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CONTENTS

FEATURES

WORKBENCH, Bill Northrop
DEAR JAKE,
OVER THE COUNTER,
ELECTRONICS CORNER, Eloy Marez 11
BIG BIRDS, Al Alman
LETTER FROM ENGLAND, Ron Sweeney
SIMPLY SCALE, Cliff Tacie
FLYING HELICOPTERS IN DANGER BAY, Dixie Cutler
ENGINES OF THE WORLD, Stu Richmond
PLUG SPARKS, John Pond
GOLDBERG'S COMET SAILPLANE REVISITED, George Shacklett 31
EUROPEAN SCENE, Cees Kaijim
R/C SOARING, Bill Forrey
SOAR SCALE UPRISING, Steve Moskal
REVIEW: FUTABA'S 6NHP CHOPPER RADIO, Eloy Marez
SAM MEETS THE MOUNTAIN MEN, John Berryman
HEY KIDS!, Bill Warner
HERE COMES FUN SCALE!, George P. Burdell
THE INSIDERS, Dave Linstrum
HANNAN'S HANGAR, Bill Hannan
FREE FLIGHT, Bob Stalick
RAMBLIN' THROUGH AUSTRALIA, Stu Richmond60
CONTROL LINE, Mike Hazel
THREE-VIEW
AVIA BH-3, Modelar Magazine

CONSTRUCTION

construction	
TR-260, Don Hirst	4
FAT CAT BOSTONIAN, Perry Peterson5	3

COVER: Susan Shacklett holds a magnificent Comet Saliplane from the Hobby Horn kit (see page 31) as built by her father-in-law. George Shacklett Carl Goldberg's classic design is still breathtaking today George built his with a Saito .45 four-cycle for power, and an onboard battery was installed for the glow plug (great for idling, says George, if you like leisurely O/T flying). The photo was taken with a Hasselblad on Ektachrome by the late Chris Van Deventer. Chris, you may remember, shot our September 1982 cover that featured his massive Thermic 210 with a 175-foot wingspan. Unfortunately, Chris never lived to fly his stunning glider, which may be put on exhibit at the AMA Museum in Reston, Virginia, some time in the future.

volume 18, number 194

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SILENTIUS 86 is the difference between gliding and SOARING!

glide : to descend gradually ...* soar : to sail ... in the air ... at a great height, ... to rise dramatically ...* * Webster's New Collegiate Dictionary



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quickly climbs far above normal hi-start launch levels. In less than two minutes it climbs into the regions of "boomer" thermals (700 feet) where your main concern will not be how to stay aloft but how to get it back. And, on one battery charge you can probably climb back up three times!

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be flown as a non-powered sailplane in which case it weighs only about 35 ounces. Silentius has all-wood construction with precut light ply fuselage sides, and a rib and spar wing. If you are not familiar with the quality of a Graupner kit you will be amazed at the excellence and simplicity of the Silentius kit.



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from Bill Northrop's workbench

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Say what!?

IMS ATLANTA, that's what, and real soon too!

It's long overdue for a major model hobby trade show to be held in a location handy to the southeastern states. Atlanta, Georgia, well known as the location for the most airline stopovers (some people are convinced that when they make their "last departure," they'll stop in Atlanta on their way to their final destination... whichever that may be!), has been selected for the site, and the dates of the first, or premier IMS Atlanta Model Hobby Show, are May 14 and 15, **1988**, that's right, 1988...this year!

IMS has been surveying the major hobby trade show situation for several years, and it has become obvious that a large modeling-active portion of our United States, the Southeast, has been continually overlooked. Consultations with many of our prominent manufacturers, who make it a point to attend shows that cover specific areas of the country, are in full agreement with this conclusion.

Taking Atlanta as the hub, or focal point, we find that all or portions of 18 states fall within a 500-mile radius, including every southern state east of Texas! This includes such well-known cities as New Orleans, Little Rock, St. Louis, Jackson, Memphis, Nashville, Richmond, Orlando, Tampa, Jacksonville, Tallahassee, Mobile, Louisville, Montgomery, Birmingham, Huntsville, Norfolk, Columbia, Charlotte, Chattanooga, and others.

IMS Atlanta will be similar in many respects to the IMS Pasadena, California show (which is just four days away as this is being written, with 197 exhibitors and 302 booths), in that selling to the public is allowed by exhibitors, a swap shop will be in operation, and there will be live demonstrations of radio controlled models. Atlanta will also include a tradeonly day (closed to the general public) on Friday (whoops) the 13th! (We'll accordingly place ladders over the entrances and order black cats for mouse patrol!)

At this precise moment, several Atlanta sites are under consideration by IMS officers. Announcements will be made through the modeling press as soon as this is determined. Show hours and admission price will very likely be the same as for Pasadena: open at 10:00 a.m. every day (we like to *sleep*), close at 5:00 p.m. on Friday and Sunday, and at 6:00 p.m. on Saturday. Admission \$5.00 for adults, \$3.00 for ages 6 through 12, under 6 free when accompanied by an adult. Hours and admission prices to be confirmed soon.

The first official announcement to the industry about the Atlanta show will be released at the Pasadena show, at which time Pasadena exhibitors will be given the opportunity to sign up on the spot and take advantage of a special booth price offer. Although it is not expected that the first Atlanta show will produce 197 exhibitors, indications from a preliminary survey to determine interest in the show, have been very promising. We'll keep you posted.

We look forward to seeing you in Atlanta this coming May. Y'all be sure to come see us, ya hear? INDUSTRY NEWS

A relatively new company has joined the model industry ranks, and when you discover what it has to offer, the normal reaction comes under the well-known category of "How come nobody thought of it sooner?" We're referring to Safety



Dr. Walt Good (center), well-known pioneer in the R/C world, paid a visit recently to the EAA Air Adventure museum in Oshkosh. Flanking Walt are EAA Senior Editor Gene Chase, and EAA Museum Director Carl Swickley. Walt, along with brother Bill, captured the R/C Model Airplane Championships in 1938, 1939, and 1940.

'Plus,' P.O. Box 1173, Clinton, MS 39056, phone (601) 924-9640, and if you haven't already guessed, the products are items to support safety in modeling, such as safety glasses, fire extinguishers, hearing protectors, paint and cyano masks, "Chicken Sticks," and disposable gloves and aprons.

Dennis Lott, of Safety 'Plus' sent us a pair of the safety glasses to examine. In shape and bulk, they reminded us of the fishing glasses that we mentioned several months ago in this column. If you don't recall, these were sunglasses with a small magnifying insert lens (clear) in each main lens. Great for those of us who need longer arms to read the dinner menue! The similarity of the Safety Glasses is in the sun shielding capabilities. These glasses feature ventilated side sun protection as well as shading over the eyes, both of which are particularly useful when you're flying pattern maneuvers that invariably find your aircraft flying near or through (judges should downgrade you for that!) the sun. Unlike the fishing glasses, these safety glasses feature a single lens unit construction that is ANSI Z87.1 ap-proved safety glass. They are light in weight, and fit over most prescription glasses. They are quartz mist coated to provide scratch resistance and help eliminate glare. They are also anti-fog, anti-ultra violet radiation, and are available in clear, amber, gray, and mirror. Prices range from \$10.95 (clear) to \$11.95 (colors), and \$14.95 (mirror), including case. The glasses have been subjected to sharp blows much stronger than would result from a broken prop blade being delivered from a high-revving engine, and came through the ordeal as well as any watch test by good old John Cameron himself.

We'd like to thank those of you who responded to our 1987 help wanted ads in all three magazines. The second position open was just recently filled by Mike Ogle, who comes to us from St. Louis Magazine, and who will be assisting us in the editorial and graphics departments. Gordon Boudewyn, who now handles our advertising accounts, joined us just in time to attend the RCHTA Chicago Model & Hobby Show, which gave us a great opportunity to pass the word. Mike's first job will be to record the 1988 IMS Pasadena show on film, for coverage that should appear in our April and/or May issues.

The other bit of news from RCMB INC Publications is, unfortunately, not as welcome to our readers. After seventeen years of holding our full-size plans prices, we have found it mandatory (like, if we want to stay in business!) to increase the cost of most all of them. New, and more durable mylar autopositives (from which the prints are made) have been gradually replacing the old, worn and torn paper autopositives. This is, of course, more costly, but will result in better prints. Obviously, increased paper, postage, and handling costs have also contributed to the need for the change.

The long-awaited Illustrated Plans Catalog should, now that Mike has joined us, get into production this year, and with a



Irwin Ohlsson has devised a method for forming aluminum cowls for model aircraft at home. Seen here is one made for his 42-inch Ohlsson Original cabin model, and a beautiful job it is, too.

total approaching 700, should cover just about any type of model that anyone would want to scratch-build. Until that is ready, the updated full-size plans list is available for a long S.A.S.E. **DIDDLE I SAY SIDDELEY?**

Back in the December '87 issue, I referred to the "Gannet" Moth as being

Continued on page 107



ADVICE FOR THE PROPWORN —By Jake

Dear Mr. Northrop: (forwarded to Jake)

I recently subscribed to Model Builder, have received two or three issues, and I have been wondering—is the Dear Jake section intended to be a humor-type column?

Edward in Minnesota

Dear Edward: The purpose of the Dear Jake column is actually twofold—to entertain the modeling public and to revive Latin from its status as a dead language.

On TV the other night they were showing

Dear Jake:

Jake

a documentary on man-powered aircraft. The Massachusetts Institute of Technology had one called Daedalus. I know I've heard that name before. Why did it sound so familiar?

Can't Recall in Kentucky

Dear Can't Recall:

Daedalus is a tragic figure from mythology. An Athenian architect, so the story goes, Daedalus was enslaved by the Minoans. He was forced to build a vast defensive labyrinth for the Minoan king. To escape, Daedalus built wax wings for himself and his son Icarus. Together they flew over

MARCH 1988

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 speci-fied. 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.

• This is certainly the time to snuggle up to a warm fireplace and read a good book; if your workshop is well-heated, perhaps you'll spend some time at work on your newest modeling project. Whichever activity you choose, we have some suggestions that should make your time well spent.

Englishman Ian Peacock has written a book entitled, Painting and Finishing Models, that should provide a wealth of solid information on making your model as attractive and scale-like as possible, be it plastic or a high-tech flying model. Mr. Peacock covers the steps to achieving a fine finish, and includes chapters on solvents, brushes, and techniques that will be invaluable to the modeler, in 160 pages and 100 illustrations. The book is available from Zenith Aviation Books, Box 2MB, Osceola, Wisconsin 54020.

Another book that should be of help to the modeler is Radio Control Model Engines, by Douglas Pratt. This guidebook will give modelers all the information needed to choose the correct engine for specific uses, with more than 150 engines profiled. Mr. Pratt gives a short review of each, listing the strengths and weaknesses of each. The proper application for each engine is recommended, be it in a helicopter, plane, car, or boat. Tips on installation and maintenance of engines is also included. Radio Control Model Engines is also available from Zenith Aviation Books.







Three new books on full-size aircraft should be of interest: Grumman A-6 Intruder, Boeing KC-135 Stratotanker, and North American F-100 Super Sabre all give full portraits of their specific subjects. The Intruder, a part of U.S. frontline firepower for over 25 years, has flown more than 35,000 combat missions. The book, by

SPREY AIR COMBAT

North



Choosing R/C Engines, from Zenith Aviation.

Robert Dorr, has 160 photos and 200 pages of information on testing, variants, cockpits, and weapons of the Intruder. The KC-135 Stratotanker, also written by Mr. Dorr, is a hardbound edition in the Modern Combat Aircraft series, with 112 pages and more than 130 illustrations.

The Super Sabre, written by David Ander-





Grumman A-6 Intruder from Zenith Aviation.



Zenith's Stratotanker book.

ton, is 200 pages of in-depth information on the design, development, and testing of this fighter. Developed as a fighter-interceptor and later converted to a tactical nucleararmed strike fighter, it served during the Vietnam war as a lethal fighter-bomber. These books are all available from Zenith Aviation Books, as is a comprehensive catalog, which is free. Write to: Zenith Aviation Books, Box 1MB, Osceola, Wisconsin 54020.

Speaking of catalogs, Top Flite Models has a new catalog with a full Monokote color chart included. The color catalog features all of the R/C and control line kits, plus the Monokote colors reproduced. For your copy of the new Top Flite catalog, send \$2 to: Top Flite Models, 2635 S. Wabash Ave., Chicago, Illinois 60616.

* * *

Great Planes Model Distributors has an ARF glider with a pylon mounted for electric power. The Melody MP has a 59-inch wingspan, a blow-molded fuselage, OHS wing construction, T-tail, and a LeMans AP-29 motor and pylon, to help you get in the air without a breeze blowing. The Melody MP comes with a Ni-Cd battery, and a quick charger, so all you have to add is a twochannel radio. From Great Planes, Box 4021, Champaign, Illinois 61820.

* * *

Cajun R/C Products, 112 Rosie St., Lafayette, Louisiana 70508, has introduced a new Sport/Advanced trainer designed by John Woods. The wing has a modified Clark Y airfoil and is very stable at slow airspeeds, yet is highly maneuverable at speed. The kit features a basic balsa fuselage assembly with a one-piece fiberglass top deck from nose to tail; a glass chin cowl and belly pan; foam core wing, with sheeting on front and rear; and sheet balsa tail. Also included is all the wood necessary, motor mount, and landing gear. For more information, contact Cajun R/C.

American Sailplane Designs is producing



High Sky On-Off Controller.

the 1/3-scale ASW-20, the sailplane that won Sportsman Scale at the '84 Nats. The model is available in a basic kit for the average builder, and a deluxe kit for those who want to get into the air quickly. A catalog is available for \$3 each, from ASD, Box 117, Dept. C, Nestor, California 92053.

* * *

Sig Manufacturing has taken their popular Kadet Senior and reduced it in size so that it easily fits small cars and apartments. That's very important if you have a small car or live in an apartment, but the new Kadet Seniorita is more than just compact. It's a fine hands-off trainer, for a .15 to .25 two-stroke, or .21 to .35 four-stroke engine. The wingspan is 63 inches, and the fuselage length is 50 inches. Weight averages 62 ounces, with a wing loading of 12 ounces per square foot. The kit includes full-size printed plans, step-by-step photo-illustrated building and flying book, pre-bent spring steel landing gear, die-cut ribs and formers,



Top Flite's color catalog and Monokote chart.



New Webra Speed .52 engines from Circus Hobbies.



Replica Mills .75 diesel now available.



Kadet Seniorita from Sig Manufacturing.



ARF Melody MP Electric Glider distributed by Great Planes.

decals, aluminum engine mount, and control horns, nylon nose gear bracket and steering arm, and blind nuts and assorted screws. At only \$49.95, the Kadet Seniorita is a great deal for little money. From Sig, and

available at hobby shops everywhere.

High Sky R/C Accessories, 3929 Kansas St., #9, San Diego, California 92104, has an efficient On/Off Controller for electric



American Sailplane Designs' 1/3-scale ASW-20,



Shock Strut Landing Gears from Impact Eng.



A Sport/Advanced Trainer from Cajun R/C.

flight that will switch the electric motor on or off on command. This new space-saving device will plug directly into the receiver, thereby eliminating the need for a servo microswitch assembly. A dynamic brake stops the prop for less drag, and the solderless terminal makes the installation easy. This unit is very efficient with only a 0.06volt loss at 20 amps. The weight of the unit is 1.2 ounces. For more information, contact High Sky at the address above, or call: (619)297-5792.

New engines of note include Webra's new .52 helicopter and aircraft engines available from Circus Hobbies. The new Speed .52 aircraft and helicopter engines offer performance and reliability you expect from German engineering. Designed to fit most .40-sized applications, these Speed .52 engines offer side exhaust, front intake, Schnuerle porting, ball bearingsupported crankshafts, ringed pistons, and a TN barrel-type carburetor. Both engines are available direct from Circus Hobbies, 3132 S. Highland Dr., Las Vegas, Nevada 89109. Tell 'em you read about it in *Model Builder*!

A step back in time has brought us this stunning replica of the renowned Mills .75cc diesel engine. The new Irvine Mills .75 diesel features a machined steel backplate, aluminum spinner, and a long, fuelefficient needle valve. This replica of a once-produced engine should find favor with free flighters and nostalgia buffs alike. It is distributed to hobby shops by Great Planes Model Distributors, Box 4021, Champaign, Illinois 61820.

Continued on page 69



Electronics Copiep by eloy marez

• World News! Well, we do go international from time to time here in EC, though this month's world news comes from Cincinnati. Ohio, that is! A couple of months ago I was talking here about the policy of one of our other radio suppliers as regards older R/C systems repairs and updates. World Engines' latest dealer newsletter states its position on the subject:

"World Engines can no longer repair older transmitters or receivers (those shipped before December 1980). These systems cannot be changed to current or the newer 1988 frequencies. Only the Mark IV and newer systems can be repaired or updated (Mark IV, Mark V, Mark IX, Mark X, and the Expert FM series).

"All Expert FM Systems meet 1991 specifications. Our new Mode I systems should be in around January '88 (*Hooray! em*).

"All repairs and new systems will be in compliance with the AMA's 35-550b plan as soon as we receive our stickers (It should be about Nov. 20)." Well, seven years' use out of something that lives as hazardous a life as an R/C system is not bad. I know that some of you are trying to stretch the life of your radios, and I don't disagree with that. We don't all need the latest thing with readouts and the ability to play compact discs, though there is a lot to be said for the strictly electronic advances that have come along in recent years. I do know also that some of you have gotten slightly upset to learn that your favorite Sky Knocker 7 cannot be made to meet all the new requirements and have had some bitter words to say about its maker. In all fairness, we should remember that our old radios-I still have a couple of Orbits-as poor technically as they may now turn out to be, at the time they were being built, met the legal requirements then in effect.

It is easy now to know and say what we should have done, and boy, can I tell you stories about *that!* In this case, who back in Orbit days would have ever dreamed that the R/C population would ever be what it is today, bringing with it the need for increased frequency spots and tighter technical specifications. Add to that the increase in the use of nearby frequencies by other radio services, and we arrive at the problems we face today. So don't be so hard on whoever made your old relic, after all, if it is still working good enough so that you would consider the expense of changing frequency, etc., it must have been a good radio, and you got your money's worth out of it; didn't you?

Frequency problems having come up in this discussion, there is one more piece of information to pass to you, again courtesy of World Engines. It reports the following list of troubled channels, compiled from fliers in those areas who have reported the local situation. Stay away from the following if you fly in: Austin, Texas, 50; Denver, Colorado, 44, 54; Green Bay, Wisconsin, 52; Houston, Texas, 12, 40, 44, 50; Lexington, North Carolina, 44; Milwaukee, Wisconsin, 52; New York, New York, 48, 50, 52; and Pendleton, South Carolina, 40.

Yes, I do know that this is not of prime interest to my one reader in Moses Lake, Washington, but it does have to be of interest to potential R/C equipment buyers in the vicinities mentioned. I do believe similar information is worth disseminating in the hopes of saving an airplane here and there. So if any of you have knowledge of unusable channels in your area, drop a line so that we can spread the word. Remember that in this case, no news is definitely *not* good news!

YEECK NO!

Some columns ago I wrote about not attempting to increase the reliability of your JR servo plugs by adding shrink tubing to them, as the body of the plug will not withstand the heat required to shrink the tubing. Shortly after, I received a note from one of my readers, whose name will not be mentioned to protect the innocent, with the suggestion that silicone rubber could be used for the same purpose. He did admit that it doesn't look too good

This is a definite *no* in my book! For a number of reasons, some of which I will admit are purely esthetic—the results are far from neat or professional looking. Also, once on, the darn stuff is there to stay, you can't take it off any time you feel the need to make a visual inspection, as you can shrink tubing. Furthermore, there is a reason not

Continued on page 88



Schematic diagrams of the Ace R/C HD-500 and DMVC AC-powered variable chargers, with points indicated at which 12 VDC may be applied for DC operation.



• We've come a long way these past ten to twelve years. In the early QSAA (Quarter Scale Association of America) days many of us were "closet" types and extremely closed-mouth about our doings. Then, at the 1980 Toledo Show, the IMAA (International Miniature Aircraft Association) was formed and BIG Birds were off and running. And we really became "respectable" a few years ago when the Academy of Model Aeronautics recognized IMAA as a special interest group.

Of course, the real clincher has been the fantastic number and types of powerful, dependable engines made available to us. In the beginning there was only the Quadra, so we used it in spite of its shortcomings. But now BIG Bird lovers can choose what they want: two-cycle glow or diesel operation ranging from .90 size all the way up to about five cubic-inch displacement. And it's hard to believe that O.S. would have put so much time and money into developing their line of BIG multi-cylinder four-strokes if there wasn't a solid market for these engines.

Yet, in spite of our growth, recognition, and unsurpassed safety record, there are still a surprising number of narrow-minded, tunnel-visioned diehards who believe that BIG Birds aren't kosher. As far as these guys are concerned, we're strictly a fad; and hopefully, if ignored, we'll go away and stop prostituting model aviation. Fortunately these "ostriches" are slowly decreasing in number, as indicated by the mail from modelers who are not yet into BIG aeroplanes. Sal Lucania's letter is typical.

Wanted to let you know that BIG Birds, Quarter-Scale, Giants, or whatever you choose to call them, are becoming more and more commonplace at the local flying fields.

"This past summer we (MCRC, West Windsor Flying Club, and the Levittown Aerobugs) had a three club fun-fly. Three clubs, three fields, on three successive Sundays; no contest rules or events. We flew, ate, and enjoyed GOOD fellowship.

"The point is that many quarter-scale aircraft were at all three fields, and I believe that all these planes flew, and flew well. They are becoming commonplace and are welcome additions to the smaller birds we're already flying." BIG Birds are, of course, just one part of the many-faceted model aviation picture, and each modeler has his own particular druthers as to where he fits into this picture. As the saying goes, "Different strokes for different folks!"

OLD DOG, NEW TRICKS

Putting together a Byron Glasair TD these past months has been an education. I'm used to working with the more traditional building materials, like balsa, ply, and spruce, but because Byron kits are foam and fiberglass, materials I'm not used to working with, progress had been kinda slow.

Finally, after all the building was completed, I found myself faced with the part I hate most...finishing. And although painting is the only way to go with the glass fuse, cowl, and wheel pants, the builder is presented with two options when it comes to the foam wings, stab, and control surfaces: either iron on a low-heat plastic, like Solarfilm or Econokote, or fiberglass and paint.

Initially I planned on the iron-on route to save time and weight, but Ronnie Kemp, a member of the Pic Skyriders Demonstration Team, didn't have too much trouble changing my mind because I didn't like the way the plastic went on nor the way it looked. So I committed myself to glassing with 3/4-ounce cloth and epoxy resin (polyester resin's a no-no; it eats up foam), although the Skyriders now prefer threeounce cloth because it makes their welltraveled and much-handled models more resistant to all kinds of abuse.

I had a problem though: it had been a long time since I'd done any amount of glassing, and that had been pretty well limited to polyester resin, so I had to get used to the difference in viscosity between the two types of resin. The thinner polyester, I remembered, brushed on with ease and wet the cloth thoroughly, whereas the thicker epoxy, I recently discovered, took patience and practice and went on better with a squeegee.

And I also found that even though polyester resin went over the cloth, epoxy resin was easier to work with if it was squeegeed out first. Then, after laying the cloth on the epoxy-smeared surface, thinning the mixture with a heat gun made it easy to remove excess resin.

Ronnie also persuaded me to try Pic's new Coating Poxy for this glassing chore, and I got to like the stuff. It has a five to one mix ratio, it's tough without being brittle, it squeegees nicely and sands one helluva lot easier than polyester.

Coating Poxy does have a relatively short pot life (you'll have a real, live smoking volcano in about nine minutes if it's still in the cup); but once poured and spread out, this



George Radmonich ruets up his 38-pound Acro Duster while buddy Jim Cline supervises.



Roger Olsen with his 109-inch, 45-pound B-25C. Two 40cc Quadras are ample power.



This 90-inch B-24 belongs to Jack Fitch. She weighs 13 pounds and uses four O.S. .25s for power.

resin is workable for at least an hour and fully cures in six hours. And it doesn't have the sweet permeating stink associated with polyester resin.

I also got to try two other Pic products on the Glasair: Slicker and Poxy Lite, and both worked as advertised.

Slicker is an anti-seize barrier and tooling agent. So far I've only used it on hinge pins to keep them free from epoxy while being installed, and I discovered that Slicker's a definite improvement over vaseline because it's not as greasy and dries in a day without leaving any residue.

Poxy Lite is a light-colored, fast-setting epoxy paste that has a mix ratio of one to one. It has a pot life of eight minutes, a handling time of twenty minutes, and totally cures in two hours. It's strong and lightweight and nice to work with because it can be sanded and carved, and it's great for filling voids and installing hinges. Also, any sanding can be minimized by smoothing and feathering Poxy Lite before it cures with a finger or squeegee dipped in alcohol.

And to make sure that you get to use every last drop of Poxy Lite, the Pic people were

thoughtful enough to include roll-up keys which slide onto the tubes flanged bottoms, allowing you to roll 'em up as their innards are used.

But don't throw these plastic roll-up keyes away once the Poxy Lite is all used up. Just transfer them to the bathroom and eliminate the usually messy medicine cabinet problem caused by twisted and dripping toothpaste tubes.

YELLOW AIRCRAFT & HOBBY SUPPLIES, LTD.

Dr. Jack Tse, who is well known for his fleet of fine-flying scale ducted-fan models, decided to market his birds under the name, Yellow Aircraft & Hobby Supplies, Ltd. (Suite 201, 3040 Palstan Road, Mississauga, Ontario, Canada L4Y 2Z6; 416/ 273-6757).

It appears as though the good doctor is going to give Byron some stiff competition because his prices are lower, and his birds are much closer to being ARFs. For example, the fuselage bulkheads are already installed and the wings come already sheeted with 1/16 balsa/epoxy.

Along with his first ducted-fan offering,

an A-4 Skyhawk, Dr. Tse is also releasing a quarter-scale CAP-10B and a third-scale Corby Starlet, which is one *cute* airplane.

Nice Roscoe Turner Special by Tom Ranta, A 3.1 Sachs hauls this

24 pound, 84 inch bird around with ease.

Ronnie Kemp, Yellow Aircraft's U.S. distributor, promised (scout's honor) that he'll let me paw through the first kits as soon as they arrive, which should be soon. So I'll have a firsthand eyeball assessment to pass on in the April issue.

I understand that although he's going to carry Spring Air retracts, Tse will also have his own custom retracts available before too long.

And I won't be too surprised to see his birds start to show up in numbers at major scale contests these next few years.

NICKEL-CADMIUM BATTERIES

I'd forgotten how much good stuff about Ni-Cds was in Ace R/C's Digipace Operating Manual. The Digipace, for you newcomers, is a quality piece of electronic equipment that cycles both transmitter and receiver battery packs. After deep discharging the packs down to 1.1 volt per cell, the Digipace then automatically switches to

Continued on page 76



Otto Taylor starts his Laser at the Hoosier Squadron Scramble.



Also at the Hoosier Squadron Scramble, an impressive-looking Zero is ready to move out.

auga, Ontario, Canada L4Y 2Z6; 416/ 1'd fo 173-6757). It appears as though the good doctor is going to give Byron some stiff competition because his prices are lower, and his birds

TR-260

By DON HIRST... A quarter-scale version of a relatively new French aerobatic plane is an easy building, fun flying entry into giant scale aircraft. With a Quadra engine and a resemblance to the Laser 200, it's a beaut!



 In 1986 at the 13th World Aerobatic Championships, the French Team unveiled their latest competition aircraft, the TR-260. It has a wingspan of 27 feet, 4 inches; length of 19 feet, 3-1/2 inches; and is powered with a 260 hp Lycoming engine. I first read of it in an article by Don Berliner in the April 1987 Model Aviation magazine. It was a neatlooking aircraft, with a strong resemblance to the Laser 200, and since I had built and flown several giant scale models in this category, it seemed I couldn't go too far wrong in modeling the TR-260. The results far exceeded expectations, as it proved to be easy-to-build, good-looking, and, best of all, a great-flying airplane. It is very maneuverable, and relatively fast for giant scale. This makes it a fun-to-fly aircraft with flight characteristics that fall somewhere between typical giant scale and the smaller .40- to .60-powered ships. If you haven't had the pleasure of owning a quarter scale, this would be a fine first one, since you won't have too much time or money invested in it. Incidentally, the relatively inexpensive Quadra 35 or 40, or Zenoah G38 is more than adequate for power, and any larger engine would not be needed nor recommended. I used an 18-10 Zinger prop on both the Q-35 and Q-40.

If all this sounds interesting, let's get to building one. I'll not go into great detail on



The author's wife, Elaine, with the French TR-260 model in quarter scale. Quadra powered, the TR-260 is a good entry into quarter scale for the modeler looking to build bigger ships.

construction as this is not a beginner's project. If you have built from plans before, little if any explanation is necessary, but for those who have not, I'll cover some of the important points.

WING

Build the wing before building the tail section. This should be done because the jigging required is a 3/8 by 3/4-inch balsa strip which is later used in building the tail. Note that the wing is built upside down over the plan, with the top main spruce spar fastened flat on the building board. This builds the proper amount of dihedral into the wing panel. You'll note that the rib templates do not show the rear 1/4-inch spar cutouts. These cutouts are easily and more accurately done after the top and bottom spruce main spars are glued in place. Just place a straightedge in the proper spar location and mark each rib, then cut for the 1/4 by 1/4-inch spars. Be sure to build the wing with the 1-1/2-inch aluminum tubing inserted in the ribs as shown. Due to a certain amount of distortion in the printing of plans, the ribs should be checked with a straightedge after they are glued in place but before sheeting. Any high ones can be sanded down, or low ones built up. You will note that the ailerons are cut out after the wing is completed. This is easily done with a razor blade to cut through the sheeting, and a hacksaw blade to cut the ribs. Quarter-inch thick strips are then added to the front edge of the aileron and to the 1/4 by 1/4-inch rear spars. Allow for the oneinch throw when hinging. **FUSELAGE**

The fuselage is very simple to build. Cut out the sides as indicated by the small arrows on the side view, add the 1/8-inch lite



FULL-SIZE PLANS AVAILABLE- SEE PAGE 106

15



Fuselage box construction is basic; standard modeling fundamentals are used in constructing the 260, but this is NOT a beginner's project!

ply doubler and 1/4-inch square strips as shown, and assemble upside down over the top view on the plans. The 1/2-inch firewall is added after the fuselage bottom half is completed and turned over. Be sure to install the pushrods before completing the top half.

The 1-1/2-inch hole for the wing tube is most easily cut before assembling the sides, but leave until later the rear 3/8-inch dowel hole. This rear dowel hole is important to locate as accurately as possible, as it determines the proper wing incidence (1/2 degree positive). Be sure both wing panels are set the same. The dowel position can be changed easily if you wish to change the incidence.

The tail section is built in the conventional manner. Be sure to use spruce where indicated on the plans, as this eliminates the need for any external bracing. When hinging the elevators, allow for a minimum



Test-fitting parts before assembly assures a structurally sound fuselage. Be sure to add pushrods before completing top half of fuse.

of 1-1/4-inch throw both down and up. Note that the elevators are not connected to each other. A separate servo is used for each one. **FINISHING**

The prototype was covered with Super Coverite on the wing and painted with Pactra Formula-U, sprayed on. The fuselage and tail were covered with silkspan paper applied damp, doped, and sprayed with Pactra Formula-U. Any covering and finishing system will be fine, so just use your favorite method. I simplified the scale color scheme on the prototype shown in the photos, but for an exact scale replica, please refer to the April 1987 Model Aviation article described earlier.

When everything is complete and assembled, accurately check the balance point to be sure that the model balances at the point indicated on the plan. The importance of proper balance cannot be overemphasized. It seems odd to have to stress this as it is so often mentioned in construction articles, and on plans and kit instructions, but time and time again I've witnessed fliers who haven't even checked this prior to making that first flight. Their cavalier attitude regarding proper balancing never fails to surprise one, considering the dismal performance of an improperly balanced model. The 1250 mA battery can be shifted as needed for balance.



Holes for wing tube are best cut before the fuselage sides are assembled.

Cowl, canopy, wheel pants (if desired), and landing gear are available from T & D Fiberglass, 30925 Block, Garden City, Michigan 40135; cowl and wheel pants only from Fiberglass Masters, Route 1, Box 530, Goodview, Virginia 24095. I used the Garmhausen Cap 21 cowl and canopy. Landing gear material (if you wish to make your own) and the 1-1/2-inch diameter wing tube are available from Aircraft Spruce & Specialty Co., 201 W. Truslow, Fullerton, California 92632. If you don't already have a favorite source of balsa, spruce, and ply, these materials are available at a very reasonable price from Balsa USA, P. O. Box 164, Marinette, Wisconsin 54143. Just be sure to specify soft, medium, or hard balsa when ordering.

FLYING

Before making that first flight, set the amount of surface throw as follows: 3/4inch up and 3/4-inch down on ailerons, 1-1/4-inch up and 1-1/4-inch down on elevators, and all the throw you can get on rudder. Seal the hinge gap with tape on the bottom side of the ailerons. After a flight or two, you can change the throws to suit your own



Stab being laid out on plan. Note that the elevators are not connected to each other; there is a separate servo for each elevator.



Wing panel with wing tube being fitted. The wing is built upside down on board in order to get correct dihedral angle set in.



Rudder is conventional construction too; be sure to use spruce where indicated so that external bracing is not necessary.



Left wing panel, right-side up. Note that on plan rib templates do not show rear 1/4-inch cutouts; these are easier once main spars are glued.



The 260 components are here assembled in a trial run to ensure proper fit of all assemblies. personal preference.

The very first flight of the TR-260 went off beautifully and with no problems. Subsequent flights have shown that takeoffs are very easy with no tendency to ground loop. Turns can be very tight or gentle, as you wish. Axial rolls are fairly fast and true. Slow rolls require a bit of down elevator when inverted, as you would expect. Point rolls are sharp and there is no tendency to roll past the desired point. Inverted flight is good, but does require some down elevator to be held. Loops look good, though outside loops are not as tight as inside ones. Landings are easy, however, in calm air, the TR-260 is somewhat of a floater, so allow ample approach space if you fly off a short runway.



The finished 260 is a beautiful model; its lines reminiscent of the Laser 200 aerobatic aircraft.

The only criticism I have of its flight characteristics would be that under strong, gusty wind conditions you have to stay on the ailerons to keep the wings level. This is a tendency that most of the giant scale ships I've flown seem to have to some degree, but it's no real problem. I wish I could say that the TR-260 can do every maneuver in the book, but unfortunately I am not able to do some of the more difficult ones myself, so I really don't know its full capabilities. This is an area that you will have to determine for yourselves after you've built one.

Here is one last sales pitch for you to consider if you haven't as yet had a gas-powered giant scale model. A Q-35 will run for approximately 15 minutes on a 16-ounce tank of gas. The cost of the gas and oil mix, as you know, is about \$1 a gallon. Glow fuel costs about \$10 a gallon. Get out your handy calculator and figure the difference over a one-year period; it might surprise you. Well, there you have it. Hope you'll build one.





By RON SWEENEY

 Until recently the annual Abingdon fanfly was the only occasion for British fan fliers to meet and collectively and thoroughly enjoy each other's company and share experiences. The inevitable result of such a superbly enjoyable day is the consequent depression following the event. Some fortunate U.K. fan fliers are able to fly fairly regularly, others strive to find the odd occasions to practice their skills. I aspire to the latter and therefore normally leave Abingdon inspired and exhilarated but deflated. A welcome change this year was to learn that a further fan-fly had been organized. Alex Cornish-Trestrail invited all those who attended Abingdon to his club site in September. The inspiration and enthusiasm generated by the Abingdon meeting could now be maintained and preparations could be made for a further bash. The Swinderby event earlier in the year made this the third fan event of 1987. Is this ducted-fan thing catching on?

The exhilaration and the inevitable postflight depression of the Abingdon meeting were for once tempered by the knowledge that I, like most of my fan colleagues would soon be in action once more. The long

drive home from Abingdon normally finds my son and I reliving, not only the triumphs, but also the tribulations of the day's events-"Must rebalance the fan:" "must try a different plug"; "wish I'd built the model 1/2-pound lighter"; "it was that last coat of paint that did it, and it didn't improve the finish one iota"; "must buy the plan of the F-104"; "wish my last landing had been better"; "why am I such a lousy flier in front of spectators"; "how can I explain to my wife that I need to build another model when I have two perfectly serviceable ones already?" No excuses for the Sedgemoor fanfly, I've learned all the lessons. I was determined to get it right this time, and we did! My son and I for once had a perfect day. I feel that the long stints between fan meetings allow all the corrective measures to be fulfilled but the interval between meetings conversely mellows one's anxieties and attention to detail. On this occasion the seven weeks' lapse was just long enough to maintain the pressure, sustain the commitment, and sharpen the enthusiasm.

I had two models ready for flight one week before the event and had the bittersweet pleasure of attending to the minutest detail of preparation. Oh, how this paid dividends! One F1 Mirage and one B.A.e.

Hawk fully serviceable. I had finally retired my six-year-old K&B 7.5 (although this has now had a heart transplant; new piston/cylinder/crank and bearings) and re-engined the model (Thorpe Bros. plan) with a meticulously prepared O.S. 46 V.R.D.F. The Turbax unit had been fitted with a trimmed micro-mold fan. This fan is very popular in the U.K. and suitably prepared is a fine performer having been developed directly from P.E. Norman's original designs, evolved by default rather than computer. A summary comment later will qualify further my choice of fan. Suffice to say that having been allocated frequency clearance and with all excuses gone, I fired up the Mirage. First problem was a crosswind, and with no long take-off runs, a short hop across the 30-yard runway presented a "love it or shove it" situation. The O.S. on fivepercent Nitro peaked out steady as a rock. The tachometer showed 24,400 rpm (remember the micro mold fan?). Fearing a rod failure I richened this to 23,300, it wouldn't slow up any further unless I used the throttle. Emitting a rich and comforting white smoke trail, the model was placed on the dolly and "shoved" (the love was to follow). The model went off like a rocket and performed faultlessly for this and two further



The Sedgemoor Fan-Fly in England brought out Chris Gold's stunning four-engine Concord, powered by Super Tigre .45s, with homemade fans.



Barry Conway, RAF officer, brought his F-104, which he wisely decided not to fly; stiff crosswinds made takeoffs tricky.

flights during the afternoon. My B.A.e. Hawk unfortunately did not fly since at 11-3/4 pounds and only 560-square inch wing area, it needed the benefit of a long take-off run to gain flying speed and, whereas several pilots did overcome this problem, I'm personally not that good a flier to attempt the tricky take-off.

The more important aspects of the meeting surrounded the attendance of most of the fan celebrities. Sedgemoor in Somerset, although not remote does pose several problems in terms of access and for most people means a fairly lengthy journey. This presents no problem for the diehards, and the majority were there, as well as several newcomers to spread the benign plague of fan infection. As usual the experts were free with their advice and encouragement. A healthy and enthusiastic band of several hundred spectators were also prepared to enjoy the twilight of our summer weather replacing the tee-shirts of Abingdon for the parkas and anoraks of an English autumn.

The lunch break free-for-all revealed that practically all these spectators are fan fliers at some stage of development, all displaying some anxiety or uncertainty about their progress, most wishing they had brought their models, regardless of completion stage. We must encourage this aspect of development since much can be learned regardless of the stage of construction. I feel the preceding philosophical comments may stimulate the aspirants to our hobby and accelerate their endeavors and help swell the ranks of D.F. activity even further. Fan meetings provoke activity and encourage progress. This, I feel, could be of tremendous help.

Having dispensed with the emotive rhetoric, the meeting was all about fan flying, and we were not disappointed. Without wishing to lapse into the realms of routine reporting, a few descriptive comments on the actual flying accompanied by the photographs will form the best narrative. I mentioned the crosswind at 20 mph, to see a four-engined concord accelerate down the runway, the port engines starved of motive power (remember the crosswind), lift its nose, stay in this mode for an agonizing 75 more yards, indecernably show daylight under its main wheels, and then immediately veer 90 degrees into wind and climb away, is a sight to behold. "Please keep all



Author's Mirage F1, weighs in at 8 pounds less fuel. Engine is an O.S. .46 with Turbax and Micromold fan combo.



Author's Hawk features Rohm retracts, glass fuselage, and built-up wings. Slotted flaps have been found by author to be unnecessary on the Hawk.

four engines going" was the silent prayer of all present. The prayer was answered. Once again, Chris Gold had applied his full-size piloting skills to his activity. I felt humble but privileged to be in such esteemed company. A superb flight ensued followed by a perfect landing. No super hot engines; no computer-aided cut designs; no superdesigned fans; just four Super Tigre ST.45s; four superbly made home-constructed fans, two six-blade, two five-blade; a few huge chunks of foam; and a few square



Chris Gold's Concord, with port engines starved, rumbles down runway with 75 yards left to go before aircraft becomes airborne. Brisk crosswind had everyone present crossing their fingers.



Author's built-up F-20 sportscale model begins to take shape on the building board.



The F-20 in its early stages. All formers are 1/8-ply, with 1/4-inch square balsa stringers.

sometime.

yards of brown wrapping paper. Add to this 30 years of piloting skills, an insatiable thirst to pioneer, a humble and helpful character, a sense of humour, and a superb mechanic, his wife, and you have the ingredients for a professional D.F. team. Oh, how I wish I could write this down into a recipe book. If food gourmets enjoy the *taste* of the chef's endeavors, the D.F. flier and spectator "savors" his experiences, audibly and visually. Chris, suffice to say, is a Master Fan Chef.

A companion of Chris and also a friend of David James, the mentor of the event, is a Swedish Expatriate, Jahn Mollmark, who always appears with something new. Not being one to emulate his contemporaries, Jahn always looks for something new. His approach is not only brave but also innovative. He and Chris produced two most unlikely models which statically produced tremendous interest and additionally proved, under less than ideal circumstances, to be fine flight performers. Chris's "Stealth Fighter" and Jahn's Mig 21 were expertly flown and impressively demonstrated to the delight of fellow fliers and spectators. Both models were heavy even under the very reliable custodianship of the Byrojet/Rossi power system. Both models suffered minor damage attempting high speed, crosswind landings but will live to fly many more sorties.

What may not be apparent to our American cousins is the power of your magazine circulation. We fan fliers in Europe are very familiar with your leading personalities. The kinship that develops, albeit remotely, through the modeling press is most gratifying. I feel that its about time you were made more aware that there is life outside the fan activity in the US and each US personality has his European contemporary. Tom Cooke must draw an obvious parallel with Philip Avondes from Belgium. What do they have in common? High performance twin scale jets. Mark Frankel? You've guessed. Chris Gold? Why? Pioneering spirit, innovative approach. Byron Godbersen-no equal-however, we have a contemporary-The Thorpe Brothers. We in the U.K. know the comparison, I hope by introducing you to our personalities I will illustrate to you that parallel development takes place across the globe. I correspond regularly with several European fan fliers from France, Belgium, and Norway and



Model was originally set up for an O.S. .46, but is now destined to carry a K&B 7.5 with a Micromold fan.

revel in their inspirational comments and free advice. There are many other characters in our sport. Their models and stories could be the subject of another article I digress; back to fan flying. Let me ask you guys and gals (Patti Violet, where are your pals?) what happened to your .45-size models? You produce the best .45-size fan engine on the market, yet according to your reports and videos you use them less and less and then only in twin-engined models. You have left it to Philip Avondes to show you how to fly the fastest twin yet with you've guessed—two K&B 7.5s. Forgive me for the following scenario:

The technology of fan design developed in parallel with the appearance of customdesigned fans and engines, regrettably catering for the larger, supposedly faster, aircraft. I feel that this progress path tends to restrict an expansive but less expensive approach to D.F. flying. If any of you think that you need a five-horsepower engine and a \$250 fan to achieve high performance, don't believe it. I have sent copies of our Abingdon fan-fly to several dear colleagues and hopefully friends in the US of the Abingdon fan flys. Nobody goes faster than we do; ask my mates, Mark Frankel, James Parsons, Josh Harrel, Bill Birt, Mont Cartwright, etc. Some of these names may be familiar to you, others not. Suffice to say when a video camera cannot respond fast enough to track a F-104, it's fast. I would re-



Intake and jet tube on the F-20 were formed from seven thousandths litho plate. Fan housing is from Thorjet.

spectfully suggest that your commercial construction methods "scale out" to acceptable weight limits, for the 65 to 80-size models whereas the original "plan build" models provide a flying weight suitable for 45-size models scaling 7-1/2 to 9 pounds. N.B.: Bob Violet this is your own special area for lightweight materials. I am a committed plan builder; oh, how I wish your materials were more affordable for scratchbuild modelers.

Back to Sedgemoor! Needless to say, most scratchbuilt models were balsa, ply, and foam construction and performed commensurate with their weight; the lighter the better. I have commented in the past on the prerequisites for a successful fan model; these are myriad. The most important, and for me the easiest to achieve, as an amateur, is weight. One assumes that the fan and engine package technology can be "bought," although its possible to remove a few ounces from most commercial units. The model design invariably suggests that the designer has suffered the heartache of prototype CG crashes and airfoil determination. This leaves the one vital element, that of weight, solely in the hands of the builder. This may sound pedantic, but I weigh my balsa and ply prior to cutting. I rub as much paint off the finish as possible, every stroke of the 320-grit wet and dry represents a few thousandths of a gram weight reduction-does this sound obsessive? It's all about collective weight reduction, and that's what's important. In the U.K. we are unaccustomed to discussing "flying seasons." Although our summers are oftimes less than clement, we can fly all the year round, and it's amusing to hear of intensive building programs during the winter, followed by a flush of spring activity at the flying field. While most of our competitive activity takes place during the summer, flying continues throughout the year. I am currently trying to raise interest in a local fan-fly in the Merseyside region during the winter.

Returning to Sedgemoor, a further observation I must make which you fan-fly regulars will subscribe to is the presence and the consistency of some of our companions. For those of you who are new to the fan branch, seek out these guys; they are the true experts. Anybody who can consistently turn out at every model meeting and



"Forget the F-20, that's my X-29 on the board!"

fly reliably throughout the day, unwittingly disguises a wealth of experience. I have vet to personally achieve this hiatus. Among the notables who do are Pym Smith, I've never seen a bad flight; naturally the Thorpe Bros.; and several others deserve the same accolade. The Thorpes were unable to attend Sedgemoor, Pym Smith appeared with John Carpenter's kit of the Folland Gnat with K&B .45 power. Pym's Gnat flew faultlessly throughout the day, the model design complimenting Pym's flying skills, entertaining the crowd with six-foot high 130 mph passes time after time. I feigned helplessness prior to one of my Mirage flights purely as a pretext to coerce Pym to give me his "papal" touch for my second flight-needless to say this was my best attempt.

Possibly the most experienced fan flier in the U.K. is Paul Mancini who flies for David James of Turbo Fan. I would suggest that he has more air time on fan models than anybody in the U.K., save perhaps for the Thorpes; I hope to enlist his services for the test flights of my X-29. The crowd were enthralled by his skills throughout the day.

Barry Conway, a serving Royal Air Force officer, attended with his F-104, wisely un-

flown, and a thrust measurement "apparatus?" This was designed to remove the excuses, being purposely constructed to adapt to measuring installed thrust performance. How could I resist the challenge. With a naive confidence, and with the model poised ready for clamping into the thrust meter, Barry mischievously challenged me to guess the output. I assessed this at five pounds and fortuitously got it right. I then removed the starting hatch, and thrust then jumped to 4.9 pounds (O.S. .46VRDF plus Micromold fan) 23,300 rpm. Remember the Micro-Model fan? My Hawk delivered 6 pounds, and 6-1/2 with the hatch removed with Picco 80/Boss 602. David James's Mig 15 with K.B.V./Viojet registered six pounds. I mention these figures to illustrate the futility of such data-get them in the air guys and then make your assessment; that's where it matters.

Why do I persist and support .45-size of aircraft? They're cheap, they're light, and in this country prolific and easy to transport. I mentioned the Micro-Mold fan; I have no commercial connections with the manu-

Continued on page 74



The model is now ready for spraying. At this stage the F-20 is covered in 6 ounce glass cloth and resin. Sanded and sprayed, weight at this stage is 4 pounds, 1 ounce.



The sports scale F-20, from Thorpe Brothers plans utilized balsa/ply construction, including built-up wing.



• It's not very often that we have someone who could be considered a true overall National Champion in R/C Scale here in the United States. By a true champion, I mean someone who has clearly demonstrated to all by his participation in more than just one scale category that he is worthy of the title. There have been many well-known scale modelers who have been "National Champion" as a result of winning their category at the Nats, or have taken first place in the Scale Masters finals, or even placed first in the team trials for the U.S. Scale Team. But usually, these titles are captured by several different individuals in a single year.

Well, now we have that overall Scale Champion, and I'd like to offer my congratulations to Ramon Torres of Hialeah, Florida. During the past year, he has managed to place first in the FAI Team Trials, earning a place on the 1988 U.S. Scale Team; place first in Giant Scale at the 1987 Nationals in Lincoln, Nebraska; and take a coveted first in that highly regarded event, the U.S. Scale Masters in Las Vegas, Nevada. Very few modelers even participate in all three events in one year, much less place first in each one!

One of the very few, in addition to Ramon, is Bob Hanft of Elberta, Alabama. Bob also has been active in the major national scale events this year, securing a spot on the U.S. Scale team by placing second in the FAI Team Trials, placing first in Expert Sport Scale at the Lincoln Nats, and again running close at Ramon's heels by placing fourth at the U.S. Scale Masters in Las Vegas.

By their performance this past year, Ramon and Bob have demonstrated exceptional skills and versatility in both the building and flying of R/C scale model aircraft. I believe all of us in the scale fraternity owe both these gentlemen a note of congratulations for their achievements and should wish them and the rest of our U.S. Scale Team good fortune in their respective World Championships in 1988. Way to go Ramon and Bob! FLYING BEAUTY

Over the past few years, you've heard me on various occasions tell you that my primary source of enjoyment in aviation is in watching aircraft fly. The beauty of flight never ceases to capture my eye.

The other Saturday morning, while driving to my weekly gab session at the local hobby shop, I got to thinking about what kinds of aircraft I liked to model most and what seemed to draw me to them. It didn't take me long to come to the conclusion that I really have a preference for the high-wing models. It also didn't take me long to realize just why I prefer this type.

When you think about the fact that when we're flying our models, we're looking at the bottoms more than we're looking at the tops, you get a perspective on where I'm coming from. You may not agree, but to me, high-wing aircraft are just plain prettier on the bottom than low-wing aircraft, and it's more pleasant to watch a high-wing aircraft fly overhead than a low-wing aircraft.

Think about it. In low-wing aircraft, the wings tend to block out a large part of the graceful lines of the fuselage. In a high-wing model, the entire fuselage profile is there for us to admire. Low-wing aircraft, although admittedly more "groovy" in flight, seem always to be delicately balancing on a bubble, while high-wing aircraft, with their



Jeff Kelety of San Francisco with his BD-8. Powered by a TD .049, his 26.5-inch span Bede weighs 21 ounces, and flies, as Jeff says, like an inebriated mosquito!

center of gravity suspended below the wing, seem much more stable and smooth.

An argument I'm not looking for, because each of us has to find that niche in this



To get this shot, Jeff had to lay on his stomach for a while until a full-scale plane passed in the background. Wait was worth it, as his little BD-8 looks very realistic in this photo.



This picture clearly shows construction technique described this month for building tail assemblies. The ailerons on the SM-81 were constructed using the same method.



A sharp A6M2 Zero by Rick Totty finished second in Sportsman class at the Volunteer State Meet in Dickson, Tennessee. Modified from a Top Flite kit, it weighs 10.5 pounds and is finished in Monokote and paint, Photo: S. Alexander.

hobby that appeals to him the most. I think I may have discovered one more definitive for my own, and I simply wanted to call your attention to something that I'd never before thought much about. What do you think?

READ THE LABEL

How often do most of us actually take the time to read the labels on the products we use in this hobby? Just think about how many warning messages from conscientious manufacturers go unheeded because we simply ignore them.

No, I'm not talking about safety here, although it certainly could apply to some products. Rather, I'm discussing the results you will or will not obtain from your favorite product, depending upon whether you use it properly.

The idea for this thought was brought to my attention recently when noted scale modeler Steve Sauger called to ask me if I'd ever used Model Magic Filler. Of course, I answered in the affirmative, as I use it frequently and consider it to be a fine product, performing exactly as its manufacturer claims. However, because I, like Steve, had never taken the time to read the label completely or carefully, I was not aware of the problem that he encountered.

It seems that if you plan to use a polyester resin over Model Magic, you are advised to use extra catalyst, or you may end up with a sticky mess like Steve did. Plain and simple, polyester resin apparently does not cure well over Model Magic filler without a little added boost. This isn't any great surprise, I suppose, since many of the products we use in modeling are not fully compatible with each other.

In this instance, the manufacturer provided the warning, "To ensure cure of polyester resins over filler, use 15 drops catalyst per oz. of resin." Steve did not read it before use. Suffice it to say, if you are going to use Model Magic, experiment on a scrap first to see if the materials you are going to use over it are compatible. Even polyester resin should be okay to use as long as you provide an insulation barrier between the Model Magic and the resin. I'm sure you'll find that following the manufacturer's instructions will give you completely satisfactory results from this fine product.

TAIL SURFACES

One area of most Stand Off-type scale models that usually deviates the most from true scale is the tail.

One of the most common modifications seen is to enlarge the surfaces to improve the flying characteristics of the model. This doesn't detract too much from appearance as long as the basic outline of the prototype is retained. However, I have seen many otherwise very nicely crafted models spoiled by sporting "slab'type tail surfaces instead of the airfoiled surface that would be found on the real thing.

It's been typical in many kits to use sheet balsa tail surfaces on unusually contoured designs, since it's usually much easier to construct, and it can be die-stamped by the manufacturer. All the modeler has to do is punch it out, sand a rounded edge on it (at least!), and install it on the model.

One detriment to the sheet surface in addition to the deviation from scale airfoil is the fact that it is usually heavier than a builtup surface would be. Depending on the density of the balsa used, you are adding unnecessary weight to an area of the aircraft



Just a few of the 23 planes entered in the '87 Volunteer State Meet. This annual meet is a Master's qualifier. Photo: Alexander.



A P-40 by Dave Voglund from Bob Holman plans. Powered by an O.S. .90 four-stroke, it weighs 10 pounds, and features Rohm retracts. Finish is lacquer over fiberglass. Photo: S. Alexander.

that is the *last* place you want to be heavy! wany full-size aircraft utilize construction in the tail area that can be easily repro-

tion in the tail area that can be easily reproduced on the model simply by building the tail up from square stock, the size depending on the scale of the model. Cubs, Champs, Citabrias and the like all have tubular framework in the tail area that is simple to reproduce, and the outline of the tail surface isn't anything exotic.

What about when you get some unusual shapes like my Spezio or SM-81 though? Or how about a Dehavilland-type tail? These tail designs not only feature non-straight outlines, but also airfoiled sections. These cannot normally be reproduced satisfactorily using sheet construction and can be difficult to reproduce faithfully using conventional built-up construction.

For this type tail, you might want to consider using a method similar to what I use (as a matter of fact, it's also the method used frequently by Aerodrome Models on their kits, and honest, Dick, I used this method before I built your Flybaby!).

Basically, it consists of cutting the outline of your tail surfaces out of lightweight thin balsa with the grain running span-wise, and then laminating the ribs, leading and trailing edges on either side of this core. It's an easy method of faithfully reproducing the outline, since it's just a matter of drawing the outline on the balsa and cutting it out. If 1/16- to 3/32-inch balsa is used for the ribs, it's easy to sand them to an airfoil shape using a sanding block once they're installed on either side. Leading edge material used is usually square stock, say 1/8 inch, and the trailing edge of the stabilizer and leading edge of the elevator can be constructed of rectangular stock, say 1/8 by 5/32 inch, depending once again on the size of the model.

The trailing edge of the elevator can be left unlaminated, with just the core forming the edge. In this way, those skinny trailing edges can be duplicated on even smaller models. Before installing the trailing edge of the stab and the leading edge of the elevator, squares can be cut out of the core at the hinge locations, so that when the construction is complete, a pocket is formed to

Flying Helicopters in Danger Bay



A simulated crash of a full-scale chopper piloted by Steven Wright was duplicated in model form by Dean Collins.

• Dean Collins builds helicopters. Recently he built two Cobra Jet Rangers, and spent hours on modifications. When the models were ready, he took them to a pier on the waterfront in Vancouver, B.C., and flew one out over the harbor. Within seconds the helicopter hit the water and sank—and everyone cheered. Dean had just crashed his model on the mark and on cue for the Disney Channel/CBC television series Danger Bay.

If seeing so many hours of work vanish into the murky waters of False Creek caused Dean any pain, he kept it to himself, but he did look pretty pleased when a diver surfaced, wreck in hand, within minutes.

Quickly Dean removed the crash "victims" (Ken and Barbie) and flushed the chopper with fresh water. Then he drenched the parts in oil and took the bird home for rebuilding. The day had started with a call time of 6:00 a.m. at the studio by 10:00 it was all over and the crew was on By DIXIE CUTLER. . . R/C flier Dean Collins makes his living by crashing choppers for the cameras. Recently he's been involved with a Disney series called, appropriately, 'Danger Bay.'

its way to another location and a new scene.

Saving time is a major requirement in the film industry. Time is money—big money—and if you waste it, you don't last long.

"You have to be comfortable with the chopper in any position," says Dean, "You practice until it's second nature. There's no time to learn on the set; you have to know exactly what the director needs and be sure you can get it." The director is usually an action or second unit director who specializes in this kind of shot. He has a lot to worry about; there may be several cameras, a crew of ten to twenty people to set everything up, plus models (or real) cars, boats, or airplanes. The only thing the second unit director usually doesn't have to be concerned with is dialogue and stars; any lines are recorded elsewhere, and the performers, if any, are usually stunt doubles.

Because it's hard to predict all the possibilities with shots like these, everyone likes to have all the backup they can. For Danger Bay, this meant a spare chopper, five motion picture and two still cameras. As well, Dean has a standby radio control for the models and a car full of bits and pieces for quick repairs. This is normal for the film business; plan to get it perfect on the first take, then be sure you can cope if Murphy's Law takes over.

The shot for Danger Bay, for a show titled "Pilot Error," was relatively simple; a Jet Ranger is approaching the waterfront landing pad when a shift in the cargo causes it to crash. The process of getting that on film was anything but simple, however.





Dean Collins with the Jet Ranger R/C chopper used to simulate crash of full-size craft.

First, Danger Bay Productions had to find a real helicopter wreck. It was used for the "after" shots of the wreck being pulled out of the water. Then they required a functional matching chopper for shots done with the actors. Once those were located, they had to find a modelmaker and pilot who could duplicate the real subjects exactly the stage and actual crash. That's when they called Dean Collins.

Dean started out like most model builders. He had a hobby, and he was enjoying it. He'd been at it about five years when the film industry came to Vancouver in a big way, and Dean's hobby became a business. Now most of his models are built to crash.

Dean's first film work was for "Airwolf" when the series was filming in Vancouver in fall, 1986. An expert from Los Angeles was

Dean Collins with models used in filming "Pilot Error" episode of Danger Bay, seen on the Disney Channel in America.

handling the model work, but someone on the crew knew Dean. They thought he could do the job equally well and save the production company some money. Dean gave a demo, and both he and the producers were happy. He's been pretty busy ever since. He built an exact replica of the Airwolf helicopter, down to the nuts and bolts, that was used for special effects photography.

Building and flying these models is not easy. It takes very special skills. For one thing, the action of the bird in the air becomes critical; it can never *look* like a model. Slight unevenness can be disguised by "overcranking" (running the film faster when you shoot, then projecting it at regular speed). This trick is limited, however, so the actual flight must be fairly smooth.

"You have to keep them reliable," Dean says, "otherwise you are wasting a lot of very expensive time." The fact that these shoots are usually done on a weekday and sometimes in or near downtown can create extra problems.

"You have to watch out for interference from other radios," says Dean, "Pagers are bad; they can be a real problem. Of course, the worst thing is to get some kid nearby with a R/C model operating on your frequency. I've never had that happen on a set, but I did have one of my own helicopters crash that way." Crashing may be the aim of the exercise, but the crash can't come too

Continued on page 72



Production Manager Harold Tichenor discusses upcoming shot for Danger Bay episode.



Canadian Coast Guard divers and Dean inspect retrieved model with passengers Ken and Barbie a little worse for wear. R/C chopper matched full-size filmed craft beautifully on film.





Small Mills .75 diesel is one of the world's favorite engines. Left is an original from the 50s. Center is a homemade faithful replica by Jiri Patrman of Czechoslovakia made in '87. At right is the new Irvine-Mills replica with modern materials, available now as you read this!

VITAL STATISTICS: 2-1/2 inches long to the prop's drive washer, 1-7/16 inches across the mounting lugs, 2-1/4 inches to the top of the cylinder head. Bore is .33 inch, and stroke is .52 inch for .045 cubic inch or .75 cubic centimeters displacement. Weight is 58 grams or about 1-3/4 ounces.

UNIQUE FEATURE: The best remembered and respected early British model engine.

• First the Russians copied the Brown Junior and called it the AMM-1, then they developed their fine record-setting K-16 which became a favorite. The Czechs had their AL-KO and Buseks for favorites. The Germans had their Kratmo and Felgiebel as favorites. We Americans had our Ohlssons and Forsters and Bantams for favorites. Japan had the Shimizu and Hope "B." It was the late 1940s and early 1950s, and the favorite British engine was called the *Mills point seven five*.

In the middle of Britain's Old Warden Airdrome in 1985's summer I spotted an old American Elbert Weathers design making flight after gentle flight; mostly about 45 seconds in time and not getting too high and not going any too far. I took the flier's picture with his model and found out he had made his own engine too. He couldn't buy any longer the respected and reliable .75 Mills, so he made his own from solid; we'd say he made it from bar stock. It sorta looked like a Mills, and I was assured the innards and timing were identical. But when I visited one of the world's largest engine builders, Irvine Engines, on the same trip and found a tiny casting proudly sitting on Ron Irvine's desk after the factory tour, my eyes bulged! I couldn't take my eyes off the tiny casting. It sorta looked like the shape and size and style of the famous point seven five, like in my collection. Dare I ask what was "up"?

Let's study Britain's favorite engine ap close. There's a tiny hole drilled in the flared part of the intake tube, about .010 inch to prevent overchoking the resultant flooding. Some Bantams and Forsters had this too. There's a double-ended brass lever centered on the fuel tank which can be timeroperated to move and open an air bleed to stop the engine before it runs out of fuel. The engine's porting is novel by current standards and novel by our Ohlsson .23 sideport standards too. The Mills' sleeve has two 3/32-inch holes about 3/32 inch apart on centers for intake 180 degrees around. On the front of the sleeve are two 1/16-inch transfer holes about 5/16 inch apart on centers that allow fuel to come up in front of the sleeve, through the two holes and into a 1/16-inch step that's on the front of the piston. The step works like the baffle on top of a K&B .40 #4011 sport engine's piston. The different hole patterns distinguish the front from the rear. There are dual exhausts

180 degrees opposed. My original Mills has the words "Mills" and "England" cast in the rear cover.

So let's see how good my 35-year-old Mills actually is. My standard hot weather mix for Florida is 50-percent ether, 25percent kerosene, and 25-percent castor oil. I don't think it took 15 seconds from the time I filled the tank until I had the Pro Tach registering 7,600 rpm on the 8-4 Master Airscrew test prop. I was dumbfounded! I must have run it six or eight tanks. It was a delight. It was fun. It was just like coming home from grammar school and taking your Ohlsson .23 out in the driveway to run it until your mother hollered at you to stop the noise! Each tank run was between 45 and 55 seconds. I wasn't getting "high" on ether; I got a high on the Mills .75!

An Indian-made Mills replica was available until just three to four years ago from Indy R/C. It was time to see how *it* ran. The repro had significantly more compression, and it bit my finger a bunch and kicked the prop loose twice before I found the initial settings. And what's this? It also ran steadily at the same 7,600 rpm and maybe vibrated just a bit compared to the glass-smooth original. I ran it over and over; five or six tanks continued the tremendous "high" I was enjoying.

7,600 rpm on an 8-4 is too much power for a Comet Sparky and probably too much

Continued on page 77



Many modelers learned to take apart and assemble engines from this Mills .75 which is .045 cubic inches of displacement. Hard landings often caused the fuel bowl to continue flying into tall grass and become lost. New Irvine-Mills corrects this problem.

Text tells importance of the two round transfer ports in the cylinder's front wall. Step cut into front/top of piston deflects fuel/air upwards and away from exhaust ports. Original hand honing marks still show on this 50s piston.

• The following report from Al Richardson, newsletter editor for the SCAMPS *Cas Lines* may seem a little dated as the O/T 1987 Wakefield contest at Warwick, England, was described by Jim Adams in "SAM Speaks." However, regardless of whether we are "scooped" or not, we are in the business of reporting fun and pleasure derived from flying old time models. On this basis, we present Al Richardson's observations on the action in England.

To begin with, all due credit should be given to Dave Baker for making his home available and failing that, find accommodations with other modelers. This week-long gathering at Dave's place is the only way to go from a standpoint of comraderie and exchange of ideas. This group included SCIF members, Mik Mikkelson and Andy Faykun; SCAMPS Al Richardson; and SAM 39 members from Ohio, Joe McCay, Bill Thompson, Tom McCoy and Chet Lanzo. From San Diego came Charlie Yost and Bob Longdon, while Ed Novak from Connecticut rounded out the group.

Upon arriving on the field, AI spotted other Californians: Jim Adams, Mike Myers, Jack Jella, and Abe Gallas. The Warwick field is used for an occasional race course, grassy with the center portion unmowed! This meant knee-high grass; great for testing, but tough to retrieve in. The Americans, used to retrieving on motor scooters, were in for a shock when all retrieving was done on foot.

Probably the most impressive flyer in the test period was Dave Baker's "Pollywog," seen in Photo No. 1, an unusual fuselage model that flew very well. As Al says, this may revise quite a bit of the present thinking about designs.

Weatherwise, in England, it rains. A light rain greeted the boys on the field, but this was not a great problem as the rain stopped at noon. However, wind, the companion to rain, was another matter. The wind gradually increased to the point where a stiff wind caused some difficulties in the launch of models. The worst part was the wind drift which took the models into the residential area making retrieving almost impossible.

Official flying got underway as C.D. Colin Chapman opened the contest at 11:00 a.m. Colin quickly stated two-minute flights and a fly at any time policy estab-



lished. For takeoff areas, woven mats were provided. These can be seen in Photo No. 2 showing AI Richardson's 1935 Gordon Light taking off. As a side note, AI says this model has flown more in England than the States.

Lift conditions weren't too bad if you could anticipate correctly. Some like Chris Stracken wasted no time and promptly posted three maxes in the eight-ounce Wakefield event. Those who also maxed on the first flight were Chet Lanzo, Bill Thompson, and Ed McCay (one second short!). However, the weather was tricky and one could miss lift very easily.

Three British fliers were the only ones in the eight-ounce Wakefield flyoffs. As can be seen in Photo No. 3, the Yankee IV design used by Mark Hinton and that of Chris Stracken were exceptional climbers. Richardson remarks they flew more like American Unlimited Rubber models than

O/T Wakefields.

What happened to last year's winner? Jim Adams had good flying stuff, but Lady Luck refused to smile. Al reports he saw Adams' eight-ounce geared model climbing steeply, flip over, and dive straight in! Not too many pieces left. Jim also had tough luck in the four-ounce event, as his model was 'lost' in the residential area. In all due justice to the tolerant residents, many models were returned. At last reports, only two were missing at the end of the meet.

Maybe Dick Thompson of Imlay City, Michigan, didn't win with his good flying 1937 Fillon Wakefield winner, as seen in Photo No. 4, but his outstanding model was selected as the Concours de Elegance (Beauty) winner. Don't know where Jack Jella was, but he also had a beautiful Lanzo Duplex.

Another excellent model can be seen in Photo No. 5, showing Bob Copland with his famous GB-3, a streamliner that flew beauti-



1. England's O/T spark plug, Dave Baker, with an unusual Wakefield design. Flies well!



2. Al Richardson's Gordon Light 1935 Wakefield model takes off from woven mat. Photo: Gallas.



3. Best-climbing model on the field was Mark Hinton's Yankee IV. Won 8-ounce Wakefield Event. Photo: Richardson.



4. Dick Thompson won the Concours de Elegance award with his 1937 Fillon Wakefield. Competition was tough with strong wind.



5. Internationally known Bob Copland cranks up his equally wellknown GB-3 design. An excellent flyer. Photo:Gallas.

fully. Copland is one of the most famous rubber power designers in Britain. His designs since the early thirties have always reflected care and patience both in construction and flying.

Worth mentioning is that the "Old Goat," Dick Sherman, missed winning the fourounce Wakefield event when his model was hit by a vagrant gust causing a hard crash. The SAM 7 boys can be proud of Dick for his good showing.

As usual, the best part of the meet was the bull sessions. In talks with Chet Lanzo (he has a million enjoyable stories), Al Richardson says the multispan wing developed by Chet Lanzo came about by necessity. Balsa was more expensive in the larger sizes but 1/16 square was sold in large bunches (100 for 10 cents) as a leader item for practically giveaway prices.

Most fittingly, prizes were awarded by Chester Lanzo, one of modeling pioneers. Lanzo, himself, thoroughly enjoyed meeting many of the famous English modelers such as Judge, Copland, Albans, etc. In short, a great time was had by all.

This meet marks the fourth annual O/T Wakefield staged with British-American competition. 1988 will see a resumption of activities at Taft as hosted by the SCIFS club. Following this, the SCIFS are attempting to provide transportation and housing at the Vincennes SAM Champs. (This was done at the Taft-W-P AFB SAM Champs.) Unfortunately, due to time conflict, the ideal setup of the 1989 International SAM Champs at Reno over June 19 through 22 using Steadt AFB, National Air Guard area, 21-square mile area for free flight, and the Convention Center for banquets, meetings, and MECA Collectogether, is completely out of "sync" with the British meet in 1989. Truly a shame as the AMA Nationals are

scheduled to "piggyback" the SAM Champs at Reno on June 24 through 31. Perhaps something can be arranged with the "lads" in England as this 1989 SAM Champs promises to be the biggest yet. SAM 30 FALL ANNUAL

Needless to say, here is one of the more popular meets in Northern California. Headed up by Nick Bicholau, SAM 30 has



7. Nice shot of Sherry Klarich with Danny's Ontario Wasp. First time out, and a winner!



6. Harry Jenks with an unusual model, Dick Schumacher's Sally Snarf, It's a 1937 Antique.



8. Nick Nicholau, SAM 30 mainstay, with his familiar red and black Super Buccaneer,



10 Mel Anderson's Baby Cyclone-powered, record-breaking duration model as sponsored by C.C. Moseley of Aircraft Industries.



11. Australian column editor, Bruce Abel sends this shot of his Ohlsson .60-powered, 66-inch Interceptor. Potent!

been running a spring and fall meet for quite a few years. Since moving from Brown's Valley to the local R/C field in Marysville, the meet has grown every year.

One of the fun things everyone looks forward to is the Saturday night spaghetti/ salad/drinks dinner. This is a great way to meet newcomers, renew old acquaintances, and, in general, have a good time.

Spotted on the field was a rare one, a Dick Schumacher "Sally Snarf" as produced by Harvey Jenks. As seen in Photo No. 6, this model is a simple square design made especially for Dick's girlfriend (and later wife) powered by a Bunch Mighty Midget. Jenks, by the way, will be our frequency control man at Steadt AFB for the 1988 West Coast SAM Champs and the 1989 SAM International Champs.

Snapped on the field is Sherry Klarich in Photo No. 7 holding Danny Klarich's Ontario Wasp. Danny is one of the SAM 30 newcomers and can use all the encouragement given; hence, this shot of his model. Good background view of the available area.

Probably the biggest fun event was the Twin Pusher Event staged on Sunday. This writer always "lays in the weeds" for the rubber events. Generally a case of beer is the prize. As you, the reader, know of this writer's penchant for beer, this is a super prize to go for...and win!

Wrap up on this meet, we feature Photo No. 8 of Nick Nicholau with his favorite model, the Berkeley Super Buccaneer in his usual red with black trim. This shot was taken at the 1987 West Coast SAM Champs held at Woodland.

As the results below show, competition was plenty tough. Even this writer was a victim of three people "maxing out" in LER Electric. You had to be perfect to place!

Saturday, October 10th

1/2A TEXACO (11)

1. Steve Rosselle	Bay Ridge Mike	30:00
2. Halsey Harlan	Request	30:00



9. It's 1937 and Nick Sanford poses proudly with his second Brown Jr.-powered gas model. Note the neat Fairchild 22 on the tarmac of Sacramento Municipal Airport.

3. Ken Kullman *Determined by a	RC 1 fly-off	30:00*
05 Electric (7)	Leave Deather Marcha	21.001
1. Jack Allon	Reinardowr Kyosho	21:00*
3. Ted Kaler *Determined by a fly	Playboy Cabin Kyosho	21:00*
Terraco (18)		
1. Stan Lane	Anderson Pylon O.S. 60	30:00°
2. Bill Burleson	Anderson Pylon O.S. 60	30:00*
3. Dave Brunner "Determined by coir	Lanzo Bomber O.S. 40 1055	29:41
Ohlsson Sideport	(6)	
1. Ed Solenberger	Lanzo Bomber	21:00
2. Nick Sanford	Lanzo Bomber	20:31
3. Bill Burleson	Lanzo Bomber	19:17

Sunday, October 11th

Tw	in	Pu	sh	er
4 1	- I	- 1	D	I

	John Tohu	
2.	Loren Schmidt	
3.	Nick Nicholau	

C1031 /4 (0)			
1. Ken Kuliman	RC 1	Elfin	21:00
2. Dan Klarich	Wasp	K & B 15	18:19
3. Nick Sanford	Lanzo Bomber	Ohlsson 19	17:48
Antique (9)			
1. Don Bishop	Lanzo Bomber	Sky Devil	30:00°
2. Charlie Critch	Ehling	Spitfire	30:00°
3. Stan Lane	Anderson Pylon	O.S. 60	30:00°
*Determined by a fly	rati		
Electric Texaco (8)			
1. Harlan Halsey	Request	Astro	30:00
2. Nick Panagiolou	Playboy	Leisure	28:14
3. John Pond	Playboy	Kyasha	27:18
Charle that a timer, th	his is what upon	all closet	

Ohisson 23 (2)

1. Nick Sanford	Lanzo Bomber	15:00
2. Ed Solenberger	Lanzo Bomber	14:01

L.E.R. B-C Combined

	-	
1. Eut Tileston	Lancer/Rossi	21:00
2. Gene Newcomb	RC 1/K&B	20:46
3. Bob Grice	Lanzo R C/Rossi	20:10





12. Newcomer Howard Osegueda, SAM 21 O/T neophyte, with his good performing Powerhouse at SAM 27 Crash & Bash Annual.



14. This 1/2A Texaco Lanzo Bomber flew well for Dan Walton. Seen at the SAM 56 WHAM contest.

50 YEARS AGO, I WAS...

Received a most interesting letter from Bill Pierson, who mentioned meeting this writer at the Bong SAM Champs. Jim is a retired mechanical engineer and has been building model aircraft since 1938. His "on again-off again" modeling activity has led to being a sport flier. (Old joke: I can't either, I'm a sport flier.) Anyway, Jim has this to say about getting competitive.

"My modeling career started with a Baby ROG and progressed through a series of rubber models increasing in complexity. My first gas model, built in 1938, was a Taylor Cub appearing in the February/March issues of *Model Airplane News* as designed by Jesse Davidson. (Charlie Grant had a hand in it also.)

"My son and I converted the model to R/C in 1968, and it flew quite well with an Enya 35 with a wing loading of 16 oz./sq. ft., making it entirely too heavy for competition. Because of trailing edge warpage, I need to recover the wing. Just a shame, as the silk covering is still in excellent shape.

"My second model was a Comet Clipper that I planned to install a Bunch Tiger Aero 45. Before I realized it, I got talked out of the engine by an engine collector, so back to an Enya 29 for R/C in 1976. Lack of flying experience was the main factor in not being competitive. A high wing loading of 10 oz./sq. ft. didn't help either. I finally folded the wings several years ago and am currently without a model for competition.



15. Lamoine Schrock's latest, an O.S. .60 4stroke-powered Powerhouse. Dan Walton, helper, on left.

Needless to say, I must get hot and build something for the 1988 Champs.

"My current thinking is to build a scaled Comet Clipper for a 35 glow engine. This would allow me to fly Class B, Class C, and Antique by simply swapping engines. (He forgot Texaco!) On that basis, I have surveyed the manufacturers' literature and charted their specifications. A side note is that I couldn't get data on the Super Tigre of 14." In the following chart, the reader will find the engines ranked in order based on hp/lb. (What we really are interested in is hp/cu. in. as can be seen in column 2.)

Weight of engines was based on no mufflers.

The last column DN is simply displacement times rpm.

Continued on page 98

SMALL GLOW ENGINE PERFORMANCE COMPARISON (All Schneurle-ported throttle valves except as *)							
Source	Model	Disp.	ABC	BB	HP/lb.	HP/in. ³	HP/DNx104
K&B*	8600	.352	X	X	2.247	4.533	2.833
K&B*	8500	.297	X	X	2.062	5.046	2.402
O.S.	40FP	.396			1.851	2.525	1.683
OS.	28F	.2788		х	1.831	3.228	2.017
O.5.*	25FPS	.2484	Х		1.814	2.818	1.761
O.S.	25F	.2484	х	х	1.728	3.221	1.789
O.S.	40 FSR	.3949	х	х	1.701	3.03	1.894
OS.	25VFRE	.2484	X	х	1.677	3.422	1.901
Enva	SS30BB	.294		X	1.652	2.823	1.764
Enya	40CXTV	.3958	х	Х	1.561	3.032	1.783
Enya	SS40	.396			1.645	2.798	1.852
OS.	40 FSR	.3949		х	1.630	2.904	1.815

engines. This makes the decision of which engine to use a tough one as ST engines have one first through fifth in 19 of 42 events. The selection of a Super Tigre engine becomes more enticing when you consider that Class B Glow had 4 places out of 13; Class C Glow, 9 of 15; and Antique, 6



13. Herb Wahl's reproduction of the Ohlsson Gold Seal has proved to be a winning engine with Don Bekins' Bomber.



16. Jim Burger displays his 1/2A Texaco Playboy built from a Kustom Kraftsmanship kit.

Goldberg's Comet Sailplane Revisited

By GEORGE SHACKLETT. . . A genuine classic OT model, the Goldberg Comet Sailplane was a great model back then, and in the P&W kit, it is just as memorable. The author takes us through its construction. . . .

· Many of us in our younger days built various free flight designs by Carl Goldberg which included rubber-powered, U-control, and gas. Later came R/C, and Carl's company wore out several die cutters making Falcons and some others. Goldberg's designs are almost all good flyers; durable, with innovative features (and parts). Those of us who knew Carl and his lifelong professional interest in modeling understand why he was so successful. Every model was welltested before marketing, and he was always open to problems which the modeler had with any of his kits. I am sorry that I was unable to finish this Sailplane project before his death, since he had given me several helpful pointers.

This was a "revisit" of the Sailplane for me, since I had built two Ohlsson .60powered ones in the forties which thermalled like mad (cost \$16.95 plus dope and covering). The Sailplane is a larger, updated Zipper or, perhaps, a Zipper descendant. These were among the early pylon designs which really revolutionized free flight in those days. If you build one, you will enjoy it.

CONSTRUCTION

The Sailplane could be scratchbuilt from original plans, of course. I chose, however, the P&W Kit with stripwood from Hobby Horn. This is an excellent kit. The wood is good quality, and machine-cut parts (ribs, formers, etc.) appear to have been meticulously done. In order to scratchbuild, one would have to find rib patterns for all ribs, since the wing is elliptical. The original "retractable" landing gear (one wheel), and pivoting "prop-saving" motor mount are probably passe in today's world, especially if you go R/C assist. The latter is highly recommended unless you live on the Salt Flats and have a motorcycle, good binoculars, plus a foolproof dethermalizer. **FUSELAGE**

Construction is easy with the Crutch Method (used in kit). It is stronger than the original and more easily built true. Just build the crutch as per plans, and the wellcut formers complete with stringer notches can be glued to the cross members of the crutch. If building free flight, I would suggest lightening holes in the formers aft of the wing. The precut firewall parts go on the nose without problems and you end up with 0-0 thrust line.

Plans for installation of your radio should be made prior to installing stringers. Get all the weight you can get up forward because of the short nose moment. The forward crutch makes a good platform for a plywood or plastic servo mount with receiver below the crutch. Dowels work well for pushrods through the solid formers. Since I needed more weight in the nose after installing a Saito .45 four-cycle, an onboard battery was added inside the cowl for the glow plug. (This gives a very reliable idle which you will need if you like the leisurely type O.T. flights.) Be sure to cut some access doors to get your equipment. I just used small hooks and rubber bands to hold these, much like Carl did on the original ignition access. Cowling is optional, but sure helps the looks. Mine is of balsa block with plywood formers front and back, tailormade for the engine used. It is held on with dowels fitted into the firewall and metal straps externally.

WING

The wing on this airplane is beautiful—at least from the viewpoint of those who "grew up" in the forties. It is relatively easily built; only one or two pointers.

1. Due to the undercamber, it is necessary to jig up the spars an appropriate amount to make them flush with the rib bottom. These could be inserted after the outline and ribs are glued, but you will get a more true wing if you glue it all while pinned down. The curved portion of the trailing edge is laminated and can be carved after wing tip sections are complete. The original ribs had the spars passing through their centers which made construction easy and strength good, but these are difficult to reproduce.

2. If you plan to stress the airplane in flight such as high-speed pull-ups or loops, the addition of spruce spars is recommended. I used spruce on all the center section spars. This is a short flat section. On the root sections, I split the balsa spars and glued the proper sized spruce to the top of each spar. (This makes for easier sanding later.) The recommended polyhedral was used. No spruce was used in the tip sections.

RUDDER AND STABILIZER

These present no construction problems. The rear spar of the stab is a good place for hinge line for elevator, and the vertical fin member is a good hinge line for rudder.

Continued on page 77







Of course, details like the arrestor hook, a fully detailed cockpit, panel lines on fuselage and wing, and the 18 exhaust stacks were not forgotten. Nine of those stacks are functional, as the Zenoah exhaust is connected to them.

Wingspan of the Sea Fury is 7 feet, 2 inches; dry weight is 22 pounds.

No less than nine servos were mounted in this ship; for safety reasons three battery packs were used: a 1200-mAh pack for the receiver, an 1800-mAh pack for the servos, and a 7.2-volt 1200-mAh pack for the work-

Continued on page 74

• The Hawker Sea Fury was an airplane that belonged to the last generation of piston-powered fighters. Design began in 1943, but the first one wasn't delivered until 1947. They saw action in several parts of the world, like Korea and much later the invasion at the Bay of Pigs. A number of these Sea Furys have served in our Dutch Royal Navy too, using our one and only aircraft carrier as a base. It was an impressive airplane, and those who have seen and heard a Sea Fury will not easily forget the sight and especially the sound from the exhaust stacks of the 18-cylinder radial engine.

Toon Verleun, from Rijswijk, The Netherlands, is one of them. What to do if the fullsize one isn't around anymore but to build a R/C-scale model of it? His creation is the subject of this article and the photographs. Although it is certainly not a precision scale model, its realism, both on the ground and especially in the air, is overwhelming. And isn't that what scale modeling is meant to be?

Toon started from tiny three-views, which he transferred into drawings. Based on them he built a plug for the fuselage, took negative moulds from it, and came out with a neat polyester fuselage. The wings were cut from foam and covered with balsa. At first, a fixed landing gear was installed, but later on he replaced it with electric retracts from Giezendanner, for which he made the legs himself. The wheel doors were made functional too; they are closed with a separate servo after the wheels are tucked in.

The necessary power is delivered by a 3.6cubic inch Zenoah, turning a $23,5 \times 10$ homemade wooden prop.



Toon Verleun, from Rijswijk, The Netherlands, built this realistic Hawker Sea Fury seen on its landing approach. Power is from a 3.6 cubic inch Zenoah.



Toon's Sea Fury on fly-by is certainly impressive; though not a precision scale model, its appearance is spectacular both on the ground, and in the air.



Toon started his Sea Fury project from three-view drawings, which he enlarged to working plans. By making a plug fuselage, Toon was able to pull a polyester fuselage. Wings are foam, covered with balsa. Electric retracts from Giezendanner add to the realism of his Sea Fury.

r/C Soaring

• About a month ago I received the kind of phone call 1 look forward to as a soaring editor. A modeler named Al Clark called me from Huntsville, Alabama, to tell me of some modifications that he had made to an LJMP Flinger which had noticeably improved its performance. He got the idea from similar performance improving modifications which had been done on other HLGs and full-size gliders such as those reported in this column in recent months (see September 1986, July 1987, and November 1987).

After about a 20-minute conversation, I asked Al if he wouldn't mind sharing his findings with *MB* readers by way of a few photos and a written explanation. He was agreeable to the idea and what follows is that letter:

"Dear Bill, I enjoyed our telephone conversation a few weeks ago. I finally got the pictures back that I took of my Flinger wingtip mods. As I told you on the phone, I feel that the modified tips have improved the performance noticeably. The sink rate does not increase as much when put into a turn, and the L/D (glide ratio) has improved slightly. I was inspired to do the mods after reading a couple of articles in the SSA's *Soaring* magazine by Alex Strojnik, 'Improving the Constant Chord Wing' and by Wil Schuemann 'A New Wing Planform with Improved Low-Speed Performance.' You mentioned the Schuemann article in your November '87 column.

"I made the mods in early '87. I did the whole thing in about three hours one Saturday morning, so it's an easy mod to do. Details are as follows:

"1. Make sure the Monokote is stuck to the cap strip, and then cut off the wing just outboard of the fourth rib bay of the tip panel. I simply used a razor blade.

"2. Prop up the whole wing on the building board and use balsa blocks and pins (or whatever) to hold the tip panel flat on the board.

By BILL FORREY

"3. Now build on the tip. I butt glued the trailing edge stock (TE) to the existing TE. The spar is just a full-depth piece of 1/8 balsa, butt glued. Likewise the leading edge is butt glued in place. I plotted the two new tip ribs using Chuck Anderson's computer airfoil plotting program. Make the ribs in two pieces to allow for the 1/8-inch spar. The D-tube sheeting is 1/16 sheet balsa, butt glued.

"4. The dimensions are: span of tip, 4.75 inches; chord of new tip rib, 2.75 inches; tip block is from 1/4-inch balsa.

"These new tips also increase the projected span out to the legal (Class A) limit of 59 inches, and, incidentally, the airfoil shown on the Flinger plans is not really an Eppler 205. I plotted my own (ribs) and made a set of templates. I also thinned the TE stock down to 1/32-inch at the rear edge.



Al Clark, of Huntsville, Alabama, modified his LJMP Flinger as you see here with performance-improving Shuemann wing tips. See text for info on how he did it.

"As you know, Bill, these hand-launch sailplanes are lots of fun. Those fliers who haven't tried them are definitely missing out! Aside from the fun aspect, my thermalling skills have really improved since I began flying hand launch in '84. I wouldn't give up my hand launch glider for anything.

"Before I close, I want to mention that we have a new soaring club in the Huntsville area, the North Alabama Silent Fliers (NASF). It appears that we will be the host club for the Southeastern US LSF Regional Tournament in 1988, so please tell your readers to come to Huntsville for this event! (You just did, Al—wrf)

"That's about it, except to say that I (and most every other sailplaner here) consider your column to be the best of all the magazines, so don't change it!

"Sincerely, AI Clark." Thanks for the encouragement, AI. It's not hard to be good at this editing game if guys like you out there keep contributing great tidbits of info like this one! I want to encourage any modelers who have "discovered" little tricks like AI's to share them with everybody. We can all save time and grief by being steered in the right direction at the start of a project; following the footsteps of those who have gone before rather than blazing a new trail or reinventing the wheel. Massive amounts of experimental data can be funneled and condensed here into "the good stuff" if we all contribute.

By the way, the computer program that Al mentioned is available directly from Chuck Anderson for a nominal fee. Call or write him at: 202 Inglewood Circle, Tullahoma, TN 37388; (615)455-5788.

THE FIVE-DOLLAR SOLUTION TO ACCURATELY SELECTING TE REFLEX

Attention Dodgson Windsong users with four-channel radios; here is a simple and cheap way to obtain a perfectly reflexed and aligned trailing edge (TE) at the flick of a single lever. All you need is some solder, a soldering pencil (or low wattage soldering iron), some hookup wire, and less than five bucks worth of Radio Shack off-the-shelf parts. With these materials you can put together an adjustable trailing edge preset switch for your competition glider.

This idea comes from Mike Watson of Lafayette, Louisiana, who sent it our way recently with a sketch of the basic circuitry and a few words of explanation. Mike came



AI Clark's modified Flinger wing tips. Modifications took about three hours, and are simple to accomplish. See text.



Buddy Fox poses with his All-American 1985 derivative thermal contest ship. Sparless fiberglass over blue foam structure.

up with the idea after flying his Windsong using the four-channel radio setup as described in the Windsong instructions and then wishing there was a better way to lift the four TE surfaces of the wing than guessing with the flap and aileron trim pots on the transmitter. He gave it some thought, figured out what was needed, then figured out a way to accomplish the task. The result is (in effect) an on-off switchable and adjustable second neutral point for the flap and aileron trim servos.

A word of background is probably in order for those not yet familiar with the way a Windsong is set up. The Windsong is a flap, aileron (or spoileron), rudder and elevator model with a span of 134 inches, the Eppler 214 airfoil, and an ingenious combination of mechanical mixing devices allowing all four servos to reside inside its fuselage. These devices allow you to have spoilerons (where the ailerons deflect upwards like spoilers) and flaps with pitch compensation for landing, and full-span trimmable trailing edge for flying a broad range of speeds from fast thermal hunting to slow thermal climbing. Then you have the rudder coupled to the ailerons, and a full-flying elevator; all with a simple, low-cost, fourchannel radio.

The pitch compensating elevator mixer has its roots in the early seventies Bob Dodgson-designed "Coupler Model No. C-2" flaperon mixer with elevator compensation bar as found on the Todi. The Windsong mixer, now affectionately known by Windsong fliers as "Der Devastator," compensates or neutralizes the pitch-up reaction of the glider's nose when the flaps are deployed. This device is actually an elevator trim bar which pivots on the flap servo output arm (thus the pivot point moves whenever the flap servo arm moves). There are two elevator pushrods. The first one is



Bob and Larry Pettyjohn, co-owners of Cheetah Models, with slope combat Cheetah and Super Cheetah.

very short and goes only as far as the distance between the elevator servo output arm and the trim bar. This is the elevator actuator rod. It causes the trim bar to move on

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1	0.0000	0.0000	0.0000
2	.0050	.0115	0047
3	.0125	.0182	0086
4	,0250	.0263	0117
5	.0500	.0385	0150
6	.1000	.0541	-,0181
7	.1500	.0635	0204
8	.2000	.0704	~.0211
9	.2500	.0745	0217
10	.3000	.0772	0215
11	.3500	.0788	0212
12	.4000	.0784	0204
13	.5000	.0754	0154
14	.6000	.0672	0090
15	.7000	.0543	0016
16	.8000	.0381	.0035
17	.8500	.0289	.0045
18	.9000	.0188	.0043
19	.9500	.0095	.0029
20	1.0000	0.0000	0.0000



Buddy's glider again, showing mirror-smooth finish of the vacuumbagging technique. Also note white balance point line and servo access batch for flaps.

its pivot whenever the elevator servo arm pivots. The second push rod takes off from the trim bar and goes back to the elevator surface of the glider's tail. When the flaps are deployed, the trim bar's pivot point moves, thus causing a slight change in the elevator setting. The trim bar will then pivot on the point where the aileron actuator push rod attaches. An illustration of this device appeared in my February 1986 column.

The second ingenious mixer is a bit more complicated mechanically. It also requires two servos: one for the coupled rudder/aileron function and one for the "spoileron" action of the ailerons (called the aileron trim servo). I am not even going to try to describe this mixer to you, as it involves four pushrods, two bellcranks on a common pivot, a Du-Bro Ball Link Mixer inside the fuselage, and four pushrods and two bellcranks in the wings...not counting Ball Links and clevises! The best way to see one of these linkage systems in action is to rent the Dodgson Video! (This requires a \$20.00 deposit plus five dollars for shipping and handling. Mail your check to Dodgson Designs, 21230 Damson Rd., Bothell, Washington 98021.)

Anyway, the sole function of the aileron trim servo is to raise or lower both aileron surfaces together. Raising the TE a little (six degrees) lowers the wing's camber and speeds the airplane's forward progress toward the next thermal (or away from sinking air). The flap servo has direct control of the flaps' mean camber line, so a change of the flap trim lever on the transmitter raises or lowers both flap surfaces together automatically.

In a four-channel system, the aileron trim servo is plugged into the receiver jack labeled "rudder." In the transmitter, the centering springs are removed from the rudder




gimbal and then the rudder stick is moved right or left to raise or lower the ailerons. Similarly the rudder trim lever raises and lowers the aileron surfaces but to a lesser degree.

Mike Watson's Windsong was set up this way. In having the neutral position of the aileron trim and flap trim tabs on the transmitter as the neutral TE setting of the wing, he found it difficult to find neutral TE during flight without taking his eyes off the glider and actually looking down at the trim tabs. He wanted to be able to put the flap trim tab all the way up for neutral and the aileron trim tab all the way to the right for neutral. This way finding neutral would be easy. The problem would then be how to get beyond neutral and into a reflexed TE configuration.

Mike solved the problem by adding two identical circuits, one for each trim pot, which would allow a preset reflexed TE position at the flick of a single switch, and yet be independently adjustable so that he could match the amount of aileron and flap reflex. What was needed were two more pots and a double-pole-double-throw switch. The illustration at the opening of this article shows the two circuits. When activated by the throw of the DPDT switch, these two circuits change the resistance value of the trim pots, which changes the pulse width of the servo signals, and tells the two servos to move to a different position. It is as if you moved the trim pot beyond its stop to get the reflexed TE.

In Mike's letter, he gave a few helpful hints for putting this circuit to work in a transmitter. The added potentiometers ("pots" for short) are 25K (25,000 ohm) adjustable types that retail for about \$1.49 each. The double-pole-double-throw, "DPDT," toggle



switch will run you anywhere from a buck to nine bucks, depending on its size and quality. The hookup wire will run you about \$2.39 per 25 feet for four-conductor rainbow wire at Radio Shack, or \$2.19 per 60 feet of 20-gauge stranded in three colors. If you have done any kind of electronics or stereophonic work in your home, you probably have suitable wire already.



To mount the two new pots in the transmitter case you will need to find a space for a board about 1/2 inch by 1 inch with enough unobstructed clearance to fit the pots with their terminal leads (about 3/8 inch). In my Airtronics SR4R transmitter there are at least two such spaces at the top right and top left sides of the case. Since the case sides are plastic, perhaps an Ambroidtype glue or Plasti-Zap glue would be best to attach the board and its shims. There is always the nut and bolt arrangement too. Once you have the board made and it fits the space, you can drill two adjustment access holes that will line up with the screwdriver slot in the two pots. Hook up the circuit, glue or bolt the board in place, mount the slide or toggle switch nearby on the face or side of the tranny case, and start adjusting.

It would be well noted here that these two circuits are just add-ons, not substitutes for existing circuits.

With the switch in the off position, turn on the transmitter and then the receiver. Place the trim pots for the flap servo and the aileron trim servo in the full-up and fullright positions which should reflex the trail-

Continued on page 90

SOAR SCALE UPRISING

By STEVE MOSKAL...Conceived by the late Dan Pruss, the SOAR Scale Uprising was held on a sweltering weekend in Oswego, Illinois with some beautiful scale models and a host of energetic competitors.



• The 1987 SOAR Scale Uprising, the dream of the late Dan Pruss, was held on August 1 and 2 at the club sod farm in Oswego, Illinois. Static judging began on a day of 90-degree heat and 90-percent humidity. Scale judges Dale Folkening, Dave Haertel, and Al Zolecki examined each aircraft and documentation package and provided the meet with an exceptionally professional job of it.

The flight tasks were: Saturday, two rounds of AMA 3.5-minute in/out followed by two rounds of 5-minute precision/duration with an in/out bonus; Sunday, four rounds of 5-minute precision/duration with an in/out bonus. This fit in with the philosophy of maximum flying time and little risk to the models with an in/out as the spot point system. With the exception of the electric motorgliders flown by Glen Poole and Mike McIntyre, all models had been flown prior to the meet. Although as many as seven categories were offered, entrants confined their types to post-1946 and motorgliders.

Glen Poole campaigned with his venerable Robbe Schleicher KA-7—the smallest PHOTOS BY DALE FOLKENING



Author Steve Moskal won it all: highest static points, flight points, and the Concours award. His model is built up from balsa, spruce, and lite ply. Covering is Super Monokote.



Jack Hiner launches Steve Moskal's 1-26B. Low aspect ratio model was kept to seven pounds, had wide speed range and spot landing capability as well.



Jack Hiner again, this time tossing Ed Whyte's TG-3. Ed has campaigned with this ship for years, and has won the Nats with it.



Rich Burnoski with 3rd place Cobra 15 in 1/6 scale from an old Windspiel kit. Minute detail can't be seen here. Rich flies it like all his ships, F3B style.

sailplane there—built from a 15-year-old kit! He also entered a Kyosho built-up balsa Fournier RF-4 powered by an Astro Flight 035 direct drive on six cells and proved that the new cobalt in the AF line packs plenty of performance despite its size. Mike McIntyre, like his dad, also had a run of bad luck with his radio and seemed to be having power problems with his Grob 109 motorglider modified from a Kyosho Valencia ARF. The club electric "pros" advised Mike to try 800 cells instead of the stock car racing pack 1.2s, but Mike's radio didn't cooperate, so Glen won first.



Jack Hiner(again!) launches Wayne Fredette's 4th Place ASW 20. Flights were extremely realistic due to fantastic L/D of the ASW 20.

POST-1946 SAILPLANE

Contest Final	Static	8/1/87	8/2/87	Final
1. Steve Moskal	101	1574	990	2564
2. Rich Burnoski	85	1410	912	2522
 Jack Hiner 	0	1377	827	2204
3. Ed Whyte	97	1470	1000	2470
4. Wayne Fredette	69	1512	933	2045
5. Glen Poole	70	1234	729	1963
 Tom Kallevang 	0	1522	0	1522
6. Jim McIntyre	83	599	0	599
Z Mike McIntyre	67	471	0	471
(* Builder of model)	rulet			

MOTOR-GLIDER

1. Glen Poole

2. Mike McIntyre

Wayne Fredette flew an ASW 20 kitted by Glasflugel Modelbau; clearly the longest wingspan of all models entered. His flights were eerily realistic. Rich Burnoski flew the Polish (what else would a guy named Burnoski fly?) Cobra 15 from a Windspiel Models kit. The plane seems to fit Rich's F3B style of flying quite well since it moves as fast as its full-scale brother. Rich added much detail and reworked the wings to true scale.

There might have been a separate



Ed Whyte and 3rd Place Schweizer TG-3 from his own plans. Ship was military trainer in WW2.



Wayne Fredette flew his ASV/ 20 with realism in the manner of its namesake. Long, majestic approaches the order of the day.

Continued on page 72

PRODUCT\$ IN USE **FUTABA FP-6NHP Helicopter Radio**

By ELOY MAREZ

 The Futaba Company has recently announced an addition to its line of R/C systems designed especially for R/C helicopter flying. The FP-6NHP/PCM, as the new baby is known, brings to five the number of such systems available under the Futaba name. At first glance, it would appear that choosing the correct system would be more than a little confusing, especially for a person shopping for a first helicopter and control system. Well, such a person is going to run head-on into a lot of confusing things, as R/C helicopters are without a doubt the most complicated and sophisticated R/C models now being flown. As one studies the various Futaba helicopter systems, it soon becomes apparent that the intent is not to add to this confusion, but to give the flier more of a choice depending on his skill level, his choice of helicopter, future ambitions, and even his choice of stick configurations.

Before we delve briefly into the full line of Futaba helicopter radios and thoroughly into the 6NHP/PCM, let us discuss a bit about what makes a "helicopter radio" as it might appear that four channels being four channels, an R/C helicopter could be flown with any aircraft-type R/C system. Well, it can, and in the early days, it was. However, the early radio-controlled helicopters were crude in comparison to today's supersophisticated machines, and their control requirements were far less.

In all fairness and not taking credit away from the individuals involved, the presentday high state of development of R/C helicopters is due also in part to companies like Futaba, who saw the need for specialized helicopter R/C equipment and pro-



Futaba's FP- 6NHP is similar in size and looks to the other already-popular Conquest transmitters, except for the addition of the most wanted helicopter flight functions.

ceeded to develop it. From the first, progress went hand in hand, until today's R/C choppers are capable of flight that their full-sized counterparts have not yet achieved—due at least in part to the development and availability of these somewhat complex "helicopter radios." Yes, the radios are complex, no two ways about it. They are complex because the requirements are complex, which brings up Eloy's helicopter radio rule Number One: One will not be fully able to understand or appreciate the features of a true helicopter R/C system unless he also has a good understanding of helicopter aerodynamics in general and model helicopter aerodynamics in particular. True, there are some similarities between fixed-wing and rotary-wing flight, especially in forward flight. But before you achieve forward flight with the helicopter, all manner of strange and interesting things have taken place—even the simple act of advancing the throttle starts a chain of events that the airplane pilot never has to



The new S148 precision servo is furnished with this R/C system. This servo includes all the latest developments: indirect pot drive, direct pot and motor connections too.



Instead of the usual assortment of parts and wires, the insides of the S148 show only an uncluttered PC board on which the IC amp and all components are mounted.

PRODUCT\$ IN U\$E

contend with-or to understand.

Let's look then into some of what makes helicopter radios different-and complex. Basically, it is the mixing and/or coupling functions that are required. These requirements start with throttle to collective pitch coupling. If you are completely new to the subject, collective pitch refers to the variable pitch of the main rotor blades. Different flight conditions require different relationships between the throttle and rotor angle, both of which are controlled by the throttle stick. Functions related to this basic feature are termed "Idle Up," and "Throttle Hold." The second mixing function required of the helicopter radio is tail rotor (rudder) to throttle (and collective). This feature, called "ATS" (Anti-Torque System), is required to automatically counteract the tail swing that will occur as the throttle is advanced. More advanced additions to the basis ATS include Hovering Memory and Acceleration Mix.

That is about as simple as a helicopter radio can get—the other end of the spectrum includes features up to and including inverted flight switching requirements. The basic rule is that as the helicopter gets more sophisticated, so does the radio equipment.

Prior to the introduction of the FP-6NHP/PCM system, the Futaba line-up for R/C helicopter flying included three systems:

Conquest 5NLH/FM, with the basics as described above plus some extras such as Hover Memory, Throttle Hold, Adjustable Servo Throw, Idle Up, and Servo Reversing.

"G" Series 7FGHi/FM, which can be considered an intermediate system, includes all the mixing requirements plus those refinements required for the more acrobatic machines including inverted flying.

Eight-Channel PCM Series, the two-stick 8SGH/P and the single stick 8SSH/P—the epitome of helicopter radio systems, intended for the expert and serious competitor. These systems include every known helicopter function and some extras such as Fail Safe, Battery Fail Safe, Servo Test, and Futaba's Digital Tachometer/Timer.

Now, for our main subject here, Futaba's latest, the PCM FP-6NHP Six-Channel helicopter radio. It is obviously intended as an intermediate system, having a number of the features required for more advanced helicopter flight. Another point worth remembering is that a radio such as the 6NHP allows the complete beginner to advance further before becoming limited by his equipment.

The T6NHP transmitter incorporates a number of the usual high-quality equipment features such as servo reversing switches (five channels) under the rear battery compartment cover and dual rates on elevator and aileron. There is a supersmooth operating gimbal with adjustments for both stick tension and stick length.

Helicopter flight requirements include Revolution Mixing, an easy to adjust twoknob control of throttle/pitch/rudder mixing. A Pitch Control Knob provides about 30-percent trim of the pitch control servo.

Continued on page 80



Set-and-forget controls are readily accessible under a flip-up clear plastic door on the bottom front. Servo reversing switches are located under rear battery cover.



Shown here with a companion 500 mil battery and S148 servo, one can see and appreciate the compact size of the companion R-116GP receiver, micro-processor and all.



One of a number of gyro stabilizers available from Futaba, the G-133B provides the additional stability demanded by today's sophisticated rotary wing aircraft.

The Mountain Men Meet SAM

By JOHN BERRYMAN... A unique pairing, the joint contests held by the Magnificent Mountain Men Flying Club of Denver, and the SAM 1 Chapter showed that two different disciplines can co-exist on the same field.



SAM 1 Co-CDs: Les Payne, and Jack Warkins.

• Labor Day marked the annual Rocky Mountain Free Flight Championships, hosted by the Magnificent Mountain Men of Denver, Colorado. It also marked the annual Society of Antique Modelers Rocky Mountain Championships, hosted by the Model Museum flying club (SAM Chapter 1). This is not in itself terribly unique, but the fact that these two fine contests were held at the same time, and on the same field, is unique.

Because of the obvious crossover between the types of events flown by free flight "purists" and many of the events flown in SAM contests, both of these Denver clubs realized that a joint contest could build participation in each club's events.

Thanks to the assistance of the members of the Colorado State Land Board, the clubs already share a terrific ten-thousand acre site east of Denver. Though the clubs have



Jim Lang with Lanzo RC-1.

access to the entire site acreage for chase purposes, the actual area available for pits and airstrips is limited. Would it be possible to operate a free flight contest and a SAM contest efficiently (and above all, *safely*) from the same area? And would a twin contest *really* bring out more fliers than when the contests were held separately?

Thanks to prior planning, the answers to both questions was yes. After initial discussions between members of both clubs, the idea of a joint contest was proposed at the Magnificent Mountain Men's annual meeting (that's right, annual meeting). Since there is a fair amount of membership duplication between the two clubs, and because several SAM officers attended the MMM meeting, it was possible for the needs of both clubs to be explored. After "some discussion" (read: when the dust settled), the clubs agreed that the joint contest idea had



Hank Sperzel with GYSOB. Shirt says it all!

sufficient merit to be explored in practice. It was decided to hold the contests over the Labor Day weekend. Since it was to be a *big* contest and out-of-state entries were expected, it made sense to give the contestants an additional travel day.

A second thing that was needed was an event that would serve to unite the two contests. Fortunately, one was already in place. A local Wakefield flier, Bill Gibbons, had donated a perpetual cup to the MMM to be awarded to the winner of his annual "Wally Simmers Design Contest." Three of Simmers' classic designs, the Gollywock, Jabberwock, and Dynamo, were eligible to compete. This meant that many MMM members would be building airplanes that would be able to compete in the SAM O.T. rubber events.

Safety was, of course, a paramount consideration. In the normal course of events,



Dave Ramsey with Harry C. Gould Sailplane.



Cody and Rick Pangell with .020 replica ship.



Mike Field's wife Terry, with Mike's Comet Clipper.



MMM CDs: Darold Jones and Gary Baughman check out the hardware.



Les Payne with Cabin Playboy. Pylon Playboy to rear; both nice flyers.



Larry Kruse with Wainfan P-30. Yes, all free flighters dress this well!



Joe Ed Pederson with Nordic.

the average R/C flier is simply not expecting to see a fellow on a motorcycle appear in the middle of his landing strip. Likewise, a free flight flier involved in a chase is likely to be watching his airplane, and praying for the DT to *finally* pop, rather than being alert for a six-foot old timer on final.

To prevent any accidents, it was decided that the free flight and R/C activities would be separated. The free flight fliers flew from their "usual" spot, on top of a small rise. The SAM fliers flew below the rise, and had



Dave Wineland and Dean Carpenter with their power ships.

their flags set up about one-thousand feet away from the center of the free flight activity. Fliers who were new to either SAM or free flight contests were informally briefed by other fliers about safety procedures, and the bounds of the dedicated flight areas. The result was that SAM fliers didn't have to worry about someone crossing their landing area, and the free flight fliers didn't worry about low-flying R/C ships, as any old-timers that did inadvertently stray across the edges of the free flight area were



Roger Maves waits for air...and waits...and very high.

The "Twin Contest" idea worked very



Larrie Schaeffer launches his .020 Wedgie.



Glen Menu packs turns into his Wakefield.

Continued on page 81



By BILL WARNER

 I had a kid once in my junior high model club who insisted on trying to glide his models before he covered them. They did not so much glide as plummet. Another young man in my science workshop classes took his Piper Cub home to cover it and lost the tissue, so he covered it with toilet paper! You can imagine how that looked! I have had kids cover with the Saran Wrap that was supposed to protect the table (actually it would work if you used contact cement, but they didn't). I have had kids bring in models with so much model dope (a liquid plastic that modelers use to paint on tissue) on them that they looked more like cartoons all shriveled up than flying models. You may not be able to judge a book by its cover, but you can sure tell a model by its covering!

PRE-SHRINKING TISSUE

There are lots of ways to shrink tissue up before it gets on the model. If you don't shrink it first, it will find a way to shrink itself later when it picks up moisture and then does what tissue loves to do, tighten up. One guy I know tapes his on the window pane and sprays it with water. Another wads it up into a tiny ball and then spreads it out and irons it to give it an "alligatorskin" look which allows for some shrinkage by accident after it's on the model. One guy out in Oklahoma sprays his with a water mist and then irons it between two sheets of newspaper until its dry. All of these methods work, and you can take your pick. The method I personally prefer is to cut a hole out of the side of a good-sized cardboard box with a model knife about a half of an inch smaller than the piece of tissue I have, and then glue or tape the tissue over it. Using an old hairspray bottle filled with water, I spray it until it's good and wet and then set it side to dry. Use a hair dryer on it at your own risk, because tissue has almost no strength at all when its wet, and you can easily blow a hole right through it. I usually use a dryer after its already dried out, just to make sure.

If you live in an area where it is damp, or where the model may get wet on damp grass, you may want to use spray lacquer Illustrations by JIM KAMAN

like Testor's Dull-Kote or thinned (mix dope thinner with it half and half) model airplane dope. Any dope will do, but clear is the lightest. There is nitrate dope (tautening and non-tautening) as well as hot-fuelproof dope on the market. Old timers prefer the tautening nitrate dope for most models, even though it can warp thin wings and tail parts. It has one advantage, and that is that it does its shrinking and gets it over with, and some models can stand the tightening effects easily. Because we're not doping the tissue on the model, but on a pre-shrink box-frame, who cares how much it shrinks? After giving the tissue a spray or brushing with the thinned dope, let it dry. Then let it dry some more. Ideally, you would let it age a couple of weeks to make sure it had stopped tightening up. Now's when a few

RIGHT

Correct alignment of wing and tail section is most important for proper flight. minutes with a hot hair dryer can speed up

the aging process.

Now that the tissue is ready to use, you can either cut it out of the frame or you can stick flat parts directly to it while it is stretched. I like to take it out of the frame and put it on the model. It doesn't give as smooth a covering job, but then, I want a slightly imperfect job so it will heve a little bit more than it could shrink up without twisting my wing. Also, people will know I did it, whereas they might think someone built it for me if it looked too good!

Modelers use about anything to stick tissue on, ranging from shellac to glue sticks. One popular way is to coat the part of the model frame that the tissue will touch about three times with dope and let it dry. The tissue is applied dry, and dope thinner brushed on so that it soaks through the tissue and sticks it on "from the bottom up." This is a lot of work, but gives nice results. Lazy modelers like me, however, prefer to mix about two parts white glue with one part water and brush one coat on the bare balsa. Then we position the tissue carefully and let it down onto the frame. You then lift it at any corner where there is a wrinkle and gently lay it back down, pulling out the wrinkle. Using your thumbs, start at the center and gently apply a little pressure



Covering your model need not be the arduous chore illustrated above, if you follow the simple guidelines presented this month.



Gluing tissue over hole in cardboard box prior to spraying it with water to pre-shrink tissue.



Brush on white glue mixture(60% glue, 40% water) on top of surfaces to be covered.



Smooth wrinkles out with thumbs. Keep them dry or tissue will stick to you and not model!

down on the tissue, sticking it onto the wood while very carefully moving them outward, pulling out little wrinkles as you go around the edges. The trick here is to keep wiping your thumbs on your fingers every couple of seconds to keep them dry. Once they get sticky, you'll pull chunks out of the tissue as it sticks to you instead of the wood!

If you like to do neat work, or if you are short on tissue, take some newspaper and cut patterns just about 1/4 inch larger all around for each piece of covering you need. Leave less on the edges of the center section and none at all on the inside of the two wingtip pieces where they will just slightly overlap the center piece. When using the pattern to cut the tissue, pay attention to the "grain" of the tissue (the direction in which it tears easiest...try a corner). The grain should run from tip-totop on the wing or "spanwise." This will become more important when we begin building wings with cambered (curved on top) ribs.

You will have to decide whether or not you wish to cover all your parts and then glue them together (a very neat way to do it) or build the airplane and then tissue it. What I like to do is "tack glue" the model together with little dots of glue, just to see how it looks, and then soak the places apart with some acetone on a brush where I



You don't have to do this, but it is a good idea in order to prevent warps later on.



Cover the top of the wing in three pieces. Do the center first, overlapping tips just a bit.



When tissue is dry on frame, trim using a shearing motion along edge with new razor blade.

tacked it, cover the parts, and then reassemble them.

Another decision on the Peck ROG, which gets covered on one side only of each part to save weight, is whether to cover on the top or the bottom side. Most of us cover on the top because it looks right, but covering on the bottom may give a wee bit more lift, and also allows the wing to be covered with one piece of tissue all the way across instead of in three parts, which is the way we are going to do it on the top.

After the glue has dried for about a half hour, it can be trimmed off with a new sharp razor blade. Use old ones at your own risk, you'll see why. It takes a gentle touch to move the blade along right up against the L.E. or T.E., holding it at an angle and moving the blade downward with a sort of "sawing" stroke as you go. The idea is to shear it off even with the wood. Some modelers prefer to use a sanding block and sand through the tissue along the sharp edge of the wood. This can make a very neat job, but be careful and not remove too much of the wood underneath, and don't break the balsa sticks. I like the razor blade. When you have finished, go along the edge with a finger wetted with a little white glue and rub down any rough edge remaining.

If you mess up the covering badly, you can always soak the whole thing in water to get it off, as white glue is water soluble, but



Tear a tiny bit of a corner of tissue to find the grain direction. Grain direction goes from tip to tip on the wing.



Carefully locate tissue over area to be covered, lower onto wet glue mixture.



Using a sanding stick to clean up the edge of the wing after trimming the tissue off.

the cellulose glue you built the model with is waterproof. If you have to do this, pin the parts down flat for a couple of days until they are thoroughly dry. Nobody messes up the job a second time! Well, almost nobody.

When you assemble covered parts, it is not a bad idea to scratch away a little of the tissue where the part attaches. Gluing wood-to-wood is always stronger than wood-to-tissue! Before everything dries completely, give the model a quick onceover (with one eye closed) at arm's length just to be sure everything is straight (see the December '87 issue of *MB* for preflight instructions).

ADDING THE ADJUSTMENT TABS

The adjustment tabs on the wings and the tail of the Peck ROG are not just there for decoration. Due to its short wingspan (we say the model has a low aspect ratio when a wing has a fairly short wingspan for its chord, or distance from the L.E. to the T.E.). The Sleek Streek we made earlier had a higher aspect ratio and did not tend to roll quite as much on torque. I suggest replacing the tabs cut out of the plan with ones cut from a 3 x 5 card, as they will be harder to knock out of adjustment. The aileron tabs are important to control the roll, keeping the bank (dropping of a wingtip) to a minimum. The elevator tab is really essential on this model because the amount of positive

incidence or angle of attach built into the wing mount is pretty small. Without some "up" elevator, the model will dive into the dirt and return itself to kit form on the first flight. You can cut down on the amount of tab needed for elevator if you sand a small angle (negative) under the rear of the fuselage and mount the stab on the bottom. Taking about half the 3/16-inch thickness off at the very end and tapering it to full width about two inches forward should do it. Then you can use about a third of the original tab size, as its purpose will be minor adjustments, not something necessary to make the plane fly.

POWER

I have had Peck ROGs fly very nicely on 1/16-inch FAI rubber indoors in a gym. with times over a minute. The less power you need the better, as flying fast makes any small warps become very effective in ruining your flight. I'd suggest using a 1/16-inch motor about 12 inches long for your first test flights even outdoors. You can go up to 3/32-inch rubber when you get it flying well. Remember that the Peck is guite a bit more fragile than your Sleek Streek, and testing under fewer turns in the motor is a good idea, slowly building up to full winds and bigger motors. Indoors, the idea is to make a motor just long enough so that the model touches down just as the last couple of turns run out. If the model has the prop stop near the ceiling, the motor is too short or too powerful. If it lands with winds left, it is too long or too weak. Sometime you might want to try adding a little more twist into the blades of the prop so that it will turn a bit slower indoors and give you a longer motor run. Outdoors, you'll probably want the extra prop speed for a high climb. I suggest you take the January issue of Model Builder with the flying instructions and trouble-shooting chart to the field or gym with you.

REPAIRS

Although you will do your best to avoid damage, things always seem to get broken on models, either while building, on the way to and from the site, or, once in a great while, in a crash. A good thing to remember is that your model is never as bad-off as it looks! I have had kids in my classes throw perfectly good models away with only five or six breaks. Remember how many places needed to be glued together when you started making it? Well, it probably needs fewer joints now! The main thing is to try and get as much gluing surface as you can. Gluing two sticks together end-to-end is never as strong as sanding or cutting an angle on each one and gluing the longer surface together. A 1/4-inch fuselage "buttjointed" end to end gives 1/4-inch of gluing surface (for purposes of illustration), whereas if you cut the wood at 45 degrees. you'd increase the gluing area to 1/2 inch! The more gentle the angle, the more surface. Of course, you need an extra piece added into the joint (see fuselage-break illustration) or you will be too short! Sometimes, if you're lucky, the break will cover a fairly large area, and, when glued back together, will probably be stronger than the original place where it broke. Always double-glue.



The finished model on the wing with rubber band knots unwinding in the air. Note trim tabs on wings, stab, and rudder. Built correctly, your model will fly just as good as this!





A quick field repair on a broken model can often be made by adding a splint made from scrap balsa to the repaired joint. This adds strength and can help get it straight again. An extra thickness of balsa is often called a "doubler," and is sometimes added in places where breaks might be expected before they happen. Where the wing L.E. and T.E. attach to the pylon wing mount, for example.

After gluing a broken section, it is a good idea to pin it down to something flat, or to put some weight on it. If you use the corner of your model box top for this, and have no Saran Wrap handy to keep the glue from sticking, you had better make sure all extra glue is squeezed out first and wiped off so the model will not become part of the model box on a permanent basis. Pieces of balsa sheet, if they are flat, often make good devices to pin wing tips and such to while the model is sitting on its wheels. This way, two or three repairs can be during at the same time.

Leading edges (L.E.s) of wings often get damaged, as they hit first. A good way to add a doubler is *behind* the break, making it hard to see and out of the airflow to keep drag down. Cut the ends of the repair doubler at angles or taper it toward each end from the middle to make it lighter and a bit more flexible.

At this point in the article, the author sidetracked for a moment to take a strong stand against the use of cyanoacrylate glues, not only by youngsters and beginners toward whom this series is aimed, but also to include modelers from all experience levels. We acknowledge and understand his concern about the safety hazards related to the use of cyanoacrylate glues, however, we cannot agree with his contention that its use should thus be avoided entirely, by everyone ... not any more than we would warn against the use of model knives and razor blades, or being around high-revving engines turning sharp-edged propellers, or taking even one "sniff" of model cement or dope. Safety hazards occur in all activities of life, some more publicized than others. We cannot ignore them, and we cannot avoid them: we can only point them out, educate our readers on taking precautions, and hope for the best. WCN.

After making repairs, and before the glue dries completely (a luxury you don't have with "instant" glue), line up the parts to make sure the fuselage is straight and the wing is unwarped. Move the parts into

Continued on page 79





Here Comes Fun Scale!

By GEORGE P. BURDELL. . . Fun Scale? Yes, it's a new category sanctioned by the AMA to include ARF, RTF, or any scale model. Only documentation necessary is a photo or drawing of full-scale counterpart.

• Hooray! There's a new R/C scale category that's official in 1988!

I received a four-piece announcement in the mail of the *Florida Sunshine Scale Championships* being flown in Fort Lauderdale at Markham Park, a county-provided R/C flying field, in late September 1987, and it included the very first Fun Scale event. I had to go see and enjoy. I used to pylon race there about 10 years ago and had fond memories. There's a paved 475-foot long



runway in the middle of a 65-acre cleared area within the park's 1600 acre total property. Bob Harbin, the park's chairman, said modelers are the number one "draw" to the park. People happily pay 50 cents admission to enter the park grounds and sit under the shelter at the R/C flying site to watch the models fly. A huge crowd was on hand for this two-day scale contest, although there are several other interesting sections of Markham Park in Broward County. The park



At top, Murry Cribb's NA Harvard T-6, and Stu Richmond's Ford Trimotor are the attractions for these kids. Stu's Ford won First in Sportsman with 323 points. Trimotor flew on Enya .40 four-cycle, flying a barnstorming airshow for the judges. At left, Don and Debby Moon hold their SE5-A built from a Top Flite kit. Model weighs 8-1/2 pounds, uses O.S. .90 four-cycle and has had almost 50 flights. They won Second in Static Scale with 93 points. At right, Joe Hancock leans to study the F-100's workmanship. Model is by Art Johnson.



Pilot in Moon's SE-5 swivels his head left and right to face the camera!



Joe Hancock's 1/4-scale Aeronca Sedan won First in Giant Scale with 325 points. Uses Super Tigre 2500.



Art Johnson's scratchbuilt F-100 jet fighter weighs 14-1/2 pounds, uses Rossi .81. Art consistently used all of the 475-foot runway on takeoffs. Won First in Expert.



A partial lineup of the Fun Scale entries in this First-ever AMA contest. ARF Cessna, Mark's Models' Harvard, Elias Aircoupe, CAP 21, two FW-190s, and a Zero.

is in the process of relocating the R/C fliers onto a new 600 by 60-foot runway; now isn't *that* nice! The club's rules are the park's rules, and it's been that way for about 20 years.

This is the first running of the new Fun Scale event, and it sure turned out successfully, with half the entrants in this new category.

There are lots of model builders who just aren't "experts" but like to fly. The current wave of imported kits include ARFs with realistic covering. Some modelers buy models from others, so don't qualify for nor-



Seventeen-year-old Stephen Storke of Boca Raton turns his Top Flite Bearcat for the judges. Stephen flew in Sportsman, but radio failure did him in. Look out; Steve is a comer, this being only his fourth model!

mal scale entries due to the B-O-M rule. Some just like sorta scale models. Fun Scale is designed to attract this type of interest. Flying judging and scoring is 100-percent normal. But if you can show a published three-view (of *any* sort), you'll get an extra five points added to your flying score. No proof, you only lose five points. Not bad, huh? Over half the total entrants signed up for this new event. So, guys, it looks like this new AMA event is going to be wellsupported starting in 1988.

Everybody had two chances to fly before the judges each day. On Saturday all en-



Bill McCallie's F8F-1 Bearcat was Second in Expert, but won the beautiful Pilot's Choice Award. In rear, Roger Tilleman worked the PA system both days, did great job.

trants voted for a "Pilot's Choice Award," which was a neat idea. During the Saturday night social hour the award was made to Bill McCallie of Tampa for his Grumman F8F-1 Bearcat built from a Royal kit. The 'cat weighs 13 pounds, uses 8 channels of Kraft, and is pulled by an O.S. .90. It drops bombs, sucks gears, lowers flaps, and is a veteran of over 100 flights.

In addition to Fun Scale, they also ran Sportsman, Giant, Expert, and Static (this is the first time I'd seen Static; not a bad idea,

Continued on page 69



Young Nicholas Corso is sitting guard for his dad's Zero.



Greg Namey flew this EZ FW-190 to First in the new AMA Fun Scale event. Fun Scale will certainly attract lots of R/C entrants. Greg's son Jimmy is learning fundamentals with his P-30 model.



By DAVE "VTO" LINSTRUM

• Right up front we are going to chastise you readers for not sending in any Hint of the Month subjects of your own. If you loyal readers are tired of seeing photos of my clubmates (MIAMA) or models at contests I attend, you are going to have to send in some stuff of your own. If you prefer national model news, you will have to become part of the network!

At a total loss for a Hint of the Month (reader contributed) we will have to mention one of our own techniques, casting humility aside. This is something that serves well for all models where weight must be kept to a minimum or when building time is short. Paul Plecan inspired this with his published paper pilots, but we have taken it a step further.

Profile paper pilots are ideal for scale or semi-scale models from Pistachio to Peanut to Coconut, from Embryo to Bostonian. You can make them from scratch on Xerox paper or 3 x 5 cards. You can use a profile photo of yourself, reduced on a copy machine, or draw your profile or that of a nostalgia-era pilot. The key is to make the bridge of the nose a fold line on the paper or card.

If you draw your own, fold the paper first and start with the nose, going over the forehead, adding hair (or a helmet or cap) then down to the neck, up the chin, back to the nose (maybe adding a mustache) at the point. Then add eyes, ears, sideburns, and maybe a collar or scarf. Do all this with a fine-line felt pen. Then hold paper up to light, tracing the features on the opposite side. Finally, unfold and color with permanent color makers.

Should you choose your own photo for the pilot, copy it once on paper and again on clear acetate or mylar—reverse this on a copy machine, and you will have your opposite profile to copy on paper. Cut this out and glue, nose bridges aligned, to the other side of your face. Talk about cosmetic surgery!

Now cut the pilot out and affix in the cockpit, to a spreader, crosspiece or perhaps to the bottom of the instrument panel or headrest. We illustrate this method with a photo of Luigi Lasagna, hot WWI pilot, glued to the headrest of our Peanut Macchi-Nieuport biplane. He adds just the right touch of detail.

We hope that creative use of paper profile pilots will help you with your efforts in making good flying, light models. Remember, you read it in "The Insiders" in *Model Builder*.

THAT OLD COCONUT SPIRIT

When we returned from a trip to Washington, D.C., about a year ago, we spread the word about a neat new indoor event created by the DC Maxecuters. The Coconut Scale event is Indoor Jumbo Scale, and the rules are simple. Max span is 36 inches (30 inches for bipes), minimum weight two ounces, and surfaces may be single-covered.

Now we have the straight scoop on Coconut from the Maxecuter who built the first one, Bud Carson. His silver Spirit of St. Louis would have made Charles Lindbergh proud as it floated under the girders at the Patuxtent River Naval Air Station meet at its debut. Here is the story direct from Bud:

"The interest generated by my 36-inch indoor scale Spirit of St. Louis at the November Pax River gala came as a pleasant surprise, and I was quite pleased at all the favorable comments it got. The model was designed for the sheer fun of it, and to this extent it was certainly successful, completing several dozen flawless flights to the delight of the crowd and the relief of the author, suffering nary a scratch or a blown motor. The idea came when I contemplated that magnificent flying site—something was needed that would fill up the room but do it in a survivable way.

"Thus the Spirit was reincarnated in indoor trappings. As such, it won't stand up to the rigors of outdoor flying, but on the other hand, has proved remarkably resilient to the inevitable wall and rafter bashes that so often spell disaster to typical outdoor models when flown between four walls. During the initial trimming flights and before the correct amount of rudder offset was established (which proved in the end to be far more than I would have thought necessary), the Spirit had its share of heartstopping encounters with the local terrain with nothing more than a split prop blade to show for it, proving once again that low inertia indoor model "crashes" tend to be rather leisurely affairs.

"I hope this example will encourage others to follow suit with their own versions, even though there are no official events for this class. In case there ever is, I have labeled this category "Coconut Scale" in keeping with the familiar Peanut and Walnut Scale categories, the coconut being the biggest nut of all, yours truly excepted. To help things along, I have put down some thoughts, realizing that the formidable Maxecuters are superb modelers and need no instruction on basic technique.

"1. For a first attempt, stick with the tried and true. I suggest a high-wing, externally braced configuration. Feel free to tinker with landing gear length, tail surface areas, and dihedral (all of which is allowed by FAC rules, incidentally) and make a working sketch or drawing before plunging into the



Dave Rees ready to hand launch his 36-inch Coconut Scale rubber Travelair 2000.



Profile paper pilot Luigi Lasagna at the controls of Linstrum's WWI Macchi-Nieuport Peanut Scale. See text for details.



MIAMA's John Tudor was first in club with a Coconut Scale; his yellow and silver Bellanca. actual construction.

2. Use Yoga, TM, or whatever suits to get yourself into an indoor mindset. Lightness not only spells endurance, it is the key to survivability; heavy models hit harder, and vice-versa. Select wood carefully for strength and lightness, and resist the urge (which can be quite overpowering at times) to add unnecessary structure. Don't get caught in the weight-growth tangle. When in doubt, scrimp, obeying the aeronautical engineer's credo: simplify, and add lightness. Be especially careful about tail weight, which can be a real killer. A needless gram in the tail may easily require three more in the nose to balance it, wiping out a lot of the "lightness" that you have carefully "added" in the rest of the structure.

"Remember that the conventional models seem to have a lot of unproductive structure devoted to no purpose other than to prevent warps, collapsed wing ribs, etc. caused by tissue tension. Since you won't be shrinking the tissue on flight surfaces, they can be made much lighter than you are used to. The wings on the Spirit had only twelve 1/32-inch ribs, and the trailing edge was 1/16-inch square.



Tony Becker uses Ray Harlan Ultrafilm covering on his Novice Pennyplane.

"3. Take full advantage of any bracing that appears on the prototype. The wings on the Spirit were very tender when framed up and downright floppy when covered, which meant that they were about right. When the struts were added, the wings became stiff enough to take the flight loads, but still retained enough resilience to survive a cartwheel without damage (try that with your 15-pound R/C scale job!)

"4. Fashion bulky items such as wheels, dummy engines, nose blocks, etc. from foam. This not only saves weight but lowers their inertia so they remain attached during close encounters with immovable objects. If the airplane is very light and the wheels are too, the whole landing gear assembly can be glued on to the lower longerons without benefit of weight-enhancing piano wire reinforcements. Coat wheels, etc. with Elmer's or Titebond to give them dent resistance, strength, and a good base for sanding and finishing.

"5. As for covering and finishing: all flight surfaces on the Spirit were single-covered with white paper that had been pre-sprayed with silver Rustoleum. The celebrated N-X-211 registration number was applied to the



Jacksonville Beach's Frank Kieser holds the Florida Pistachio record with 'model of a model' ornithopter, Fancy Girl.

paper prior to covering using a large stencil coated with spray adhesive, and sprayed black. The fuselage was covered and shrunk conventionally, and later sprayed directly without benefit of clear dope. As a result, I don't think there is more than a gram of paint on this model, which grossed out at just under 30 grams. Of course, colored tissue, Magic Markers, etc. can all be used, depending on the model. A light coat of clear acrylic on the raw paper will retard shrinkage and subsequent warping of the flying surfaces as humidity varies over time.

"6. After much agonizing, I finally decided to attach the wings on the Spirit permanently since there seemed to be no way of maintaining rigidity with a detachable wing. This has worked out well, and losing trim each time the wing is removed is of no concern.

"Otherwise, a model of this type goes together quickly, and is well worth a try. I hope to see the 'sky' blackened with Coconuts next spring when we return to Pax for another fun-packed day. Who will be the first to build a Coconut trimotor pusher canard? Anyone for a mass launch?"



Coconut Scale originator Bud Carson winds his prototype Spirit of St. Louis in stooge at Patuxtent River Naval Air Station.



Bud Carson(right) argues a Coconut Scale rule point with fellow Maxecuters Capt. Davis(Curtiss Robin) and Don Srull(in center).



"Just as important as having ideas is getting rid of them."

• Our lead-in line, by Francis Crick, via Herb Kelley, applies perfectly to model builders. If you decide to design or build something, there are only two possibilities open to you: You can try to ignore the thought, leaving potentially valuable ideas bottled-up, or you can have the satisfaction of bringing your creation to life. The choice is yours....

SPEAKING OF LEAD-IN LINES

Ted Ballin, of Seattle, Washington, found one of our quotations incorrectly attributed. According to Ted, it was not Goethe, but Hippocrates of Cos (5th Century B.C. Greece) who said, in part: "Life is short, art (or science) is long; opportunity is elusive, experiment is dangerous, judgment is difficult." Heavy thoughts; aren't they?

TIGHT LINES

Turning to lighter subjects, did you know that the U.S. Navy did not officially abandon airships until 1962? (And that they might now be reconsidering them?) Were you aware that the U.S. Army, who began using homing pigeons for message delivery during 1878, did not officially drop the system until 1956? These and many other significant (?) facts were gleaned from the most recent issue of *Tight Lines*, a most fascinating newsletter devoted to kiting. If kites may be of interest to you, you can subscribe to *Tight Lines* for the small sum of \$6 per year (six issues) from: Leonard M. Conover, Dirt Cheap Press, P. O. Box 888, Newfield, New Jersey 08344.

THOUGHTS FOR THE DAY

Dr. David Goodman brought to our attention this quotation from pioneer aircraft designer Igor Sikorsky: "The work of the individual still remains the spark that moves mankind ahead." And Bill Kincheloe wrote in to say: "As my rubber-powered scale model was whipped into the ground by an errant gust, I was reminded of von Karmann's comment: 'The last frontier of aer-



Enthusiastic members of the Four Corners Free Flighters Club. Read about their historic interstate model flight this month in the Hangar column.



Closeup of a Czech Wee R/C Thomas Morse Scout. Antonin Alfery's model is powered by Stefan Gasparin's CO2 engine, and guided by Stefan's original electronics. Object between printed circuit board and battery box is CO2 fuel tank. Model has duration of from 90 to 120 seconds, weighs 28 grs. onautics is turbulence."

SPEAKING OF TURBULENCE

Turbulent versus laminar flow is still very much under study, not only by aerodynamicists, but also by hydrodynamicists. One promising approach to improving the flow over vehicle surfaces has been the application of tape embossed with tiny grooves. In nautical use, the America's Cup-winning vacht Stars and Stripes employed the material on its hull. In the aviation arena, Boeing expects to test the system on a 757 airliner, according to a newspaper clipping sent to us by Pearl Reynolds. The article, authored by Malcolm W. Browne of the New York Times News Service, guoted Boeing aerodynamicist J. Douglas (!) McLean as saying that the much-touted "laminar flow" wings of several World War II aircraft, including the P-51 Mustang, did not really preserve laminar flow because "they were manufactured too crudely." It is hoped that modern techniques and materials may alter this, and permit greater efficiency from airfoils.

Other methods to improve surface-flow involve the sucking of air through perforations in wing skins, as currently being explored by NASA, and fundamental airfoil redesign.

Another bugaboo (if you'll pardon the word choice) of wing efficiency is surface contamination caused by insects, rain droplets, and ice. Efforts to combat these factors include retractable leading-edge shields, Teflon coating and fluid-washing techniques, in addition to constant research into revisions in wing contours.

What does all of this have to do with model aircraft? Maybe nothing, but maybe everything. Controversy has long existed among modelers regarding turbulators and the relative efficiency of shiny coverings, such as plastic films, versus the more traditional tissue or woven-fabric covering materials.

Perhaps instead of looking at full-size aircraft studies for potential solutions to our small-scale questions, we should be examining Mother Nature's miniature flyers, the aforementioned insects. Certainly they are well-tested performers! Note that many of



Two approaches to electric motor reduction gearing. In foreground, Fritz Mueller's; in background Ferrill Papic's. Model is simple flying test bed, permitting quick comparison experiments to be made.

them are not smooth at all, but downright hairy. Maybe aerodynamicist Dr. Julian Wolkovitch was on the right track when he suggested felt-flocking the covering of a Peanut Scale model?

SPEAKING OF PEANUTS

Remo Galeazzi, constructor of the EAA award-winning full-size Marquart Charger biplane, wrote in to say how much he enjoys Model Builder and his return to the hobby via building Peanuts: "They certainly have come a long way—I feel like Rip Van Winkle!" Although Remo's earlier experience included various types of models, he finds the tiny ones particularly challenging: "I'm still trying to figure out how you fellows can build eight-gram Peanuts, as I just finished a Bristol Scout that weighs 19-1/2 grams. Oh, well, that figures out to 9-3/4 grams per wing—maybe next time I'll try a triplane!"

TIGERSHARK PEANUT

Diels Engineering has recently released a Curtiss P-40 kit of exceptional quality. The box contents include a large construction plan, comprehensive instructions, a proofof-scale three-view, photos of full-size P-40s, two colors of tissue, a formed plastic canopy, balsa sheet and strip wood, colorful decals (complete with Chinese markings and sharkmouth emblems), a plastic propeller, nose bearing, rubber motor, and

Continued on page 83



Genial Don Munn, president of the San Diego Scale Staffel, with his greatly enlarged Flying Aces Moth. Note logical markings!



Model Builder's "Hey Kid" columnist Bill Warner is accomplished in many facets of our hobby. Here he holds one of his many fine-flying Peanuts, a Waco cabin model.



Larry Williams designed and built this beautiful R/C Wedell-Williams racer, and Dan Lutz applied the magnificent finish.



A genuine "Wright Flyer" glider manufactured by Lorin Wright, brother of Wilbur and Orville. More details on this interesting model in text.





By PERRY PETERSON... Take a Peck-Polymers' Nesmith Cougar Peanut kit and widen the fuselage a bit, and you have a plane that'll conform to the Bostonian rules and fly great too.

• The Nesmith Cougar has established itself as a great flying rubber-scale model. The Peck-Polymer's peanut kit has made the design a very popular entrant at most contests and fun-fly sessions.

This plane is basically a Cougar with the fuselage widened a little to conform to the Bostonian rules. The fuselage of a Bostonian must be large enough to contain a theoretical box 3 x 2-1/2 x 1-1/2 inches in any orientation. Most Bostonians are designed so the 2-1/2-inch dimension is vertical. This plane uses the 2-1/2-inch dimension in a horizontal position, hence its name—Fat Cat.

With its wide fuselage, your Fat Cat may turn out heavy with more balsa, tissue, and dope than some Bostonians. Although it will be legal (weight rules say not less than 14 grams without motor for Bostonian West), it may not fly as long. Mine weighs 20 grams without motor and may not win any duration contests, but it sure looks great climbing in a rock-steady circling flight path. Barn door fuselage proportions will increase drag, but probably add to stability.

Now its time to build your Fat (and sassy) Cat. Most of the construction is familiar if you have built a rubber-powered plane with a box fuselage. The landing gear and propeller deserve special instructions for those who have not developed their own methods for these procedures. The wheel pants are made from three laminations of very light 3/16 balsa sheet. Use the pattern on the plan, and carve and sand the lamination to shape. Bend .025 music wire to the landing gear pattern on the plan. I used Sleek Streek-type plastic half wheels sanded on a block from the back until narrow enough to fit easily into the wheel pants.

Trap wheels in the pants by sliding the landing gear wire in from the back. Cut a slight notch in the back of each wheel pant to recess the short vertical portion of the landing gear wire. Glue in this short recessed wire with five-minute epoxy. Use epoxy sparingly—this can build weight up

Continued on page 76



Simple, lightweight construction and a cottage cheese container prop make for stunning flights for the Fat Cat. A wider fuselage on a Nesmith Cougar turns it into a Bostonian Fat Cat.



• Free flighters seem to have that little humorous edge that makes attending a free flight meet a little bit like watching reruns of the Three Stooges' cartoons. The incidents on the field just lend themselves to reporting in the newsletters. I'm not just talking about the storytelling or the tricks that we play on one another, I am also talking about the unplanned, the unexpected. After all, when you release that brand new ship on its first test flight, or when you take a "welltrimmed" ship out of the shop for the first time in a year or so, you really don't quite

once you let go of it, it's on its own to do what it pleases. It's one of the real thrills of flying. A secret to the humor in the free flight situation is that you should never get too emotionally involved with the model. Nor should you keep a tally of the time and money that you have invested in the little beast. These emotional or financial ties will cause you more grief than enjoyment. Just let things be as they are. Once you can allow yourself to get beyond these attachments, then you can reach a higher plane of pure enjoyment of free flight; you can laugh

at yourself. You can also laugh at others, but

you can never be quite sure if this laughter

know what to expect. And in free flight,

is appreciated.

Now, if winning big at the local meet is your prime motive for attending a free flight contest, then you have another and more serious problem with your sense of humor. Some meets have wonderful trophies and expensive prizes; however, where I fly, the trophies are usually creative but unassuming, if given at all, and the merchandise is, at best, modest. So, flying to win becomes more of a macho exercise than a chance to go home with a bunch of exquisite loot. Can you truly enjoy yourself if winning is so important? So, I suggest that you return back to enjoy those around you on the field and those crazy things that happen.

By BOB STALICK

in he

Now, free flight newsletter editors are not in such positions because they are the only clubmembers who own typewriters and actually know how to type. They are there because they are willing observers and reporters of the human scene. The scene in our case is free flight. This month, I would like to share with you some of the humorous anecdotes and quips that I have culled from the model press and that I have witnessed myself during the past year or two. I hope you enjoy this wintertime diversion from the usual column. If so, let me know; if not, let me know. But first, the usual features. MARCH MYSTERY MODEL

I truly love this model, even though I have never built one. It is one of the graceful and well-designed 1/2A ships that was popular during the late 1960s and through the 1970s. It was built in other sizes as well, including an FAI version that was successful. One of the N.W. free flighters recently showed up on the contest field with the 1/2A version and did quite well with it. It was and is a hot performer with a Cox. 049, and features slight undercamber on a 275square inch wing. The rear fin feature was a relatively new development for us USA types at the time, and this ship took advantage of its popularity. I think that this ship was actually responsible, in part, for the popularity of the rear fin. Now, you think you know what it is? Well, here is what you do—you send your best answer directly to Bill Northrop at *Model Builder* magazine. He will select the first correct answer and award a free subscription to my favorite magazine.

MARCH THREE-VIEW-TILKA WAKEFIELD

This is Bror Eimar's very successful Swedish Wakefield. It is not a new design, but this three-view by Allen Chapman is. The ship has been available as a kit for several years now and can be ordered from FAT Model Supply, P. O. Box 3957, Torrance, California 90510, for \$38.95 plus 10 percent for postage and handling. It is a real bargain at this price, as the kit includes the Montreal Prop Stop, printed parts, drilled prop blanks, and all the hard to get hardware.

What I like about this ship is that it is straightforward in design and construction. It also shows, on the plan, how to rig an autostab for those fliers who wish to have this added fillip of technology. If you are a newcomer to Wakefield and want to get into the competitors' circle with your first model, this one will do the trick for you. Take a look at the three-view, it can be scaled up pretty easily if you use a metric rule. Airfoils are provided full size for your convenience. If all of this seems like just too much work, drop a check to FAI Model Supply for the kit.

MARCH DARNED GOOD AIRFOIL-Hansen's AH 6-40-7

This airfoil reached me via an old copy of the Bat Sheet which copied it from the Brazilian newsletter, Voo Livre. The text was presented in Portuguese, so interpreting it has proven interesting. In brief, the section was developed by Arno Hansen for A-2 gliders and was the airfoil used on the Quarnstrom's Cirkeline F1A flown to first place at the 1979 Taft World Championships by Thomas Koster. That in itself should recommend it as a good choice for the next A-2 glider that you might be contemplating. The editor of Voo Livre's newsletter, Andre Gomide, also suggests that the section appears to have the right numbers



Bruce Kimball's 1/2A Flymax entry at the recent Fall Thrash. Bruce won First in the hotly contested event. Three-view of this model appeared in the July, 1984 issue of *Model Builder*.



Upwardly mobile Flymax on one of its many max flights.

for Wakefield.

As far as construction information for this airfoil, the Cirkeline used a sheet leading edge for the front 25 percent of the top camber out to the polyhedral break with false ribs at the tips. Spar structure included three webbed flat spars at the center. One is at the 25-percent location, another at about 45 percent, and the third is at 65 percent. The spars are thin and set in flat. The stab section is thin—approximately 5 percent.

So, there you have it. A nice competitive airfoil for your collection.

REED VALVE ENGINE TIPS by Steve Baker This information article was carried recently in the *Satellite*, the newsletter of the San Valeers Free Flight Club, edited by Ralph Prey. It looks useable for anyone who is using reed valve engines in Nostalgia or even for that Pee Wee 30 powerplant. Read on:

"As a result of the new 1/2A Nostalgia NFFS rule (no T.D.s or T.D. parts allowed), I decided to see what could be done to im-



Your FF editor with his Ay-Jay Nostalgia cabin model. Ship was 3-view in March, 1986 issue of *Model Builder*,



MARCH MYSTERY MODEL

prove the performance of Cox reed valve engines. After gathering information from various magazine articles, I reworked some of my old reed valve engines. The results are as follows:

Chicipie	STOCK BOM	DELMORYED	0.04
ENGINE	STOCK KPM	REWORKED	KPA
Black Widow	15,100	17,000	
Golden Bee No. 1	14,700	17,900	
Babe Bee	no data	17,500	
Golden Bee No. 2	no data	17,900	

"All of the tests were run with 40-percent nitro, Cox 6-3 grey prop cut to 5-1/2, low compression heads, Royal Tach and on the same day. All engines were run on tank suction. I have since modified one engine to run on pacifier pressure with good results, but I have not had a chance to put a tach on it yet to see if there was any gain in rpm.

"The rework is guite simple and cheap.



Closeup of Ay-Jay's cabin area, complete with worried-looking pilot. Note Cox BabeBee engine and real Spitfire pneumatic timer(not recommended). Photo: Stalick.

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%	0	1,25	2.5	5	7.5	10	15	20	25	30	40	50	60	70	80	90	95	100
EX	0.8	2.6	3.5	4.8	5.8	6.6	7.8	8.5	7	9.1	9.1	8.7	7.9	6.7	5.1	3.1	1	0.7
IN	0.8	0.1	0	0.1	0.25	0.5	1.05	1.65		2.6	3.2	3.4	3.4	3.0	2.3	1.3	ľ	0



MODEL BUILDER

58

All of the parts needed are found in a Cox reed valve overhaul kit for about \$1.75 per kit.

"1. Using any two-port cylinder engine, completely disassemble engine except crankshaft removal, and clean.

"2. Match drill the tank venturi and backplate to 3/32-inch diameter (.093). Make sure that you get all of the chips out using a pipe cleaner.

"3. Lightly polish the reed seat with jewelers rouge or Dupont white rubbing compound.

"4. With some 600 wet or dry paper on a good flat surface, apply some Three-in-One oil and lightly lap the back surface of the crankcase (tank/crankcase mating surface) until it is flat and smooth. This removes the burrs caused by tapping the four screw holes.

"5. Using the same method as in step 4, lap the sealing surface of the glowhead.

"6. Thoroughly clean all parts, oil and reassemble using a new mylar reed, reed retainer, tank gasket, and tank/backplate gasket ('O' ring).

"Of the four engines I have reworked, all have turned at last 17,000 rpm."

LARRY FRY'S FUEL CUTOFF

Here is a nice little gizmo for your gas model, as developed by Larry Fry and printed in the Phoenix Model Airplane Club newsletter recently. It solves one of the picky problems facing AMA gas fliers who wish to use a Tatone-type tick-off timer to shut their engines down without flooding them off. This is something just for you to make in your shop. Take a good look at the sketch provided in this column. If you have trouble figuring out what to do, here are some written directions:

Find a chuck of 3/16-inch thick aluminum, and cut it into a block approximately 1/4-inch by 1/4-inch. Drill two 1/16-inch holes as shown in the sketch. Bend a loop of 1/32-inch music wire and fill one end with silver solder as shown, slide into the aluminum block, fit the fine wire springs, and solder on the brass end plate.

The aluminum block can be mounted directly on the engine lug, and the shutoff is held in the open position by a braided wire line from the flood-off timer wire. Install the fuel tubing from the fuel tank then through the open fuel cutoff wire on the newly made unit ending at the needle valve nipple.

Now you can use that flood-off timer to pinch the engine fuel supply off quickly and surely, and you can still use the floodoff timer to mount other devices such as a VIT and/or Autorudder. I guess that is the feature that I like best about Larry Fry's shutoff switch. I plan to use it myself. CAMPBELL KITS UPDATE

I just received a couple of press releases from one of the more prolific free flight cottage industries—Campbell's Custom Kits, P. O. Box 5996, Lake Worth, Florida 33461-0181. Lee Campbell announces that Russ Hansen's T-Bird Nostalgia kit and the entire Bill Chennault Pearl kit series is now available from him. The kits all feature machinecut ribs and other parts. All feature the best quality balsa, plywood, and spruce parts. All 1/2A-sized kits also contain Japanese tis-



Pee Wee Spacer as presented by Meredith Musick from San Diego. Competitive ship in the new Pee Wee 30 event. Plans are available from Bob Stalick. Photo: G.M. Musick.



Russ Hansen's design, the T-Bird is now a kit produced by Campbell's Custom kits. The ship is Nostalgia legal. Details in column.

sue. The T-Bird and the Mini-Pearl sell for \$19.98 plus \$2.50 postage and handling. The A-B Midi-Pearl sells for \$49.98, and the BC Pearl Express sells for \$59.98.

Lee Campbell has maintained a high quality product with his other kit offerings, and I expect these new kits will help to expand a growing line of fine free flight offerings.

Bill Chennault's 1/2A FF, the Mini-Pearl, is also available as a kit from Campbell's. See text this month for more information.

NOW TO THE HUMOR

(From the pages of the New York Indoor Times, edited by Ed Whitten.)

"God does not deduct the time spent building and flying model aircraft from a man's life span," according to Doc Mathews.

Continued on page 93



Fuel cutoff by Larry Fry, designed to mount to engine lug or fuselage. Can be used for all gas classes.

RAMBLIN' AROUND AUSTRALIA

By STU RICHMOND. . . Our Ramblin' Wreck hooks up with John Pond for some fun at the Australian Nats as we fly in the Old Timer events. Stu gets a look at the Australian 'Scramble' event, and recites a poem, too.

• Model builders in Oz have a helluva lot of fun. They have a free flight event called Scramble that I've never seen before. It combines models that *don't* fly too well, engines that start easily, and the legs and heart of youth in *all* ages of entrants at their Nats. Sometimes they schedule the event at night when the breezes have calmed. They put Cyalume lightsticks on their models for night flying...cray-zee! At some Nats they've had as many as 75 entrants in Scramble, which is considered their most fun event.

This was a daytime Scramble. They use 2cc or smaller engines, and the best way to describe the event is to tell you what the CD said to the entrants: 'At 10:00 o'clock I'll blow the hooter, and you can start and launch. Your timekeeper will record all flights in excess of 15 seconds. 120 seconds will be a 'max.' Timekeeper will be totally yours for the one-hour duration of this event. Engines must be started at this common flight launching line...not on the way up to the line. There'll be a notice by the hooter that five minutes remain, another at one final minute. The hooter will blow again after 60 minutes to conclude the Scramble and timing will stop. You may have one helper, runner, or fetchamite who can collect (retrieve) your model, but he cannot start the engine for you nor launch the model." John Pond and I were awed spectators at this 40th Nats Scramble, except he'd seen the event before. Pondy sez to me, "ya oughta see a nighttime Scramble, Stu. All you see are lights flying around. You have to slouch way down near the start line when they launch 'cuz otherwise you might be in their way." When this Scramble started it was like an outdoor hospital. One model had a B-38 Italian Barbini diesel. There was a D.C. Merlin diesel running, a Dixielander had a screaming Cox .020, and Ivor F. flew a



lan White at left, builder and flier of the justlaunched Folly II. Model has a .40 glow engine and made four consecutive perfect flights of ten minutes duration, followed by a landing in a given circle for 20 bonus points. Ian won the Old Timer event at the Oz Nats with the only perfect four-flight score among the 14 entrants. MB's columnist John Pond can be seen next to lan checking his watch.

P.O.S. made from coat hanger wire and a bamboo fishing pole fuselage that was covered with oiled silk and used a Doonside Mills .75 diesel he'd made himself (he'd made 1,000 of them).

James McFall flew a Delta Doova with a Doonside Mills too. There was an Ebenezer from Bert Striegler origin. Master model builder Ian White proudly flew a hybrid of a Fokker D-VII and a slab-sided diesel pusher. There was an *Aeromodeler* Tomboy; even a flying carpet was entered by Paul Harwood using a small PAW diesel. Most used diesels, and the ether gave the sanitized aroma. When the final hooter blew, K. T. Murray won with almost eight minutes of official airtime.

I was entranced by Jim McFall's Delta

Doova and encouraged him to send plans to *MB*. He seemed a bit reluctant. However, he offered a poem to *MB* publication that he wrote at their 1984 Fun Nats. Jim's reference to either "k" or "kay-ems" is kilometers. One kilometer is about 6/10ths of a mile. The poem tells a neat story of fun and frolics.

- It was after lunch on Boxing Day of nineteen eighty-four
- When Ivor F. and James McFall on Mazda wheels once more
- set out to cross a continent in quest of model sport
- with navigator, young Shane Cross, who, F. said, "must be taught
- Of matters aeronautical and take within his ken
- The Way we fly, then crash, rebuild and, next round, fly again."
- At first the car seemed hesitant, but still it passed the test
- And carried them, through baking heat, four thousand kay-ems west.
- This is a law of the Nationals, which Westerners obey:
- You cannot have dead heats for first, especially four-way.
- Events, computer-guarded then, were spread o'er half the State
- To help the tourist industry (though fliers got home late).
- The Mazda crew watched team race being flown in sand-filled air
- Which penetrated eyes, ears, noses, engines, everywhere.
- So Shane learned aeronautic terms quite new to his young ear,
- And Ivor said, "Those aren't the words that I meant him to hear."
- When they flew control line seaplane, lvor drew the shortest straw,
- Flew first tried a maneuver he had never done before,



John Pond, left, poses with Stu and John's Long Cabin with an O.S. .48 Surpass. Model flew in Texaco and R/C Assist Old Timer.



Val Vickers' scaled CAVU at launch. She, like most in Oz, flies Mode I on her Tx. Waikerie Glider Aiport buildings in back. Val's husband, Steve, holds, Mike O'Reilly (left), times.



, Oz's premier model builder with license Number One, launches his P.O.S. Scramble entry. Model flew nearly to the rear tree line in the distance. Doonside Mills .75 diesel engine is one of a thousand lvor has made



Scramble! James McFall launches his Delta Doova in the Oz Scramble at the 40th Australian Nats. Ivor F. prepares in the background.

- And did a one-lap taxi with the engine on full song,
- On lines "U-Reely"-shortened to no more than ten feet long.
- But then the handle jammed and at that length they had to stay.
- He was whirling like a Dervish and thinking "I must pray," Fell prostrate facing MECA in a reverential
- pose,
- While his model power-landed and his floats did touch and goes.
- Then Turna flew, with Nolan next. McFall was last away,
- And then they flew the second found and packed up for the day.
- They'd had no rules or judges, so the placings were in doubt.
- Norm Kirton said; "we'll let the Nats computer work it out."
- Next day he told the four of them, "I'm glad it's you, not l
- The electronic marvel has declared a fourway tie!
- That violates its program, so your fate could not be worse.
- Be on your guard against the dreaded electronic curse."
- The Nats Committee, horrified, said "No, this cannot be.
- We cannot give four trophies when they cost ten bucks for three."
- And while they missed their chance to boast an aeromodeling first,
- The Mazda crew set out for home, not ready for the worst.



Bruce Ramsey and his Cabin Ruler powered by a Dunham Engineering Elfin diesel. Bruce finished third in R/C Assist at the Nats.

- The second day they tried the surf at Cactus Beach, Penong,
- And while they surfed, the electronic petrol pump went wrong.
- They jury-rigged a rough repair and got back on the way,
- And reached Ceduna where they camped to end that hectic day.
- Next day when they had started out the fuel pump failed once more.



Double-size CAVU with Enya .46 flown by Val Vickers, who looks at thermal her timer is pointing to. Val's husband is the able mechanic holding CAVU. Nice flying field, eh?



Close up view of James' Delta Doova.

- And Ivor had to hold a plastic bottle out the door
- To feed the carb by gravity and keep them on their way,
- With stops to fill the bottle up at every sixteen k.
- Then after trying in five towns, another pump they found
- Which had them on the road again and safely Sydney bound.
- Friends sympathized, but Ivor made this observation shrewd,
- "All inconvenience is just adventure mis-construed."
 - Neat huh?

I have a suspicion that the vintage or oldtimer movement is strongest in California, USA. Next strongest in the rest of the world and old-timers will eventually be discovered more in the remainder of America. This Nats flew both vintage and Texaco, and spectating was a drag for me. I got so enthusiastic I bought two Price Rite Engineering kits in Oz, a Red Zephyr and a Trenton Terror, and hand-carried them back to Florida. The kits are beautifully manufactured and prefabbing is first-class. My current modeling interest leans to this relaxed flying now, and I think the Oz Nats is what did it to me. In Texaco it was common to use gasoline and eight-percent Yamaha racing oil for the longer running Texaco engines. They simply kept a single Ni-Cd cell hooked up to the glow plug, and it worked

Control Line

By MIKE HAZEL

PHOTOS BY THE AUTHOR

• There is probably no mode of model aircraft power that is less understood by the modeling masses than the pulse jet engine. Jets have long been shrouded in mystery, myth, and misinformation. Now in modern times, as they are much less commonplace than in previous decades, and there are very few modelers that know much of anything about them. Most of the knowledge is confined within the ranks of control line jet speed enthusiasts. However, there are still modelers who find the jet engine appropriate for their sport and scale ships, if for nothing else, the sheer novelty of it.

For our discussion here, we will be dealing with the Dyna-Jet. While there have been many pulse jets manufactured both domestically and abroad, none have enjoyed the success and favor of this classic powerplant. And a classic it is, now just over four decades old and still available in basically its original configuration.

Now for a brief historical digression. You may have thought that the Dyna-let was inspired, or at least based upon the principle that governed the operation of the WWII German V-1. Actually, both are true. Sometime around the end of the war, William Tenney had an opportunity to briefly inspect a V-1. He felt that it could be duplicated in miniature, so he and fellow experimenter Charles Marks went right to work on the project. To make a long story short, many months and hundreds of cutand-try experiments later, they succeeded in making the engine that would go on to be marketed. This was in the spring of 1946, with the actual production and sales following later in the year.

Jet speed was first held at the Nationals in 1947, with a winning score of 110 mph. Performance increased rapidly in the following years (present national record is 212+ mph).

These increases have come as a result of various modifications to the engine, fuel formulations, and overall knowledge of

how to make them work. By the way, it is ironic that some of the misinformation regarding the Dyna-Jet is from the manufacturer's instruction manual itself. It has not been updated as far as I can tell since it was originally written and is hopelessly outdated. I am sure that when it was written there was a proprietary interest in making sure the average modeler would be successful in operating the engine. However, the instructions which spell out failure in using different fuels and modifying the engine just ain't so! Much of the dope regarding fuel tank and plumbing can also be treated as hot air out the tailpipe.

Before the actual operation of the engine is discussed, let's cover the physical makeup of this critter.

The largest component is the combustion tube, which consists of a 2-1/2-inch di-

ameter combustion chamber at the front and the long 1-1/4-inch diameter tailpipe. This tube is constructed from welding two halves of very thin stainless steel together, along with a threaded brass ring which is positioned in the front to accommodate the valve head. The only other part of the combustion tube is the spark plug and retaining nut.

The valve head is machined from a single piece of aluminum stock. The major diameter section is threaded so as to screw into the combustion tube. A large lock ring also goes on the head's threaded portion which serves both to keep the head from turning and to seal off the internal pressure inside the tube. The inside of the head (from the front) has a venturi section of 15/16-inch diameter. As you can see from the photos, there are ten port openings which face into the combustion chamber area. The so-called cooling fins are strictly ornamental, and the engine will run just fine without them. The head only becomes hot immediately after it stops running and the heat from the tube soaks forward. When the engine is running, the head stays cool with the fuel/air mixture entering.



Langlois-Pardue Super Burp, constructed of wood. Engine is offset slightly for centrifugal fuel feed.



Daddy's partners display a couple of classic speed designs. Brent on the left is holding a Thomas Ironsides Too, and Chris holds a Hoyt Sidewinder.



The Sidewinder here is resting in the takeoff dolly. The offset engine makes the dolly necessary for getting airborne.





Here are two complete Dyna-Jet engines. The bottom one has the spark plug located more towards the rear, indicating that it is of antique vintage.

Covering the ten port openings are the "petals" of the thin steel reed valve. This is the engine's only moving part. It is held in place by a curved round aluminum piece called the valve retainer. Besides holding the valve in place, the curvature controls how far the valve petals can move back away from the valve head face.

The amount of fuel entering the engine is controlled by the metering jet, which is the small piece in the exploded-view photograph. There is a fixed-size orifice in the metering jet, so to change the fuel/air mixture a different metering jet is installed.

The metering jet screws into the "flojector," which in turn screws into the front of the valve head. The flojector serves as the equivalent of a spray bar in a carburetor. The angled part of the flojector is designed to accommodate a connection from a tire pump. The incoming air blows over the fuel inlet holes in the flojector to draw fuel in.

That covers the physical description of the components. The assembled engine weighs 16 ounces and is of about 21 inches in length.

The pulse jet engine appears to be a very simple engine, however, the principles on which it operates are not. The entire unit is harmonically balanced, perhaps making it the very first *tuned pipe* used in model planes.

An oversimplification can be made with the following description: As fuel/air charge enters the combustion chamber, it burns and creates a positive pressure which closes the reed valve and pushes against the valve head face. While the exhaust wave goes out the back through the tailpipe, it creates a negative pressure which opens the reed valve and another fuel/air charge enters and the process is repeated. Again, this is an oversimplification. There are only a handful of people who have an accurate idea of exactly how a pulse jet engine works (I am not one of them!). To illustrate just a little of the complexity of the principle, ponder this: The negative-positive pressure



This box houses T-coil and battery which provide spark necessary for starting engine. A remote spark probe is also shown.

An 'exploded' view of the Dyna-Jet. As you can see, there are very few moving parts. The only moving part is the reed valve.

scenario is happening simultaneously with multiples of pressure waves all going against each other. On paper the formula includes such specifics as temperature, volume, length, speed of sound, and other factors regarding wave reflections. Another interesting point is the bell mouth at the end of the tailpipe. For efficient thrust? Nope, it is so incoming air can enter more smoothly. That's right, the jet engine *also* breathes through the exhaust! (I told you it was not really simple!) At any rate, the whole process occurs at the rate of about 220 cycles per second.

At this point, it would be appropriate to address one important thing. Jet engines are very noisy. They should only be operated where noise is not a concern. To do so otherwise could cost you a flying site.

Now let's get into the actual operation of the jet engine. As with most anything, the safety aspects should be covered first. There are some folks who believe that because the jet engine is noisy, it must be dangerous. Hey, go ask a deaf person if a two-pound, hundred-mph plane powered with a prop engine is less dangerous than a two-pound, hundred-mph jet plane. Get the picture?

The jet engine generates a tremendous amount of heat and cannot be touched while running or immediately after running. Don't worry, it cannot explode. Adding to that, there is no discernible vibration from the jet engine, and no propeller blades to cause concern. With that, the unsafe myths go out the tailpipe. As with any engine, proper strong mounting and routine checks of same are vital.



Here are two valve heads. The one on the left has been modified, and the other is a stock unit with valve retainer in place.



Here's a closeup of the reed valve shown above, which is made of thin steel. The one on the left has been badly damaged by a toolean fuel mixture.



Next let's take care of the fuel component discussion. In considering what to use for fuel, there are some important bits of criteria to think about; cost, economy (mileage), availability, power, ease of starting, combustion range, and safety. The Dyna-Jet instructions specify use of white (unleaded) gasoline only. This is bad dope right off. Gas meets about half of the criteria points. It is definitely down in power in comparison to some of the exotic highspeed blends, but gasoline is sufficient for most sport applications. Its main drawback is that because it runs on such a lean mixture, very small variations in fuel head, bumps and jerks on launching, or tank

problems will frequently cause the engine to cut out. But what the heck, modelers used it for years and a few still do.

A fuel ingredient that found favor with the speed fliers many years ago was benzene. However, it fails in the safety department, as it has been found to be a cancer-causing chemical and has been made hard to get.

Some years later the speed guys "discovered" nitromethane was good for power in a jet. However, it cannot be used straight, as it will not sustain combustion. The presentday standard is to use a 50/50 mix of the nitro and propylene oxide. The proportion can be varied slightly to achieve the best results. This type of fuel must be run very rich,



and, coupled with the cost of nitro, your fuel bill skyrocket. The nitro/prop mixture has a good broad combustion range and generally starts okay. Even if this type of fuel is metered a bit lean, engine cutouts are rare because of the sheer volume moving into the engine.

The Hoyt Sidewinder design has its own fuel formulation requirements due to its design principle of a centrigual-feeding tank. One of the formulas that has been used in competition is 40-percent nitromethane, 40-percent alcohol, and 20-percent propylene oxide.

A couple of years ago, some of the Texas jet fliers experimented a bit and found a fuel formula that met every point of criteria, other than being slightly down on power in comparison to the nitro blends. It is 80percent alcohol (methanol works well) and 20-percent methyl ethyl ketone (MEK). The MEK is available at many paint supply stores. Don't bother to try straight alcohol, as it is very unsatisfactory.

Remember to exercise caution when mixing fuel ingredients, avoid spillage, and do it only where there is plenty of fresh air. If one does not want to bother with all of this blending business, then go ahead and use a petroleum-base fuel. There is gasoline (low octane unleaded is best), Coleman appliance gas, and Chevron Blazo, among others that will work.

Now about the air source. As was mentioned, a heavy-duty tire pump is a fairly standard piece of equipment here. A compressed air bottle also works well, and eliminates one person from the starting crew. We can't cover the air source without discussing the air nozzle on the flojector.

Virtually all speed fliers remove the air nozzle part of the flojector since it creates "dirty" air in the intake. So rather than making a physical connection between the air source and the flojector, they fashion a small pipe on the end of the air hose, which they must carefully aim into the intake to "find" the fuel pickup. This sometimes involves getting down and looking into the intake to watch for a spray being pulled into the intake. Some of the fliers fashion a locater piece on the air pipe which helps position it in the intake at or near the best place. The air pipe can be made of 1/8- or 5/32-inch brass tubing.

For those who prefer to leave the air nozzle on the flojector, it is suggested that they do away with the screw-on portion of the tire pump hose. The hose end can then just be slipped on and quickly pulled off when the engine starts. An even easier to use slip hose can be fashioned by putting a length of brass tubing in the air nozzle and then appropriately fitting fuel tubing to the air source pipe. This method assures the slip hose will come off easy with no embarrassing jerks.

Last, but not least of the starting components, is the spark source. As mentioned, the source of the spark is a Ford T coil and a six-volt battery. Actually, don't get hung up on getting any special six-volt battery, as any twelve-volt unit will also work well and will not damage the coil. Refer to the photo of the starter box. It is recommended that you use a momentary type of switch, so that the

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power is automatically turned off when the switch is released. On my box there is a doorbell-type switch and a safety switch. Leads from the coil should be of sufficient size and well-insulated. I use a heavy-duty lampcord-type of wire, and some prefer to use automotive ignition wire.

The photo also shows a remote spark probe that can be used in lieu of the tailpipe spark plug. If you are using the spark plug, it is recommended that a piece of copper wire be attached to the top for the alligator clip attachment. This will minimize any possibility of damage to the plug when disconnecting in a hurry. The other lead can be attached anywhere else on the tailpipe or mounting strap. By the way, the reason for the remote probe is that many speed fliers prefer not to bother with connections. The probe is pushed out the back of the tailpipe when the engine starts, thus facilitating a quicker launch. Some also prefer to fill in the spark plug hole, as this eliminates a little bit of air turbulence.

You also need to know that the coil puts out a very high voltage, and you need to take care as to not becoming part of the circuit. The shock is not harmful, but very uncomfortable. Also make sure you are starting the engine on dry ground.

Now let's go over some of the modifications that are sometimes made to the Dyna-Jet. Let me emphasize that these descriptions are for the most part very general and serve to illustrate what development work has been done. If you make mods to your engine, only make them one at a time. If you can, communicate with an experienced jet modeler.

One of the most common modifications is that of the extended head. Jerry Thomas pioneered this development long ago. He produced some special heads which were stock units cut at the small diameter of the venturi and a machined extension welded on the front. (These are no longer available.)

The photo with two heads has a stock unit on the right and an extended head on the left. The extension is a piece of thickwall aluminum tubing with steel-filled epoxy on the inside and has had the venturi section recontoured. Also note that the head fins have been turned off, as they are dead weight.

It has been a source of debate among jet speed enthusiasts whether these heads really are "tuned," or more simply allow the incoming air to enter more smoothly.

To use the high power fuels that were already discussed, the flojector must be modified. The holes as they come are much too small for the volume of fuel that must pass, so they are drilled to a larger size. By the way, whether running stock or modified engine, it is important that the two holes are lined up vertically. This ensures a more even distribution of fuel into the ports.

Some modelers build their own flojector units and use remote metering jets. This is mainly an effort to clean up the air intake. but also makes for quicker adjustments.

Any serious jet flier will have a large selection of metering jets. Different fuels, different weather, and different planes will all require changes here. The sizes can range from a .038 hole for petroleum-type fuel, clear up to around .096 for high nitro fuel. The stock metering jets can be drilled to desired size on a lathe, or very carefully on a drill press. You can also make them from brass stock or a 10-32 brass machine screw.

Moving to the back of the valve head, the valve retainer is another item frequently modified. The curvature is increased to allow a longer opening time of the reed valve, allowing more of a fuel charge to enter the combustion tube. This curve is very critical, so do not attempt to change it without very specific guidance.

Air passageways in the valve head are sometimes cleaned up or enlarged, and this again can be a very critical area.

Small extensions in the length of the combustion have sometimes been successful in raising the power output.

One very useful thing to do on both stock and modified engines is to lap the front of the combustion tube and the rear of the lock ring. This helps ensure a good leakfree fit at that particular point.

Another useful "trick" which is helpful for both stock and modified engines alike is to camber the reed valve petals. This is done by centering the reed in a piece of 1-1/2-inch pipe and pushing it down a little ways. Then when you tighten down the reed valve in place on the head, there is extra tension of the reed petals against the

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port openings, ensuring a good seal. The reed valve has a small notation printed on one of the petals that indicates which side of the valve is to face the port. Make sure you note this before putting the camber in. Every jet engine will need some valve maintenance sooner or later (with the speed jobs they are usually sooner). When the valve petals start to look nicked on the ends or the engine becomes hard to start, it is time for a change. The bad valve depicted in the photo is way over the hill and oc-



curred during a very lean run. When the valve is damaged, it will, in turn, damage the face of the valve head. This can be corrected by carefully lapping the valve head on a piece of glass with oiled wet or dry fine grade sandpaper. This must be done very carefully, as the face must be perfectly flat.

Dyna-Jets are not available through normal hobby retail outlets. However, they can be had through mail order or by obtaining a used one. I have bought most of mine at collector's swap meets and watching for ads from individuals. Unless the engine has been somehow damaged, a used unit is as good as a new one. Get your local engine collector working for you.

Jets are a great deal of fun. There is also a great deal of information yet to be shared, but we only have so much room! Please feel free to write if you have a question that needs an answer, and I'll do my best.

Meanwhile, here's some places to write for information and equipment.

P & G Metal Shop, 301 North Yale Drive, Garland, Texas 75042 (Dyna-Jet engines and parts).

J.C. Whitney Co., P. O. Box 8410, Chicago, Illinois 60680 (Ford T coil).

North American Speed Society, P. O. Box 82294, Burnaby, B.C., Canada V5C 5P7 (listing of various magazine and newsletter jet articles available).

J-T Products, 9215-33rd Street East, Puyallup, Washington 98371 (custom valve retainers and special oversize reed valve).

See you next month! Mike Hazel, 1073

Windemere Drive NW, Salem, Oregon 97304.

Counter..... Continued from page 10

. . .

Impact Engineering has announced the release of the SS Series of Shock Strut landing gears, designed to meet the needs of the scale and sport fliers' for detailed, operational landing gear. Tests of these new shock struts on grass and hard surfaces have shown maximum absorption of shock while keeping the rebound effect to a minimum. Shock Struts feature a scale appearance; easy, universal installation on fixed and retractable gears; selectable scissor positioning; and a music wire axle. The Shock Strut housing is made of aircraftgrade aluminum bar stock, and is machined in one piece to form a strong, light structure. The strut pin is machined to provide the retention and torgue control, as well as providing a press-fit for the music wire axle. All aluminum parts have a natural satin finish. Two styles are available: The Nose or P-51-style incorporates a massive offset yoke to complete a tri-gear installation or a superb scale P-51 set of mains. The main gears feature a round, detailed hub such as that on the P-40-style gear. For more information, contact Impact Engineering, 2100 Stonehill Ct., Arlington, Texas 76012.

Fun Scale.... Continued from page 47

huh?). Something else I'd not seen was the awarding of "appreciation" trophies (tiny ones at \$3 club cost) to judges, transmitter impounder, scorers, hamburger servers, and to genial Roger Tilleman who manned the PA system from the elevated control tower, along with those others who made the contest a success. Nice.

The pictures and captions give you an idea of who flew what models.

One of the Fun Scale entrants was none other than the world-famous Dave Platt. I was lucky to be invited by Dave to visit his workshop after the trophies were awarded Sunday afternoon; we had a nice time. Although Dave is known as a scale modeler, I've now learned Dave is actually a model builder involved in U-control for simple recreation, rubber endurance (Mulvihill & Wakefield), free flight gas, etc. Dave's classic lesson to me was that a propeller on a real airplane has two functions. Dave says, "the prop pulls the airplane and it also cools the pilot. If you doubt that, just watch the pilot sweat when the prop stops!" Good, huh? I found Dave's shop very interesting. There were two supplies of balsa wood; there was regular balsa and there was a smaller, carefully stored supply elsewhere in the shop that was labeled "FF." Yes, light models sure fly better. Dave was actively working towards next year's Nats. His interest in free flight and rubber scale is vibrant and new. An Oliver Tiger Cub .09 diesel was on hand for the 90-percent complete free flight power scale model of a British light aircraft. A Rossi .60 was going into a magnificent WWII control line scale entry. Just wait until the competition sees how Dave's flaps, retracts, machine guns, and







such work. It looks like he's preparing to blow the competition out of the air!

Dave's invitation to visit really capped off a great model weekend in South Florida. Every time I get into a model building workshop I learn something new. In addition to having a fun weekend with modelers at the R/C flying field, I also had a chance to visit one of the premier model builders in the world. Dave was born and grew up in Britain. He designed and worked on the fleet of R/C model planes that were used for many scenes in "The Battle of Britain." Through an open doorway of a fast-driven Volkswagen van many feet of film were shot of three or more R/C models being flown



from a railed cage on top of the van. Filming was done at Duxford Royal Air Force base, north of London. Footage was so good that, as a modeler, I bet you can't tell the models from the real stuff when you see the movie again! Then Dave came to the USA for Top Flite Models as a kit designer. He's been in America for about 20 years and now runs his own R/C kit manufacturing business. Dave still reads the British model magazines, and the American mag he has in his shop is—you guessed it—Model Builder! •

Ramblin'..... Continued from page 61

great! This was strictly a fuel-allotment-byweight event with 10-minute maxes plus 20 points for an in-circle landing. It was won by Ian White with four consecutive perfect flights!

R/C Assist old-timers was one by Rex Brown flying a Goldberg Sailplane with an Enya .29. Engine runs were: Schnuerle, 20 seconds; loop scavenged, 25 seconds; fourstroke, 30 seconds; antique diesel, 35 seconds; and antique spark, 40 seconds. Some of the models were a Jerry Broffman Starduster, Long Cabins, a double size CAVU, and Bruce Ramsey flew a Cabin Ruler with a Dunham Elfin diesel by Alan Holmes. Bruce talked to me: "In my car is the latest issue of Model Builder. It's wellreceived here in Australia. The construction articles and editorials are really good. 'Jake' is an absolute madhouse! I like 'Jake' MB covers so many things, it's so interesting, and like I said to you the other night, we've really enjoyed 'Ramblin' through Europe.' It's nice to get a glimpse of modeling in faraway places." Ian White, the Texaco winner said, "You can use any engine you like. Our 225-square inch rule is the same as yours. We fly for a ten-minute max. The worst round is dropped of five; four are scored. You fly for ten minutes and then are allowed two minutes to get down. A circle landing gives an extra 20 points. 620 is a max score. We get three ccs of fuel per pound of model weight up to seven; it's bits and pieces out of your USA rules. Spark ignition gets two ccs/number. There's no fuel rule; you can use any fuel ya' like. If you're a nuclear scientist and can mix up some hydrogen fuel that's radio active an' can get 48 minutes outa your allotment, good luck to ya'. I'm running petrol with continuously 'on' glow plug heat and using eight-percent Yamaha mineral oil; if it's good enough for factory bikes, it's good enough for my engines! I get 4-1/2- to 5-minute runs." I'll enjoy building my two Australian-made old timer kits. Maybe there'll be more old timer and vintage interest in Florida eventually!

I'm an old control line speed flier (had three AMA records back in the forties), so I was interested in Noel Wake's sidewinder. Noel turned 153 mph with a glow Rossi Mk III on its pipe and a single-blade composite carbon/glass prop. Oz only has about 200 U-Control fliers, but the speed circles were plenty busy at this Nats. Paul Howard flew a profile team racer with a ST G-20 diesel using two-percent IPN (iso propyl nitrate) added as an oxidizer. He too flew a composite prop.

Gotta leave room for pictures, so next

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stagecoach and narrow gauge railroad.

So plan to attend, whether you compete or not. Static judging will be held on June

17th from 10:00 to 4:00 at Silverwood, and the flying competition is scheduled for June 18th and 19th at nearby Farragut State Park.

A special banquet will be held in

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honor of the competition Saturday, June 18th at Silverwood, and overnight camping is available at Farragut for self-contained vehicles.

Silverwood, Idaho and the Northwest Scale Internats. Without question, the premier scale event of the season. We'll see you there.

For more information or entry materials, contact Paul W. Parks, Contest Director, 4200 Woodland Drive, Sandpoint, Idaho 83864, or telephone (208) 263-2045.
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month we'll look closely at indoor flying and feature an in-depth interview with Les Bollenhagen of Bolly Props, which are Australian-made and sold around the world. The USA agent is Tom Dixon who

SOAR	Scale	• •	Cont	inued	from	page	37
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with his favorite Schweizer TG-3 and proceeded to show why he won the AMA Nats with the big bird. Steve Moskal entered his new 1/4-scale Schweizer 1-26B; demonstrating the fact that the Schweizer brothers designed good subjects for modelers. He demonstrated that even scale contests can be won on the ground with consistent flying and spot landings (seven for eight).

As the photos prove, Jack Hiner was every big bird owner's favorite human launching device. Unable to finish his own LK-10 in time, Jack flew Steve Moskal's Schweizer TG-2 for the fun of it. And Contest Director Tom Kallevang did the same with an enormous Graupner Discus owned by Larry Sperling. Club member Dave Haertel shot and edited a 15-minute video of the meet, something every club should consider, which has proved to be an extremely popular account of the proceedings.

The contest was supported by many manufacturers, and this first turnout has caused the club's leaders to plan another meet for '88.

Danger Bay... Continued from page 25

soon or in the wrong place. If the cameras aren't on it, it's all a waste.

The Danger Bay shoot was an example of planning ahead, watching all the details and getting it perfect on the first try. Part of getting it on the first take comes from Dean's passion for detail. The models were

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perfectly matched to the real subject. This meant hours of work fitting the models with pontoons and getting all the markings right. Preparing the two models for "Pilot Error" took about two months. If you hate fussy work, this is no career for you.

NO FUL

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UNTOFF CONTROL

Dean also pays attention to the way the engines operate. He runs them fairly lean to cut down on exhaust smoke; another essential part of maintaining the illusion.

"I lean out the needle valves and use less oil," says Dean, "but motors don't last long that way. I generally get about one hour from an engine, if I don't lose or destroy it in the crash anyway!" Dean not only has to know how to make his models fly like the real thing, he also has to be prepared to match the live action shots so that the editor

will be able to intercut the real and model shots at the right moment. This can mean watching the footage after it is shot, but it's better to take time to be on location when the live action is being filmed. For the Danger Bay episode, Dean was at the dock to watch how Vancouver Helicopter's Steve Wright flew the lead-in shots. Steve has been flying for the film industry for years, and he's so good that people living nearby must have had a fright watching the performance as the helicopter tilted towards the water.

"The shot gave me a bit of a problem," says Dean, "because the only way to match it for the camera position was to have the model coming at me nose first. That's not the easiest for accurate control." The chopper had to hit the water 15 feet out from the dock. That was where the cameras were focussed. When the crew had them loaded and ready, and the models were tested out, everyone took their positions. Then Dean became the center of attention. At least, he did until one of the crew noticed a very large yacht approaching. It was definitely not to scale, so the crew relaxed again and waited for it to pass. Then, with that intrusion out of the way, another problem came into view---a floating milk carton. Removing that ate up more time, but it had to be done. The film industry works, in part, because the human mind will accept plausible illusions; there's just nothing very plausible about a 30-foot milk carton!

Finally, the magic word, "Action!" The helicopter lifted off from the slippery surface, wavered slightly (was that someone being paged?) then moved up and out over the water. Everything was perfect-the right amount of light, the right flight path, even the waves were to scale. As the model was just at the right spot, Dean locked the blades, and the model plunged the last several feet into the water.

A moment of silence as the cameras recorded the bits of blade still floating on the surface, then "Cut!" Another successful crash for Dean Collins. Watch for "Pilot Error" on The Disney Channel in the USA or CBC TV in Canada and enjoy a brief glimpse of a perfectionist's work.

Euro Scene. . . Continued from page 32

ing lights and the electric retracts. Like I said, the realism of this ship is overwhelming. Personally, I think this is showed best by the flight shot of the Sea Fury with the gear retracted, but on the ground it is also present. When diving for a high-speed low pass over the runway, this airplane is as real as a model can be, and that's why it is a favorite in many model airshows all over the country. The spectators love it and keep asking for more.

Well, I hope you don't, because I'm running out of space. See you again!

England..... Continued from page 21

facturer, but I do support this product. The only comparison must be the Turbax. The Micro-Mold fan was developed from the P.E. Norman experiments. It possesses less static thrust than the Turbax but ample for take-off. It does, however, out perform the Turbax dynamically and produces a few hundred more rpm, which, regardless of engine power curve does mean you should move more air, which in simple terms is the motive power, all things being equal.

My forthcoming F-20 will be powered by the Turbax and Micro-Mold fan combination. I have two new K&B 7.5s and have recorded the following data: No. 1 engine, one hour's running, Enya No. 3 plug, no head shims, E.D. carburetor (size 10/15), 23,300 rpm. No. 2 engine, 1-1/2 hour's running, Taylor medium heat (standard) plug, O.S. 7D carburetor with Venturi insert removed 24,100 rpm. Both engines had the pump bypassed and ran on exhaust pressure only. Fuel formulation was 15-percent nitromethane, 20-percent castor oil, and 65-percent methanol. I enclose several photographs of the F-20 which, now complete, weighs nine pounds one ounce with retracts.

Back to Sedgemoor. There is nothing wrong with cliches and to say that a good time was had by all is the best description of the occasion. It was yet again a super fan-fly, once again dominated by the .45-size model. I would be pleased to hear from any .45-size fan builder. By the way, my latest model is Byrofan and 80-powered cheers.•

Simply Scale. . Continued from page 23

accept the hinge, instead of having to gouge it out like we usually do.

Once all the ribs and edges have been formed, and the tail sanded to an airfoil shape, I like to cut a lot holes in the core material between the ribs. This doesn't seem to affect the strength or rigidity of the assembly, and every little bit of weight saved in the tail area is to your benefit.

I'm not going to be specific and describe step-by-step how to build this type of tail, but you should get the general idea from the photo of my SM-81 tail assembly. I'm sure this method could be modified to be used with sheeted surface tail assemblies also.

To each his own in construction methods, but to this idea I say, try it, you might like it. **IDDY BITTY BEDE**

When I first saw the runway photo of Jeff Kelety's Bede BD8, I thought "I've seen this model before," since I have seen several quarter-scale models of the Bede at various competitions. However, it wasn't until I saw the last photo in the pack, the one of Jeff holding his little gem, that I realized this was a little model, not the larger ones I had seen previously!

Jim, of San Francisco, writes, "The outline is exact scale, and, on its first showing, it came in third at a local sport scale contest; 97.5 out of a possible 100 points in static judging. The really fun part is that the tiny bird beat out 25 other planes, most of which were 1/6 to 1/4 scale! Lots of jokes about test flying it in the living room, but I'll tell you, it drew lots of attention." Jim says it is a little flitty to fly. He's powered it both with a Cox TD .049 and a Astro Cobalt 035. The TD was the better performer in this model.

Thanks to Jim for sharing his little model with us. It just goes to show that exact scale doesn't have to mean big.

VOLUNTEER STATE SCALE MEET

Thanks to Stan Alexander, Newsletter Editor for *Replica*, the newsletter of the National Association of Scale Aeromodelers, for his photos taken at the 1987 Volunteer State Scale Meet held September 11, 12, and 13 at Dickson, Tennessee.

This Masters Qualifier is in its fifth year, and you can see by the photo of the models on that 4,000-foot runway that it has a lot to offer (Like to have a runway like that in my backyard!). Sponsored by Hobby Lobby, the hosts are the Middle Tennessee R/C Society. This is one event you might want to put on your agenda for next fall.

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engine and radio and ily! It can easily be ready for the flying field the same day it is purchased. Hirobo's Shuttle is a fully acrobatic helicopter. Don't be misled by its simplicity: the Shuttle has full collective pitch, bell hiller mix and... autorotation; so it is a competition class helicopter which suits both experts and beginners alike! The Hirobo Shuttle is <u>now</u> available at your local hobby store.



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To quote a saying I picked up recently taped to a laboratory bulletin board: "The fellow who is a good sport has to lose to prove it." Til next time... Keep It Scale and Simple!

Cliff Tacie, 49404 Michelle Ann Dr., Mt Clemens, Michigan 48045

Fat Cat. Continued from page 53

in a hurry.

Don't be tempted to omit the wheel pants or you will not retain the sassy character of your Fat Cat.

The propeller blades are cut from a plastic eight-ounce yogurt container. Turn the container upside down and draw a line from the bottom to the top. This line should be about 15 degrees offset to the left at the top. With this line as the prop blade center, use pattern on the plans to cut out a blade. Move over on the container and cut out the second blade at the same angle.

Carve out a spinner using a medium weight balsa block and cut a slot for the prop blades with a razor saw. See plan for proper angle. Press blades in the slots and you have an efficient homemade propeller. If the blades are a tight press fit, you can change blades. Experiment with blades cut out at different angles and different sizes. Just remember to keep the prop diameter at not more than six inches to be legal for Bostonian.

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Big Birds. Continued from page 13

the charge mode.

Here are a few important tidbits about Ni-Cds gleaned from the Digipace Manual. Read and heed because if your battery packs aren't up to snuff, your nice BIG Bird is gonna go boom.

"Several factors cause permanent loss (of capacity) and should be avoided during the battery's life, and the biggest killer is high temperature. A Ni-Cd being used in a hightemperature environment has increased self-discharge rate, reduced-charge acceptance, and has lower charge voltage. The most important effect of temperature is the reduction of the physical life of the battery: the separators and seals will decompose, eventually causing internal shorts and loss of electrolyte.

"Brief periodic excursions to high temperature will not cause problems, but repeated long exposures will decrease life expectancy. Very low temperatures cause similar problems. So avoid exposure to temperature extremes. Keep the plane and transmitter in the shade, and avoid leaving the radio in a hot (or cold) car trunk for all day. Charge and store the batteries in a cool place.

"Store your batteries with a full charge because Ni-Cds stored with a low state of charge have a much higher probability of getting a permanent internal short. This is due to the fact that the internal energy of a fully charged cell is enough to 'clear' or vaporize a short that is forming, but there

1757

isn't enough energy in either a low-charged cell or the charging circuit to do so, causing the short to be permanent. This is why sometimes apparently permanent internal shorts in cells can be 'cleared' with a momentary high burst of energy through the cell."

THOUGHT OF THE MONTH

If you build poorly, at least apply a perfect finish!

Al Alman, 16501-4th Avenue Court East, Spanaway, Washington 98387; (206)535-1549. It's the middle of winter, and for most of us that means building time. There's plenty of time to work on your new bird, so why not try a little harder to build better, putting more elbow grease into the sanding prior to finishing and being more exacting when checking balance, control surface throws, and thrust and incidence angles. It'll all payoff come that first flight. AND DO BE CAREFUL IN THE SHOP AND AT THE FIELD!

Comet..... Continued from page 31

Doublers are installed here and the movable surfaces can be cut apart after assembly. The twin skids or sub fins on the elevator should be 1/16-inch plywood, reinforced at their insertion with spruce, especially if you are going to ROG off grass or the like. Small metal inserts or wire should be embedded at ground contact points on the skids to protect them. I used a "Y-shaped rear end to the elevator pushrod with an exit on each side to control horns rather than try to connect the two elevators together via a dowel. PYLON

Parts for this are furnished and the plan is self-explanatory. Rather than 1/64-inch plywood, I preferred balsa to cover the pylon. Quarter-inch dowels were installed on the wing which fit into key slots on the wing platform, giving uniform alignment after assembly as per the original. Dowels were inserted front and back on the pylon for six # 64 rubber band hold-down. Fillets are helpful at the pylon-fuselage junction.

OPTIONS

1. The tail feathers can be made removable using a dowel for the hold down in front, and 1/4-20 nylon bolts at the aft end. The stab platform will hold things level, or you can add shims.

2. Maybe you'd like to hide your antenna in an old nyrod or the like. Just run the tube back through the bulkheads and thread antenna in. Might not be too good if you have used wire push rods-too close to the antenna.

3. The firewall with motor, tank, and landing gear attached can be made to pull out of the front of the airplane. Use two #8 hex head screws into blind nuts to hold the assembly in with a platform on the back of the firewall to support the tank. Removal only requires removing the screws and disconnecting throttle cable. This is an oldfashioned idea but practical.

COVERING

I used clear Monokote on the wing and stab, because it seemed a shame to cover all those pretty ribs. Goldberg Colortex was used over the sheeted sections of the HAYES WHIP ANTENNA

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fuselage and pylon, as well as the balsa cowl. The fuselage is red, and I couldn't resist a yellow ball and stripe as per the original.

FLYING

Without warps or other no-nos it will fly off the board with the Saito 45 four-cycle. Be sure the C.G. is way back-about 2/3 or so of the chord from the leading edge. (A pylon job with a lifting tail changes the C.G. location as compared to some other designs.) The model can be hand-launched or ROG, just like the original and will fly pretty fast or pretty slow. Just feel it out and suit yourself as to thermal hunting, buzzing around, free-flighting, or touch-and-goes. A 12-5 prop is about right for the Saito. Be sure you make your landing gear long enough to clear this. The airplane is inherently stable but very responsive. Dual rates might make for more smooth flying if you have it. You old timers will like this one. Maybe some are like me-a museum piece yourself. Good memories-good flying.

EOTW...... Continued from page 26

for the Clipper Jr.; it oughta be about right in the 54-inch Comet Taylorcraft; oughta go like smoke in a Goldberg Interceptor or Megow Ranger.

When Britain's Peter Miller sent me my original 1953 Mills point seven five he told me that on a scale of one to ten, with one being what he calls "lousy," the Mills was a "ten." He was right. Peter said: "The Mills point seven five was probably the finest be-





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ginner's engine ever made; always easy to start. It was docile, and yet it would fly comparatively large models. It would turn a large propeller, and, most of all, it had a very nice characteristic; in today's computer language it would be called 'user friendly.' Just find any British model builder from the 40s and 50s and mention Mills .75 and watch his eyes go moist with nostalgia. I rate it among the four all-time great engines-the Dooling .61, the Fox .35, and 2.5cc Oliver Tiger and the Mills point seven five!" I carried my history research still further back. One of the world's most famous hobby shops is Henry J. Nichols and Son in

London. It is now run and staffed by both the second and third generation of the Nichols family; a rarity. I asked Henry J. for his memories of this month's engine and he wrote:

"Your letter addressed to me at 308 Holloway Rd., London, has been forwarded, and I write in reply to your request for a few words about the Mills .75 diesel. The Mills engines, both the original 1.3cc and later the .75cc were two of the most successful ever made. They were designed by a charming Swiss engineer who worked for Mills Engineering who were originally builders of scale model locomotives. The workman-



ship was impeccable, and they were famous for one quality above all others-they started easily!

"At that time we had guite a number of engines made on the Continent, mostly in France with names like Ouragan, Maraget, Micron, and others. But they all had one drawback in common; they were not easy to start. So when the Mills came along with its quite different porting with those two small holes for the transfer that effectively vaporized the charge as it entered the combustion space, even the beginners to power flight found the engine would start with just one or two flicks of the propeller-it was an instant winner." The British Mills diesels were made from 1946 to 1964. Production stopped because the company was bought by a conglomerate who decided they could "better" use the production facilities for more profitable precision machining. The .75 was made from 1950 to 1964. The factory is at 2 Victoria Colonnade, Southhampton Row, London W.C. 1, England. Tooling was sold to Kumar in India where some production continued with varying quality. One thousand Doonside Mills .75 engines were made in Australia by Ivor F, who you've met through the "Ramblin' Around Australia" column in MB. Jiri Patrman in Czechoslovakia has made three precision copies (the legal limit in CZ), and one is in my collection.

But the best news of all for you engine lovers concerns that tiny casting I saw on Ron Irvine's desk in London in 1985, Mike Callaghan of Irvine wrote me on November

26, 1987, as follows:

"Please find enclosed one of the very finest examples of the Irvine-Mills .75cc replicas (serial number 0005). Reaction from the domestic market has been fantastic. Modelers of all ages ringing up just to say thanks for producing such a great little engine-easy to start, good power, and it looks great. After 20 years of serving modelers' needs I have never experienced such a reaction. Give the engine a run to clear out the preserving oil, then if the settings are anywhere near correct a couple of chokes and a couple of flips should produce a running engine. With luck and a tailwind (from Britain) supplies of these new Mills .75s should be in the USA about March 1988. I hope you get as much pleasure from the enclosed engine as we all have from making it." My Irvine-Mills .75 turns the 8-4 test prop at—you guessed it—better than 7600 rpm!

RATINGS

My old original .75 from the 1950s only rates a "5" for manufacturing excellence. They were made in smaller numbers than American engines of that time and lacked the elegance of casting and machining pretties. It rates an "8" for design and rates a perfect "10" for performance. The new Irvine-Mills .75 is beautiful. It corrects the design flaws of fuel tank bowl mounting and the problem prop driver. The shaft is bigger, and the case casting is thickened for more strength. It is a "10" 10" 10" engine for 30 total perfect points!

NEWS FLASHES

A six-inch diameter turbine with 46 pounds static thrust flew an R/C target drone at 226 mph during acceptance trials in December. Catapult-launched and skid-landed. Developed for U.S. Army. British Davies Charlton (DC) diesel engine in four to five sizes back in production. USA's Davis Diesel is exclusive importer. Watch for ads.

Hey Kid!..... Continued from page 45

alignment as many times as you need to until it's right.

Repairing tears in tissue can be done with a little line of cellulose cement (our trusty old Testor's "Green Tube" or Ambroid) along the tear line if it matches up pretty well. Not too much, as it will shrink a little. Frosted "Magic Mending" tape can be used in a pinch. The ideal would be to cut the injured section out all around the balsa "frame" and make a patch to cover the whole area. You can use the square you cut out as a pattern for the new tissue, cutting it a little bigger so there will be something to glue to, and just recover that part. If you only tissue-patch a part of the area between the ribs or between the L.E. and T.E., it will stand out like a sore thumb.

A final note on repair concerns added weight. If you added weight on the fuselage behind the wing with your repairs, you will probably need to add some weight to the nose with a little modeling clay to move the C.G. back where it belongs (unless you were nose-heavy to start with!). A heavier, repaired right wing may force you to add a little weight to the left wing (unless you **MORE POWER** WITH LESS NOISE

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want some right turn!). **DEALING WITH WARPS**

Thin wings and tail surfaces will warp or twist until they look like Pringles at the least excuse. The main causes are weak balsa structure and tissue which shrinks when it gets wet or damp and then dries out. Adding gussets at the corners of wing and tail structure as shown in the drawing helps. A "gusset" can be a little triangle of balsa glued in a corner, or it can be a 1/16-inch square bit of balsa with the ends sanded at little angles about the same length as the wide end of a triangular gusset. Angle braces or "truss" bracing can be added from corner-to-corner across the wing "bays" as shown. A strong wing-to-pylon joint will help, too, as when one side of the L.E. warps "up," the opposite side warps "down." The heavier the grade of balsa sticks used for L.E. and T.E., the less warping you will get. All these additions make the plane heavier and cut down on flight times, but then a badly warped wing makes flight impossible.

Using pre-shrunk and/or pre-shrunk and pre-doped tissue as mentioned earlier is a big help. Even so, the weather can do you dirty tricks. I live near the beach, and anything I cover is a tiny bit damp. Tonight, the wind is blowing from the desert, and I can tell how dry it is by looking at my Peck ROGs. .. "Pringle City!" I could avoid this by covering models out in the desert, or at least waiting for the driest, sunniest day I



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Most manufacturers profess incredible current capacities of their controllers. For instance Futaba says that its controller will pass 150 amps

continuous and 450 amps surge Now really consider the wires entering and exiting these devices and you will find the wire rating alone does not support that level of energy. In addition, while the main power devices may be bolled or riveted to a heat sink, the wire leads are still soldered to the main circuit board and will transfer the heat to the foil and other sensitive components. True, it makes for a smaller package but just how many small packages" do you want to buy this year?? Spending \$100.00 for a piece of toast should not be the idea of having fun

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If you already own a controller other than a ROBART HQ unit install it in your car, plane or boat and before you activate the full-on position. stall the drive wheels or propellor and see if the control lasts more than a few seconds. Many of you have already experienced the painful and expensive reality of this problem. The ROBART HQ electronic trottles will not destroy themselves no matter how long you stall the motor. If you think we are trying to fool you by using a fuse well guess again¹²¹

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can find! Some indoor model builders even make cardboard boxes with electric light bulbs in them to dry the air, and cover their models inside, making sure no damp air can get in by sticking their arms through holes cut in the box while they work!

On the flying field, most modelers try to take warps out by breathing moisture on the wing and then twisting it in the opposite direction. If that does not work, they may try to crack the L.E. or the T.E. and reglue it without the warp. Then if that does not work, they try to overpower the warp with a control tab made of card stock or balsa glued to the T.E. and bent opposite the warp to try and cancel it out. The next step might be to try slitting the tissue as shown and then, when the wing is flat again, covering the slits with tape. Really bad warps might require removal of the part from the plane and the soaking of a wing or stab (uncovered) in water overnight and then pinning it down flat for a few days (or cooking in the oven while pinned to a flat surface at low heat for an hour). Then re-cover it with preshrunk tissue. The worst thing that can happen is to have to make a new wing, which only takes about ten minutes.

WARREN SHIPP VS. THE PECK ROG

Warren Shipp used to be a guard in the New York Subway. As this was a pretty boring job, arresting muggers, critiquing spray can art, and the like, he used to dream of retiring and building model airplanes. When he did retire, he turned to crazy stuff like autogiros. Probably the result of too



much carbon monoxide down in the tubes or something. When he saw the Peck ROG, something in his mind snapped, and he began a campaign to drive Bob Peck nuts, too. Each time Bob would see him, he would have a new modified version of Peck's wee wonder. One time it would be a canard (tailfirster), the next time would be a biplane, etc. You may want to try some fun things with it yourself, but I warn you, Warren has probably beat you to it!

Just a reminder, in case your local hobby dealer doesn't have the stuff you need to make the models in this series, you can get a price list to order them by mail from: Peck-Polymers/Beginners, Box 2498, La Mesa, California 92044. Include a self-addressed, stamped envelope. For \$2 you can get their full catalog of goodies, but the Hey Kid list is free.

Next month we begin the next step up the model-building ladder with the Sky Bunny, a special ROG (rise-off-ground) model designed just for this series. Plan to join us! Happy landings!

Futaba Review. Continued from page 39

And there is a Throttle Hold Switch and trimmer for those practice auto-rotation landings. An Idle Up Switch with its associated trimmer permits a constant rotor speed when the pitch needs to be reduced during rolls and other maneuvers. High and Low Pitch Curve trimmers permit adjustments of the pitch at either extreme of their



best positions. The all important throttle operation is further improved with Throttle ATL (Adjustable Throttle Limiter), which permits in-flight low end changes to be made without affecting the top end.

One never tires of seeing R/C helicopters fly inverted! And as soon as your skills permit it, you'll be ready to try it. The T6NHP comes with an Inverted Flight Switch, which reverses the pitch, elevator, and rudder controls for normal flight reactions while your machine is on its back. A second generation fail-safe system is included, which is activated at the touch of one pushbutton, and does not require resetting for each flight. There is also a Power Warning LED, which flashes when the battery reaches a critical level. And if you prefer gyro stabilization in your helicopters, a toggle switch is available for in-flight rate gyro output adjustments with one of the Futaba gyros.

The T6NHP, available only in a two-stick version, is the same size and general configuration of the well-known Conquest transmitters, with the exception of a flip-open door at the bottom which exposes all the set-and-forget adjustments. It is powered by the common eight-cell 500 mAh battery. The current consumption is stated to be 230 mA, which should give a safe operating time of two hours.

The companion R116GP receiver is a beautiful example of modern miniature electronic and mechanical design. Considering what is contained in it, including a microprocessor IC and narrow-band ceramic filters, it is amazingly compact, being only 2.23 x 1.65 x 0.94 inches in size and a mere 1.85 ounces in weight. It incorporates Fail Safe and Battery Fail Safe features and a Servo Hold function which keeps the servos from operating during any period of nosignal for any reason. An externally visible LED provides a visual indication of any normal or abnormal conditions of the received signal. The R116 is powered by the normal four-cell Ni-Cd pack, which it shares with the servos, and its current drain is claimed to be 24 mA. The servo and power plugs are of the female-type known as Futaba type "I." Four S-148 low-profile servos are included with the FP-6NHP system. This recently introduced servo incorporates all of the latest developments in servo design and is slated to replace the 28/38 servos in systems now so equipped. It measures .77 inches wide

by 1.59 inches long by 1.4 inches high and weighs 1.5 ounces. However, it is not equally small or light in power, being rated at 42 ounce/inches of torque with an operating speed of 0.22 second for 60 degrees of travel.

The insides are also impressive and comforting; one finds indirect pot drive, circuit boards with plated-through holes, SMT (Surface Mount Technology) components, and direct (no wire) connections to both the feedback pot and to the motor.

Timing of the S-148 is at 1.52 milliseconds for neutral; the Futaba norm for all presently produced equipment and that equipped with its "J" servo plugs. The current drain, at rest, is less than 8 mA. I have done a lot of flying with this Futaba servo and have found it adequate for all but the smallest and the largest flying machines. More important, one has never let me down!

The rest of the system is more or less normal; switch harness, dual charger, servo arms and spares, neck strap, and frequency flag. And, oh, yes, an instruction manual that will definitely help you to understand the FP-6NHP PCM Helicopter Radio—and R/C helicopters—but will not make you an expert on either one. No, sir, R/C helicopters are not for the faint-hearted!

There remains but one last thing to tell you! Frankly, I have had doubts all along about the value of this, and other more highly touted "Fail-Safe" systems. My opinion has been that all they do is change the location of your crash, but, at least in one case, my thinking has proven to be incorrect. I have a young friend in Costa Rica, Juan Ochoa by name, who still owns a helicopter through the courtesy of the Fail-Safe in his Futaba 8SGH/P. Juan was flying when the Battery Fail Safe in his transmitter went into action. He immediately landed, which was good; but he did not kill the engine, which was bad. As he tried to analyze exactly what was happening, his transmitter died completely. His receiver, doing what it was programmed to do, took control, at which point the helicopter took off, hovered for a while, and then flew off in the direction of Tarzan-Land, some very dense jungle growth close to the local flying field. Obviously, Juan and all his friends also took off after it, but it outdistanced them, and it was not until the second day that it was located, atop a tree, completely safe and unscratched. All of which goes to prove that under the right conditions, with obviously a little luck thrown in, Fail-Safe can save the day

The Futaba FP-6NHP/PCM is in the \$300plus class, but think about it, would you really ever feel at ease flying a helicopter with one of those \$80 radios available? •

Denver Meet. . . Continued from page 41

well, indeed. Cars lined the entire quartermile of pit area between the two flight areas. SAM free flight events were flown both at designated times in the SAM area, and in the MMM free flight area, so free flight modelers who wished to compete in both MMM and SAM events didn't have to move tents, stooges, etc.



Out-of-state fliers came from Kansas, Nebraska, and Wyoming to attend the twoday meet (out here, folks, that's a *trip*, since both towns and states are rather widely spaced). Next year, it is expected that the "Twin Contests" will see even more entries from Wyoming, Utah, and surrounding states.

Since the site is located on an area of rolling prairie, many visiting fliers elected to camp at the site. Though sanitary arrangements are limited (read: nonexistent), campers at the site get a terrific view, as the skyline of Denver is just visible to the west and, on a clear evening, Pike's Peak is silhouetted by the setting sun. The resident population of cattle, antelope, and coyote give the camper a taste of the "Old West" as well.

Thankfully, the weather cooperated. Temperatures were in the eighties during the two-day meet, and even the traditional Denver "Thunderbumpers" held off until daily flying activities had ended.

There were even a few surprises. Cody Pangell, the five-year-old and three-feet-orso tall son of MMM member Rick Pangell, was given a shot at launching Dad's A-1. Cody gave it his best, but legs two-feet long aren't quite enough when you're being chased by an angry A-1. The glider had

CESSNA 180 - 108" Wingspan CURTISS P40D - 102" Wingspan BERLINGER/JOYCE P-16 - (102.5") PAZMANY PL-4 - 105" Wingspan F/W FW44J Stlegiltz' - 89.5" Wingspan DOUGLAS A1H 'Skyralder' - (120") SHOESTRING - 95" Wingspan F6F HELLCAT - 98" Wingspan BERLINGER/JOYCE OJ-2 - 102" Span EASTBOURNE MONOPLANE - 112"

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gained only about twenty feet of altitude when it came off the line. It circled, bumped, and steadily rose into the sky. Rick and Cody promptly gave chase on their Honda, saw the glider DT when it was very high, and sat back and watched as it continued out of sight. The Pangell family was well-represented at the meet, as Cody's eight-year-old brother Josh flew HLGs during the meet, and shows indications of having inherited his dad's talent in the event.

During both official flight days, the thermal activity was tough to follow. Bill Gibbons was able to post a string of successive

maxes in Mulvihill, working up to sixminute flights; Gary Baughman managed to max-out in Hand-Launch-Glider and Nordic; and Rick Pangell maxed out in P-30, but most other fliers were amply challenged by the tricky air, and the winners of the other eleven events flown by the MMM club had to settle for less-thanperfect scores. The winners of the Magnificent Mountain Men's Rocky Mountain Free Flight Championships were:

High Point Winners:

- 1. Bill Gibbons
- 2. Dean Carpenter



3. Hank Sperzel

F1A.

- 1. Gary Baughman (Max-out)
- 2. Pete McQuaid 3. Bill Gibbons

F1R-

- 1. Bill Lovins
- 2. Glen Menu 3. Bill Gibbons

F1C:

1. Dean Carpenter (sole entry)

1/2 A Gas:

- 1. Hank Sperzel
- 2. Dean Carpenter
- 3. Bill Etherington

A Gas:

- 1. Rick Pangell
- 2. Dean Carpenter 3. Gary Baughman

B-C-D Gas:

- 1. Dean Carpenter
- 2. Dave Wineland
- 3. Norm Roglitz

P-30:

- 1. Rick Pangell (Max-out)
- 2. Jeff Johnson
- 3. Bill Lovins

Gollywok-Jaberwok-Dynamoe

- 1. John Berryman
- 2. Bill Gibbons 3. Darold Jones

Coupe d'Hiver

1. Cliff Reed (sole entry)

Mulvihill:

- 1. Bill Gibbons (Max-out)
- 2. Glen Menu
- 3. Roger Maves

Hand-Launch Glider:

1. Gary Baughman (Max-out)

- 2. Darold Jones
- 3. Greg Drake

Ir.—Combined:

(A "Run Wot Ya Brung" event for younger fliers.)

- 1. Cody Pangell
- 2. Josh Pangell

Rubber Scale:

- 1. Larrie Schaeffer
- 2. Larry Kruse
- 3. Perry Peterson

Peanut Scale:

- 1. Larry Kruse
- 2. Larrie Schaeffer
- 3. Cliff Reed

At the SAM flight area, a graceful collection of antiques motored around the sky. Mike Fields flew a gorgeous silk-covered Comet Clipper in yellow and blue. Tom Ray brought an Ehling Record Breaker to the meet that flew well. Les Payne flew his veteran Cabin Playboy in several events, and backed the ship up with a conventional Playboy in the pylon events. Dave Ramsey flew a stately Harry C. Gould Sailplane in the Nostalgia events, and Jim Lang brought a nice Lanzo RC-1 to the meet. In addition, there were the usual gaggle of Sparkys, Gollywoks, and assorted vintage handlaunch and towline gliders present at the SAM end of the field. The winners of the SAM events were:

Old Time Pylon:

1. Les Payne

- 2. Dave Ramsey
- 3. Art Hillis

Free Flight Rubber/Towline:

- 1. Bill Etherington
- 2. John Berryman
- 3. Ed Smull

Old Time Cabin (A⁴ B⁴ C):

- 1. Art Hillis
- 2. Dave Ramsey
- 3. Les Payne

Free Flight Scale:

1. Larry Schaeffer (sole entry)

R/C Antique:

1. Jim Lang 2. Chris Hillis 3. Mike Fields

1/2 A Texaco:

- 1. Jim Lang 2. Mike Fields
- 3. Ed Smull

Old Time Gas (A, B, C Combined)

1. Mike Fields 2. Jim Lang 3. Ed Smull

Free Flight Nostalgia:

- 1. Dave Ramsey
- 2. Art Hillis
- 3. Larrie Schaeffer

Hand-Launch Glider:

- 1. Dave Ramsey
- 2. Mike Fields 3. Bud Warren

J. DUU vvaliteli

.020 Replica

Rick Pangell
 Dave Wineland
 Larrie Schaeffer

Pee-Wee 30

- 1. Bill Etherington
- 2. Dave Ramsey

MARCH 1988

Purely by accident, it happened that the MMM club brought the beer, and down at the SAM end of the field, "SAM burgers" and "Sam furters" were being prepared. Consequently, there was a lot of fraternization between the two clubs' members as each day's activities drew to a close. Good flights were remembered, and poor ones "analyzed" over beer and burgers.

The Twin Contests idea proved itself in practice. Thanks to prior planning and contestant awareness, there were no problems with R/C and free flight ships sharing a relatively confined area. Between the two



clubs, total entries in their contests amounted to over 125, far better than would have been the case if the two contests had been held separately.

At this point, because of the success of this event, it appears likely that the Twin Contest concept will become a tradition. As more fliers become aware of this excellent opportunity to fly in two major contests on the same weekend, it is expected that out-of-state participation will increase. And, with the successful completion of this "proof of concept" demonstration, perhaps other clubs with compatible contest formats will be able to follow suit, allowing increased participation in their events, and more efficient site utilization.

Hannan..... Continued from page 51

music wire. Priced at \$8.95 plus \$1.50 shipping, the kit and a list of other offerings is available from: Diels Engineering, Inc., P. O. Box 101, Woodville, Ohio 43469. Please tell 'em *Model Builder* sent you.

LARGEST FREE FLIGHT?

Turning deftly to the opposite end of the size spectrum, reports sent in by Ed Toner, Chris Britz, and Bill Dahlgren described the flight of a runaway Aeronca Champion, which took off from a private airstrip without its pilot and landed in a tree some 65 miles away!

Bill Dahlgren's reaction: "... I'm ac-



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The FFC is a fast/slow rate charger that will safely and rapidly charge both receiver and transmitter batteries from any 12 volt DC source, then automatically cuts back to an overnight charge rate.

Charges 500 ma receiver packs to 85% capacity in less than an hour.





FLYING PENGUINS, ANYONE?

"Penguins" were a species of aircraft designed not to fly. Typically featuring abbreviated wings and low-power engines, they were intended to teach student pilots how to taxi and gain a general feel of flight controls while rolling along safely groundbound. Craft of this genre appeared before World War I and persisted until the early 1940s, sometimes in children-sized versions. These machines often had pleasing proportions (long noses, large tail areas relative to the wing areas) suggesting them as attractive flying scale model subjects. However, the AMA Unified Scale Judging Regulations specifically exclude them, perhaps unfairly.

Although Penguins were never intended to fly, some of them *did*, even if only for short distances, according to recently retired airline pilot, Ed Toner. While still a youngster living in Franklin Square, New York, around 1939-40, Ed recalls about five Penguins, with lucky kids taxiing them in formation, or individually: "I wasn't one of the lucky ones, however.

"Needless to say, it was the ambition of every red-blooded American boy to get one of them airborne, and a few did. One was exceptionally well-built by a father who was an aero engineer at Grumman and a real craftsman. The lucky kid was Paul Olsen. He was a very small frail kid, but very intelligent. Paul's Penguin had an engine that was considerably more powerful than any of the others. Thinking back about it, it had to have been a small motorcycle engine of around 10 horsepower. Paul's Penguin was also lighter than the others.

"There was this place on Long Island called the Wright (!) Estate, owned by some very generous people. They opened the grounds to us kids during the winter when there was snow on the ground. They had a great sledding slope on the property, unusual since hills were scarce in the area. We all used it, and it was customary to build a snow ramp about halfway down the longest slope, so we could 'jump' the sleds.

"Paul spotted this and decided it was time to get his Penguin airborne. He already had





some successes (of about 50 feet or so) from ramps constructed on level ground. With the extra speed he would get going down a steep slope to a real good snow ramp, he figured it would work better. (We all considered ourselves expert pilots, of course, having read every flying lesson from Flying Jack.)

"Paul started his Penguin down the hill, heading right for the ramp, throttle wide open and attaining very good speed. He went over the ramp and was airborne in level flight, screaming louder than the engine. There was a line of trees ahead of him, and I guess he figured he couldn't land short of them, so he made a hard turn to the right, closed the throttle, and landed safely. Naturally, he was a real hero that day. Unfortunately, nobody else got to duplicate the feat because a horrified butler came out and ordered no Penguins ever again on the Wright Estate!"

ANOTHER WRIGHT FLYER

One of our photos shows a vintage 1926 model glider, dubbed a Wright Flyer. It came by that name honestly too. Most history-minded model builders are familiar with the fact that Wilbur and Orville Wright built rubber-powered helicopter models which they called "bats." These were based upon designs by Frenchman Alphonse Penaud, according to Orville's published descriptions, and helped inspire interest in other forms of flying machines. Orville remained interested in toys and patented a flying clown during 1925, from which he apparently made a profit, according to a mention in Fred Howard's book Wilbur and Orville. When the manufacturers of the novelty item underestimated the demand, one of the other Wright brothers, Lorin, bought into the company and eventually became its president. Although seldom identified with aircraft, Lorin had served the Wright cause in a most unusual way many years earlier, when he served as a spy in the Glenn Curtiss camp during the infamous trials of the reconstructed Langley Aerodrome.

Thus Lorin retained an interest in aviation, and it is perhaps not so surprising that his company should produce a line of model gliders. Through the generosity of Bob Mikesh, whose grandfather employed the gliders for advertising, we have an example here in the hangar. The design is rather unusual, featuring a profile hardwood fuselage, a dihedral-less 14-inch span balsa wing secured with a rubber band, and an adjustable incidence balsa tail assembly. While the fuselage has details of a pilot and passengers printed on its sides, the wing surface displays advertising for "Berwin Briquets, The Ideal Fuel For The Home," from the Central Park Fuel Company, of Cedar Rapids, Iowa.

Our July 1985 Hangar column included a photo of Orville Wright adjusting one of these catapult-launched gliders for a group of undoubtedly fascinated youngsters. We find the model equally enticing...think we should try to fly it?

THE BEGINNINGS OF BALSA?

Reader Norm Jacky noticed an article about the late Ralph Barnaby, lifelong model and full-size glider enthusiast, which appeared in the June 1934 Model Aircraft Engineer. (Recently reprinted by Gleason Enterprises, 1106-10th Drive S.E., Austin, Minnesota 55912.) Within the Barnaby story, written by Jacey Vincent, are some comments: "Up to 1911, balsa wood was unknown in the model building world. While working near the docks in Long Island City, your editor discovered a man chopping wood in a boat factory. The chunks from his axe were so large that I figured to myself: That man is very powerful, the axe very sharp, or the wood is very soft and light.' Investigating, I found my last assumption was the correct one, and went so far as to ask for a sample of the strange new wood. To my surprise, I was presented with a log about the size of a railroad tie,

which I shouldered, and carried it (under the admiring eyes of the onlookers who thought I was probably advertising a vaudeville strong-man act) to the N.Y. Aero Club. This log was the first balsa we used in model construction." Also mentioned in the same article: "Dope was not discovered for model use until 1912, when Frank Shober found it in a coffin factory and adapted it for models."

AND FROM ANOTHER 1934 MAGAZINE

Sportsman Aviation, for January 1934, featured an item about flying models by the late Joe Nieto, well-remembered for his detailed aircraft drawings, from which we quote: 'Generally, a flying scale model should show the same characteristics that the real, life-size airplane has or did have. If the real airplane which you have made a flying scale model of, has a tendency to ground loop, the same trend may also be noted in your model. This is one of the many things that makes flying scale model constructing as interesting as I have found it to be. If it is a flying scale model, it should fly scale."

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The Four Corners Free Flighters Club is so named because of their location near the border intersections of New Mexico, Colorado, Utah, and Arizona.

Member Bob Whitney conceived the idea of flying models over the four different states in one revolution, calling it "The Most Sensational Event in History for Free Flight Modelers." Any type of model was

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eligible, and on the appointed September day, eight eager contestants gathered at the four-state juncture. Since Whitney had proposed the concept, he was permitted the first attempt, and chose to fly a Bostonian Banana for the try. Launched just inside the Colorado border, the Banana travelled up and over the corners of Utah, Arizona, and New Mexico, establishing a new historical record!

Next up was the Cessna 140 of Earl Eckerson, who chose to launch in Arizona, and succeeded in aerial navigation over New Mexico, Colorado, and Utah, thereby establishing a new record for flying scale models.

Junior Jacob Saiz took a different approach, directing his Sig Cub from Arizona, over Utah, through Colorado air space, finally landing in New Mexico. His sister, Claudia Saiz, not to be outdone, commenced the flight of her Sig Cub in Colorado, and the model circled over Utah, Arizona, and New Mexico.

Ann Eckerson set yet another interstate record, employing a *Peanut* Nesmith Cougar to journey nonstop over the four boundaries. Maria Saiz, flying an enlarged Hannan AM/FM, circumnavigated the four-state juncture for the final qualifying flight of the meet, since Hoby Clay and Karen Whiney had to withdraw because of damaged aircraft.

Summing up the experience, club newsletter editor Ann Eckerson reported: "We fought tourists, souvenir vendor stands, and gusty winds—but six out of eight participants successfully flew their models in the four states. R/Cers can do it! U-





Bob is a former World Champion, an eight-time National Champion and a six-time member of the U.S. International Team.

If you're the kind of builder who won't settle for anything less than Jet[™] Professional Grade CAs, we thought you'd like to meet a couple of fellow modelers who feel the same way.





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YEAR'S END AGAIN

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ber of 1987. As time accelerates by, it is time to reflect on the passing year and to wonder what the future may bring to our hobby and lives.

Although the past is beyond our control, perhaps we can learn from it and take steps



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to improve our present, and thus our future memories? Suggestion: Why not start out by showing more appreciation for your fellow model builders? How much more enjoyable is our hobby when shared with others, whether they live next door or on the other side of the world. As Air International model editor Fred T. Henderson has written: "Aircraft modeling transcends international barriers." And how about offering more consideration to our family members who support (or at least tolerate!) our "toy aeroplane" obsessions?

My personal thanks to the readers of this column and to its many contributors, who do most of the work. And finally, to Bill Northrop and the entire Model Builder magazine crew, who have made this hangar space available to us. Let us hope we can extend our lease for another year!

Electronics.... Continued from page 11

based on my personal likes and dislikes, a very good reason at that. The silicone rubber that most of us have in the shop, excellent for molding wing saddles and the like, the type that comes from the hardware store, is corrosive to a lot of electronic components, especially to the copper, which is the base for all printed circuit boards and lots of wire and connectors. You can identify it by the strong smell of vinegar when you open the tube.

There is silicone rubber compound made especially for use in and on electronics, and you will sometimes see it inside some of our equipment, as for example to provide a cushion of sorts for a crystal. This, however, is not the plumbing department-type of silicone, nor is it available there. If you've got to use a silicone around your R/C equipment, there are a couple that I know of that are safe: Dow Corning RTV 3140, and General Electric RTV-102 (white), -103 (black), and -108 (clear). They are available from most major electronic parts suppliers. Betcha don't know what RTV means?

ACE R/C DC-POWERED VARIABLE **CHARGERS**

I spend a lot of time at trade shows, studying catalogs and brochures, and ves, even reading the ads so that I can stay abreast of things electronic in the hobby, which means that I can then keep you up-to-date. I think you will agree that my methods work—I'm about to tell you about a product before the manufacturer knows that it has it

Actually, it is an improvement to a couple of existing products, the Ace R/C DMVC (Dual Metered Vari Charger) and the HD-500. Both are AC-powered, constant current, variable chargers. The DMVC has two independently variable outputs, each capable of charging as many as ten cells at up to 250 milliamps. The HD-500 has a single output, but will charge as many as twelve cells at up to 500 mils. Both are excellent units which I have used since their introduction and find guite useful for any and all charging chores.

The mod to be described came about as a result of a flying field conversation with a friend, another Ace R/C equipment fan,

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who asked me for a simple solution to fieldcharge glow plug and fuel pump Ni-Cds. Like many of us, he is not quite as religious about the caring of these non-fatality causing batteries as he is about those in his flight equipment, and now and then finds that they are just too tired to do their job properly.

As we talked, I remembered that he owns an HD-500 and had the idea of seeing if it could be externally powered with 12 volts DC. The answer is that it can be, quite successfully and with little mechanical modifications and absolutely no electronic ones. All that is required is to bring in the 12 volts and connect it at the output of the rectifiers. With the exception of a reduced output when charging eight cells, the operation of the chargers is exactly the same as before.

A little review in the operation of ACpowered chargers is in order. In the beginning we have a transformer and rectifier(s) that change the incoming 110 VAC to a lower DC voltage. This DC voltage *must* be higher than the voltage rating of the battery to be charged. Then there is some method to control the current to a specific value, depending on the ratings of the battery. In a simple charger, a resistor is used in series with the battery to set the charge current as required.

In more sophisticated chargers such as these Ace R/C units, a power transistor is used to control the charge current; it in turn being controlled by some additional circuitry. This transistor and control circuitry is also powered by the DC output of the transformer/rectifier combination—but as long as DC in the proper polarity and voltage is present, they don't really care where it comes from. Thus, powering the chargers from DC is as simple as making two connections.

Referring to the diagrams included, notice that in both cases the incoming DC connections are made just past the rectifier diodes. It seems easier to think of it as connecting the 12 volts across the large filter capacitors, as they are easily located on the assembly boards and are clearly marked with polarity signs. In actual practice, it is not even necessary to include any kind of AC-DC switch, as the DC will not travel back through the reverse connected diodes and into the transformer. All that is needed is some kind of polarized plug on the charger case and whatever cord you need to connect to your particular DC source. The latter can be your car's cigarette charging socket, or your 12-volt field battery-just make sure that plug goes to plus, etc. For an Ace quality modification, drill a couple of holes in the PC board, anywhere in the lands that the filter capacitor (C1), for the wires used to make the incoming connections.

In operation, the Ace R/C chargers will work exactly as they do on AC except that the maximum current possible is reduced somewhat. On the DMVC it will reach 200 mils with four cells connected; 110 mils with eight. The HD-500 does a little better, going the full route on four cells, but only to 160 mils on eight. The reason for this reduction is that in both chargers, the net results of the transformer/rectifier are higher than the twelve volts we are now feeding in. It does work out, however, that either one of these chargers can be used to top off R/C equipment batteries, on top of being able to revive those field support batteries which started off as the topic of conversation.

VISA"

This one is for Donna!

Wee R/Cers are not to be forgotten this month. We have news of some ARFs for you, courtesy of Barry A. Eisen, from "Pgh," Pennsylvania, who writes:

"Greetings from a Pittsburgh Wee R/Cer. It is about time that proper attention was given to those of us who don't want to fly large planes. If someone would be willing, I would like to trade a few two-gram Ni-Cds I have for a tiny actuator. If I have time I will send you a picture of one of my latest planes and a small article on how it was built. You see, I found a series of foam kits that are perfect for single-channel flight. The company that makes them is Bentom. One evening is all it takes to have a plane that won't die the first time that it crashes.

"Back in the seventies Mattel manufactured a nice single-channel system that is still on the surplus market. (I just bought two more.) The actuators are garbage, but the rest is very nice, especially the transmitter. It has styling like a regular transmitter. Anyone who dreams of a reliable Staggerwing Beechcraft r/o will find their dream



come true...inexpensively. I do recommend using a muffler on the .020 engine or using CO_2 , since neighbors have a right to quiet. In the future I intend to fly rubberpowered R/C. The flights may not be long, but they will be clean.

"Back in the mid-seventies, a magazine which lasted only three issues had an excellent article on single-channel flight. I wish that I could get a copy of it. Copies of the magazine would be even better. It has plans for model V1 buzz bombs and the kamikazi flying bombs. Why it lasted only three is-

ELECTRIC SUPPLIES *You've tried the rest... Now buy the Best!* AIRCRAFT SPEED CONTROLS SC-5 02 to 05, 2 to 8 cell S62 SC-4 05 to 40,7 to 26 cell S62 SC-3 25 to 200,8 to 30 cell S127 WIRE & CONNECTORS #16 WIRE - 259 STRAND S7 #12 WIRE - 665 STRAND S7 #12 WIRE - 665 STRAND! S7 SERMOS CONNECTORS - 4 poles S3 and accepted JOMAR, 2028 Knightsbridge Dr. Cinti., OH 45244 / 513-474-0985 sues is a mystery to me." Well, I hope that we get the information Barry promises—I'll share it with you as soon as space permits. In the meantime, I can tell you more about the Bentom airplanes, having personally had the same thoughts that Barry writes about. To start with, they are manufactured in Japan, and imported exclusively by California Model Imports, P. O. Box 1695, Garden Grove, California 92642. They are common hobby shop items—those of you who have to depend on mail order can do your shopping with Ace R/C.

The line includes the Beech that Barry mentions, at 22-inch span. Others just slightly smaller include a non-scale "Skykid," and scale Schweizer 1-30, Mustang, and a Messerschmidt. There is also a Spirit of St. Louis; I believe in the same size range. Larger Bentoms include an Edelweiss at 37 inches and a Cessna 180 at 35 inches. All foam, all lightweight, their use limited only by your imagination.

As for the three-issue magazine mentioned, I don't know what it could have been, but it sounds interesting. If anyone of you in EC-land have any news about it, or anything else interesting, please share it with the rest of the world's Wee R/Cers. For any of you interested in Barry's swap meet, you can reach him at 12412 Browning Rd., Pgh, In Pennsylvania 15206.

Me? I'm here at *MB*—please reach out! Oh, yes, it means "Room Temperature Vulcanizing!"

R/C Soaring. . . Continued from page 35

ing edge of the wing from tip to tip. Physically readjust the linkages to make this trim setting the neutral trim point of the airfoil.

Now turn on the TE reflex switch. The TE should change position. If either surface (flap or aileron) goes the wrong way; i.e., down instead of up, turn the receiver off and then the transmitter off, then for the offending surface, go to the corresponding transmitter trim pot and switch wire "D" from terminal "A" over to "B" and try again.

Adjust each pot through the transmitter case until the TE is equally reflexed the amount you want from tip to tip, usually six degrees for the Windsong. Now go fly! And the next time you need to book to the other side of the sky in a hurry, just flip the switch and move out!

As a footnote, if your plane only has flaps and ailerons or flaps and polyhedral, you can still use this TE position switch idea to either flex or reflex your glider's flaps to any preset angle for thermalling or speeding around. Just use one pot, and one SPDT or SPST (on/off) switch.

Reflexing your glider's TE to the same preset position time after time will allow you to learn the handling characteristics of the "new configuration" (singular) much faster than an infinite variety of settings and characteristics. If you pick an unsatisfactory setting first off, you can always adjust the system to a new setting and try again.

Thanks, Mike, for sharing this simple circuit with us. I for one will remember your idea when I want to design or retro-fit my next sailplane for camber changing performance. It makes a lot of good sense.

AIRFOIL OF THE MONTH: QUABECK'S HQ-3.0/10

Now here is a good candidate for the above camber-changing circuitry in a fullspan flap and flaperon model. Lacking sophisticated transmitter mixing, you would need to have the above-detailed Windsong setup to allow for reflexed ailerons.

According to my limited understanding of the German language information supplied in the MTB 7 book on Quabeck airfoils, the HQ-3.0/ series of airfoils is superbly adapted to thermal flying. It has proven excellent in applications involving high wing loadings (over 13 oz./sq. ft.) and wingspans around 3.5 to 3.7 meters. With reflexed (or negative) flap settings this section makes a perfect choice for a slope glider as it will allow good wind penetration.

I picked the 10-percent thick section because it should be thin enough to be fast and thick enough to be moderately strong for most model designs. I believe this section would make an excellent choice for an AMA thermal duration sailplane of 100- to 130-inch span. Physically, this airfoil has a maximum thickness of 10 percent of the chord length occurring 35 percent back from the LE. The mean camber line is actually less than 3 percent at 2.88-percent occurring 50 percent back from the LE. The leading edge radius is 0.64 percent of the chord length. The pitching moment about the quarter chord point at zero lift angle is



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70	5.43	-0.16
80	3.81	0.35
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100	0	0

If you choose to make a wing using this section, or have already done so, we would like to hear how it performs.

AMERICAN SAILPLANE DESIGNS

With a name like that you wouldn't expect imports, would you? No way. Introducing the new kid on the block, American Sailplane Designs, 2626 Coronado #89, San Diego, California 92154; (619)429-8281, Gary Anderson proprietor.

This new company has been founded upon the perceived need for a single mail order source for many hard to find or unique domestic sailplane kits. A catalog is offered, as are such nice things as telephone specials, club discounts on volume buys, and personalized service: you deal directly with the boss, Gary.

In the catalog you will find sections on thermal designs, slope designs, scale designs, electric designs, and soaring related supplies. Many of the items are manufactured by so-called "cottage industry" sources and may at times be hard to get if purchased directly from the source. At American Sailplane Designs there is no waiting (except for normal shipping and handling times, of course).

Brand names include (alphabetically): Advanced Glider Concepts (F-16 and F-20), Astro Flight (Challenger and Viking OT), Buzz Waltz R/C Designs (Poquito Primero, El Primero, Primero Grande, Conquistador), Cheetah Models (Cheetah slope combat ship, and Super Cheetah), J.A.D.E. (Telos canard sloper), J.M. Glascraft (Pee Wee Penetrator, Penetrator, Song Bird 2M, Song Bird 100), L.J.M.P. (Icarus, Electricus, Flinger, Pantera, Meteor, Comet-check for availability), MILO Models (ASW-20formerly a Mark's Models kit, and wing bags), Pierce Aero (Paragon, Gemini MTS, Ridge Rat), Sunfair (Slope Master flying wing, Slope Dart), "Check" Sailplanes (Salto, ASW-17, LS-3, Orlik, Twister), and Whitney Models (Paraphrase RCHLG).

Give Gary a try. Send him three bucks for his catalog. I don't think you will be disappointed!

BUDDY FOX'S POLY CONTEST SHIP

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WIDE

WORLD

Now you could read that as poly-contest ship, or as poly contest-ship, but either way you'd be right. Jerry Krainock sends word of the latest AMA (or-what-have-you) thermal contest machine from the "Silent Flyers" of the San Fernando Valley, California (SFVSF), and that word is Buddy has a winner!

The sailplane has no name, however, because it is based on the 1985 U.S. F3B team's "All American" design flown by Mike Bame and Mike Reagan, I am inclined to call it "Buddy's All American," and I don't think anyone would object. lerry writes:

"Dear Bill, the enclosed pictures are of Buddy Fox's new airplane. So far as I know, it doesn't have a name.

"Its span is 92 inches, its area is about 778 square inches, the wing profile is E374, the fiberglass fuselage is from the "All American 1985" mold, and the stab is a 15-



percent (of wing area) scaled down Gemini. The control functions are: rudder, elevator, and flaps with elevator pitch compensation.

"The wing is vacuum-bagged, glass skins over blue foam. The ship is Gorilla-able, yet it has no spars. (The Gorilla was a twomotor, two-battery winch designed by the SFVSF and built by Dick Odle for the U.S. FAI/F3B team selection finals of 1982. Only the very strongest of F3B ships were allowed to launch from it—wrf) The wing's finish is as good as a full-size Ventus or LS-6. The model's size is very similar to my 1984 'Cheap Thrill,' but it should launch and land better." Here is yet another thermal or multi-task sailplane designed around the E374. It's getting to be a popular choice among scratch builders these days.

Jerry had a few more paragraphs in his letter related to club news for my benefit which I don't need to reproduce here, but one subject was the 13th annual SFVSF's cross country race. It struck home that even though this event is the grand daddy of all cross country contests (it started out life as the SFVSF Desert Dash); it is only 13 years old! As things go, that's really quite young!

SUPER CHEETAH-THE REAL STORY

Jerry's letter continued about the birth of the Super Cheetah. I reproduce that section of the letter here because it provides some insight into the development process of a unique sloper.

"Here is the true story about the Super Cheetah wing. (See March 1987 MB and May 1987 MB--wrf)

"In May 1986, we had a challenge combat contest with Aerovironment (AV) at Snake Hill. (Note: AV is the group responsible for the design and construction of the Gossamer Condor, Gossamer Albatross, and Solar Challenger record-breaking HPV and SPV aircraft—wrf) AV showed up with 72-inch to 78-inch span, tapered wing Cheetah's covered with Kevlar. We got killed with our stockers.

"After the TOSS X/C race last year, Mike Bame and I had to make combat Cheetah wings, and we had to learn how to vacuum bag them. I laid out the Super Cheetah wing as two panels 32 inches long with a taper from 9 inches at the root to 6.5 at the tip. I figured I didn't need a 72- to 78-inch wing, and I wanted to retain the wing loading and maneuverability of the stock Cheetah. Bame cut different airfoils for each of us.

"Mike used half of a 1/4-inch arrow shaft (back-filled with epoxy and cable, of course) for the leading edge. On his wing the tip section was different than the root. Voila! Super Cheetah was born.

"Bame and I were much more competitive (I think I placed fourth and Mike third in our August return engagement with AV). We both thought the wing could be better though, so we decided to make new airfoils with production of a new wing in mind. The planform remained the same, and the new 'foils were based on the need to use 5/16- by 1-1/4-inch aileron stock without changing the width or thickness. I also asked Mike to move the high point back to 40 percent.

"We both built these wings, tried them, and were satisfied. When Larry Pettyjohn bought out Cheetah Models, he got Bame's

MARCH 1988



airfoil templates, and that is where the Super Cheetah came from.

"Neither of us had seen a Conan before we built our Supers. An Eppler 374 wing is faster, but a Super Cheetah will stay up in less lift and has nice stall characteristics.

"With a rudder, the Super Cheetah's roll rate is very adequate at 180 degrees per second. That's not as fast as some of the tiny ships, but certainly respectable." Thanks for setting the record straight, Big Jerr. If anyone out there would like to give slope flying a try (you don't really need to dog fight!), the Super Cheetah would make an excellent aileron trainer. You certainly couldn't break one...at least not beyond repair! Contact Larry Pettyjohn at Cheetah Models, 14725 Bessemer St. "B," Van Nuys, California 91411; (818)781-4544, or give American Sailplane Designs a try.

Free Flight..., Continued from page 59

"A prop with no blades never breaks," overheard being muttered by Ed Mitten.

"As the wing is bent, so flies the plane," ostensibly spoken by Thomas Hardly.

"Sure I took my time building it...maybe fifteen minutes," allegedly announced loudly by an RTF modeler.

THE CASE OF THE MISSING MOTORBIKE

Each club seems to have one...this is the flier who jumps to conclusions based upon incomplete data. One of my favorites is a fellow I'll call Carl for the sake of my safety. Here is the scene: A two-day free flight con-

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test set in the Oregon Ryegrass fields where we fly. As is not uncommon, we set up the parking area next to a farm fence to the side of the flight area. Carl has a habit of parking his motorbike next to the fence by his Travelall. At the end of the first day's flying, all of us pack up and head over to the annual club barbecue. Carl does the same, leaving his bike behind.

The next morning dawns, and the contest crew heads to the field to find that the wind direction has changed by 180 degrees. All of the equipment and the field tent is moved well upwind to take advantage of the length of the field. Sure enough, just after all of the work is done, Carl shows up at the site, parks his Travelall in the same relative location to the field tent as he was when he left the night before.

Then, the wailing begins, "Some &\$@* has stolen my Honda!" The cursing sound carries above the roar of the Rossi, beyond the scream of the K & B, and past the screech of the Cox. No one on the field can avoid it. Soon, the familiar form of a bellowing free flighter comes careening to the tent, expletives abounding. "Did you know that someone stole my bike?" he shouts.

"Everyone within two miles has already heard about it," is the calm response.

What kind of &\$@* would do such a thing?" "Beats me." Then, the patient C.D. lifts his binoculars and looks upwind along the fence row while intoning, "Is it red? Is it a Honda 90? Is it parked neatly against the fence row-about a quarter of a mile away?"



Carl focuses his binoculars along the fence row and spots the offending motorbike parked just where he left it the night before, 'Is that my bike down there?" he queries.

There is general agreement that indeed the Honda is his.

"Who moved it?" he asks.

"No one touched your bike, we moved the tent." "Well, why didn't one of you &\$@* tell me?"

AND MORE FROM ED WHITTEN

"Shall I tell my wife that nobody took third place?" this from a second-place Nats winner.

"Hey, my Cougar was climbing nicely. . . then something fell off. I think it was the C.G." by PeeWee Reese at Columbia.

"All's well that flies well." William Shakespoor.

You are an individual interested in forward thrust and upward lift." from a Chinese fortune cookie with intentions unclear as to whether it speaks to model aircraft or sex.

CARL AND THE CIVY BOY

I have never built or flown a Civy Boy, although I have been regaled by stories of its stellar performance. One of the primary regalers has been my friend Carl (see above). Carl has built and flown several of recent date, due largely to the advent of the Nostalgia movement. His most recent Civy Boy was a little 1/2A version powered by an Atwood Wasp. As usual, the ship was immaculately constructed, and Carl had spent a number of hours trimming it to perfection. One the occasion of the big annual contest, Carl was set to show off his workmanship.

First came the big test flight-the little Civy Boy leaped into the air and performed a perfect climb and a hanging glide, the stuff that makes legends like the Civy Boy.

Second, it was time for the first official flight. Time to take a walk to the tent, the walk back with the flight timer in tow, the bragging of the virtues of the Civy Boy loudly described in glowing terms for all to hear-these were the setups for what was to come in due time.

Third, the model was readied with fuse in place, battery clip hooked onto the little Atwood, model clutched, flier peering for the patch of warm air and elusive thermal. It was a classic scene. Then the warm air arrived, and with it came frantic movements to get the engine started. Of course, it didn't! Expletives spewing forth, the engine

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is coaxed and forced to run. Finally, it bursts into life. Finally, the fuse is lit. Finally, it is launched—into a perfect loop to the ground.

More expletives are hurled into the air. And with nearby fliers watching slackjawed, Carl grabs the fractured fuselage, rips off the engine, stomps the offending airframe pieces into the hard ground, and lights the shattered remains on fire. Soon, the smoldering Civy Boy is just a green and yellow memory.

Several quite moments pass...then the hubbub of the contest continues. At this point, Carl recalls that the Civy Boy had a nice Tatone Timer installed in the fuselage. Of course, no fuselage or other part even exists any longer—having flown heavenward in a puff of smoke. Some wag suggests that Carl investigate the heel of his shoe to determine if the timer might be imbedded there—no luck! At the end of the contest, Carl's antics bring him the first annual Clog Dancing Award. The Tatone Timer? Who knows what happened.

TIME TO GO AGAIN

Thanks again for bearing with me for another month. I hope that the humor for March has kept your enthusiasm for free flight strong during this long winter. Keep those cards and letters coming, and thermals to all.

Jake..... Continued from page 7

the Minoan walls and away to freedom. Unfortunately, Icarus was a typical teenager. He ignored his father's warnings and flew too close to the Sun, where the wax in his ears melted. He couldn't hear the control tower's instructions and crashed on landing approach. Saddened by the tragedy, Daedalus went into seclusion for three years, and then took a job with Boeing.

Jake

Dear Jake:

What's an autogyro?

Nigel in Newport News Dear Nigel:

An autogyro is an inertial stabilization device that was used to keep 1948 Packards from tipping over when they went around a corner.

lake

Dear Jake:

As a dyed-in-the-wool glider guider for over twenty years, there's not too much I don't know about sailplanes. But even an old bird like me doesn't know it all, so I thought maybe you could clear up a puzzler that I've never been able to figure out. If a thermal is associated with warm air, then how can you explain why there are so many thermals in the winter when all the air is cold?

Otto in Michigan

Dear Otto:

Thermals are common in cold winter air because that's when the people wearing them are trying hardest to keep warm.

Jake

Dear lake:

Is Jake Doe your real name, or is it a pen name?

Curious in Kalamazoo

Dear Curious:

I answered a similar question a couple years ago. I said at that time that my pen's name was Sheaffer, but in view of the recent Wall Street wallow, my pen's name is now Bic.

Jake

Dear Jake:

I've enjoyed your discussions of "emotional torque" and "kinematic ugliness," but so far as I know you've never explained the derivation of those terms. How is it that these opposing forces got their names?

Drew in Drexel

Dear Drew: For those of you unfamiliar with the terms, emotional torque is a force as-

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sociated with pretty airplanes that are wellloved by their owners that attracts them to solid objects like rocks and trees, and thereby shortens their life expectancy. Kinematic ugliness is a repulsive force emanating from hideous and disliked aircraft that prevents them from hitting anything, and thereby makes them last forever. I'm sure you've all experienced these phenomena; when your gorgeous project that took all winter to build stuffs itself on the first flight, or when the toad you got stuck with because you had the last pick at the Christmas gift swap will never die even though you don't charge the batteries.

The names given to these forces are actually the obvious, self-explanatory choices. "Emotional" refers to the emotional attraction between a handsome airplane and its builder. "Torque" is a force in opposition to a screw-like rotation. So "emotional torque" means if you love your airplane, it's going to screw up. "Kinematic" refers to the study of forces of things in motion, and "ugliness" is just ugliness. So "kinematic ugliness" is a repellent force experienced when something really ugly goes by, like my ex-wife in her Studebaker. Jake

Dear Jake:

If I were sitting in an airliner right where the wing joins the fuselage, and I ordered a Michelob, would that be considered a root beer?

Tremaine in Twenty Nine Palms, California Dear Tremaine

Spare me! Puns are the lowest form of humor on the face of this Earth. Besides, I can barely stand it when somebody brews up a beer joke. It makes me hopping mad.

Jake

Dear Jake:

If brains were cheese, nobody could ever have a fondue in your hat.

Critic in Carthage Dear Critic:

That's an interesting analogy. Maybe it explains why my fourth-grade teacher always called me "Roquefort breath."

Jake

Plug Sparks. . . Continued from page 30

Food for thought, men!

ENGINE OF THE MONTH

For this month's engine, the Lykens Brown, we are indebted to Robert P. Scarsdale, 79 Fairview Avenue, Park Ridge, New Jersey 07656, for the information on Bill Brown's small motor.

In 1936, it was no great secret that Bill Brown was dissatisfied with the policy of Junior Motors to manufacture and promote only the Brown Jr. Bill had envisioned a smaller motor for a small model of four or five feet that modelers (in the depression without cars) could carry on the municipal trolly or bus system to get to the flying field.

The first project, of course, was to produce a smaller and lighter coil than presently marketed. To that end, using the finest enamel-coated copper wire, Brown started winding small ignition coils. He finally succeeded in producing a coil 3/4 inch in diameter, 2-3/8 inches long, and weighing two ounces that required only two AA pen cells.

With the ignition system solved, Brown could now proceed with the design of a small engine that eventually became known as the Lyken Brown. The name taken by Bill's middle initial to differentiate it from the standard Brown Jr. 60 engine.

The production of this .12-cubic inch displacement engine led to a parting of the ways with the Jr. Motors Corp. Brown was instructed via a memo of policy which prevented Bill from using the machinery and his time in developing a smaller and/or new engine.

Bill then set up his workshop in the basement of his home. In 1937 with testing of the Lykens successfully completed, the engine went into production on a small scale. During this time, a small number of Lyken Brown engines were assembled and purchased by modelers in the Philadelphia area. Advertising was strictly by word of mouth.

Early in 1938. Fred Megow kitted Maxwell Bassett's "Cardinal" which Bassett had designed with the Lykens engine in mind. Flights with this combination were so successful that Fred Megow was convinced this was a winning team. He immediately negotiated an agreement with Bill that gave Megow exclusive distribution of this new engine.

The engine was promptly advertised in the Megow catalog and down payments taken. Bill moved the production facilities to a new shop in the Philadelphia suburbs. At this time, the demand has far outstripped the ability to supply engines. Further expansion was financially out of the question. In February 1939, the contract with Megow was terminated by mutual agreement.

Bill decided to move production of the Lykens Brown to Penn State College and produce engines while attending classes to help defray expenses. This lasted only one semester and Bill again discontinued production. He returned to Philadelphia to take a position with Leeds and Northrop Instrument Co. This marked the end of a long association with ignition-type model airplane engines.

During the 1937-39 era, two types of Lyken engines were produced, MKI and MKII, with the former featuring a fixed timer. The MKII featured movable timer, screw-type needle valve, and a higher compression. In all, about 100 engines were produced.

For the benefit of the technical people, the Lyken Brown had a bore of 9/16 inch and stroke of 1/2 inch giving a cubic inch displacement of .12. A 9-5 propeller was recommended giving a top rpm of 6500. According to Scarsdale, the porting was reverse loop scavenged; i.e., forward-facing ports.

The cylinder was steel, machined in one piece; intake tube and bypass brazed in place. A mehanite cast iron piston (flat head, no baffle) with a steel connecting rod. The cylinder and piston were individually hand lapped. The crankshaft, made of three steel pieces, were brazed together and machined. A sand-cast aluminum crankcase was provided with a bronze bushing. The timer assembly was heattreated high carbon steel with tungsten points.

The complete engine with coil and condenser was provided on a hardwood test stand (similar to the Brown Jr.). Price was tentatively set at \$21.

BETTER THAN 50 YEARS AGO

Much to this columnist's amazement, the original nine members of the S. F. Vultures, which started as a Junior Birdmen Club in Pond's basement room, only three to date have passed on. Actually, the record would even be better, as Alex Drobshoff died of stomach cancer at an early age while Willie Deutscher died in the Death March to Cabantuan in the Phillipines.

Photo No. 9 shows Nick Sanford, long time buddy and friend, about 1936⁴37 with this second gas job. This photo, taken at the Sacramento Municipal Airport, is truly representative of the type models built when the Brown Jr. engine was king. This model reflects considerable improvement over his first model, which was built on the

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style of a rubber model featuring 1/8 square fuselage longerons and a very light construction. Only one flight with that model, as the engine and gear literally tore the model apart when it spun in.

Nick is still an active modeler, now residing in Santa Rosa. In company with Ed Solenberg, Nick can be generally found at all the Northern California O/T R/C annuals.

READERS WRITE

We still have several photos left from a letter written by Bill Simpson of 7413 Via Lorado, Rancho Palos Verdes, California 90274, who sent in ten pictures of Anderson, Atwood, Hassad, and the rest of the boys.

This time, this columnist has selected Photo No. 10 showing the model used by Aircraft Industries (C. C. Moseley) Grand Central Air Terminal in Glendale to break/ establish a world record for duration. According to Simpson, this model was built by Mel Anderson, but it appears to have all the characteristics of the Phantom Sincor as designed by Bill Atwood (with a stretched wing).

When Atwood left Baby Cyclone, he offered the Flying Phantom Jr. kit as a promotion to buy his new Bullet engine. To this day, however, this writer has not seen a copy of the Phantom Sr. Who knows, one of our readers may have this rare plan.

It might also be of interest when Simpson wrote his letter in 1983, Anderson was 80 years old then!

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Joe, the K of K & M Reproduction Orwicks, some examples of excellent machine craftsmanship, has been involved with Cox Tee Dee custom-tuned engines, stock and parts, old timer supplies and kits, transistorized ignition packs, and now O/T shirts with a variety of designs of model aircraft, logos, cartoons, and appropriate sayings like "S.A.M. Flyers do it casually." Best idea is to write Joe and get his latest sheet (or telephone 713/830-5162) to find your fa-

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Dials Diesel	McDaniel R/C, Inc 64	
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Again, Bruce Abell, former newsletter editor of the Australian paper, Duration Times sends in Photo No. 11 showing a scaled Goldberg Interceptor to 66-inch wingspan.

Bruce, who lives at 17 Ferguson St., Cessnock, N.S.W. 2325, Australia, reports the model, powered by an Ohlsson 60, is a bloody potent machine. The model climbs almost out of sight on a 40-second engine run. Glide is fast and flat with excellent penetration in the wind to hunt up those hard-to-find thermals.

Test flights show the climb at 60 to 70 degrees and a five-minute flight at sunset in late winter conditions (60 degrees F). (Dead air?) The only problem Bruce has run

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No. 6872 SWALLOW P-30 \$5.00 Flying wing type contest winner with a unique DT hookup, Barnaby Wainfan.

No. 687-O.T. ROCKETEER 'A' \$8.00 Original Eagle kit plans for 40" span version of Schoenbrun's winning design.

into is the single wheel landing gear which as he says, makes takeoffs a bit "dicey." The smaller rudder is practically inoperative until the model builds up speed. Bruce has broke more than one prop!

Propeller size is of interest being a 14 x 6 Taipan. Bruce intends to try a 14-7 Master Airscrew eventually moving up to 15-8 and then 16-7. Good fun!

SAM ACTIVITIES

SAM 21

We would like to run Photo No. 12 depicting Howard Osegueda with his wellbuilt Taibi Powerhouse at the SAM 27 "Crash and Bash" annual held in Marin County. Howard, who was the successor to Roots' Hobby Shop in Oakland finally sold out and is now working for an elevator company.

For years, a member of the East Bay Radio Controllers (ERBC), Howard has become intensely interested in the old timer phase of modeling. Another major reason is the number of old timer annuals (two-day meets) being staged on the West Coast. No. 5871 PAYPOD \$10,50 A 7-foot span civilian RPV for aerial photography, etc. By Fred Lehmberg.

- No. 5872 ERLA 5A \$4.50 Jumbo rubber scale German lightplane. Span over 36 inches. By Walt Mooney.
- No. 587-O.T. STRUCK'S 'JENNY' \$4.50 From Henry Struck's 1/2-in, scale Trail Blazer series in late '30's Flying Aces.
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- No. 2871 SWEETY S7.50 Low cost and easily built 035 electric R/C sailplane for single ch. Bruce Gray.
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- No. 1871 BIG APPRENTICE \$17.00 Enlarged version of Bill Northrop's popular R/C trainer, 4/S 60, Bob Benjamin.
- No. 187-O.T. FOOTE'S WESTNR \$10.00 Big contest-winning Class C pylon, has unusual fuselage design. By Don Foote.

No. 12861 SIERRA TRAINER \$8.00 Tailless R/C trainer for .20 eng., 3-4 ch. Foam wing cores avail. By Bill Evans.

With some SAM Chapters putting on two annuals a year, it is pretty tough to find a date. Right now, one can find the lineup on clubs as follows: SAM 31, SAM 41, SAM 30 (2), SAM 26, SAM 49 (2), SAM 21, SAM 26, SAM 27, and SAM 51. Whew! **SAM 27**

We have run numerous pictures of Don Bekins, but Photo No. 13 is intended to show you that you don't need a red hot engine to win. While Don is posing on his veranda overlooking Richardson Bay (yacht in the background), the main point of interest is the Ohlsson Gold Seal engine in a standard Lanzo Bomber. This 1938 reproduction made by Herb Wahl (this one a Herb Wahl Ohlsson Commemorative finished in gold anodizing) is an excellent running engine with a large Taipan propeller. As can be seen by the winner's plaque, this is a combination hard to beat. **SAM 56**

Bill Schmidt, 4647 Krueger, Wichita, Kansas 67220, reports the "WHAM BAM" Chapter (Wichita Historical Aircraft

MODEL BUILDER

Modelers) has been holding meets of all sorts. Probably, from a fun standpoint, the June 6 and 7 meet was the best yet.

The only competitive event was the 1/2A Texaco. SAM 56 has initiated a 1/2A Texaco perpetual trophy. This meet was the first contest to count towards the new trophy. Although he didn't win, Photo No. 14 shows Dan Walton with his Lanzo Record Breaker that placed seventh. While we are at it, let's take a look at the results (to fifth only).

c a look at the l	esuns no man	Offry/.
1. Larry Bishop	KK Playboy	1641
2. Bill Schmidt	Sailplane	1569
3. Jack Phelps	Playboy	1480
4. Dean Zongker	Sailplane	1290
5. Lamoine Schrock	Pylon Buster	1124
Transformer and the second	1. 18 116 -11	

Getting around to the "fun" portion of this meet, Photo No. 15 is of Lamoine Schrock's O.S. 60 4/C-powered Powerhouse. Dan Walton on the left found time to help out. Also, another photo, No. 16, shows Jim Burger with his 1/2A Texaco entry, a Playboy built from Joe Klause's KK Playboy kit. This kit is turning out to be a very popular small Texaco model.

SAM 56 has ambitious plans, as they are joining the Tulsa Glue Dobbers in sponsoring the first Annual SAM 56 Invitational. R/C and free flight officiating will be split between the two clubs. By the time this is published, the meet will be history. Hopefully, we will receive some good photos of the action at the Perry Municipal Airport, Perry, Oklahoma.

THE WRAP-UP

We would be remiss if we didn't acknowledge the help and generosity of Vic Didelot, 4410 Lorna Lane, Erie, Pennsylvania 16506. When in Australia flying the Strato Streak in O/T free flight power, after the official flights, somehow or another, the drive washer was lost.

Now, Arden 09 drive washers are not like pebbles on the beach, rather like finding hen's teeth. Imagine my surprise when a letter arrived from Vic with a brand new, never-used Arden 09 drive washer. Great stuff!

Vic Didelot runs a small reproduction parts business for old timer Ohlsson engines. This is his specialty. He has a remarkable backlog of Ohlsson parts. This includes 19, 23, and 60 items. In addition, Vic can provide intake tubes, replacing costs \$7.50. He also restores old Ohlsson engine lugs that have been broken by heli-arc welding and refinishing. Slot lugs cost you \$7.50 per lug. Now, hole-type flanges cost \$5.00 per corner to restore. Also a general cleanup (ultra sonic) and repainting cylinder fins, as required, costs \$10.00. If you have an Ohlsson engine problem, write Vic. He can help!

Workbench.... Continued from page 7

the only radial engined version of the Gipsy Moth. Reader David Jacox, of Vancouver, B.C., Canada wrote to correct us on the spelling, and to give more information on the "Genet" (correct spelling) Moth. The Genet engine, also known as the "Civit" in military clothing, was a seven-cylinder (we thought it was five) manufactured by Armstong Siddeley. David included copies of material from the '39 Jane's All the World's Aircraft and **COVERUP!**

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several other publications, giving specs and photos of the engine on the Moths as well as on a Fleet 7C "Fawn II" of the Canadian Royal Airforce in which David flew as an instructor in early WW-II at the Central Flying School. Our information on the Moth had come from an early issue of Aeromodeller which was not at hand when we wrote about the Moth in the December issue, thus the misspelling.

Anyway, every time I run across the name "Armstrong Siddeley," it always reminds me of the silly little joke about the guy who came into a butcher shop and asked for a pound of "kiddley." The butcher said, "Did you ask me for a pound of kiddley?" And the guy says, "Oh ... diddle I say kiddley?" It always helps if you've had a couple of rounds before you hear it...


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