavers have plenty of it, and at reasonable prices too. His comes from Begley Caning and Basket Supplies, 3517 North High Street, Columbus, Ohio 43214. They ask $1 for their catalog, which is filled with unusual materials, tools, and finishes. Their reed is available in sizes from 1-1/4mm to 7-1/2mm diameter in one-pound coils, which Matterfis says "will keep a dozen modelers busy for several lifetimes." Tom also advises that silk thread, so useful for rigging model planes and ships, may be obtained through firms catering to fishermen, since the thread is employed in fly-tying.

FLYING IN FLEMALLE

Thanks to reports from Benno Sabel, Lubomir Koutny, Antonin Alfery, and Sigfried Glockner, we have the results of the 1988 Flemalle, Belgium, indoor contest. Modelers from Belgium, Czechoslovakia, France, Germany, Greece, Holland, Japan, and USA took part in the annual affair, which includes practically all indoor categories. Since we anticipate that "Mr. Insiders," Dave Linstrum, may report on the non-scale models, we'll concentrate on Scale.

Two Peanut categories were flown: Peanut Duration, which favors performance, and Peanuts Maquettes, which favors moderate flying, highly detailed models. Christoph Hanriot, of France, made a clean sweep of the Duration Junior Class with a top time of 63 seconds, and Jacques Delcroix, of France also, had a top time of 112 seconds to take first in the Open class.

Peanut Duration (Junior)

1. Christoph Hanriot	France	Fokker E III
2. Christoph Hanriot		Volksplane
3. Christoph Hanriot		Pottier 100 TS
4. Thomas Merkt	Germany	Volksplane

Peanut Duration (Open)

1. Jacques Delcroix	France	Lacey M10
2. Jurgen Weil	Germany	Cloudbuster
3. Antonin Alfery	Czechoslovakia	Heinkel He 70G
4. Lubomir Koutny	Czechoslovakia	Kalinin K-3
5. Jacques Delcroix	France	Trempik
6. Antonin Alfery	Czechoslovakia	Farman Mosquito
7. Jurgen Weil	Germany	Sky Rider
8. Siegfried Glockner	Germany	Volksplane
9. Henri Fraikin	Belgium	Pottier 100 TS
10. Jacques Delcroix	France	Pottier 180

The sole U.S. entry in Peanut Duration was a Messerschmitt 17, by Millard Wells, of Florida, which placed 19th with a respectable top flight time of 56 seconds, proxy-flown by F. L. Van Hauwaert.

George Kandylakis, of Greece, ended up with 512 scale points and 19-second flights to take first in the Maquette Open Class.

Peanut Maquette (Open)

1. George Kandylakis	Greece	Avro F
2. Antonin Alfery	Czechoslovakia	Spitfire
3. Antonin Alfery	Czechoslovakia	Messerschmitt
4. Lubomir Koutny	Czechoslovakia	Albatros W-4
5. Benno Sabel	Germany	1910 Deperdussen
6. Antonin Alfery	Czechoslovakia	Aichi Seiran
7. Benno Sabel	Germany	Bleriot VIIIC
8. Heinz Neumann	Germany	BD-4
9. Maurice Huybrechts	Belgium	RSV 18 105
10. J. Bourdeaud'Huy	France	Pitts Special

The Junior Peanut Maquette category was won by Thomas Merkt of Germany flying a Bleriot XI.

In Pistachio Scale Jurgen Weil, of Ger-

many, won with 460 scale points and a 59-second top flight. Bill Hannan, of the USA, took sixth and was proxy-flown by Siegfried Glockner.

Pistachio Scale (Open)

1 Jurgen Weil	Germany	Cloudbuster
2 Antonin Alfery	Czechoslovakia	Spitfire Mk XI
3 Antonin Alfery	Czechoslovakia	Drzewiecki Canard
4 Jacques Delcros	France	Potter 100 TS
5 Antonin Alfery	Czechoslovakia	Waterman Racer
6 Bill Hannan	USA	Renard SR 78
7 Lubomir Koutny	Czechoslovakia	Guillebaud Tandem
8 Benno Sabel	Germany	Windham 1909
9 Shoichi Uchida	Japan	Lacey M10
10 Pascal Orsini	France	Farman Mosquito

Antonin Alfery, attending the Flemalle contest for the first time, described it thus: "Unusual rules, unusual models, and an unusual hall. . ." And people? "The same as in our country; some of them build models for victory and the others for fun." Tonda was delighted to meet Benno Sabel: "His models are amazing. He doesn't speak either of my languages and I don't speak German, but we understood ourselves well." And isn't that the most rewarding part of our hobby? We think so. Another contest is scheduled for August 25, 26, and 27, 1989, at Flemalle, Belgium.

FIFTIES FLYERS

Time really *does* fly! The latest book from Argus Press Group is a retrospective look at model airplanes of the 1950s, which now seem to be taking on some of the aura of "Old Timers," which is a difficult concept for those of us in the graying set to accept!

Be that as it may, Vic Smeed, who did such splendid work on earlier books in the series, has gathered 166 free flight control line and radio-controlled model designs which were published or kitted during 1947 to 1959. Most are reduced; however, some are printed full size. Many are by well-known designers such as Louis Garami, Sal Taibi, Howard McEntee, Bill Krecek, Roy L. Clough, P. E. Norman, Clarence Mather, Bob Palmer, Gerry Ritz, Ray Malmstrom, Paul Plecan, Frank Ehling, Paul Del Gatto, and lots more. Truly a comprehensive collection within 96 pages, even if it does make us feel the clocks are increasing speed lately.

Flying Models, Favourites of the Fifties also includes useful kit and model engine lists (ignition, diesel, and glo types).

AIRCRAFT ARCHIVES

Also new from Argus Press Group are two volumes in their Aircraft Archives series *Bombers of World War Two* and *Post-War Jets*. These compilations of magnificent scale drawings are in the *Aeromodeler* and *Scale Models* English magazine tradition, which makes them unusually suited to model building and proof-of-scale purposes.

The *Bombers* book features the work of technical artists such as G.A.G. Cox, Ian R. Stair, Bjorn Karlsrom, J.D. McHard, and many more. Their subjects include such model-worthy selections as the Fairey Swordfish, Boeing Flying Fortress, Handley-Page Halifax, Consolidated Liberator and

Privateer, Martin Marauder, Junkers Stuka, Avro Lancaster, Ilushin Stormovik, and others. In addition to exquisite detail, these publications provide photographs and complete specifications; as the Introduction explains, ". . . levels of intricacy to satisfy the most demanding enthusiast." *Post-War Jets* should have special appeal to the ducted-fan and Jet-X model aficionados who may be searching for unusual projects. Like flying wings? Here's a choice selection: De Havilland DH108, Douglas F4D-1 Skyray, and the Avro Vulcan. Or, how about a jet-powered flying boat; those don't turn up at scale meets every day! The Saunders-Roe SRA/1 is just the ticket, if you like challenges.

Or, maybe you'd prefer to model a BAC TSR2, described in the book's introduction as ". . . a monument to a political disaster; an engineering achievement which was cast on the scrap heap by a sad error of government judgement but is thankfully not oblivious." Along more conventional lines, we find a MiG-15, which, to our surprise, was drawn by Ron Moulton! Nice job, Ron! And a Gloster Meteor, De Havilland Vampire, Douglas Skyhawk, and many more, even a McDonnell Douglas Eagle and some jet transports.

All three of these fine Argus books are available through Zenith Aviation Books (see their *MB* advertisement for address) or directly from the publishers at: Argus Books, Wolsey House, Wolsey Road, Hemel Hempstead, Herts. HP2 4SS, England.

MODELING IN MALAYSIA

Ho Tet Shin reports finishing a simple rubber-powered helicopter for his five-year-old son: 'The gleam in his eyes as it lifted out of his hand really encapsulated the joy of aeromodeling. I must now look for a way of squeezing time out to finish some models. When it is not raining, we are blessed with almost perfect flying weather, being almost flat calm every morning and late evening. By the way, I still get looks of pity when I tell others that I fly rubber-powered model aeroplanes as a hobby."

SIGN-OFF

Ed Whitten sent us a newspaper report of a Chicken Flying Meet, held every year outside Gallipolis, Ohio. The article, by Lonnie Wheeler, explains that most chickens have lost the art of flight through generations of domestication and need extensive retraining before the contest. The idea is to urge them to fly from the top of a hill to their food, which is moved further away each day. The lady chickens are generally lighter, thus generally better flyers than the males, and the current record of 302 feet, 8 inches in distance was established by Lola B., a hen from West Virginia, doubtless in the featherweight class. •

Technical Stuff *Continued from page 11*

especially tricks that make composite-material structures practical.

FIBERGLASS

The weight of fiberglass cloth is specified in ounces per square yard. Sig, and several other model companies, sell it in conveniently sized packages of different weights, from 0.75 to 6 ounces or more. Dan Parsons sells a very light (0.6 ounce) fiberglass by mail order, along with useful instructions for fiberglassing. You will find Dan's ad in *RCM*. Dan seems primarily concerned with putting very light fiberglass over already structurally adequate models as a step in achieving a rugged finish. My goals, as described in this column, are different. In the interest of low weight, the airplanes I fiberglass would fall apart without the glass because they are nothing but hollowed-out foam. The epoxy/fiberglass *is* the structure. Therefore, in most cases, I use 1.5-ounce glass to get adequate structural strength (for .40- or .60-size models) in a single layer of glass. Dan says you should put on more layers of finer glass cloth, but that is more work than a single layer, and I'm allergic to work that can be avoided without penalty.

HOW MUCH FIBERGLASS?

Actually, not only is the statement, "One layer of 1.5-ounce glass on .60-sized models," an oversimplification, but this writer is too green at this type of model construction to tell you just how much glass you will need for a given application on your model. We will learn together on this one. I will tell you what I already know, or think I know, on the subject, however. Frankly, my first self-designed all-foam-and-fiberglass model is only half completed at this writing, so the following are guesstimates based on a lot of other model design experience and an engineering background. Ask me next year and some of my answers will have changed.

How much glass not only depends on the strength requirements for the part of the airplane we are looking at, but on the foam core, and whether we are glassing both sides of the core or only the outside. Where you can get at the inside of the part you are making, glass the inside as well, because that makes it into an inherently high-

strength-to-weight ratio composite sandwich. If not, make the foam core thicker and/or put more fiberglass on the outside to get the required strength.

The strength needed in a wing can be calculated (but most of us modelers don't bother). The strength needed in most other model parts is pretty hard to determine, since the largest loads are apt to be indeterminate and variable things like landing shocks or even transportation and handling abuse. Also, at this early stage in learning to use foam and fiberglass for model structures, we don't really know much about how strong a given design will be in terms of formal engineering numbers, so to heck with them, let's wing it.

Back to the wing. My gut feeling is that the single layer of 1.5-ounce glass that I'm going to epoxy onto the white foam core of the wing for the six- or seven-pound plane I'm now building is going to be plenty, except near the center of the wing. Many of us have, for years, used a wrap or two of fiberglass cloth to join the two halves of sheeted foam wings at the center. Whether or not we have a center joint in the wing, we need extra strength there because the bending moment is highest in the center. The wing bending moment decreases almost uniformly from maximum in the center to zero at the wing tips, so a built-up wing will have better strength-to-weight ratio if the spars are tapered; thick in the center and thin at the tips. The same applies to composite wings.

It isn't very easy to taper sheet balsa or thin plywood, so most of our sheeted foam wings have been as strong at the tips as at the center, but our foam and fiberglass wings can very easily be built with decreased strength and weight near the tips. Fiberglass the wing or wing halves all over with glass of a weight just strong enough near the *tips*, then add more glass as required inboard of the tips. But not that the bending moment doesn't decrease in steps as we move out on the wing; it is a smooth decline, so we will have the best strength-to-weight ratio if we taper the structural strength smoothly too, instead of putting additional glass on in steps. To do this, we can use diamond-shaped pieces of glass cloth for reinforcing, instead of constant-width girdles. This is illustrated in Figure 1.

The long triangular arrows of cloth pointing at the wing tips will reduce the strength and weight gradually, and it is very easy to do. Maybe we use one diamond patch of 6-ounce cloth, or maybe use two or three stacked patches of 1.5-ounce cloth of different lengths and different taper. Make sure you center the patch tips over the thickest part of the airfoil, since the deepest beam has the most strength for its weight. The neat thing is that the gloss cloth is so thin that we can readily fill and sand the edges where our patches terminate for a smooooth wing, fuselage, or whatever. The concept of tailoring the strength of composite structures to the need, by adding additional layers of glass locally, applies to all parts of the model structure.

For the fuselage of my model under construction, I again used a single layer of 1.5-ounce glass, this time over hollowed-out blue foam. I will add another layer of 1.5-ounce cloth or two around the firewall, etc. as it appears to need it. These fiberglass doublers will also be tapered in planform to "fan out" the load and strength gradually and efficiently. General rule: Add weight only where you need more strength, not all over the part. Another neat thing about this type of design and construction is that it is easy to add more strength later, if you built it too light. When you get a part finished, flex it, heft it, and think about what loads will be imposed upon it. If it now seems too weak for its job, add a little more glass and epoxy. Remember that it is easy to strengthen but very difficult to remove unnecessary weight, so build light to start with.

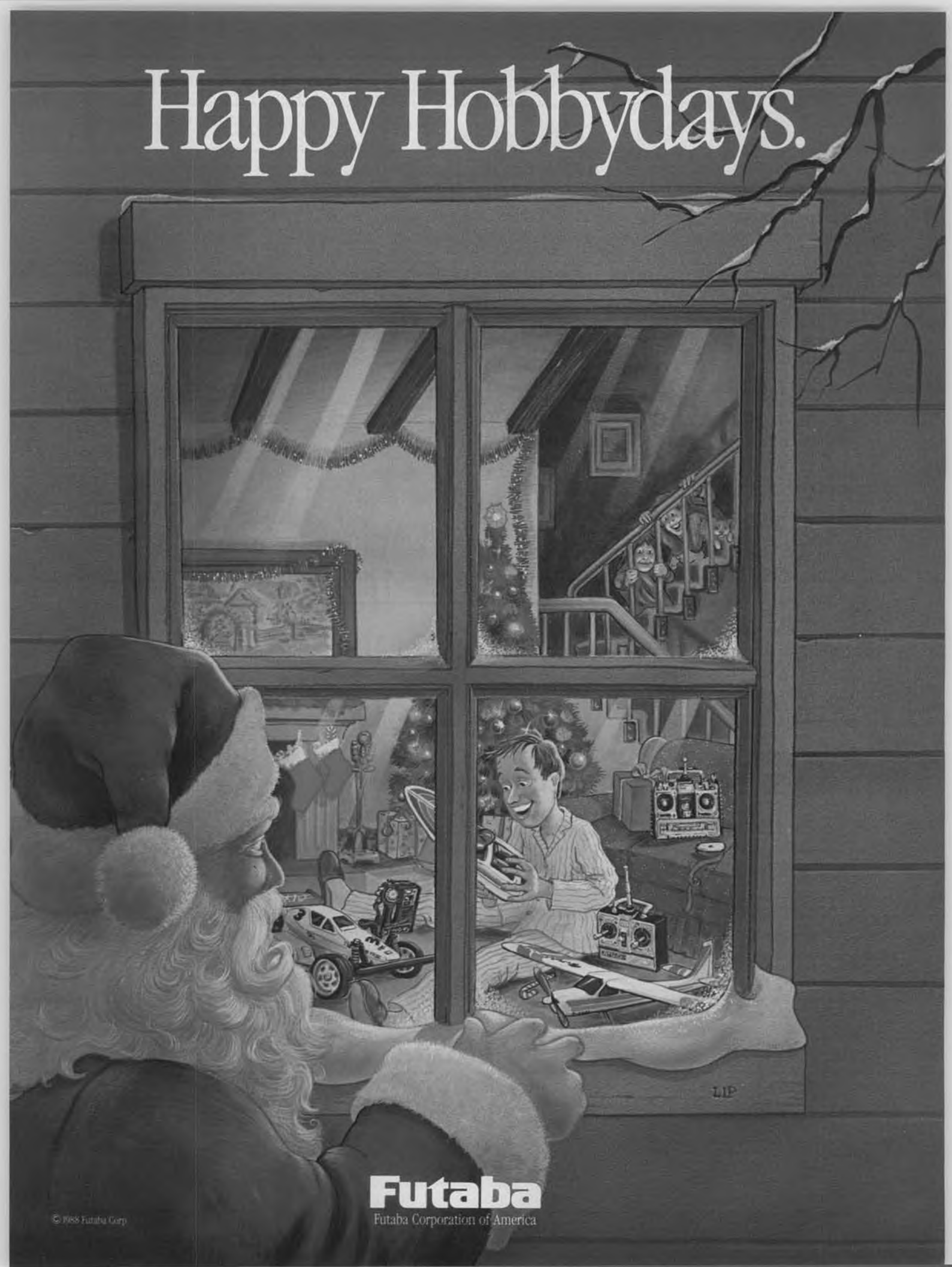
My tail feathers are going to be one layer of .6-ounce glass on 1/4-inch foam cores. If they are too flexible when they are cured, I'll add diamond patches of glass.

The weave direction of the fiberglass will affect the strength of a part somewhat, but I'm not worrying about it. I cut pieces of cloth so the force will be with the "grain" when it is convenient, but I estimate that the strength will be reduced only about 20 percent if the cloth is on the bias, and that is within my range of ignorance as to strength requirements.

FOAMS

Now that we have our foam cores all fiberglassed, let's go back and design and build the foam cores. Okay, so I'm a canard (bass-ackwards). First, the foam itself. The plastic foam best known to modelers is the white polystyrene expanded-bead foam with a density of approximately 1.0 pounds per cubic foot. We have used that almost exclusively for wing cores because it is light enough that we can leave the entire volume of the wing full of foam without the wing being excessively heavy. Sometimes a few of us put lightening holes in various configurations in white-foam wing cores, but the weight saving frequently isn't worth the effort. The beaded foam is the lightest foam commonly available, but it does not have the best strength-to-weight ratio. Furthermore, it is disappointingly flexible, spongy, or whatever. An engineer would say it has a low modulus of elasticity. Because of this sponginess it doesn't support fiberglass as well as we would like. We really need a more rigid foam for our cores.

The best answer most of us playing in this development have found is extruded polystyrene "blue" foam. This is Dow Chemical's Styrofoam SM type. This blue foam runs about 2.5 lbs./cu. ft. but it is much stronger and more rigid than the white beaded foam. The Dow literature rates SM blue foam at 25 psi compressive strength. They also show other blue Styrofoams up to 115 psi in compression! These could be excellent for modeling if they aren't too heavy. I will let you know after I have checked them out. SM blue foam is available in "planks" 16, 24, and 48 inches wide, 8 feet long, and 1 to 4 inches thick. You can buy it from most companies that sell insulation. Look in your yellow pages. I paid $25 for a


Happy Hobbydays.
Futaba
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2-foot by 8-foot by 4-inch plank last year. That is making a lot of cores, and is much cheaper than balsa.

FOAM CUTTING

Blue foam cuts fine with a hot wire, but at a slightly higher temperature than beaded foam. Because it is more rigid than beaded foam, it can be carved and sanded with much less difficulty. Both blue and white foams are basically polystyrene, so they are both dissolved by the same things, including polyester resin and cyanoacrylate glue. I find that cores for most parts can be cut mostly or entirely by the wire cutter, but sometimes it takes several steps and a little ingenuity. It is very easy to glue foam parts together, using epoxy or white glue, so the fuselage core, for instance, may be built up of several easy-to-cut sections.

The "tail-boom" section of the fuselage aft of the wing can be wire cut outside and also hollowed out very easily with the hot wire. Just use a hollow or ring-type template on each end of the foam block. Leave the templates on after cutting the outside, and drill a hole inside of one template through the length of the part and out through the other template. Now thread the wire through the hole, reattach and tension the wire in the bow, and cut to the inside of the templates. Since most fuselages are tapered, the "core of the core" will drop out neatly, leaving a completely hollow section with whatever wall thickness you decided to make it when you designed the templates.

HOW MUCH FOAM?

How much wall thickness *should* you decide to use? Good question, but not an easy one. Don't ask me. How should I know? When we have a lot more experience with foam and fiberglass structures, we will be better able to judge how thick the foam needs to be for each different part of an airplane. We know we can play games with core thickness vs. fiberglass thickness, however. That is, if we made the core much beefier than it really needs to be, we could get back some "lightness" by using less glass than we would otherwise use. Likewise, if the core turns out too thin, use more glass.

These tradeoffs are useful for recovering from unwise decisions, but their use doesn't produce completely optimum structures in terms of strength-to-weight ratios. For every composite structure, there is an optimum core-thickness-to-skin-thickness ratio. What that optimum ratio is we can only guess at for now. Among other things, it depends on the stiffness and strength of the foam we are using compared to that of the fiberglass or other skin we have. For blue foam and epoxy/fiberglass, my SWAG (Scientific Wild-Assed Guess) is that the weight of the core should approximately equal the weight of the skin. On the fuselage I am now building, the blue foam is 2/10 inch thick, and it is covered with one layer of 1.5-ounce glass, except where I think more strength is needed. If that guess results in disaster, I will admit my ignorance to you later. ARF fliers must lead a dull life.

Advanced construction methods give the O.S. Ryan the same durability and flying stability as the original full-sized aircraft.

The Ryan will be a hit at the flying field with its distinctive color scheme.

The Ryan assembles easily and looks great, it comes 90% completed for you right out of the box.

The reliable, easy-starting O.S. 40 FP is ideal for the Ryan.

Simply the Best ARF, or It Wouldn't Be O.S.

With over half a century of experience at producing the finest R/C aircraft engines available, O.S. has tackled a new goal: developing an ARF airplane that meets their uncompromising high standards. Drawing upon decades of expertise in model aviation and working closely with industry experts, O.S. has developed an ARF that is, quite simply, the *best* in every respect – the new **O.S. Ryan**.

Advanced construction.

No other pilot at the field will be flying a plane quite like the Ryan. It displays the most advanced ready-to-fly construction techniques available. A special four-layered covering process gives its built-up balsa wing a strong, tight, and fuel-proof finish. No covering, painting, or sanding is required. The process yields exceptionally brilliant color that resists fading, trim that is absolutely outstanding, and the stunning looks of a superbly hand-crafted kit.

The O.S. Ryan comes 90% complete out of the box. Practiced fliers with little time to build will appreciate the steps O.S. has taken to make assembly fast and easy. No special tools are required. You simply join the wings, attach the tail feathers, and then install the radio, pushrods, cowl, and landing gear. All major accessories except wheels are included.

Classic O.S. performance.

Historically, the Ryan name is as symbolic of flying perfection as the name of O.S. is for power. A popular sport trainer in the 1930s, the Ryan earned very high marks for its flight performance. Combining O.S. model technology with Ryan tradition has resulted in a 58" span low wing that flies smooth and steady, just like the the full-size Ryan, and is capable of full 4-channel aerobatic performance.

Making the most of the flight-ready Ryan design is the included and installed O.S. .40 FP engine – an outstanding mid-size powerplant that provides high output, longevity, easy maintenance, and reliability.

Everything that you want in an ARF, from looks to performance, you'll find in the new O.S. Ryan. O.S. has combined the best of technology and tradition to achieve its latest goal – bringing you a totally satisfying flying experience. After all, if it weren't the very best, it wouldn't be O.S.

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My Jim Dandy word processor tells me that I have written 2881 words to this point, and Bill is going to take away my Christmas bonus if I don't stop. One last thing: I remind you of the useful trick of putting on enough glass so the part is strong enough without the foam, then dissolve out the foam with common paint thinner (it is slower, but lacquer thinner or acetone may soften the epoxy/glass). Glass-shell only or full monocoque parts are handy for such things as cowls, and the foam mandrel approach to making them is a lot easier than making a female mold, for only one or a few parts.

Good designs come by design. •

Counter. . . . . . *Continued from page 10*

rocket hobby shop.

* * *

The Dolphin Super from Cambridge Model Aircraft is a high-wing aileron trainer that is one step above an ARF—it is called an RRF (really ready-to-fly). The Dolphin is said to be extremely stable while at the same time highly maneuverable. The model flies slowly, giving the novice time to think when trouble arises. The plane is constructed of high-quality balsa, with veneer-covered wings, and pre-hinged surfaces using Robart steel pin hinges. The Dolphin comes completely pre-covered with Solarfilm, so you can make repairs easily, or add whatever decoration you wish. All necessary hardware, wheels, gas tank, push rods, and engine mount come with the Dolphin. A four-channel radio is needed to fly this 55-inch span beauty, along with a .25 to .40 cu. in. engine. Look for it at your hobby shop now.

* * *

New from Great Planes is this 44-inch span Electrostreak, an electric-powered model that comes with a Goldfire 550 motor and matched 7x6 nylon prop for superb performance. The kit comes with precut balsa and ply parts for easy assembly. Advanced fliers will appreciate this model, as aerobatic maneuvers are easily attainable with a four-channel radio system. Look for it at your nearest Great Planes Hobby dealer. •

Fan Fly. . . . . . *Continued from page 14*

R/C Aircraft.

One of the most interesting scale models at the Fan Fly was a Northrop X-4 Bantam designed and flown by Harry Wood, of Long Beach, California. This tailless jet model exhibited superb stability. In fact, Wood's model appeared to fly better than the full-sized X-4. It is always a pleasure to watch such a rare model perform.

Yellow Aircraft, Suite 201, 3040 Palstan Road, Mississauga, Ontario, Canada, (416)273-6757, was represented by Bill Harris and Dennis Crooks. Bill flew an A-4 Skyhawk and F-15 Eagle. The Yellow Aircraft F-15 is slightly smaller than the Byron model; however, it is a perfect size for twin Dynamax fans. At 22 pounds, this model performs with all the authority of a full-sized Eagle. The speed envelope of this model is truly exceptional. The Yellow group plans to release this design as a kit in the future. Dennis Crooks flew a large Lockheed SR-71 Blackbird and a Grumman F-14 Tomcat. The Tomcat is, without a doubt, the most sophisticated scale jet that I have ever seen. Increased in size to 1/9 scale from the earlier 1/10 scale examples that flew in Canada last year, this design approaches perfection. The Tomcat features a complex set of rotating retractable main landing gear, a variable geometric sweeping wing, and a precise control system that directs the model equally well in all flight regimes. The Tomcat uses spoilers for roll control when the wing is forward. However, when the wing sweeps aft, the spoilers begin to align with the airflow loosing their roll effectiveness. At some point the stabilizers, which are used primarily for pitch, work differentially to provide the roll control. Dennis flew the Tomcat three times during the weekend. During each flight he exercised the wing sweep frequently and reliably.

The Tomcat is a perfect example of what can be achieved with current radios, jet propulsion systems, and airframe design. Bob

Flight School.

It's elementary with the Professor.

Go to school with the Professor, the radio control trainer that makes electric flying easier than ever.

Extremely stable design and ARF assembly are just a few of the features that make the Professor ideal for novice flyers.

The complete Professor kit comes out of the box ready to assemble.

Clean, quiet flying excitement is as close as the schoolyard. Let Futaba and the Professor show you how simple it can be.

Advanced, lightweight materials are used for the fuselage for exceptional strength and rigidity. And built-up, pre-covered wing, tail and stabilizer eliminate the need for special assembly skills. Simply join the wing halves, attach stabilizer, tail and pre-installed linkages. Mount the propeller to the gearbox of the powerful Mabuchi RS540SH motor, install radio and batteries and you're ready for takeoff.

PROFESSOR SPECIFICATIONS	
Length	35.04" (890mm)
Wingspan	48.82" (1240mm)
Area	446.5 sq. in
Weight (w/rec. system)	39 oz.
Motor	RS540SH w/3:1 reduction gearbox
Recommended system	Futaba 4NBL/MCR

REQUIRES: 7.2v/1200mAH NiCd battery pack and charger, 2-4 Channel radio control system (electronic speed control optional)

Futaba MCR-4A Integrated MOSFET speed control/ receiver (Not included) required for optimum performance. Specifications: 4 Channel; 1.5 oz. (excluding switch and connectors); 1.24" x 2.92" x 0.63" BEC Voltage regulator.

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Kress, who was part of the full-sized F-14 design team at Grumman, watched Dennis demonstrate the model. I couldn't help noticing that Bob's mouth was agape each time Dennis put the Tomcat up. Bob, in his own words, was "having deja vu all over again" watching this twin jet pull its wings back and accelerate upward. Like the F-15 Eagle, Yellow Aircraft hopes to market the F-14 in the near future.

I always use the Southwest Fan Fly to measure the progress made each year in jet modeling. It seems hard to imagine that further progress is possible. But next year will offer, I am sure, quieter propulsion systems, lighter airframes, more powerful and reliable engines, and even more exotic designs. •

Electronics. . . . *Continued from page 45*

ground is necessary only when long servo leads, 12 inches or longer, are to be used. It should be installed on all channels to which such leads are to be attached. IC-2 channel output numbers are as follows:

Channel	IC Pin No.
1	2
2	4
3	7
4	10
5	1
6	5
7	6

Not all channels have to be wired or used; as mentioned earlier, you can simply ignore unused channels. As far as what channel number will correspond to what control in your airplane, that is determined by the transmitter design and can best be determined by looking at the IC pins with an oscilloscope. Lacking such an instrument, one can simply connect a servo to each output pin and see what control on the transmitter actuates it.

CONNECTORS are important to our R/C hobby, not only in the R/C system itself, but throughout the airplane and in our support equipment. In the past few months, a number of magazine articles have appeared wherein the authors recommend completely unacceptable connectors, based I'm sure only on their physical characteristics with no consideration being given to the equally important electrical features. I would like to discuss such connectors as are readily available to us so that you may make a more proper selection the next time the need arises.

There are three types of these small two-conductor plugs readily available from commercial sources. These are generally classified as phone plugs, audio or RCA plugs since they were originally introduced by that company, and power plugs. Please refer to the sketches for clarification as to what is officially what. The phone plugs, so named because they first appeared on switch boards on which human operators actually made a telephone connection between two parties, are probably the most appealing to the uninformed, easily the most misused, and have the least desirable physical features. They are available in four basic sizes, in matching socket and plug configurations with .250, .173, .141, and .087-inch diameters. They are also available in various metric dimensions from many importers. These plugs, especially the smaller diameter ones, are commonly used for speaker and headphone connections, radios and tape recorders, and all entertainment-type electronic equipment. Furthermore, they are available in two- or three-circuit models, and, in some cases, the jacks have switching contacts that rearrange some internal circuitry whenever the plug is inserted in the socket.

All of these fittings, while excellent for

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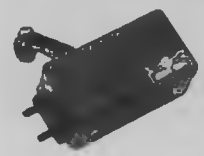

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the purpose intended, have extremely poor qualities for our applications. For one thing, they all have rather high contact resistances, low contact pressures, and very low current ratings. A company named Switchcraft, one of the largest US suppliers of these devices, rates them as follows: Standard (.250-inch diameter), 1A; Miniature (.173-inch and .141-inch diameter), .250A; and Subminiature (.087-inch diameter) at .125A. These are very low current ratings, especially for glow plug connectors where these plugs are often seen. All of the undesirable features mentioned all contribute to an important factor: reduced voltage at the glow plug.

Equally important is another poor feature of these plugs, though it must be mentioned that it does not affect their original intent to connect the headphones into your "Walkman." That being that as the plug is inserted into the socket, there is a momentary but complete short across the circuit! This means that if you are making a battery connection, you actually apply a dead short across it. If you are slow in inserting the plug, or if vibration causes it to partially unplug, the sustained short will surely burn up things. Not good at all!

The RCA audio plugs are somewhat a better choice in all respects. I could not find a current rating for them, but they have a .125-inch center pin and a .250 outer shell that should carry a much higher current than the phone plugs. The jacks are also available in a switching configuration, and there are no built-in short circuits either during insertion or removal.

The power plugs fare a lot better in all respects. They too are often found on home electronics, probably most often seen on the end of AC adapters for battery-powered equipment. In R/C equipment, we see them on the end of transmitter chargers on Futaba equipment, among others. Switchcraft supplies two such connectors, with .08 or .10-inch internal plugs. Both are rated at 5A, which is an acceptable figure for most R/C applications including glow plug connections. A switching jack is available, and as in the case of the RCA plus, there are no built-in short circuits. This socket/plug is recommended above all others.

There is a wide variety of all of these plugs to be found in large electronic stores, differing mostly in plug bodies. In all cases, choose one with solder instead of screw or pressure connectors, solder them properly, with heat shrink insulation at all points, and with a piece of larger diameter heat-shrink over the wires as they enter the plug body for further protection and longevity. Whatever connections you make, may they be enjoyable and long-term ones!

Referring again to my opening paragraphs, after all this time you'd think I would no longer get mail starting off with: Dear Elroy. Oh well! ELOY Marez—AMA 1995, NMPRA 22B! •

Daydream Bipe *Continued from page 23*

With the laminates finished, you can go on to build up the stab and elevator as indicated on the plan. Don't leave out the 1/8-inch ply doubler at the center of the trailing edge! Be sure you understand how R-1 will fit between the two center "ribs" of the stab. Don't forget the gussets.

Build the vertical tail and rudder in the same manner. Block sand all tail surfaces perfectly true after assembly, then round the edges to a constant radius, remembering that you are simulating a tube and fabric structure. Fine sand everything, make the necessary holes for control horns and hinges, and clear the board for the wings.

WINGS

The upper wing is built flat on the board. Start work by laminating the tip and center section bows so you will have them ready to go when you need them, and avoid having to pull the partially completed wing off the board to do the laminating. Lay out the bottom leading and trailing edge sheet, the capstrips, and all the center section sheet in place and glue the edges as appropriate. Note that the forward portion of the leading edge will have to be shimmed up to match the curve of the ribs. You may want to measure off some reference points on the plan outside the center section structure, or perhaps make a copy of the plan, so you can locate the center spars and ribs where the plan is covered by the bottom 3/32-inch sheet. Assemble all the lower 3/16-inch square spars in position, followed by all the WT ribs. Add the leading edge. Fit and glue

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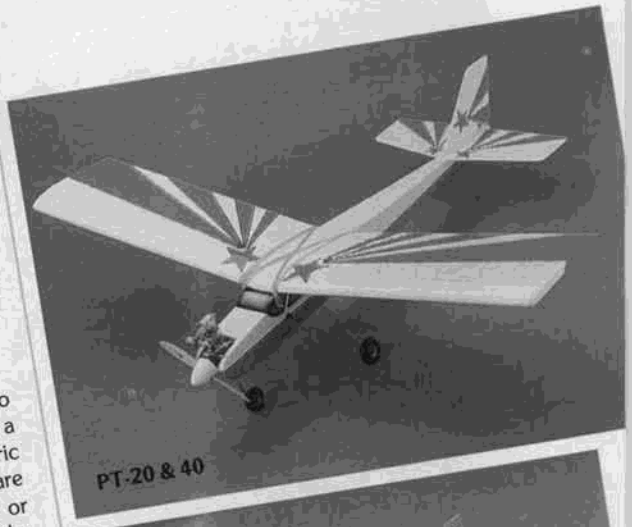
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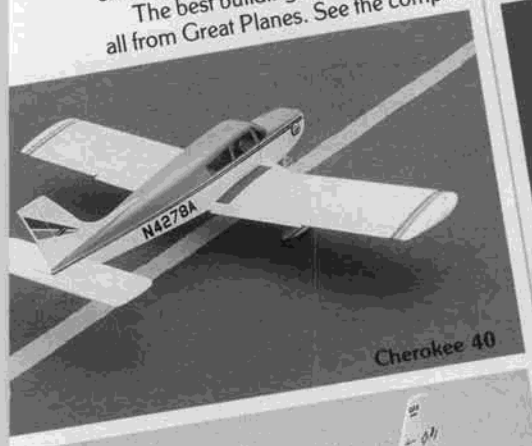

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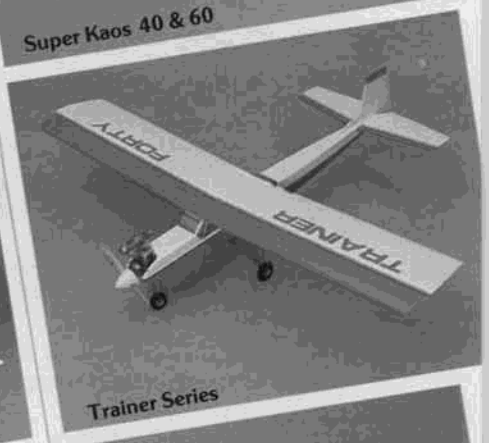

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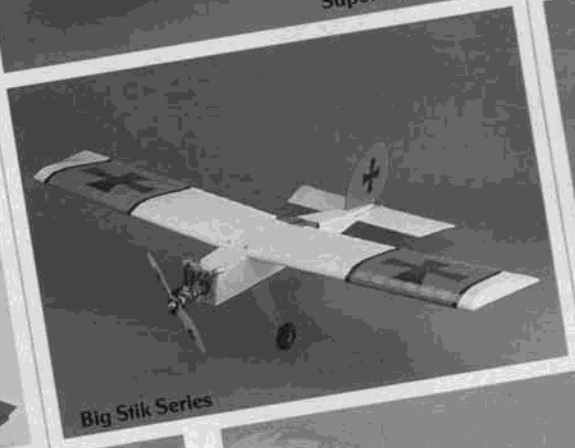
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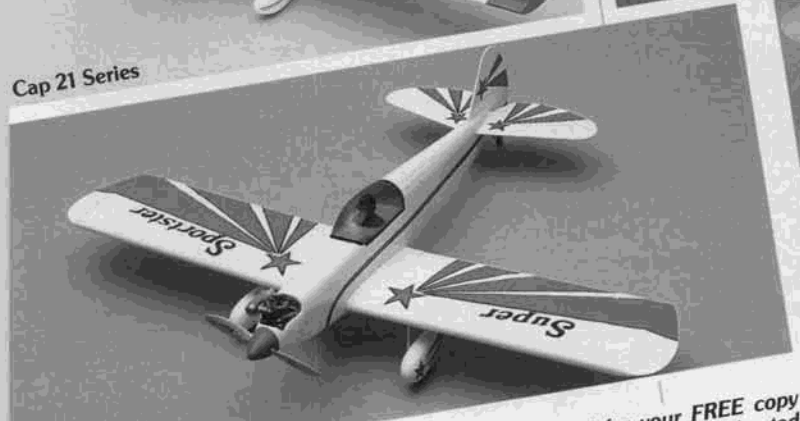

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the upper spars, followed by all ply doublers and spar webbing. Fit and glue the hardwood upper wing attachment blocks. If you fit, drill, and tap these accurately, you can install them predrilled and open up the screw holes in the bottom sheet after removing the wing from the board. The alternative is to leave the top center sheet off until after the wing is off the board and to drill and tap the blocks from the bottom.

The lower wing incorporates four degrees total dihedral (two degrees per panel), and is built flat as two separate panels and joined before the top surface sheeting is added. Lay out the bottom surface sheet, capstrips, and trailing edges as with the upper wing, and follow with the lower 3/16-inch square spars, all WB ribs, and the leading edges and then add the tips. Fix one panel to the board and block the other up at a four-degree angle, trimming as necessary to get a proper fit between the two WB-5 ribs. I would suggest that you cut out the lower spar doublers and joiners without adding the rib notches. Mark the rib notches using the actual locations of the ribs in your wing and cut on these marks. Install the doublers and joiners making certain that the dihedral angle is maintained as specified.

Add hard balsa filler blocks for the wing bolts to bear against at the center trailing edge. Make up and install the aileron horn assemblies, being certain that they are installed on the same centerline as the aileron hinges. When these are in place, you can go ahead and finish up the top surface sheeting and capstripping. Build the ailerons over the plan, trimming and fitting to match the wing panels. Now carve and sand everything to finished shape, giving the entire structure an extra pass with the fine sanding block when you have finished. Drill the leading edge and fit the 1/4-inch dowels as indicated. Locate and test-fit the aileron hinges. Make up and install the interplane strut tabs as you did with the upper wing.

FUSELAGE

As they say, this one is built up just like the good ol' rubber-powered scale models, only bigger. Start by laying out two identical side frames using hard 1/4-inch square balsa or, as I prefer, spruce. Note that the wing saddle pieces are part of the basic side frames; build the frames using 1/4-inch sheet saddle pieces, then add 1/2-inch "doublers" on the inside after the basic fuselage structure is assembled. When the frames are removed from the board, you can add the 1/8-inch Lite Ply doublers at the nose, being careful to make both a left and a right side. Make sure you leave room for the doublers to butt against the back side of F-1. Now join the sides at F-2 and F-3. Add the extra wing saddle material and then the plywood wing mount. Join the side frames at F-1, taking extra care with alignment. Using the top plan view as a guide to alignment, pull the sides together, and join with

1/4-inch square crossmembers top and bottom at F-4, F-5, and F-6, and at the tailpost; note that the inner surfaces of the side frames will need to be beveled to yield an outside width of 3/8 inch to match the rudder leading edge. Temporarily fit the lower wing, marking and drilling the holes in F-2 for the leading edge dowels. Following this you can add all the top contour formers.

Make up the landing gear, using hard solder on the joints. Fit the gear mounting blocks at F-1 and F-2. You might want to consider drilling and bushing these with metal tube to reduce the possibility of the holes wearing oversize.

In order to avoid extra complexity in assembling the gear and subsequent finishing operations on the nose, and to leave the battery/tank compartment free for a maximum of flexibility in equipment installation, I split the landing gear assembly on the prototype, eliminating the "crossover" portion of the front and rear legs. A little extra care taken in fitting the landing gear mounting blocks below the lower longeron, between F-1 and F-2, and reinforcement of the blocks with tubing as just mentioned, created an assembly more than capable of handling the vertical and twisting loads imposed on the gear assembly. All horizontal loads on the gears legs are handled by the "V" member between the legs. Over a year of flying has produced no signof strain on the installation. If you feel more comfortable with a one-piece gear, split the legs as mentioned at the centerline and rejoin them after assembly by soldering a tubing sleeve over each joint.

Add the doublers to F-1A and F-2 and drill them to accept the cabane struts. Make up the cabanes. I'd suggest that you start with just the fore and aft vertical members. Jig up the fuselage on the board with the landing gear hanging over the edge and level the top longeron parallel to the surface. Lay out a reference line at right angles to the fuselage centerline, in line with the upper wing trailing edge tips. Slip the separate cabane struts in place, mount the upper wing with 10-32 screws, and start adjusting until the lower surface of the wing rests at zero degrees incidence parallel to the top longeron and the tips line up with the reference line. Now you can add the cabane diagonals, wrapping the joints carefully with wire. Temporarily glue several hard balsa braces across the cabane assemblies, then carefully remove the upper wing and take the cabanes off the fuselage and solder the joints. You can fair the cabanes using spruce, basswood, or whatever once the soldering is complete and you have rechecked alignment.

Test-fit the lower wing in place. Block the fuselage up again and adjust the lower wing mounting for one degree positive incidence relative to the top longeron, as measured at the lower surface of the wing. With the incidence set, square up the wing relative to the fuselage centerline and drill the wing and wing mount for two 1/4 x 20 bolts. You may want to consider using threaded inserts as an alternative to tapping and reinforcing threads in the wing mount plate.

Now put the upper wing back on the airplane and recheck the entire assembly for alignment. When both wings are in place and you are satisfied that they are on correctly (and you have taken a break and relaxed!), go through the drill again with the horizontal tail, making sure that you have it shimmed off the top longeron extension for one degree positive incidence. Follow this with the vertical tail, which has only to be square to the stab. When you have checked everything once again, go ahead and make up the interplane struts. Note that the prototype flies well now without washout in either wing. When the flying surfaces are under control, mark and drill F-1 for the engine mount. Using the Saito 65, my airplane

trimmed out comfortably using one degree each right and down thrust. If you use a significantly larger engine, you might want to add an additional half degree in each direction.

With the hard part done, you can finish up the fuselage structure. Add the tailwheel mounting plate and fill in the contours of the nose with the F-1F and F-2F formers. Fit the turtledeck stringers, noting that the top stringer is 1/4 inch sq.; all the rest are 1/4 x 1/8 inch. I'd suggest spruce to resist bowing under the tension of the covering. Fit the filler blocks behind F-3A and sand them to contour, noting that the top center blocks extend rearward to provide a mounting surface for the headrest. Add the side stringers. These extend forward to F-2 and are relieved to accept the side sheeting. Add a 1/4 x 1/8-inch strip of balsa across the bottom of F-3, tapering it to fair into the lower longerons so it matches the contour of the lower wing trailing edge. Add a 1/4 x 1/8-inch belly stringer from F-3 to the cross member at the F-6 station; I relieved mine to allow it to fit progressively deeper over the belly crossmembers so that it tapers smoothly into the tailwheel mounting plate. Add the two 1/4 x 1/8-inch fabric attachment strips to the top center section of the horizontal tail; these should fair smoothly into the vertical tail trailing edge and lie flush with the outside of the top longeron at the front. Include a small block of scrap at F-6 to provide a continuous base for attachment of the covering. The 1/4 x 1/8-inch strips on the stab are necessary to allow you to do a faired fabric fillet with the covering. This is much easier than it sounds and looks spectacular; the whole idea is to cover the area between the top longeron and either side, the top center turtleback stringer, the vertical tail trailing edge, and the vertical tail leading edge with one piece of material. (Now you can see why you need the extra strips; without them the covering would have no place to go at the base of the vertical tail.) The trick to the whole thing is patience in stretching and attaching the covering. Believe me, it *will* work; this is the way many of the older biplanes and virtually *all* classic lightplanes are covered. When you are done being worried about this coming test of your covering skills, add the 3/32-inch sheet balsa inlays on either side of the fuselage below the tail to serve as control rod exit fairings.

Drill the requisite holes to route your fuel system plumbing and test-fit the tank. Depending on the particular arrangement of your airplane, I'd suggest either a floor or

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roof of 1/8-inch Lite Ply for the tank compartment to isolate the tank from the battery. When you have all the internal cutting and fitting complete, go ahead and close up the nose by adding all the 3/32-inch balsa cowl sheet. This extends back over the bottom of F-2, back to the curved outline shown on the plan on the fuselage sides, and back to a butt joint flush with the outside edge of F-3A. While you are at it, make up the lower wing center section fairing.

I built the cowl on my airplane in two sections; a fixed base or "dishpan" cowl and a removable portion, to replicate the appearance of the full-scale airplanes after which the Daydream is patterned. You can build the entire cowl in one removable piece if you choose, at the expense of having it appear rather deep. If you go the route I did, make and attach a 1/8-inch Lite Ply base cowl mounting ring and construct the base cowl "dishpan" to fit over it. I cut two rings of 1/4-inch balsa on the jigsaw, laminated them, relieved the rear edge 1/32 inch, and wrapped a cowl body of 1/32-inch ply around the balsa rings using a circle drawn on a sheet of paper as a pattern. Sand the leading edge of the laminated portion to a smooth, rounded section and give the entire assembly a covering of 3/4-ounce fiberglass attached with CA, or, if you prefer, resin. If you want it to appear to be a removable base cowl section, don't attach it to the fuselage until after your finish is complete. There is no reason for it actually to be removable.

The main cowl is made in the same manner. If you can find a metal pot to fit, or want to mold a glass cowl, have at it. This is where the "daydream" part of the project takes over; do what turns you on. If you want rocker box fairing blisters, try what I came up with. I found an old metal spoon of the proper size (small) and used it to press female mold depressions in a smooth block of non-oily potters' clay. I then mixed up a batch of polyester resin with lots of extra catalyst and poured fourteen spoon-shaped depressions full. (I had no trouble, but epoxy might be less critical to work with.) The cured resin "spoons" were pulled free of the clay, cleaned up, and trimmed to fit closely against the cowl, where they became instant rocker box blisters! The cowl on my airplane is mounted to three brackets cut from 1/4-inch ply; these are drilled for 4-40 screws which go through the rear edge of the cowl and into a blind nut on the inside of each bracket. The brackets are mounted to the base cowl with sheet metal screws and cyano. Give each one a good shot of cyano after drilling, before the blind nut is installed, and run the drill through it again, and you'll have a really tough, oil-proof mounting system.

Make up a headrest from light balsa, cut out the cockpit openings, and sand, sand, sand everything in sight. Extra attention paid to the sheeting on the nose and to the stringered portions of the tail will pay big dividends when you have the finished airplane out in the bright sun for all the other guys at the fly-in to see! Fit the hinges and horns to the control surfaces and do a trail mounting of your radio system. I prefer to get everything cut to size and working before beginning any covering or finishing in order to avoid nasty surprises later when trying to make control rods and other goodies fit where there isn't room. I used fiberglass push-pull rods with 2-56 hardware on the prototype.

The flying wire rigging on my airplane, as seen in the photos, is semi-functional but not necessary. It is intended to carry a load should something in the primary structure fail, but the airframe is intended to fly safely without it. I made it up using ordinary hobby shop music wire, 2-56 threaded fittings and clevises, and thin aluminum tabs shaped to fit inside the strut ends or to bolt in place as shown in the photos. If you are going to use the rigging, make it up now to avoid messing up your finish later.

My airplane is covered with Sig's Koverall (Dacron polyester) and finished with two coats of nitrate clear dope followed by K&B epoxy primer and a Superpoxy color finish. I went all-out for "show finish" (three colors and a clear top coat) and came out at a gross weight of 9-1/2 pounds. This worked out to something like a 24-oz. per sq. ft. wing loading, and the airplane is very comfortable flying at those numbers. It has, in fact, been loaded up to 10-1/2 pounds and flown without problems. I suspect that a nice finish could be done using one of the precolored dacron fabric coverings, trim striped, and given a clear finish for a significant weight saving. Another super bet for a

really lightweight finish would be dyed, clear doped silk. I have proven to my satisfaction that a well done clear dope and silk finish is no heavier than the loudly touted "light" film coverings, and a whole heck of a lot stronger and longer lasting. Whatever you choose, I strongly suggest that you cover the center section of both wings and the fuselage back to F-3 with 3/4-ounce glass cloth. Done correctly, this process adds a few ounces at most, but imparts tremendous strength. I would not build an airplane without it.

Now put the whole thing together. Set up your balance and control throws as shown on the plan. I built in aileron differential (that is, the ailerons go up further than they go down). My airplane is rigged with about a two-to-one differential and exhibits no tendency to develop adverse yaw. You could accomplish the same thing with a rudder-aileron coupler if your radio has one, or by coordinating the sticks the way we're supposed to know how to do. The built-in differential seems the neatest solution to me, since the problem never develops. You might want to increase the aileron throw, although the movement shown yields nice, scale-like maneuvers. The balance shown is at about 30-percent of the projected chord and results in docile handling characteristics at low speed, yet gives a clean spin entry and a spin rate that will stand your hair on end. Move it back if you must, but experiment a little at a time.

My flying is being done with the aforementioned Saito 65 running on Red Max 15-percent nitro four-stroke fuel, which is all I have used for the past several years. I have recently started ordering my fuel mixed on a castor-oil base and feel that the slight extra cleanup effort that results is well justified by the extra margin of protection my engines get. The prop I have settled on is a Graupner 15-7 (yes, that much prop). The airplane will take off at under 3/4 throttle and will do sequential big, hundred-foot-high loops without straining. I have read that the Saito 65 likes to work best at moderate rpm on large props, and this setup seems to prove it. What's really neat is that it is *quiet*! Control is by Airtronics in the person of one of my ol' reliable Championship 7 systems. The whole point of my having set the airplane up this way is to fly it like an old-time biplane, not some hot-dog mosquito. Long, smooth takeoffs, with power added gradually, not jammed in, will really make you look like you know what you're doing. Learn to fly the airplane comfortably at reduced power and to make smooth sweeping turns instead of jerky reversals at the far end of the field. Big round loops with power reductions on the down side will get you into the spirit of the thing, and a long, straight final approach followed by an old-time wheel landing, carrying just a little extra power until the wheels touch, and letting the tail ride high for a few seconds will bring the house down. Do it with finesse and a light touch, and be one of the good guys! •

Control Line. . . *Continued from page 39*

couraging the beginner and the junior flier. I must say the recent *Model Builder* article on beginning control line fliers will no doubt be reprinted in countless club newsletters around the world.

"The main magazines of interest to Australian CL modelers are those American ones with CL sections in them, and the Australian *Airborne* and the (British) *Aeromodeller* magazine." Peter also notes that the Australian dollar is worth about 80.5 cents U.S., and there are only one or two main importers, making finding control line equipment an expensive and occasionally difficult proposition.

He concludes: "I will extend invitations to any modeler to visit us at CLAM should you come over to Australia. It is cheaper for you to visit us, so why don't you come?"

* * *

In this column recently I reported on the efforts of Robert "J.B." Jablonski to get a control line club going in Heidelberg, West Germany.

Robert reports that a small club has formed, and, "Yes, CL is alive and well in Heidelberg, Germany." The club is starting out with basic airplanes such as a Baby Flite Streak, a P-51 Mustang semi-scale profile kit, etc. Robert's own design, "Mr. No-Name," is a simple trainer used by the fliers. The Mustang kit, by the way, came with instructions in Spanish, but the fliers are using the diagrams as a guide. It just shows what dedicated modelers can accomplish!

"Our main flying consists of solo stunt practice, as all of us are new or getting back in after many years like myself, or imitation combat with whatever is at the field. The combat is popular and helps build our flying skills, and it's fun for spectators." The Heidelberg group requires mufflers on all engines above .049.

"I only have nine months left in Germany, but the seed is now planted," Robert writes. "I only wish I had a couple of years to see where it goes and watch it grow."

* * *

Since May of 1988 I have enjoyed receiving correspondence from Frank Bowman of Farmington, New Mexico, who has provided some wonderful photographs of some vintage CL speed airplanes built by his father in the 1940s and 1950s. Frank's father, Charles B. Bowman, born in 1908, now lives in Berino, New Mexico. He also was an active free flight modeler, and Frank is trying to identify some of the F/F planes pictured in an old photo album.

Frank has received eight of Charles's old speed planes and one that belonged to one of Charles's flying friends; he has restored seven of them, along with an old team racer. Speed engines included McCoy .19, .29, .49, and .60 engines, and the racer was powered by a Fox Rocket .35.

Frank also included a list of information taken from the trophies won by Charles while he was a member of the Miniature Motor Club of El Paso, Texas. The following are the more impressive when we remember that such contests in that era drew dozens, sometimes hundreds, of entries:

1. International Aviation Celebration, El Paso, possibly for ignition-powered speed plane.
2. First place open UC, A-B speed, July 4, 1949, El Paso.
3. Tucson Roundup, First Place, D Speed.
4. Lubbock Open, Second Place, D Speed, 1952.
5. First Place, D Speed, El Paso.
6. First Place, D Speed, December 31, 1950, El Paso.
7. High Point UC, El Paso.
8. New Mexico State Fair, A-B Speed, First and Second Places, 1952.
9. High Point UC, El Paso, December 31, 1950.

Speed contest cards showed that Charles Bowman turned the following speeds: A Speed, 108.23 mph with the McCoy .19; B Speed, 126.76 mph with the McCoy .29; C Speed, 120.72 mph with the McCoy .49; D Speed, 129.03 mph with the McCoy .60.

After the restoration project, Frank reports that he was impressed with the time and work that went into their construction.

If anyone who remembers flying with Charles in the "good old days" and would like to write to him or to Frank, here are their addresses: Frank Bowman, 1211 N. Allen, Farmington, New Mexico 87401; Charles Bowman, P.O. Box 97, Berino, New Mexico 88024.

* * *

Along the same lines, I have some photos provided by Lee Hoffman of some of his first CL models, with dates ranging from 1937 to 1939.

However, here are a few words from Lee: "A section of that article (August 1988 *Model Builder* CI column) regarding the inquiry of Ronald Cunningham as to the historical aspect of monoline control lines sure twanged my 'G' string.

"When I was a kid, some 5- and 10-cent stores were selling a single sheet of printed balsa to cut out and form a glider. We had to make our own glue from acetone and film or use LePages Mucilage.

"From there, someone got the idea to tie a string to the wing and swing it overhead like a sling and go round and round. We learned trimming the glider to fly level.

"Then, balsa and tissue built-up ROG came next. After we got tired of getting that sucker to fly off the ground and fly into the nearest obstruction, somebody got the idea to pound a stake into the ground, fix a rotating sleeve to it and sewing thread to the wing. Stretch the length of the thread out and let her take off and circle the area. The length of the thread depended on experimentation. No instructions were available for any of these experiences, just determination.

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ELECTRIC FLIGHT EQUIPMENT: The best and largest electric flight supply in the Northeast. Specializing in ASTRO FLIGHT Equipment. Kits, motors, batteries, light weight building supplies and all your electric flight needs. Send $2.50 for Catalog to CS FLIGHT SYSTEMS, 31 Perry Street, Middleboro, Massachusetts 02346 or call (508) 947-2805 to order, VISA & MASTER CARD.

thermals and with the advent of gas engines being developed, the same problem became prevalent with gas-powered free flight.

"Monoline control was inaugurated by Victor Stanzel somewhere in the mid-thirties with a kit called the Tiger Shark, a racing-looking plane. It was controlled in flight circles by using a long rod with a wire (or string) attached to the wing and by describing an arc with the pole, the model was supposed to loop, dive, or climb. I grew very weary of whipping that pole around to keep the plane from diving in.

"My 1937 Tiger Shark was powered by an Ohlsson .19 and underpowered (still poor instruction).

"About the same year, Jim Walker entered the field with his U-control, which made a lot more sense to the pilot, and I converted that same plane to U-control with an inverted Ohlsson .60, which sure put me in

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the racing class and having an adventure with every flight. (The .60 added nose weight to balance the CG, which was too far aft.) Still trial and error by the individual in those days.

"Another 50-year-old memory is using electricity up the control wires to the plane is in the package of Electra-Line Control-Wire, 150 feet of .014-inch in. plated wire from Sage Engineering Co., Chicago, Illinois, for $1.50. With instructions that showed the batteries attached to the pilot's belt and clipped to the control wires. So what else is new?" Lee's description of the old days of CL modeling brings back memories for every one of the older generation, and that includes those of us who grew up in the 1960s, who learned this hobby largely by their own trial and error.

When people talk about how to bring junior fliers into the hobby and create elaborate methods for attracting and teaching youngsters to fly, a commendable and necessary thing these days, I remember my

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A small electric version of Dick Obarski's 1938 Old Timer favorite. By Don Srull.

No. 6881 SUKHOI SU-26 $10.00
A control line profile model for .35 engines. 48-1/2-inch wingspan. R. Schneider.

own youth, when I learned to fly CL models not from adults but from other kids. The adults flew their .35-sized planes at one end of the field, and the kids struggled with the .049s on the other. As we got bigger, so did the planes. There were several kids in my own neighborhood who worked together to learn to build and fly. That kind of energy for a hobby which requires some continuing effort seems to have disappeared; without an adult's guidance, the modeling hobby simply doesn't germinate.

Lee's mention of the electric control lines also reminds us of the use of control lines to transmit both electricity and fuel when the Prop Spinners of Eugene, Oregon, made their single flight of more than 64 hours in 1957. The plane, a modified Veco Chief with a custom two-plug K&B .35 engine, used an electric servo to control the needle valve and a tank fed with fuel from a gallon can on the pilot's belt. The fuel and electrical systems were designed by the late Oba St. Claire, credited by many as being the actual originator of CL flying. Imagine a single flight of a single airplane lasting from Saturday until Monday!

* * *

By the way, Lee Hoffman mentioned the late, great Jim Walker, CL's most famous early flier and promoter.

Well, along comes a letter from Jim Walker, of Everman, Texas. Jim writes:

"I just wanted to let you know I really enjoyed your article in the September issue of *Model Builder*. For some time now I have wanted to fly control line planes. I built a Flite Streak, with a Fox .35 stunt.

"My only problem is no one to help me fly. I had given up on the idea of even flying it. After reading your article, I have decided not to give up, but work harder to get some flying help." I'm glad to hear that because Texas is the home of many great CL fliers in stunt, combat, racing, and speed. Besides that, a guy with the name Jim Walker, *has* to fly control line!

GOING SHOPPING

The mail also brings news of control line products, and the supply of those items continues to grow, most of it in the form of small manufacturing companies operated by modelers who have seen the need to supply the growing number of CL fliers orphaned by the big companies.

Here's a letter from Jim Correll, of Clarksville, Indiana, about a new operation.

"I just read your article on starting out in the control line events. Having started myself in the 1940s, I feel I am qualified to get in on this subject. I, like many others in those days, learned to fly on a 'goat.' My goat was a Buzzard Bombshell with a Super Cyclone and a control system installed. My flying buddy had a Comet Clipper with an Ohlsson .60 converted to CL.

"We learned to fly the hard way: Do it until you can do it! We both learned to fly and went on to some of the very few kits of the day. The kits I liked the most in the late forties were the Berkley Zilch types. (I have three of them in my collection now.)

"The thing that really made CL take off was the invention of the glow plug. Many fellows just could not get an engine to run on spark ignition. The glow plug also allowed the use of smaller engines, no coil and batteries to haul around.

"You are right about the manufacturers and hobby shop operators abandoning the CL flier. The sad part about the shop owner to me is the fact that much of the equipment bought in local shops is credited to R/C, but used for CL. If you walk into hobby shops today and mention CL, they either don't have time to deal with you or they don't have the background to speak the language.

"With all of the above in mind, a few months ago I decided to set up a small mail-order business and try to bring back some of the good old tried and true methods and equipment that very few hobby shops will

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I certify that the statements made by the above are correct and complete. Anita Northrop, General Manager

stock.

"The first step was to become a distributor for Randolph butyrate and nitrate dopes. Very few shops today stock any dope, and none stock Randolph, which is the best.

"The next project was to develop three CL kits, locate wood, hardware, wire, etc. These kits are now about ready to box (as of August 1988).

"They are of the style of the fifties, with straight wings, upright engines, gear in the body, full body, by the way. I have never like profile models with the side-mounted engine along with the vibration problem at the wing-to-body joint. Even in a trainer I don't recommend it.

". . .The engine sizes are .19 to .49. This is as you say, a cottage industry. Production will be low but of high quality." Jim will send an information package to anyone who sends a large, self-addressed, stamped envelope to ABC Hobby Supplies, P. O. Box 2391, Clarksville, Indiana 47131.

A flyer Jim enclosed shows pictures of three very nice-looking airplanes called the June Bug, Commander, and Lady Bug.

* * *

The mail also brings a letter from Eric Clutton, distributor of PAW diesel engines in the United States, chastising me roundly:

"I don't see much mention of diesels (don't see *any* mention!) in your column. PAW .35 has won the British Gold Trophy at the Nationals over there twice, with many high places plus places on overseas stunt teams.

"Flying a diesel control liner is a different experience. Speeds tend to be constant with no slowing up for the corners. A diesel is also less critical on fuel and will continue to run even when the settings are wildly off.

"Fuel consumption is only about two-thirds of a similar size glow, so smaller tanks are used. Finally, with all this talk about noise problems, diesels are *quiet*! The larger PAWs also have a proper silencer/muffler fitted as standard, so they are really quiet.

"Don't let the lack of noise fool you. Noise and rpm do not fly airplanes; the magic word is *thrust*." Everything Eric says about diesels is true in my observations.

The chief thing that keeps diesels from becoming more popular are the unfamiliarity of American fliers with them, combined to a lesser degree with a distaste that many people have for the strong smell of the fuel. Fuel also is a small problem, not often being available in hobby shops; it usually must be ordered by mail or obtained from the local FAI team race enthusiast.

I've flown a number of diesel planes and been amazed at the amount of power generated by a small engine running at low rpm and turning a big prop. One of the Northwest's balloon bust champions uses a very heavy foam-winged copy of a Flite Streak, powered by a .19 diesel, that seems ideally suited for that event. As Eric says, a diesel even with a sour run often will continue running.

My own experience with them is limited. I've observed some team racing, flown some of other people's planes, and tried one project myself.

My own project was prompted by receiving in the mail, from my pen pal, Charles Windows, in England, a PAW .19 and .09. Along with them came plans for the Fifth Revolution, a plane used in the popular English Diesel A Combat event, their equivalent of American slow combat.

I found the plane to be an excellent flier with the .19 engine, but confess to never having quite solved the mysteries of the diesel engine.

I had difficulty getting it started and keeping it running; when I was successful, I was never sure why. I finally ran out of fuel and the plane now hangs unused.

However, I was convinced at the time that my failures were largely the result of not having any idea what I was doing; I felt that if I could learn how to set the compression and needle valve and had some practice with it, it actually would become quite a simple endeavor.

For the rest of us in the CL community who are curious about diesels, I'd like to invite anyone out there who has some expertise to send in some information; perhaps we can put together a future "how-to" column.

Meanwhile, interested fliers can write Eric for a catalog of his diesel engines and products, including PAW and Quickstart engines in a variety of sizes. His address is: Eric Clutton, 913 Cedar Lane, Tullahoma, Tennessee 37388.

* * *

Precision Aerobatics supplies may be hard to find in the hobby shops at times, but

there is no shortage of cottage businesses that supply the needs of the casual and serious stunt flier. A new shop has just opened up in the Pacific Northwest, operated by one of CL's master craftsmen, Gerald Schamp.

For information, write Cascade Control Line Stunt Shop, 931 Calapooia SW, Albany, Oregon 97321.

* * *

Speaking of stunt, the latest from Control Line Classics is that they have released their kit of the Oriental as promised but have decided not to produce the T-Bird I because another company has one in the tooling stage. However, Control Line Classics has announced plans to make a CL profile Buster kit, suitable for sport flying, Northwest Sport Race, and similar events. For information, write Control Line Classics, 1788 Niobe Ave., Anaheim, California 92804. By the way, the Oriental and the earlier Classics kit of the Pow Wow are among a tremendous variety of control line products listed in the latest catalog from Tom Dixon, a stunt expert who specializes in supplying hard-to-find items. For a catalog, send $2 to Tom Dixon, Suite 401, 1938 Peachtree Road, Atlanta, Georgia 30309.

* * *

"Modelers serving modelers." Now there's a slogan that catches my eye.

And when I saw the rest of the catalog from Craftsman Models, Inc., I was even more impressed. Here is a new company in Indiana that is going all-out to serve the needs of CL modelers of all kinds. They are pulling together all kinds of control line kits, engines, tools, and accessories, as well as making some of their own.

At the very least, CL fliers will want to check out their catalog. Send $1 to Craftsman Models, 1311 East 161st St., Westfield, Indiana 46074.

* * *

Most CL fliers already know about Kustom Kraftsmanship, a longstanding service to CL fliers that we almost couldn't live without. Joe Klause supplies a wide range of competition items ranging from racing fast-fill fueling plugs to Nelson engines. Joe has a complete line of stock and custom Cox parts and engines for .049 competition events such as racing and combat. And many, many more things are listed in a catalog available for $1. Regular customers as well as new ones want to note Joe's new address: Kustom Kraftsmanship, P. O. Box 3010, Fallbrook, California 92028.

MARK YOUR CALENDARS

If you are interested in old-time stunt and classic stunt, mark your calendars for February 18 and 19, 1989.

That's when the Vintage Stunt Championships of 1989 are scheduled at Whittier Narrows, California, near Los Angeles. For full information, write the contest director, JoAnne Keville, at 6618 Dashwood St., Lakewood, California 90713.

As always, letters, questions, photographs, etc. are invited. John Thompson, 1505 Ash Ave., Cottage Grove, Oregon 97424. •

Air Races. . . . . *Continued from page 18*

car racing engines, and underwritten by a visionary sportsman, Bob Pond.

This writer had a chance to chat with Rutan on the press bus on the way out to #8 Pylon. Burt, a devoted and enthusiastic modeler in his youth, talked of his unlimited racer project. Its speed will be in the 550-mph range and light, using the very latest in composite technology. Its daring concept is based on a canard laminar flow forward-swept wing.

Reno's Championship Air Races in 1989 hold a promise to be a vintage year for racing fans at the Shrine of Air racing. •

Jake. . . . . . *Continued from page 9*

to August 27, 1988. On that fateful day, a shorted cell in the battery pack sent the Ryan careening toward Mother Earth. It strained itself through a set of telephone lines, leaving the wing behind. An AT&T crew was at work below the phone lines clearing a fallen tree. The Ryan fuselage flew directly into their wood chipper and exited the other end in a cloud of powered balsa wood and MonoKote particles. The wing stayed up on the wires for two and a half weeks until the wind from a thunder and lightning storm blew it down into the path of a cattle stampede, which had been started by the storm. Whatever was left was carted off by ground squirrels for next lining materials.

Our condolences, Mr. Lomax, may it rest in pieces. •

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7UAP PCM 1024 transmitter with trainer system and RF module.

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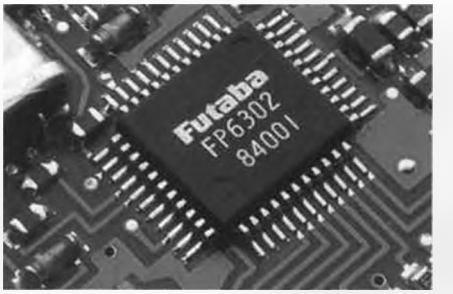
Large LCD indicator screen monitors all programming functions.

THE NARROW MINDED RECEIVERS

Both the 7UAP and 7UAF systems include narrow band receivers that meet the 1991 standards. The 7UAP uses the same R129DP/9 Channel PCM 1024 receiver as our 9VA professional model,



An inside look at the R129DP shows the exclusive Futaba PCM 1024 microprocessor and surface mount construction (SMT).

while the 7UAF is equipped with an R128DF/8 Channel, dual conversion FM unit.

The R129DP and R128DF are assembled using the latest, SMT construction for super reliability, efficiency and compact size.

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The stunning electronics of the Futaba Seven Series are encased in an all-new transmitter case, ergonomically designed for comfort and optimum control access.

The contoured back gives you a more stable grip. Mix, rate and auxiliary channel controls are slanted for easier reach. And the open gimbal control sticks are adjustable for length.

CHOPPER COMPUTER

There are Futaba Seven Series for helicopters, too, but you won't see the usual difference in the transmitter cases. Because of the many functions of the computer system, it was unnecessary to reposition many of the controls. What is different in the 7UHP/7UHF systems are five S5101 servos and 1000mAh NiCd packs.

Join the computer age. The new Seven Series from Futaba are the systems advanced airplane and helicopter pilots can count on.

7UHP PCM 1024 Transmitter.

Futaba 1024

Futaba Corporation of America
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HOW DO YOU FOLLOW A LEGEND?

GRASSHOPPER II

Its namesake, the Grasshopper, continues to be the best-selling entry-level R/C off-road buggy made. It's the one responsible for introducing more hobbyists to the sport than all other vehicles combined. But the similarity between these two buggies ends with the name.

The Grasshopper II is another story. It's easy to assemble, offers high-performance features, and has an ability to be transformed into a racing machine.

If you're coming into R/C off-road, or looking for a sensibly-priced entry-level buggy that can offer Sunday fun, everyday value and still be competitive...you want the Grasshopper II.

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To begin with, there's a new, sleeker, more rounded aerodynamic shape to slice through the wind. Rear spike tires have been added to dig in and hold tight. There's also a new, more rugged sealed gear box with longer throw coil spring suspension. In addition, there are heavy-duty coil springs on the independent front suspension. The drive train uses a rolling rear axle. And while it's compatible with standard two-channel radios, it can be equipped with Battery Eliminator Circuitry (BEC) or be used with a radio BEC R/C system.

Most interesting, is that as your driving skills advance, the Grasshopper II can keep pace. You see, it was designed to accept a wealth of souped-up parts, including ball bearings, oil-filled shocks, a 540 or Technigold motor. If you like, you can also install Tamiya's Adspec R/C system with electronic speed control.

Grasshopper II...it's the next generation and the only buggy that could follow a legend and borrow its name.

MRC

TAMIYA

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