

2

HOT RC AIRCRAFT REVIEWS:

- Almost-Ready-to-Fly "Scorpion" from Cox
- DCU's "Toucan" Tailless Slope Glider

MODEL BUILDER

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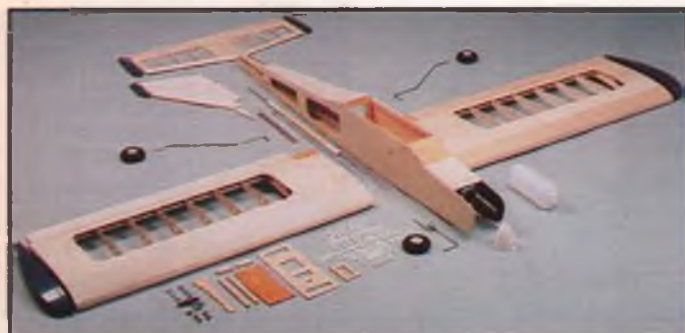
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Wing 2: Dark Red, Metallic Blue, Black, Chrome and Aluminum
Wing 3: Neon Pink, Metallic Plum, Royal Blue, Cub Yellow, Black and White
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ON THE COVER: Now here's something really different! Aircraft designer George Heaven is pictured with the 1/4-scale proof-of-concept RC model of his full-size "Rubber Bandit," which, if all goes as planned, will put him in the record books for having built and flown the world's first rubber-powered man-carrying aircraft. How much rubber? No less than 800 strands—90 pounds' worth—of 1/4-inch FAI Tan! The model is itself rubber powered, spans 17 feet, weighs about 10 pounds (scale weight) and has successfully flown many times. We visited George's hangar recently and were extremely impressed with the engineering and workmanship that has gone into this project. Frequent MB contributor Ken Johnson has been helping with the construction and will be doing a feature story for us after the Rubber Bandit's inaugural flight—stay tuned!

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PLANE TALK

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How about this cute little Knight Twister control line biplane? The key word here is *little*; the model spans only 10-1/4 inches, is 9-7/8 inches long and is powered by a Cox Tee Dee .010! Ben Torre Sr. did an excellent job of building this little cutie from an article in an old *Mechanix Illustrated*, which reprinted artist/modeler Jim Triggs' original model plans from the March/April 1966 issue of *American Modeler*. That article also included Triggs' detailed scale three-views of a typical modernized homebuilt version of the Twister. Interestingly, *AM*'s full-size plans for the diminutive Twister—included with three other more typically sized models—sold for \$1.10! Ben P. Torre, Sr., 19 Gregory Terrace, Belleville, NJ 07109.



"I spent countless hours as a kid over 40 years ago admiring a beautifully constructed Korda Wakefield hanging in a local hobby shop," writes California modeler Lee Hunt. "Several years ago the appeal of building some old time free flights grew. When I discovered that Dick Korda not only made his historic 43:15 flight in 1939, the year I was born, but on August 6, the day I was born, I knew I had to build a replica! My Korda was ready for covering in December 1994, however, the Northridge quake totally destroyed nine of fourteen completed models, including the Korda. Only the prop block and landing gear were left!" Thus Lee undertook to start over from scratch, the result being the beautifully built tissue- and silk-covered model pictured here with his wife, Lois. Lee Hunt, 19600 Singing Hills Dr., Northridge, CA 91326.

Of his static scale B-17D/E, Paul "Skeeter" Meketa writes: "The front half is from a Guillow kit; the rear fuselage and tail feathers were scratch built using photos and Boeing sketches as a guide. I had originally intended to finish it in the old Air Corps colors of blue/yellow or olive/yellow, but research indicated that no B-17s were ever painted that way. Since all aluminum paints fail to look really authentic, I decided to cover it with real metal. I used .007-inch thick aluminum over balsa sheeting. Over two years elapsed from start to finish of the project, due to the many problems that I had to work out and/or redo. I'm not too sure whether I'll do another metal job or not." Paul J. "Skeeter" Meketa, 1645 Samedra St., Sunnyvale, CA 94087.



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weigh 2 ounces less than the stock fuselage alone. All-up weight is under 6 pounds, and best performance to date has been with a geared Astro 40 on 18 cells and swinging a 14x10 prop. John offers a number of plans for glow and electric models; send him \$1 for an illustrated catalog. John Chapis, Rt. 5, Box 848, Seaford, DE 19973.

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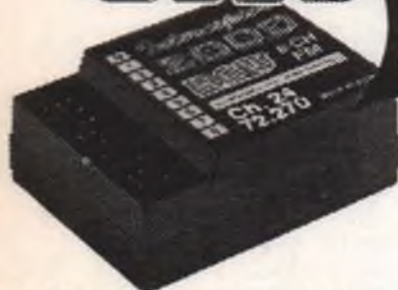


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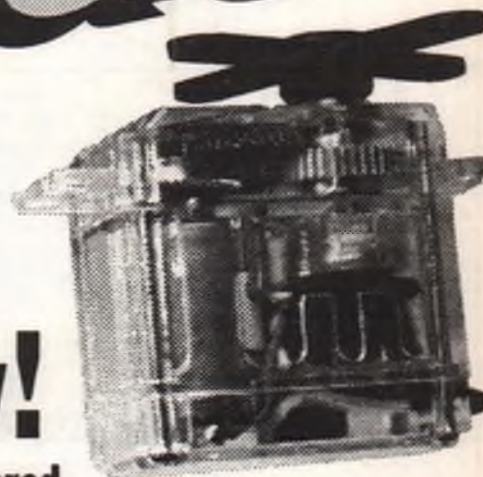
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.30-SIZE HELI POWERHOUSE

Webra's latest entry into the .30-size heli engine market is the new .33H, designed to provide both top power and



long life. Contributing to the latter is the steel liner combined with a Dykes ringed aluminum piston; with no chrome or nickel to chip or wear off, the engine should live up to Webra's reputation for long life and durability. The .33H features a heat sink head and Webra's TNil carburetor with a machined aluminum extended throttle arm for easy hookup. The engine carries a suggested retail of \$189.95 and is distributed by Horizon Hobby Distributors, 4105 Fieldstone Rd., Champaign, IL 61821; (217) 355-9511.

TOP FLITE'S "HOLLYWOOD ZERO"

With only a couple of rare exceptions, all of the Japanese Zeros you see at airshows and in the movies are modified AT-6 Texans, as the number of surviving genuine flyable Zeros can be counted on the fingers of one hand. Now Top Flite has gone the same route by introducing the "Hollywood Zero"—basically the same as its Gold Edition AT-6 kit but with all the necessary parts,



decals and instructions to create the Zero lookalike, which is still a scale model and for which documentation is available. Kit options include

a belly-mounted drop tank, dummy radial engine, in-cowl muffler, headers, and static scale prop. See it at your local hobby shop. From Top Flite Models, 2904 Research Rd., Champaign, IL 61826-9021; (217) 398-6300.

SCHOOLYARD ELECTRIC SOARER

The pre-built Graupner "V-Star" RC hand-launch glider listed in the last couple of Hobby Lobby catalogs has now been joined by a Speed 400 electric version, dubbed the



"Electro-Star 400." The new model sports the V-Star's pre-built (but uncovered) wing and tail but comes with a longer, fatter fuselage designed to accept the electric power package. The fuselage is white gelcoated fiberglass and has the motor mount already installed. Specs: 57-1/2 inch span, 388 squares, RG-15 wing section, and 25 ounces flying weight. If you're not a current Hobby Lobby customer, you can get a copy of Catalog 27 for \$2, which includes a \$5 discount voucher for your first purchase. Order from Hobby Lobby, 5614 Franklin Pike Circle, Brentwood, TN 37027; (615) 373-1444.

FOR YOUR BOOKSHELF

Volume 2 in the comprehensive reference work compiled by John C.

MODEL WARPLANES 1996

Compiled By
John C. Fredriksen, Ph.D.



Volume 2:
Golden Age, 1919-1939

Fredriksen, Ph.D., entitled *Model Warplanes 1996*, is now available and should be in the personal libraries of all modelers interested in military aircraft. Volume 2, subtitled *Golden Age, 1919-1939*, comprises 94 pages in all and lists 272 aircraft types, 155 model kits, 1,361 model plans, and 200 sources for kits, plans, documen-

tation, accessories, etc. Each of the five planned volumes sells for \$15 postpaid, or you can order all five for \$55. John C. Fredriksen, Ph.D., 461 Loring Ave., Salem, MA 01970; (508) 745-9849.

GREAT FF SCALE PLANS

Admirers of the long-out-of-production Flyline Models free



flight scale kits put out by the late Herb Clukey will be delighted to learn that the plans for 24 of them are once again being made available for scratch builders. Favorites include the Curtiss Robin (pictured here), Velie Monocoupe, Heinkel He 100d, Bellanca Skyrocket, Kinner Sportster, Fairchild 22, Stearman C3B and a bunch more—an SASE will get you a complete list.

When contacting the manufacturers/distributors mentioned in Over the Counter, please tell them you read about their products in Model Builder magazine!

Prices range from \$4 to \$7, plus 7.15 percent tax for Arizona residents. Send for your list today from Flyline Models, Plans Division, 15127 N. 100th Way, Scottsdale, AZ 85260; (602) 451-3238.

ANOTHER FOR THE BOOKSHELF

Editor/Publisher A.C. Anson is back with another of his



AeroPlans journals for modelers, a very interesting and nicely produced 32-page, 8-1/2x11-inch publication that concentrates heavily on plans, three-views, photos and data of rare and unusual aircraft. The latest issue of *AeroPlans*, volume 7, for example, contains three-views for the 1912 Flanders F-3, WWI Roland D.VIb (along with plans for a 15-1/2 inch span rubber scale model), three-views and Peanut plans for a 1916 Rex Scout, Halberstadt D-1 drawings, Chuck Hafner's highly detailed 1912 Albatros Taube biplane drawings, and more. *AeroPlans* #7 sells for \$10 plus \$2.50 S&H (\$5 S&H foreign surface mail or \$8.50 S&H foreign airmail), from *AeroPlans*, 8931 Kittyhawk Ave., Los Angeles, CA 90045.

A MODEL YOU CAN FLY IN

"ZING" is a low-cost, quick-building all-wood ultralight aircraft, the third such design to be marketed by Pop's Props. The prototype is powered by a Kawasaki 340 F/A engine, but Rotax, Cuyuna and 1/2 VW powerplants could also be used. Span is 25.5 feet, wing area 118.8 square feet. The fuselage is made with a rigid Warren truss type of construction, while the wings



(which are easily removed for transporting) use built-up ribs and wood spars. ZING plans alone are \$60; complete airframe kits sell for \$2,950. Full particulars on all three of Pop's Props ultralight designs can be obtained for \$10 from Pop's Props, 331 Ave. F—Hilltop, Bloomington, IL 61704; (309) 829-8343.

HEAVY-DUTY SERVOS

If it's real servo power you crave, check out the HS-700BB and HS-705MG from Hitec RCD. The 700BB is equipped



with a ball bearing at the top of the output shaft, features a custom IC and SMT circuit board construction. Rated performance is 133 ounce-inches at .22 second transit time; weight is 3.6 ounces. Even more powerful is the 705MG with its all-metal gear train, rated at 161 ounce-inches at .27 second, and tipping the scale at 4 ounces even. Both servos measure 2.3x1.1x2.0 inches and are available with your choice of connectors. From Hitec RCD, 10729 Wheatlands Ave., Suite C, Santee, CA 92071; (619) 258-4940.

HIGH-PERFORMANCE MINI DIESELS

The Russian-made AME .049 and .061 glow engines that have been taking the small

engine world by storm are now also available in diesel versions, complete with muffler. No performance figures were given, but it won't cost you



much to see first-hand how fast they go, as they're priced at only \$33 plus shipping, same as the glow versions. Interestingly, the AME .049 and .061 diesels can be retrofitted with AME glow heads as well as Cox Tee Dee heads and engine mounts. For more info, or to order, write or call Norvel, 3656 State Rd., Cuyahoga Falls, OH 44223; (800) 665-9575.

PLANS GALORE

Nexus Special Industries, British publishers of *Aeromodeller* and *Radio Modeller* magazines, has come out with a series of five



different planbooks featuring full-size plans for small flying models that were originally printed in the English model magazines in the 1950s and '60s. Volume 1 deals with CO₂ models (eight full-size plans), Volume 2 with free

flight scale (seven plans for rubber, electric or CO₂ power), Volume 3 is strictly model boats, Volume 4 has full-size plans and/or parts for eight small FF and RC gas models, and Volume 5 has plans and/or parts for 10 small CL models. All four of the aviation volumes are available from Wise Owl Worldwide Publications, 4314 W. 238th St., Torrance, CA 90505; (310) 375-6258, for \$13.50 each postpaid or \$45 for the set of four. California residents add 8.25 percent tax.

THROTTLE THAT .010!

For you small model devotees, a company called Little-Gem Products is offering a tiny, true air-bleed RC



carburetor for the Cox Tee Dee .010. No specs were supplied, other than that it permits a Cox .010 to be fully throttled between 7,000 and 25,000 rpm. Going price is \$22.50 plus \$2.25 S&H. For info contact Little-Gem Products, 9107 E. Milton, Overland, MO 63114; (314) 429-7792.

HANDY WORKBENCH TOOL

Bill Reed of Alco Tool & Die favored us with a sample of his



continued on page 85

MODEL DESIGN & TECHNICAL STUFF

BY FRANCIS
REYNOLDS

•Unruly Rules •Ancient Antics •A Handy Do-It- Yourself Field Box Light

I see from the MD&TS Index that we have talked about model airplane rules a bit in the past, but I find I still have a lot of strong unpublished thoughts on the subject. Nature is full of rules, the laws of science—natural laws. Whether we like some of these laws of nature or not is beside the point, since we can't change them. Man-made laws and rules, however, which can be created, amended and eliminated, have been the subject of effort, controversy and sometimes wars, since the beginnings of civilization. Basically, rules are written to tell us what we cannot do, not what we may do. Rules are almost always restrictive.

For the purposes of the following discussion I am dividing modelers into two groups: first the technically curious, creative designer types; the readers of this column, "us," "we." The other group consists of those modelers who would just as soon not have to use their heads in connection with their model airplane hobby; those who would like to be able to win contests by the luck of the launch, the weather, the laws of chance, or by superior flying skills. This other group, of course, we will call "they" or "them." They are still good guys, you understand, but they are different from us.

Games of chance don't interest me personally. I have no curiosity concerning just when the dice will come up in my favor, or in how long I would have to play before I would lose everything to the odds masters. But certain games of skill definitely interest me—designing and building better model airplanes, for instance. Learning to do a better job of flying model airplanes also interests me, but not as much as the designing efforts



Our columnist's clever idea for an easily made, inexpensive lighting device that's powered by a standard glow plug starting cell and fits easily into your field box; it's handy for peering into the darkest depths of fuselages and such whenever the need arises. Further described in text.

do. I am one of "us."

But if I entered, say, pattern contests, I would become, to a degree, one of "them." In pattern, I think flying skills *should* be the primary goal, not design skills. Certain design rules are obviously necessary there. The real purpose of that game is to separate the better fliers from the poorer fliers, and to attempt to identify the best aerobatic RC fliers in the world. Pattern might best be a one-design event; that would more completely make it a flying-skills-only game.

But in many other events—control line speed, free flight duration, etc.—the design of the airplane is more important than the skill of the pilot. In my opinion, the name of the game in such events should be

superior design skills, not luck. But rules very often convert games of skill into games of chance. In what should be skill events, often it is "they" who end up being the rule makers, since they are usually in the majority. They don't want "us" to develop a better airplane for a particular event, because that would reduce their chance of winning or force them to also try to develop a better airplane. Such rules protect non-designers by robbing creative competitors of the opportunity to use some of their superior technical skills.

Model Builder's "Electric Power" columnist, Roger Jaffe, wrote last November in connection with electric duration events: "The limitations on motors, batteries, wiring and/or propellers lead to a loss of innovativeness and creativity. What's really needed is an event specifically for these duration models with no limitations to the configurations."

But in all fairness, "they" and even "we" do need some

continued on page 84

Beauty is in the eye of the beholder; and it depends a lot on what the beholder is used to beholding. I, for one, think that a lot of our latest jet fighters are ugly, probably because their shapes are relatively new to me.



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One of the most rare collectors kit we have come across is the JIM WALKER FIREBALL W/C KIT NEW IN THE BOX. A TRUE FIND—\$100.00. CD Scale Master 3/4"=1 ft.—SM Series WW1 SPAD NIB \$50.00, Lite weight Kavan starter—engines up to 60 size NIB—\$30.00. Extra large Deluxe super scale 4" dia. wheels for Piper Tri-Pacer main gear \$28.00 pair (can be inflated). Deluxe Partial Kit of the Piper Tri-Pacer—88-1/2" span, W/ micro sawn ribs for the wing, ailerons, flaps and body formers, 1/4 Ply fikrewall + L.G. mount, Instrument panel W/cutouts for dials, bent main gear, nose gear & tail skid, ply butte ribs for wing center section—ALL FOR \$200.00. PLEASE REMIT AMPLE POSTAGE, INCLUDING HANDLING AND INSURANCE ON ALL ORDERS. SEND \$3.00 & DOUBLE SSAE FOR GIANT SALES CATALOG TO:

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RC SLOPE COMBAT!

How one Southern California glider club breathed new life into slope combat with its "CarnageSoarus." Maybe *your* glider club ought to give it a try!

You have to give credit where it's due when a big success like this one comes around. This time some pretty creative minds came up with an instantly popular and original slope combat event called "CarnageSoarus." For accidental humor, harmless hostility, guileful aggression and non-stop entertainment value, the CarnageSoarus concept ranks number one in my book and deserves to be emulated!

It all started when FAI/FSB (electric multi-task) guru Jerry Bridgeman came back from the Pasadena IMS show with a kit combat plane somewhat like the Anabat. It was an all-hot-wired foam combat slope ship with colored packing tape for covering and very little hard structure, making it almost indestructible. Jerry and Tony Martin put them together, flew them and became hooked, but quickly discovered that the airfoil was wrong for conditions at the local slope. Nevertheless, crowds soon



Here six planes are doing battle in the air while another is on the ground, eliminated! This event, dubbed "King of the Mountain," was pure barroom brawl in the air and loads of fun!



■ LEFT: Some fliers went combat crazy and painted their CarnageSoarus—check out the camo scheme on Dave Sanders' ship. ■ RIGHT: In the Slope Derby event, jammers launched last at the beginning of the 2-minute time slot well after the packers get into defensive and offensive positions above the cliff. Here Larry Enger, the jammer of "Team Wolf Pack," gets off to a start near the lap-counting goal posts.



Joel Johansen launching his Carnasoar into the fray. This enterprising 14-year old was the master kit builder for the 50-or-so kits made for this event. Profits went into his own "glider fund."

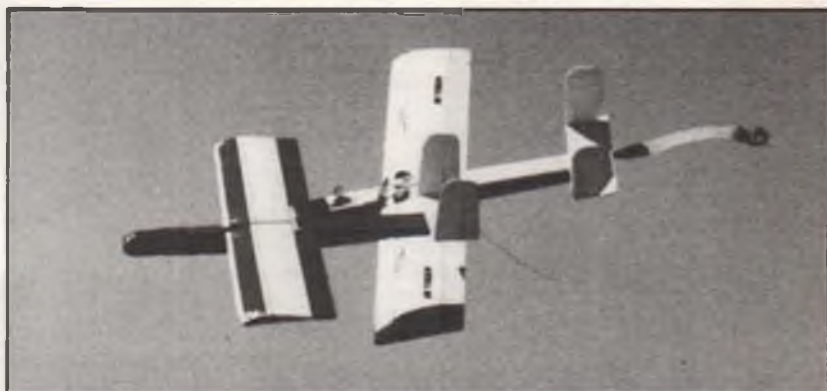
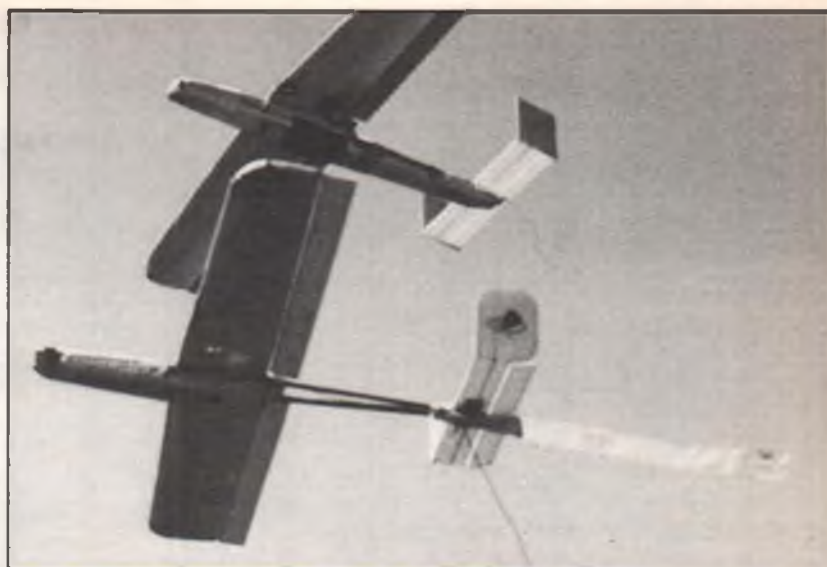


Young Tim Elliott flew a very effective and successful flying wing combat ship which featured a high aspect ratio delta configuration with Selig 4083 airfoil (yes, the HLG section!). Proper CG, wing sweep and trailing edge reflex provide pitch stability while triple verticals give yaw stability. Transmitter-mixed eleven control does the rest.

gathered to watch as they flew in mock combat, although most rounds ended in fits of laughter.

To remedy the airfoil situation, another

"Carnasoar" was born. Per Larry Tuohino, HSS VP, "Most of the kits were cut for the event by Lyndon's 14-year-old son, Joel, for 'glider money.' Joel also coined the term



Miscellaneous packer/jammer confrontations. Jammers have streamers, packers don't. Only jammers can score laps for their team. They must stay aloft and rack up laps or all is lost. Note in one of the photos that the air fuselage is a double arrowshaft boom. Also, light showing through the one-piece stab is indicative of the corrugated plastic (sign) material used. Malleable wire inserted through the corrugations keeps the 90-degree bend in the vertical/horizontal junction.

'CarnageSoarus.'" Fifty kits were quickly cut as it became obvious that this idea was catching on fast. Then Tuohino made up a flyer "Inviting the Few, the Proud, and the Completely Insane to the CarnageSoarus Foam Bash & BBQ," and the concept took off exponentially!

The appointed day, Sunday, April 14, rolled around and the Harbor Soaring Society fielded eight three- to four-man teams. It's interesting to note that this turnout included many fliers from the mostly thermal flying segment of the club, in effect "bringing the club together for the first time in years," as Tuohino observed. CD Lyndon Johansen got the action moving quickly and demonstrated enthusiastic and humorous bullhorn skills throughout the entire afternoon.

The format of the contest consisted of three main events preceded by an unofficial hand-launch event. The latter was similar in form to an HLG golf tournament:

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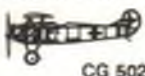


SCALE MODELS

.020, Electric, CO2, Rubber
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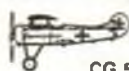
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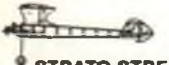
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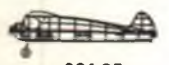


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two traffic cones were placed about 50 yards apart on the flat; you stood at one and threw your slope glider to the other, trying to land as close to it as possible. This was your basic time-killing, fun-fly event that served to keep the troops happy until the wind came up. To get the most fliers interested, a prize of one free hot dog and a Pepsi was offered to the winner.

**MAIN EVENT ONE:
 SLOPE DERBY**

This was truly a creative idea. The explanation of the task was started with a question to the pilots: "Are any of you old enough to remember what roller derby is?" This event was to emulate roller derby (RD)! Like roller derby, there were to be two teams and a "track" with cliffside pylons determining the two ends and the near end being the "goal." Also like RD, there was to be one appointed "jammer" per team whose plane was to fly a short crepe paper streamer to serve as an identifier. The rest of the team of two or three guys were called "packers," as in RD. The job of the jammer was to rack up as many laps on the 75-yard slope course as possible in the 2-minute time frame. The job of the packers was to clear the way for their team's jammer while at the same time preventing the opposing team's jammer from making laps.

Each of the eight teams adopted a name. In the spirit of roller derby and carnage, names were created like the Numero Unos, the Buttheads, Team Destructo, the B4's (flying wings), Team Funk, the Wolf Pack, Foam Death, and the Black Sheep. There was laughter even before the first heat!

With the wind finally up in the 6-8 mph range and hitting the cliff at 45 degrees, the competition began. First up were the Numero Unos and the Buttheads. The ensuing combat was absolutely hilarious with mid-air collisions and dumb-thumb errors occurring right and left as the light lift forced planes into the same airspace. Eventually the Numero Unos would win, but a protest by the Buttheads forced a last-round



Mass launch at the start of the time slot in the Window of Opportunity event. Every plane had an ID ribbon so that teams could be identified in mid-flight. The object was to try to eliminate the competition and make your window!



The "window" in the Window of Opportunity event was a real trick to fly through. Many bonked and bounced off of the wooden crossbars and verticals. Smart pilots learned not to look at the window but instead look only at the plane and fly where the 4'x8-foot window should be. Pilots often launched in close proximity of the window when traffic allowed. Here the striped CarnaSoar has just hit the horizontal and is dropping to the ground.

re-flight where they took the win. It was chaos at first because nobody really knew what to do, but as the heats moved on, knowledge piled up fast, and the combat became bloody!

**MAIN EVENT TWO:
 WINDOW OF OPPORTUNITY**

The eight teams again queued up for more 2-minute carnage. This time a diabolical "Window of Opportunity" was devised wherein each CarnaSoar combat plane had to fly through a crude lumber window measuring 4x8 feet. That might sound easy, but it proved very hard. Plane after plane crashed into the wooden uprights and crossbars, causing bursts of laughter and a mad scramble down the cliff



Our columnist's sons, Andy and Matt, were also pretty enterprising kids as they made a dollar a minute for downed gliders!

by the affected pilot. After a rapid recovery of the fallen craft, a hasty toss into the air and a quick re-alignment the result would often be a cliffside cartwheel or yet another smack into pine or ply. In spite of the merciless impacts and even more insensitive laughter, the CamaSoars and their pilots kept on taking the abuse and coming back for more!

To keep things interesting, it was OK to try and eliminate members of your opposing team while trying to make your window. Very short ID streamers of two different colors were issued to the two teams in each heat. Spectators and pilots agreed that, by far, the Window of Opportunity was the most popular event.

MAIN EVENT THREE: KING OF THE MOUNTAIN

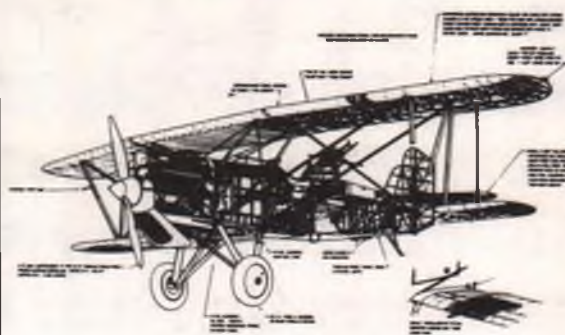
Like the game you used to play atop the sand pile in a construction yard, King of the Mountain was pure combat! A fight to the finish, pure and simple, the idea was to be the last one flying in a mob of planes. Avoidance was just as important as aggression. Kill or be killed was a decision that had to be made in the flick of the stick. Balancing the light and variable lift conditions, conserving kinetic and potential energy and getting the jump on the nearest opponent were constant concerns. The physical dexterity and mental calculations that transpired in this aerial barroom brawl left pilots completely drained and ready for a cold one.

ARE YOU READY TO DO COMBAT?

If all this fun and excitement has "captured the flag" of your interest, consider organizing a similar event in your club. I think you'll be pleasantly surprised at the enthusiasm you'll find, even among the thermal fliers! There are slope combat ships available from mail order companies and/or direct buys from cottage industry manufacturers. Heck, there's really nothing to these tough birds—design your own, hot wire it from white foam, cover it in packing tape and get out to the slope!

Bill Forrey, 3610 Amberwood Ct., Lake Elsinore, CA 92530; (909) 245-1702. MB

PETER WESTBURG'S SCALE VIEWS



Super-accurate aircraft drawings. Use for scale documentation and/or for developing model construction plans. All drawings are 28x40 inches border-to-border, and are scaled as listed below:

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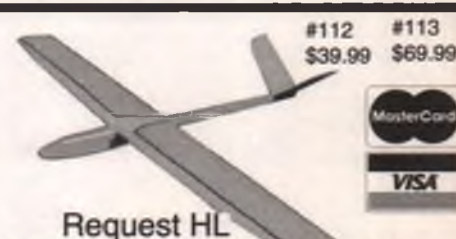
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INTER-EX '95

"The Meetingpoint for Peculiar Modelers" is how our Dutch reporter describes this most interesting and unusual meet. We need something like this in the U.S.!

INTRODUCTION

By MB's editor

We wish to thank our Dutch correspondent, Theo Gordijn, for his report on the two-day Inter-Ex '95 meeting in Europe. We've actually had this article in house for some time now, waiting for an opportune time to run it. Fortunately it's the sort of thing that's as interesting to read now, several months after the fact, as when it first took place.

We asked Theo to concentrate his efforts on detailed photo captions, but we've also excerpted from his cover letter a few paragraphs that explain the philosophy behind this unique meet.

By Theo Gordijn

Theo also sent along a copy of the judging guide, which is included here.

For U.S. modelers who have never heard of Inter-Ex, this is THE premier gathering of modelers who like to experiment, who enjoy the challenge of taking an intriguing, sometimes never-before-tried idea and then making it work. Here you see all manner of unorthodox flying machines—canards, flying wings, birds, scale replicas of man-carrying aircraft designs (many of which pre-date the Wrights), and more, with all types of propulsion systems. It's strictly a non-competitive

event; there are various categories set up, but the winner in each, as determined by a panel of judges, is not necessarily the one that turns in the best flight performance.

Inter-Ex 10, hosted by the Modellvliegclub in Nederweert, Holland, attracted a total of 68 modelers from six different countries; total number of models entered was 90. Inter-Ex 11, which promises to be even bigger, will be held this year on August 10-11 in Mengen, near Ostrach in southern Germany, close to the Swiss border.



■ ABOVE: One of the most interesting models at Inter-Ex was the 1/3-scale Horten XII by Eric van den Hoogen and Aad van Sorgen. Spans 210 inches, wing area is about 43 square feet, flying weight is 35 pounds. Power comes from two Keller 240/5 motors geared to a single shaft, running on 40 cells and drawing 80 amps apiece. Features homemade pneumatic retract and electronic speed controls. An excellent performer, it took the award for Best Flying.

■ RIGHT: Close-up of the beautifully built servo-operated folding prop mechanism on the Horten XII. The one and only H-XII was built in 1944 as a two-place trainer for the H-VII tailless fighter, but was never equipped with its intended 88-hp DKW engine and was flown only a few times a glider.



WHAT IS INTER-EX ALL ABOUT?

"We see at Inter-Ex modelers who are often real 'loners' in their own club or completely on their own. They don't like to compete and are often not interested in winning. They just want to show what they (can) do, a bit modestly proud of success and not going to pieces when the project fails partly or completely. It often leads to a new, better idea. Lack of success can be discussed with friends and unknown modelers who might have the answers or can be told what does not seem to be a good idea.

"Talking to English modelers who saw my photos, they thought that 'continental' European modelers are more skillful, daring, and clever than the English. *I don't agree with that!* The point is that only Inter-Ex offers a *no-competition* meeting where results are only part of the game. That is what lures those different (sometimes shy) modelers to come out into the open.

"Praise to Jupp Wimmer who realized this and started the experimental get-together in 1984. When in 1986 three Dutch blokes (including me) showed up, the idea came to make it an international event and the name Inter-Ex was chosen. At that time it still was a bi-annual event.

"To prevent it from becoming a typical German event we chose to have it alternating between Germany and Holland. At first the German locations were close to Holland, but in 1995 a location was chosen in southern Germany to make it more convenient for more mid-Europeans to attend. That means that in even years we, from Holland, have to travel farther, but it does not stop us."



■ ABOVE: We don't know whether to class English modeler Steve Webb's "Thoth" as a tailless biplane or a very short coupled tandem wing aircraft. Regardless, it flew well, is electric powered.



■ LEFT: Of the nine entries in the Flying Creatures class, Fred Ludwig's Pteranodon Sternbergi was easily the crowd favorite. Spans 130 inches, weighs 138 ounces ready to fly and is powered by a 12-cell electric system geared to a 28x18 prop mounted at the rear of the body. Construction is all wood with paper covered flying surfaces. But here's the best part: Inside the body is another electric system whose function is to make the wings flap up and down at 48 cycles per minute! RC controls consist of ailerons, elevator, motor, flapping wings, opening and closing the beak, and sound effects. Must be incredibly realistic in flight.

WHO DOES THE JUDGING, AND HOW DO THEY CHOOSE THE WINNERS?

"The judges at Inter-Ex are modelers who have a broad interest in a wide scope of modeling. Because a fair comparison of 'apples and pears and cats and cows' is impossible, the following handout was given to the entrants and judges at Inter-Ex '95":

JUDGING

An important part of judging is evaluating new ideas and structural innovations, as well as the way these are applied in the models. Then the result: How does the model perform (behave) in flight?

Consider: When a model does not fly perfectly, the experiment can still be a success!

Essentials:

1. The idea; innovation; originality.
2. Execution of the project, design and finish.
3. Flying shall be smooth, suitable for the type of model design.

Fair judgment is possible after talking to the designer/builder(s). A jury of about 10 "semi-experts" judges as many projects as possible. Each of the three "essentials" is rated between 0 (really poor) and 9 (excellent).

You may be asked questions like:

1. How does it rise? How does it stay up?
2. What makes it go?
3. In which category/concept/type/class does this creation belong?
4. What makes it special, what is different?
5. What is (so) new in *this* model?
6. How does it fly? Why not? Etc., etc.

The question "What is an experimental model?" should be the key to this judging. However, if this fails, still every serious experimenting modeler should be welcome to an event like Inter-Ex. This is what friendship among airplane addicts commands. Pre-selection by the organizers is not to the benefit of the case.



Siegfried Heerlein took the award for Best Idea with his "Senkrechtsstarter" (vertical takeoff aircraft), a twin-engine vectored thrust model he's been developing for some time now. Model spans 6 feet, weighs just under 11 pounds, is equipped with two K&B 7.5s. This photo was actually taken at last year's Inter-Ex meet, as our author's '95 photos didn't turn out.

"Strumento" is the name of Jupp Wimmer's graceful biplane glider, a 10-foot span soarer that can also be flown with a .10 engine mounted at the leading edge of the upper wing. Wing loading is only 6.7 ounces per square foot, making it a real floatin'. Note the geodesic construction and natural clear finish, a trademark of all of Jupp's models.



Noel Remers of Belgium flew a scale model of the Rutan Solitaire canard sailplane using a hinge-assisted takeoff. Gas engine can be shut down and retracted, then extended and restarted in flight by RC.



A naturalist's delight! An unidentified builder put together this four-motor job from disposed plastic bottles and scrap foam. Wing was covered with paper using wallpaper paste. Uses no wood, no paint, no solvents. Four Speed 400s.



Just for laughs, Helmut Siebarth put together this flying air mattress, which was deflated between flights.



The ultra-light Suppenkasper by Stephan Delch spans 58 inches, can be flown either as a hand-launch glider or as an electric (7.94 and 14.3 ounces respectively) simply by swapping front ends. Features a homemade Rx and speed control. Typical flight duration with electric power is 45-60 minutes.



■ LEFT: The AMA Dart was the inspiration for Arthur Leeuwangh's 8-foot-plus "Fold-It-All," so named because it all folds up and fits into a tube 3 inches in diameter by 42 inches long. A good flier although very slow, uses a seven-cell Graupner electric power system.

The "Speedcanard" is the German equivalent of the Rutan Long-Eze, features the same basic layout and retracting nose wheel as the Long-Eze but has a cleaner, rounder fuselage. This four-stroke glow powered model is the work of Dutch modeler Peter Stultjens.



THE EVENT THAT INITIATED ME INTO MODELING

All of us get involved in modeling in different ways. Our author recalls that it was a promotion by a non-aviation company that got him started more than 60 years ago!

By Stephen E. Kanyusik

There is much talk these days on how influential the heroes of today are on the youth of America. However, some of the talk rightly points out that it's the negative behavior of some of these so-called "heroes" that has the most influential effect on youngsters.

I can reflect back on my youth on the real heroes that were making a definite mark on me. They were the early aviators that were in the news. To this day, Lindbergh's crossing the Atlantic was the most memorable to this six-year-old! Then lowly, others were impressed onto my mind. Post and Gatty, Jimmy Doolittle and Roscoe Turner and Speed Holman at the Air Races! The Gee Bee Racer with Benny Howard's string of airplanes, Pete, Ike, Mike, and the Mr. Mulligan! There are

many other names that are faded into my memory tapes that could be mentioned. Howard Hughes started with the movie "Hell's Angels," which he followed by his speed flights with the Hughes Racer and the Around The World flight in his Lockheed twin-engine transport. Then there were the female pilots—Jacqueline Cochran and Amelia Earhart were on the forefront.

My start in modeling was with a plane that cost a couple of cereal box logos. There was this James Cagney and Pat O'Brien movie, "Devil Dogs of the Air." The Quaker Oats Company of Chicago was offering, among other things, a flying model kit of the early Vought V-65 Corsair biplane that was featured in the movie. The kit was actually produced by Allied Industries, "Manufacturers of Quality

Model Airplane Construction Kits." The cost was four Quaker or Mother's Oats trademarks, or one trademark and 10¢. I went for it! When I received the model, it was like some special gift.

I had some difficulty trying to assemble it, but eventually it was completed. I can tell you that my mother was very happy when it was over with. I built it on the dining room table—there were glue stains left behind when I was finished. This assured me of a space in the basement for my model building. My dad obtained a used roll-top desk from a Mr. Holmes, who was an executive at the Tube Works in McKeesport, and set it up in the basement—



LEFT: It was over 60 years ago that our author built a Vought V-65 Corsair biplane—his first kit-built model—offered as part of a promotion program by the Quaker Oats Company. Recently he got hold of a set of the original Allied Industries kit plans and built the one pictured here, this one strictly as a static display model. He readily admits that his 1935 model didn't look anything like this one! RIGHT: Close-up of the nose and dummy engine detail on the author's nicely built recreation of the Corsair biplane.

it served as my "special spot." I built the Megow, Comet, and the spendy Cleveland model kits there. We had our model club meetings of the "First Pursuit Group" down there. No girls were allowed to spy on us.

Recently, I tried to find more information on the promotion of the model. I wrote to the Quaker Oats Company, but they had nothing in their files on it. Then I wrote to Jim Alaback in San Diego, California, and he suggested I write to Walt Grigg in Orlando, Florida. Bingo!—Walt had copies of the original advertisements. He sent me two color copies of those offerings. In one, there are Jimmy Cagney and Pat O'Brien extolling how well they feel after stoking up on Quaker Oats for breakfast. The other ad, reproduced here, shows the premiums offered for the Quaker Oats logo—Devil Dog pins, helmets, goggles, and Devil Dog rings, in addition to the Corsair kit.

For me, the real clincher came at one of the recent Cloud Busters meetings, when Don Campbell brought for the Show and Tell segment of the meeting a model of the Quaker Oats Vought Corsair biplane—the igniter of my model building! Don also still has some of those

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Copy of the original Quaker Oats ad showing the premiums that were being offered in conjunction with the just-released Jimmie Cagney movie, "Devil Dogs of the Air." The offer expired May 16, 1935.



Four members of the First Pursuit Group (the model club that met in the author's basement workshop) on a trip to the Allegheny County Airport in the 1930s. From left: Ed Usko, George Babrak, Steve Kanyusk, and John Lepiak in front.

other old Quaker Oats giveaway premiums. Some guys are just lucky!

In the summer of 1993 my wife, Pearl, and her sister, Martha, who

lives outside of Cleveland, Ohio, and I were treated to a couple hours' visit at the Cleveland Model Supply Company—or what is left of it. On the second floor of a building on Detroit Avenue in the western part of



In 1983, the author, accompanied by his wife, Pearl (left) and her sister, Martha (right), visited Ed Packard of Cleveland Model Supply and listened to his stories of modeling history in years past. It was 56 years earlier that our author had first visited this revered model company on his way to the 1937 Cleveland Air Races.



■ LEFT: A small part of Ed Packard's vast collection of Cleveland kit boxes. Today, vintage model kits like these, complete and in top condition, bring good money from collectors.
 ■ RIGHT: Now 72 years of age, our author is still turning out some neat models, both of the flying and non-flying variety. This static scale F-4-F Wildcat was made for a recent U.S.S. Ranger CV-4 reunion rally.

Cleveland, we met with Ed Packard. Ed has been in the modeling world since 1919. I brought along a one-half size model of the last model that I made prior to my entry into WWII. It was the Cleveland Cloudster, my first gas model. The time we spent with Ed brought back many fond memories for me.

For example, in 1937 I went to visit my cousins in Cleveland, with the purpose of seeing the famous Cleveland Air Races. My cousins, Nick, Steve and Bill, and I got on the streetcar to go out to the airport. However, on the way we made a detour; we stopped off at Lorain Avenue and entered the holy place, the Cleveland Model Supply Company. Exceptional models of museum quality construction were on view. I bought a dwarf-size P-26 for myself. It was a spendy Kit D-60 for the price of 85¢. That was a third of the price of the Greyhound bus ticket from McKeesport, Pennsylvania to Cleveland, Ohio!

Cleveland model kits are still revered by many modelers—mostly senior citizens who can afford to purchase the kits from collectors. I usually will copy the printwood so as to not destroy the kit. Someday, I want to build the Cleveland Boeing B-17. I believe that it has somewhere around 400 parts that must be cut out before one can assemble that spectacular plane.

Now that I am living in the Detroit, Michigan area, I have become associated with a bunch of super modelers. The Cloud Busters are museum quality model builders—and they fly! Cloud Busters members are the most helpful modelers one would ever hope to be associated with. Got a problem with a model? Need



Our author is thoroughly impressed with the models built by members of the Michigan-based Cloud Busters club, to which he belongs. He submitted these two samples of their work: the gorgeous Grumman TBM built by Fred Bruning from his own plans, and a close-up of the WWI Roland DV16 that Paul Boyanowski built from Bruning's plans. Paul generated the lozenge pattern on a computer, printed it directly onto the superfine Japanese lacquer and colored in each block by hand.



any plans? Want some help in making a canopy? Just mention it, and you've got it!

Back in 1935, I got into modeling via a promotion by a non-aviation company. This event led me down a wonderful journey—and at 72 years of age, I still get a thrill from it! There isn't a plan that I don't like.

Just to spread them out on the living room floor and study them when the night is old and quiet . . . that's relaxing!

You know, if there are no more heroes for the kids of today, they can't follow them in their dreams. It's kind of sad to come to that place in life. I liked my heroes! **MB**



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BUILDING YOUR OWN NICD BATTERY PACKS

If you fly electric, sooner or later you're going to have to assemble your own battery packs—not exactly an enjoyable task for most, but one that can be eased considerably by following the steps and advice outlined here.

Electric power enthusiasts know that while the motor is the heart and soul of your aircraft, the battery pack is its lifeblood. And a battery pack is like your kid brother—when it's good it is very, very good; and when it's bad it is horrid.

Although electric power is more popular than ever, there are still just a few basic battery pack configurations readily available for sale. If you fly only seven-cell planes you'll have no problem finding a pre-assembled flat or hump-style pack of the cell capacity you want. However, if you want to fly with more cells, or have a small or otherwise awkwardly shaped battery compartment, you'll need a custom-built pack. SR Batteries and New Creations R/C are two companies that come to mind as ones that can supply custom pre-assembled packs of any cell count and in any configuration you want. However, in keeping with this column's emphasis on do-it-yourself projects, this month we'll show how to build your own battery pack.

Not only is it worth the trouble to make your own packs, it is deceptively easy. This method was first shown to me by Steve Neu as part of our electric flying club's monthly program, and it has served all of us well for many years.

Photo 1. These are the tools needed to build battery packs. Pictured are an 80-watt chisel-tip soldering iron (a hardware store item) and holder, liquid soldering flux (the non-corrosive type for electronics work), 60/40 rosin-core solder, wire braid, the battery cells, different types of battery jigs (made from scrap wood), 120 to 220-grit sandpaper, razor blade, metal file (to clean the soldering iron if necessary), needle-nose pliers and diagonal cutters. The 60/40 solder refers to 60 percent tin and 40



percent lead—other alloys are available but 60/40 is by far the most common for electrical work.

Not shown in the photo is the most important tool for building battery packs: safety goggles. Molten solder and flux can splatter when performing this battery soldering technique so be sure to wear these when you work. It's really hard to fly an RC aircraft if you're blind!

Photo 2. The first step in building a battery pack is to prepare the cells for "tinning" (i.e., adding solder to the ends of each cell prior to joining them into a pack). Use the sandpaper to scratch up and thoroughly clean the positive and negative contacts of each cell; don't touch the ends with your fingers after they've been

cleaned. This photo shows four of the seven cells prepared for tinning. Now is also a good time to point out that the battery's button end is the positive and the flat end is the negative.

Photo 3. The liquid flux is applied to the positive battery terminal of the cell; a drop is all that's needed. When heat is applied, the flux boils and cleans the metal so the solder will fuse onto the battery terminal. I normally apply flux to the positive end of all of the cells first, then apply the solder (shown in photo 4). Then I flip the cells over and do all of the negative terminals.

Photo 4. All seven cells are lined up like toy soldiers to have their terminals tinned. Apply the tip of the soldering iron to the



battery terminal, let the flux boil off just for a second, then touch the solder to the terminal, not the iron. The solder will melt and flow onto the battery terminal. When there's a small blob of solder, remove the iron quickly. The tinning process should take only two or three seconds; much more and you could damage the cells with excessive heat. If you've never soldered before, it would be a good idea to practice on old battery cells or small pieces of flat brass.

Photo 5. Close-up view of a tinned cell contact. A shiny blob of solder indicates a good solder joint; a dull blob is evidence of a bad or "cold" solder joint. The solder blob will make it quick and easy to join

the cells to one another.

Now that each battery end is tinned, it's time to build the first battery stick. (This particular pack will have two parallel sticks of three cells each plus one cell on top.) Three cells are placed on the end-to-end soldering jig—*make sure the polarity is correct!* Make sure the round end of the soldering iron is clean (use a wet sponge to clean it off if necessary—if that doesn't work, use the metal file or scrub it with a wire brush, then melt a little solder on the tip).

Photo 6. Push the cells together so that the tip of the soldering iron touches both battery terminals simultaneously.

Photo 7. When the solder has melted on both batteries (a couple of seconds at most), remove the soldering iron and gently but quickly slide the cells together while the solder is still molten. A gentle push is all that's needed—slapping them together too hard will splatter solder. Let the joint cool for several seconds.

Photo 8. Pick up the cells you just joined and hold them up to a light to inspect the joint for quality. This photo shows the pack already built, but it illustrates a good end-to-end joint: the solder blobs that were tinned on the cell ends have fused together. If the cells are "slapped" together too hard, little drops of solder will separate from the



main blob and harden on the perimeter of the cell. These blobs will be visible when you look at the joint this way. If you see these little blobs, it means there is less solder on the main joint and the connection may not be optimum.

If you suspect you have a bad end-to-end joint, just grasp each cell in one hand and snap them apart like you would a wooden stick. As long as you do this within a few minutes after you've soldered the cells together they are easy to snap apart.

Photo 9. Here I have built the two three-

cell sticks, have temporarily taped them together and placed one end in my side-by-side jig. Again, make sure the polarity is correct—i.e. the positive terminal of one stick is next to the negative terminal of the other. First tack the wire braid to one of the sticks; easily and quickly done since the battery ends are already tinned. Cut the braid to length and tack the other end to the other stick.

Photo 10. Now go back to the first side and add more solder so that it flows onto the cell and is absorbed into the braid. Do

it quickly so as to not overheat the cell. Let that side cool, then solder the other side.

Photo 11. Flip the sticks over, brace them so they stand upright and tape the seventh cell to the sticks as shown. *Do not allow the wire braid to touch the battery stick terminals until you are absolutely sure of the correct way to wire them!* Inadvertent contact across the two long sticks will short-circuit all of the cells—your batteries will go up in smoke and your workshop may go up too. Use the same procedure as before to attach the braid to the last cell.

Photos 12 and 13. All that's left now is to add the connector wires. Be sure to use color-coded wire (the most common colors are red for positive, black for negative) and make *absolutely sure* you get the polarity correct. The wires are soldered just like the braid—tack it down first, let the cell cool, brace the wire so it remains still, heat the joint and quickly add more solder until you get a good joint.

The final step is to add connectors (I prefer Sermos) to the wires and insulate the ends of the pack; I like to go the economy route and just use vinyl electrical tape, but you could also encase the entire pack in the colored shrink wrap available at virtually any hobby shop that sells RC car stuff. The important thing here is to insulate the bare contacts to prevent short-circuits. One time I went completely brain-dead—I put a finished but unprotected battery pack on a postal scale with a metal platform. Pow! So just remember that a "finished" battery pack isn't really finished until it's been properly insulated.

Of course, you aren't limited to simple seven-cell packs with this method of construction. The only limit to the physical configuration of your cells is your imagination and the size and shape of your fuselage. Time to warm up the soldering iron!

Please send your comments and suggestions to me at 6462 Sunny Brae Dr., San Diego, CA 92119; (619) 463-4453 between 8 and 5 Pacific time, Monday through Friday) or via e-mail at 74164.3237@compuserve.com. MB

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●The "New and Improved" MicroPace

While some modelers seem to think that the electronic trim system is a giant leap for mankind, there is still some question as to their final acceptance. Since my last word about electronic trims (June '96 MB), I have read yet more negative remarks about them, mostly that some RCers have problems adapting to them and thus don't like them.

Also since that time, I have sought out and talked to fliers using electronic trim equipped transmitters, asked for opinions and have come to a few conclusions. But first, for those who have not yet encountered this advanced feature, a little review.

A couple of RC systems on the market—the Hitec "Flash" four- and five-channel series and the new eight-channel Futabas—do not have traditional transmitter trim levers. Instead, they have spring-loaded switches that have the same trimming effect, but do not themselves move off center. They are similar to the controls found on consumer electronic products to change channels or volume. The electronic trims used on the Futaba and Hitec transmitters include a "beep" that sounds for every movement of the servo as the



In place of the standard ratcheted trim levers, Futaba's new eight-channel systems use spring-loaded, self-centering switches to add servo trim inputs electronically. The Hitec RCD "Flash" series radios use a similar setup. Electronic trims are receiving mixed reviews in the field—see text.

switch is depressed.

In my tests of the Hitec system, it took three "beeps" to move the servo arm 1 degree—a far finer trim than is possible with conventional ratcheted trim levers. We all know how difficult it can be to add "one click" on a conventional trim lever without over-trimming; why then is the more precise electronic trim system not more enthusiastically received?

After my discussions with those flying them, I feel there are two main reasons. The first is that some people simply do not like change, possibly because they don't feel they can cope with whatever the new thing is. This gives root to remarks like "If it works, don't fix it," which is not bad advice, except that often, "improve" would be a more accurate term than "fix."

Reason #2 has to do with the airplanes and pilots. In the first group, there are RC airplanes that you point, and RC airplanes that you pilot! And in the second group, there are those who point RC airplanes, and those who pilot

them. Another way of stating the latter is that there are those that fly the airplane—while others actually fly the transmitter. And this, to me, makes the difference whether one likes electronic trims or not. The transmitter flier's thoughts seem to be, "My transmitter needs two clicks of left trim to make my airplane fly straight"; by contrast, even though he's making the same mechanical inputs, the airplane pilot's thoughts seem to be, "I need some left trim in my airplane to make it fly straight."

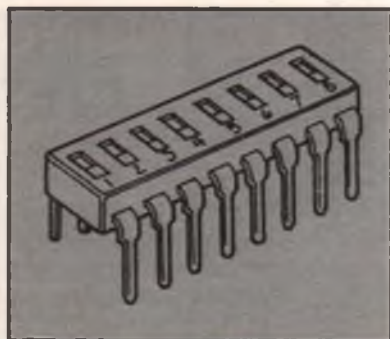
Though I personally think that electronic trims are a great improvement and the way of the future, I never forget that I also predicted the "Ugly Stik" would never be popular (most are flown by "pointing"), so I will admit to making mistakes. And I am reserving space in future columns for those of you who have flown with electronic trims and may have differing opinions.

MODEL AIRCRAFT TERMINOLOGY

I see in the latest (1996/1997)



The Ace MixMaster is a small, lightweight unit that connects between the receiver and servos and adds to a basic radio the mixing found in more complex systems. Measures 1-7/16x1-2x1-1/16 inches, weighs 8.8 ounce and retails for \$39.95. Further discussed in text.



IC devices are also known as "DIP" switches because they are built into a Dual In-Line Package used to standardize many electronic components; available in many switching arrangements.

AMA Competition Regulations that AMA is making an attempt to standardize some of the modeling terminology that we see in print every day. For example, we are no longer to refer to the "rulebook," but to the "rule book." "Wingtip" has become "wingtip." Incidentally, the spell checker dictionary in my word processor approves rule book but not wingtip!

Wouldn't it be nice if another body that effects our everyday RC life, the RCMA (Radio Control Manufacturer's Association), made a similar effort to standardize the phraseology as applied to RC systems? Just think, we could remove such misnomers as "PPM," "cycle," and "ATV," to name just a few, and replace them with words that are correct or more applicable to airplanes or the task being performed.

THE MICROPACE REVISITED

No more soapbox (or maybe it should now be "soap box") for this month! Instead, I'll tell you about a definite improvement I learned about lately that has to do with the MicroPace, the NiCd battery analyzer . . . well, "cycler" if you must . . . that was described in the May 1995 column. The MicroPace differs from other similar devices in the manner by which it displays the measured capacity of a NiCd battery, but is similar in that it first discharges a previously charged battery, charges it, and

ultimately switches to a trickle rate at which the batteries can be left connected indefinitely.

The new and improved MicroPace now features an "auto cycle/analyze" function through which the battery in question goes through two discharge/charge periods, without you having to tell it to "go" the second time around. This seems like a worthwhile idea, especially for new batteries or those that have remained idle for long periods of time—or anytime you just want a little extra assurance.

A device of this type is something no serious RCer should be without. The updated MicroPace is available at the original price of \$59.95, with \$4 S&H and 6 percent sales tax if you live in Michigan. Complete info from MicroPace Inc., P.O. Box 648, Northville, MI 48167; (810) 347-7654.

AN ITEM FOR MODEL BUILDERS

One more deviation from the usual electronics subjects follows, but I'm sure that if you are a *real* modeler, i.e., one who builds his own airplanes, you will appreciate the advice I'm going to give you.

Said advice is to send your name and address to

Woodworker's Supply, 5604 Alameda Pl. N.E., Albuquerque, NM 87113-2100, and ask for a copy of their free catalog—155 pages of illustrated and clearly described tools and supplies, most of which is actually intended for working with larger hunks of wood than we normally do, but which still includes a lot of interesting and useful hand and power tools we can all use. For example, I now buy from them the best sanding discs I've ever used. After years of struggling with such discs and the messy glue with which they attach to the sander's faceplate, only to have them buckle and loosen in just weeks, I ordered some pre-glued resin-bonded discs from Woodworkers. They have now been on for months, without no sign of the old problems. The catalog includes all manner of other types of sandpaper, clamps, glues, saws and other cutting tools, etc., etc.

Woodworker's Supply has shipping points not only in New Mexico, but in Wyoming, New Hampshire and North Carolina, so that things get to you cheaper and faster. If you build, you need this catalog!

ACE'S MIXMASTER

Ace R/C continues to show up with new products. One item of interest to owners of the more basic radio systems is the

Ace "MixMaster," a name that old-timers will associate with mother's baking days. In this case, though, the MixMaster provides a completely different service—that of adding mixing functions to RC systems not so equipped.

This small, lightweight device becomes part of the airborne system, being connected between the receiver and the two affected servos. By making the proper settings to a series of internal DIP switches, the MixMaster can be programmed to perform any of various mixing functions.

Basically, two types of mixing are possible with the MixMaster. One is referred to as bidirectional, in which activating either of the two control sticks operates both servos in the proper direction and degree. Examples of bidirectional mixing are elevons, flaperons and V-tails. The other mixing mode is called unidirectional, in that one stick motion causes both servos to move, but the second stick will only cause movement in its primary servo. An example of unidirectional mixing is coupled ailerons/rudder, where moving the aileron control adds a predetermined amount of rudder but moving only the rudder stick does not move the ailerons. In both cases, not only the type of mixing, but the degree—i.e., the ratio of one to the other—can



The original MicroPace NiCd battery analyzer, which Eloy wrote about in his May '95 column, has now been updated; see next for details.

be set by the user as required.

Interfacing the MixMaster into the other airborne components is done with three-pin female servo connectors. For some applications, a Y-connector is necessary—simple instructions are included, as are enough Molex crimp-on connectors to fabricate most any adapter you may need. Instructions are included on how to assemble the connectors and how to crimp on the female pins. You will probably be tempted to solder them, which is acceptable, but I highly recommend that you heat sink between the solder end and the opening with a pair of needle-nose pliers or forceps. Otherwise, the whole pin will become hot enough to cause it to lose its

temper, resulting in a loss of contact pressure when it is mated to its other half.

As with all of Ace R/C's products, the instructions are complete in every detail, and profusely illustrated. If you can read, you can't go wrong. Ace products are available from major hobby shops or direct from Ace R/C, P.O. Box 472, Higginsville, MO 64037-0472; (800)322-7121.

"DIP" SWITCHES?

Some of you will be thinking, "What the heck is he talking about?" No, we're not referring to that stuff you stick your chips in; actually the reference is to an electronics component package than to a particular type of switching sequence. The term

actually means "Dual In-line Package," being the familiar IC (Integrated Circuit) many-legged electronic part now so common. The pin spacing, both lengthwise and across, as well as the pin dimensions themselves, are standard all over the world, so that a PC board designed here in the U.S. will accept a DIP package made by any company anywhere. Don't you wish we had that kind of standardization in the RC industry? Whoops, I got back on that soapbox again, didn't I?

But again, I don't intend to hog it . . . the soapbox, that is. It's available for your use also.

Eloy Marez, 2626 W. Northwood, Santa Ana CA 92704. MB



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Wonder how it flies? Wonder IF it flies? Your first adrenalin-pumping, action-packed, speed-blurred WONDER flight will answer those questions in a big hurry! The WONDER is best described as a very fast, go-where-you-point-it, turn-it-quick-or-it'll-be-gone kind of plane designed for hot-thumbed R/C pilots. With an .09 or .10 size engine, the WONDER is actually a very nimble, aerobatic, smooth flying sport plane, but with a snarlin' .15 or .19 up front it's a hand-launched hot rod! Landings are no sweat thanks to the thick symmetrical airfoil and the light wing loading. C'mon, shake things up and take a walk on the wild side of sport flying - fly a WONDER!



KIT FEATURES:

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Full-Size Plan Sig Easy Hinges
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Complete Hardware Package

ENGINES: .09 - .19
WINGSPAN: 37-1/2 in.
WING AREA: 338 sq. in.
WEIGHT: 26 - 38 oz.
RADIO: 2 - 3 Channel
(Aileron, Elevator, Throttle)

CAUTION: The Wonder is not recommended for beginners or the faint of heart. It's fast!



PRODUCTS IN USE

■ By Ben Chiu

THE "TOUCAN" FLYING WING SLOPE GLIDER FROM DCU

If your tastes in model design lean toward the unusual, take a close look at this forward-swept tailless slope glider. Fast, maneuverable and virtually stallproof—just the ticket for intermediate pilots and medium power slopes!

The first time I ever saw a forward swept wing tailless airplane, adjectives such as "radical," "awkward" and "unstable" crossed my mind. It certainly *looked* neat, but it was obvious that such a configuration could never be made to perform well, if at all. Boy, was I wrong!

FSW (Forward Swept Wing) designs, although they may look futuristic, have been around for many years. In fact, the first manned airplane to actually leave the ground was an FSW design. In 1873, French naval officer Félix Du Temple became airborne after running down a ramp in his FSW aircraft but he could not achieve sustained flight. Many other FSW designs followed. The most famous modern FSW aircraft is the Grumman X-29, an early '80s experimental aircraft that validated the FSW design.

Why FSWs? Put simply, FSWs eliminate tip stalling and reduce drag. Glen L. Spacht, former Deputy Director/Development of the X-29 Program, found in wind tunnel tests that FSWs achieved drag figures lower than the best attainable from any conventional aft-swept wing. No tip stalling and less drag? Sounds like the perfect wing design to me! It's no wonder that DCU, one of the most innovative manufacturers in the model industry, chose to kit Larry Renger's high-performance "Toucan" FSW slope glider, which was previously featured in *M.A.N.* as a construction feature.

THE KIT

The Toucan features a balsa sheeted foam wing and a mostly balsa fuselage that has lite-ply bulkheads and 1/32 ply doublers. While unpacking the box, I was surprised to find a very low parts count,



The author's review model photographed against an outer space background to emphasize its futuristic appearance. Model was covered using white, neon red and metallic blue 21st Century film from Coverite. The striping tape is from Carl Goldberg Models.



Designer Larry Renger has built several Toucans, is currently flying this basically stock model.

which means quick building—I like that! The Toucan typically goes together in about 15 to 25 hours, depending on the covering method you use and your

building experience.

Supplied in the kit are the wire-cut white foam wing cores in their corresponding beds, all required balsa sheeting and strip



The canopy/nose is cut free from the rest of the fuselage after the fuselage has been built and shaped. Use of balsa triangle stock in the corners lets you carve and sand the fuselage to a nicely rounded cross-section.



Bottom view reveals the aileron servo installation—in Ben's case, JR 341 micros. Note also the plywood wing jolmer, which is flush with the bottom of the top skins and flush with the bottom of the bottom skins.

stock, and a bag of machined/small parts. The photo-illustrated instruction booklet contains a scaled-down plan sheet. I'm used to working from full-size plans, but these worked fine.

The kit comes devoid of hardware. This isn't such a big deal because the only hardware needed is four Robart 1/2-inch ball link control horns, one Sullivan split elevator connector, flexible pushrods, hinges, and a servo Y-harness if you don't have a computer radio. You probably have most of this stuff lying around anyway.

CONSTRUCTION

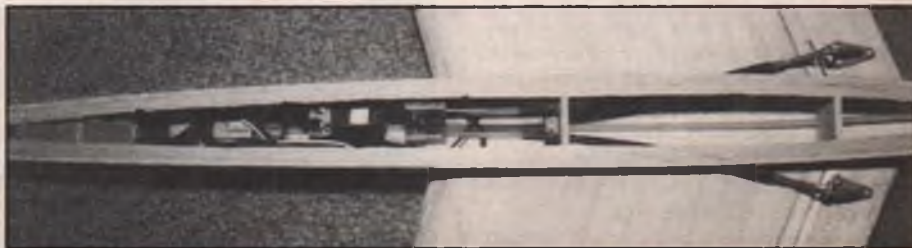
There was a small correction note included in my early kit that instructed me to cut out the wing spar slot before starting construction. Simple enough. I just stacked the wing cores and saddles together, lined them up, and cut out the slots. I used a fine-tooth hacksaw blade and was finished in short order.

There are a total of six 1/16 balsa sheets supplied for the wing skins; three of them edge-glued together and then split diagonally form the two top skins, ditto for the bottom skins. Be sure to check and plan ahead carefully before making the diagonal cut, as it's important that you follow

the instructions and make the grain of the skins parallel with the wing leading edge.

The instructions advise against using spray adhesives to bond the wing skins to the foam cores and instead recommends using 3M #465 double-sided adhesive tape, Sig Core Bond or Sorghum. Being the rebel that I am, I went ahead and used the 3M Super 77 spray adhesive that I've grown to love. (I did check for compatibility with the foam first and found no problems, so I pressed on—pun intended!)

After cutting out the servo pockets, spread some 30-minute epoxy all around the inside of the hole—try not to get any in the hole for the servo wire. This will make



The corner triangle stock hides some of the radio from view, but you can still see part of the radio battery, receiver and elevator servo. Note how the single pushrod from the servo is joined to two separate Gold-n-Rod pushrods via a Sullivan split elevator connector. Early Toucans were tried with electronically mixed full-span elevators, but did not perform as well as the current setup.

DCU'S "TOUCAN" SLOPE GLIDER

WINGSPAN 43 in.
WING AREA 278 sq. in.
FLYING WEIGHT 16.5 oz. as tested.
WING LOADING 8.29 oz./sq. ft.
ASPECT RATIO 6.65:1.
AIRFOIL SD8020 root, SD6060 tip.
OVERALL LENGTH 25 in.
RADIO Two channels required
(ailerons and elevators); optional third
channel for flaperon mixing. Three micro or
mini servos required. 270-mAH battery.
SUGGESTED RETAIL \$59.95.

Produced and distributed by DCU,
45 Steel Rd., Wiley, TX 75098; (214) 429-0440.

the whole area stronger and will provide a smooth, hard surface for the recommended servo mounting tape to stick to.

After completing step #14 in the instructions, I fit the aileron/elevator stock to the wing and sanded them even though the instructions don't have you do this until step #38. I did this because the fuselage will be later built directly onto a more or less completed wing assembly. Trying to sand and fit the aileron/elevator stock onto a 90 percent complete airplane would be awkward, so I chose to do it now.

The construction of the fuselage is a bit different from what most modelers are normally used to. You basically build the fuselage onto the wings. An extra pair of hands comes in handy as you juggle the bulkheads around before you glue them in. Most of the parts used in the construction of the fuselage are machine cut and pre-shaped.

COVERING

To cover and trim my Toucan I used Coverite's 21st Century Film. With this stuff, Coverite has turned the art of film covering into a science. When you follow the instructions and use a Coverite pocket thermometer, you'll feel like you can cover anything. This is a definite plus because covering the Toucan is a bit tricky, due to the fact that the wing is permanently attached to the fuselage.

The panel lines on my model were put



Larry Penger about to launch the #1 prototype Toucan on one of its early trim flights. This model used later, fully symmetrical airfoils and full-span elevators; current Toucans use an SD8020 section at the root and an SD8000 at the tip, and split control surfaces.

on with 1/16-inch Goldberg trim tape. It looks like a lot of time was spent putting on the panel lines, but it was actually very quick and easy to do because the tape sticks very well and goes around curves quite easily.

RADIO INSTALLATION

The Toucan requires three micro or mini servos. One is mounted in the fuselage and is used for the split elevators, the other two are mounted in the wing, one for each aileron. I used servo tape to mount two JR 341s in the wings and an Airtronics 94401 ball bearing servo in the fuselage. The receiver is stuffed in behind a 270-mAH battery. The radio gear is as far forward as I could get it, but I still needed another 1.5 ounces of lead to bring the CG within limits.

FLYING

I took the Toucan up to what the locals call the "Psycho Slope." (I'm not sure if the name refers to the slope or the people who hang around up there. If it's the latter, I guess that would make me one!) The winds are generally between 12-50 knots most of the time, but when I took the Toucan up for its maiden flight the winds were at a constant 25 knots.

Launching the Toucan is . . . well, awkward. The manual suggests gripping the fuselage with only your forefinger and thumb at the CG and "loft it gently into the air." Well, as you can imagine, "lofting" at the Psycho Slope was a challenge, to say the least. The first launch resulted in a quick dive into the ground. (In all fairness, the manual did state that I would "throw it into the ground about one out of three times.") On the second launch a nose block broke off upon meeting the ground. It was a clean break and was repaired easily.

At this point I decided it would be best to take the Toucan out to the cliffs over nearby Pismo Beach since the sand offers the softest landing area around. The wind was at a constant 25 knots again. I launched

the Toucan and it went almost straight down the cliff like a downhill skier, but I was able to pull it out and fly it around a bit. I found that even full up elevator trim wasn't enough to maintain level flight without also holding some back stick.

To get the Toucan to fly level, I needed to adjust the elevator to a full 1/4 inch up at neutral—quite a bit over the recommended 1/16 inch, but it worked. Later I removed 1/2 ounce of weight from the nose and the up elevator required to fly level decreased, but it's still not 1/16 inch. After adjusting the elevator, I can successfully launch the Toucan every time.

Even though I bypassed the "swing test" described in the manual, I advise that you do it. I think it would have saved me those initial launch mishaps.

I found the recommended amount of control throw (1/4 inch up and down for

both the elevators and ailerons) to be too mild for the amount of wind at Pismo. I increased them to 1/2 inch up and down for the ailerons and 3/8 inch up and down for the elevators, and found them to be just right.

So how does it fly? In a word, fabulously! The Toucan cuts the wind beautifully. And I still can't believe how slow I can make it fly and still have full aileron control! In fact, the Toucan will hover if you fly it into the wind. I can't make the Toucan stall. Inverted flight requires about 1/4 down stick, as do axial rolls. I noticed that my Toucan has a tendency to "twist" as it nears the top of a loop. Not a big deal because you can compensate with aileron, but it's annoying. At first I thought it was the wind, but after doing loops with one of my other slope ships, I'd have to say it's the Toucan. I checked the wings and they aren't twisted.

Now for the big question: Do you need a Toucan? It depends on the conditions you normally encounter and your skill level. If you usually only get enough wind to fly "floater" type gliders, forget it. The Toucan will fly in light wind, but it's not a floater and you'll be disappointed. On the other hand, if you're at least an intermediate builder/pilot and know a slope where you can fly medium power slopers, you need one of these. It's that much fun.

DCU has a winner here. If you meet the above criteria, run down to the hobby store and pound on the counter until they order you one! My only wish is that the Toucan was a bit larger. Could a Super Toucan be far behind? If DCU ever produces another FSW, especially with a fiberglass fuselage and a removable wing, you'll have to stand behind me because I'll be first in line to get one! **MB**



Ben finishes his review of the Toucan wishing for a larger version with a fiberglass fuselage and removable wing. Well, here it is, boys: Larry Penger's 66-inch Toucan is due to become a DCU kit soon, features a super-sleek glass fuselage and two-piece plug-in wings. Wing area is 570 squares, weighs about 30 ounces unballasted, and will retail in the \$150 range.

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releases cleanly, without damaging the color/adhesive layer or the covering surface underneath. And once it's in position, applying a little more heat will fully activate MonoKote's adhesive and create a fuelproof bond that starts tight and stays tight — even on seams.

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HANNAN'S HANGAR

BY BILL HANNAN

"Every child is an artist. The problem is how to remain an artist as he grows up."

Our lead-in quotation, by Pablo Picasso (1891-1973), quoted by Robert Spear, reminds us to maintain our creativity and imagination regardless of our ages.

FUN FLYING LEAF

Take a good look at that realistic-looking oak leaf in one of our photos. Obviously its builder, Wijnand De Joode, of Holland, has retained *his* artistic talents!

Powered by a Gasparin G-3 CO₂ system, the flying model is composed of two layers of condenser paper glued together and sprayed with appropriate colored ink. Thin aluminum strips function as "hinges" to allow all portions of the leaf to be adjusted for flight trimming. The model spans 175 millimeters, is 227 millimeters long, and has a total weight of 3.4 grams. A magnificent concept!

NASA NERF?

Are model gliders art? Per-

haps not, but designing them certainly is, as discovered by the Hasbro toy company when they decided to produce a series of Nerf gliders. These are made from a special soft foam so as to not injure children even if the toys are carelessly thrown. The difficulty was that the toys did not perform well enough.

Enter NASA, the aerospace agency, now offering technical services to private businesses.

According to a letter from Hewitt Phillips, and a front-page article from the *Newport News Hampton*,

the needed assistance. As Whipple put it: "Making a little plane fly at low speeds takes different skills than making a big plane fly at high speeds," and he knew just who to call.

Dave Robelin and Hewitt Phillips, both well-known for their model designs, are now retired from NASA, but remain available for consultation. Hasbro's toy parameters were quite specific and rather restrictive. No balsa, no adjustable parts—only Nerf foam.

The Hasbro people arrived with their foam prototypes, while the NASA folks

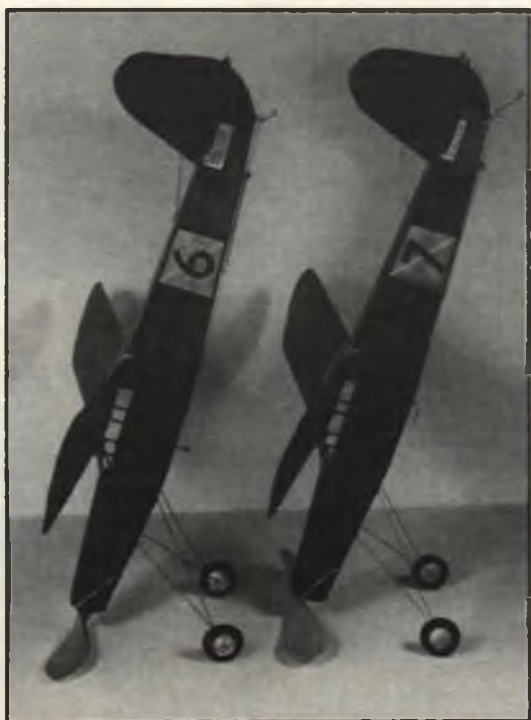
... Computers cannot determine exactly how a flying object will perform. As in model building, there are always details which must be resolved by intuition and experience, plus plain old trial-and-error testing.

Virginia Daily Press, Hasbro approached NASA about developing better flying toys. The initial contact was with aerospace specialist Gaudy Bezos-O'Connor, who brought in wind-tunnel expert Ray Whipple. Ray immediately understood what Hasbro was trying to achieve and suggested that model builders, not aerodynamicists, could provide

brought balsa gliders. The foam toys looked impressive but wouldn't fly. The NASA designs looked and flew well, but were not foam. Obviously a compromise was needed, and the two teams began building new models from the stipulated material. First tested indoors, then later outside, the sight of "Ph.D types playing like kids" attracted a fair amount of attention, however the desired results were eventually



We've all heard of the "falling leaf" maneuver, but how about a flying leaf? More info in text about Wijnand De Joode's unusual CO₂ model.



Two of seven Flying Aces Models constructed by Jim Alaback, of San Diego, California. Why no money? Answer in text.

achieved. So, four different flying foam toys should soon be appearing on toy shop shelves, complete with appropriate credit to NASA on their packaging.

MEANWHILE, ON THE WEST COAST . . .

A University of Southern California seminar was devoted to other types of flying objects, including the Wham-O Frisbees, Malewicki Can-o-SOAR-us, and other spin-stabilized things such as footballs.

It was conducted by Professor Peter Lissaman, who has been an important participant in such fascinating projects as the AeroVironment pedal-powered planes and semi-truck drag reduction devices, as well as model airplane engine propellers. Lissaman pointed out that the study of aerodynamics is as much art as science, and that computers cannot determine exactly how a flying object will perform. As in model building, there are always details which must be resolved by intuition and experience, plus plain old trial-and-error testing. Isn't that somehow reassuring? Our thanks to Lee Reynolds for sending us the *Los Angeles Times* report of the seminar.

INTERNATIONAL FLIER

The San Diego (California) Scale Staffel club conducts contests on a large field whose southern boundary is only about a half-mile away from the border of Mexico. On January 7, club member Jim Alaback lost a Flying Aces Moth, the fifth example he had made, and it was last seen heading over Mexico. Since the San Diego Orbiters had scheduled a contest at the same place two weeks later, Jim went home and built another Moth with a large "6" on its flanks. On January 21, after a couple of test-flights, the model made an official 2-minute max contest flight. The next attempt was also a max, but Jim had failed



Rick Dort, of West Linn, Oregon, used Siegfried Glockner's December 1982 Model Builder plans to build his fine F.R.E.D. Peanut. The full-scale VW-powered F.R.E.D. homebuilt was designed by modeler Eric Clutton, who now imports P.A.W. diesels from England—see his ad elsewhere in this issue.

to set the DT and the Moth vanished high over the southern border. Hastily pressing a Comet "dime scale" Puss Moth into service as a back-up entry, Alaback managed a third flight good enough to win the event.

Two weeks later, Jim had completed Moth #7 when he received a phone call from a border patrolman saying that his #6 had been found about 100 yards inside the U.S. boundary. Although exposed to the elements, including rain, the deterioration was relatively minor, and Jim soon restored the model to flying condition.

As near as can be determined, the Moth had flown well into Mexico, but encountered a wind change that returned it to the U.S. Thus the model had made a non-stop, round-trip international flight!

ERNIE WRISLEY

Longtime San Diego modeler Ernie Wrisley passed away during March at the age of 77. Wrisley was an exceptionally cheerful and proficient model builder, with interests in most facets of the hobby, including Old Timers, free flight scale and indoor. He was an active competitor in various categories and a frequent winner. One of Ernie's original designs,

the "Great Expectations" Bostonian, was published in the July 1981 issue of this magazine. We feel privileged having known him, and offer condolences to his family and many friends.

WHAT DOES AGE HAVE TO DO WITH IT?

Not much, when it comes to flying model airplanes, unless you allow yourself to think so. We receive numerous letters from people returning to our hobby after years of "abstinence," and most discover, after a period of readjustment, that the satisfactions gained equal or exceed those they experienced as youngsters.

Example: R.E. "Doc"

Nichol, of Tigard, Oregon, a noted model engine collector and aviation philatelist, had not flown control line for 30 years. Yet, when he was invited to take the handle of a profile stunt ukie recently, he simply hauled off and flew it! No problems and no dizziness either. Since it was a borrowed model, he didn't try inverted flight, but feels he could have done so. As he summarized: "... it is even better than riding a bicycle... I did it effortlessly... one truly doesn't forget... the old dog flies again at age 67. So I thought some of your readers might like to know... you don't lose your old flying reflexes."

NEW THINGS DEPARTMENT

• Dave Diels has added another kit to his line, a 1/24-scale rubber-powered Italian Macchi C.202 Folgore. Spanning over 17 inches, the low-wing WWII fighter is of traditional stick-and-tissue construction. The kit contains detailed plans, instructions, proof-of-scale three-view, printed sheetwood, stripwood, lightweight tissue, markings decals, plastic propeller, strip rubber and accessories. The cost is \$29 postpaid from Diels Engineering, P.O. Box 263, Amherst, OH 44001. Or, \$2 will bring a complete catalog



Ron Hummel, of Reno, Nevada, built this impressive Becker Jungmann from Walt Mooney's full-size plans in the March 1972 Model Builder.

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of this and other products.

•ScienText is manufacturing a complete kit for a 28-inch span Messerschmitt Bf-108b Taifun. Featured are full-size plans, balsa printwood, construction manual, stripwood, hardwood, Esaki covering tissue, decals and wheels. A brochure is available for a SASE, or send \$2 for a catalog of other kits and plans. ScienText, 48 Whitney St., Westport, CT 06880-3753.

•Charles F. Schultz, 910 Broadfield Dr., Louisville, KY 40207, is also offering a new catalog of model construction plans. The samples he sent were beautifully drawn and of widely varied subjects, including a Caudron, Miles Magister and a towline glider. All were accompanied by detailed instructions, and are very reasonably priced. A dollar and a business-size SASE will bring you the complete list.

•And speaking of plans, Dr. John Fredriksen has published the first volume in his series of model plan directories. Entitled *Model Warplanes, Volume 1, World War One, 1914-1918*, it is a remarkable compilation of plans from 14 different countries! Each design is tabulated by wingspan, power (rubber, CO₂, electric or gas), type (FF, CL or RC), price and source. One can only imagine the patience, dedication and correspondence needed to compile this work. The softbound, 85-page volume sells for \$15 postpaid. Four others are planned to finish the set. Order from Dollar Scholar Press, 461 Loring Ave., Salem, MA 01970.

AVIATION MODELLER INTERNATIONAL

Editor David Boddington favored us with a sample copy of the new British magazine *Aviation Modeller International*. This broad-spectrum publication covers everything from indoor models to control liners to RC. Featured in the first issue are full-size construction plans for a rubber-powered free flight "Skeleton Scale" (profile) Focke Wulf 190A, a Tucano profile CL stunt model, and RC combat profile models of the Grumman Hellcat, Hawker Typhoon and Messerschmitt Bf-109E, the latter on pull-out pages.

For subscription information, send three International Reply Coupons to Aviation Modeller International, Model Activity Press, 33 Star Street, Wane, Herts, SG12 7AA, England. Please mention that *Model Builder* sent you!

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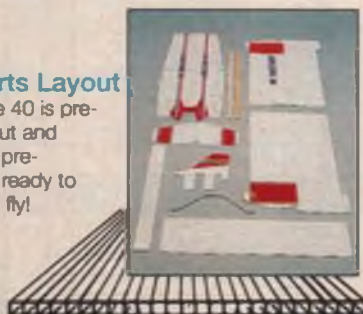
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Main Parts Layout

The AirCore 40 is precision die cut and completely pre-decorated, ready to fold up and fly!



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into the nose of your fuselage on a set of rails. You can then slide the PC out of your AirCore 40 and insert it into any other "PC compatible" plane you own! This saves you hundreds of dollars every time you add a plane to your fleet! All U.S. AirCore planes are PC compatible. These days, it only makes sense to go modular!

AirCore 40 Specifications

High Lift, Multi-mission Airfoil
Wingspan - 64"
Wing Area - 704 sq"
Wing Loading 18.8 oz/sq"
Weight - 5.75 lbs
Engine required - .40-.50 2-stroke or
.48-.50 4-stroke
Radio required - 4 channel

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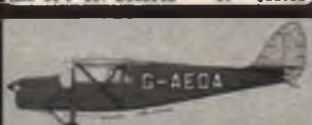


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AN ITALIAN FIGHTER FOR PEANUT SCALE

THE
S.A.I.-207

Arguably the best example of the "light fighter" concept to come out of WWII, the S.A.I.-207 has the elegant lines that all Italian aircraft seem to possess.

Everybody wanted one. Just about everybody tried to build one. And it appears that only the Italians nearly got one. I'm talking about the "Light Fighter" concept: a small, light pursuit machine, constructed of "non-strategic materials" (read: wood), that would somehow manage to perform on a par with larger, heavier, more sophisticated machines.

The S.A.I. (*Societa Aeronautica Italiana*) 207 was an outgrowth of the pre-war S.A.I.-7, a civilian, tandem-seat, two-place monoplane that achieved a 100km closed-course speed record of 244 mph on a

piddling 280 horsepower. After some fumbling and false starts, this aircraft evolved into the S.A.I.-207. Of all-wood construction, the 207 flew for the first time in 1942. Powered by a 750-hp., air-cooled, inverted V-12 Isotta-Fraschini Delta engine, the 207 achieved a maximum speed of 398 mph at 14,765 feet, and was robust enough to hold together during a series of 466 mph dive tests.

Armament was composed of two 20mm Mauser MG-151 cannon and two 12.7mm Breda-SAFAT machine guns. As many as 13 pre-production prototypes were completed, but production was stopped to accommodate production of the even more

advanced S.A.I.-403.

I've always found Italian WWII fighters to be extremely attractive, and when I saw an illustration of the 207 (which displayed its too-cute-for-words pant-ed tail wheel), I was hooked.

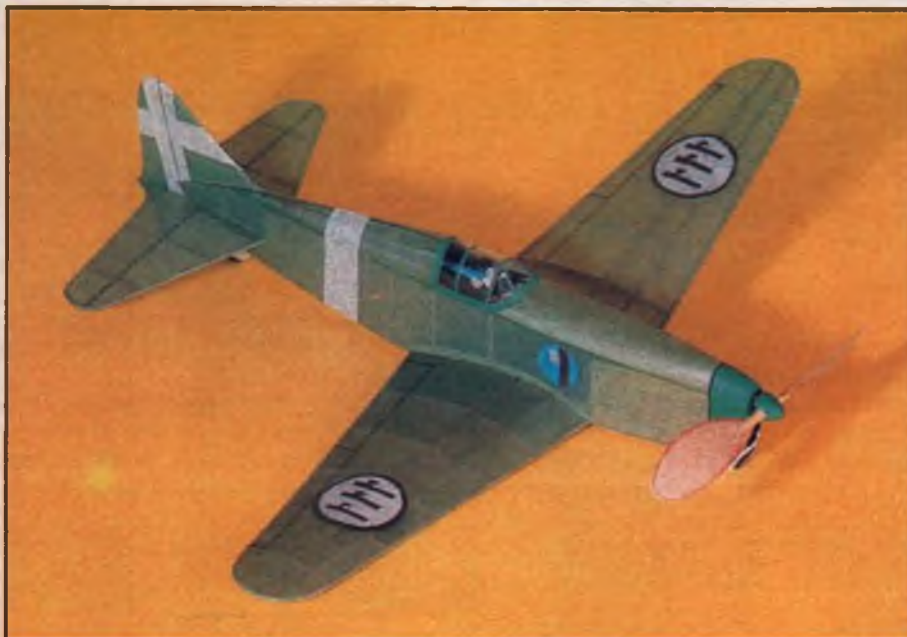
CONSTRUCTION

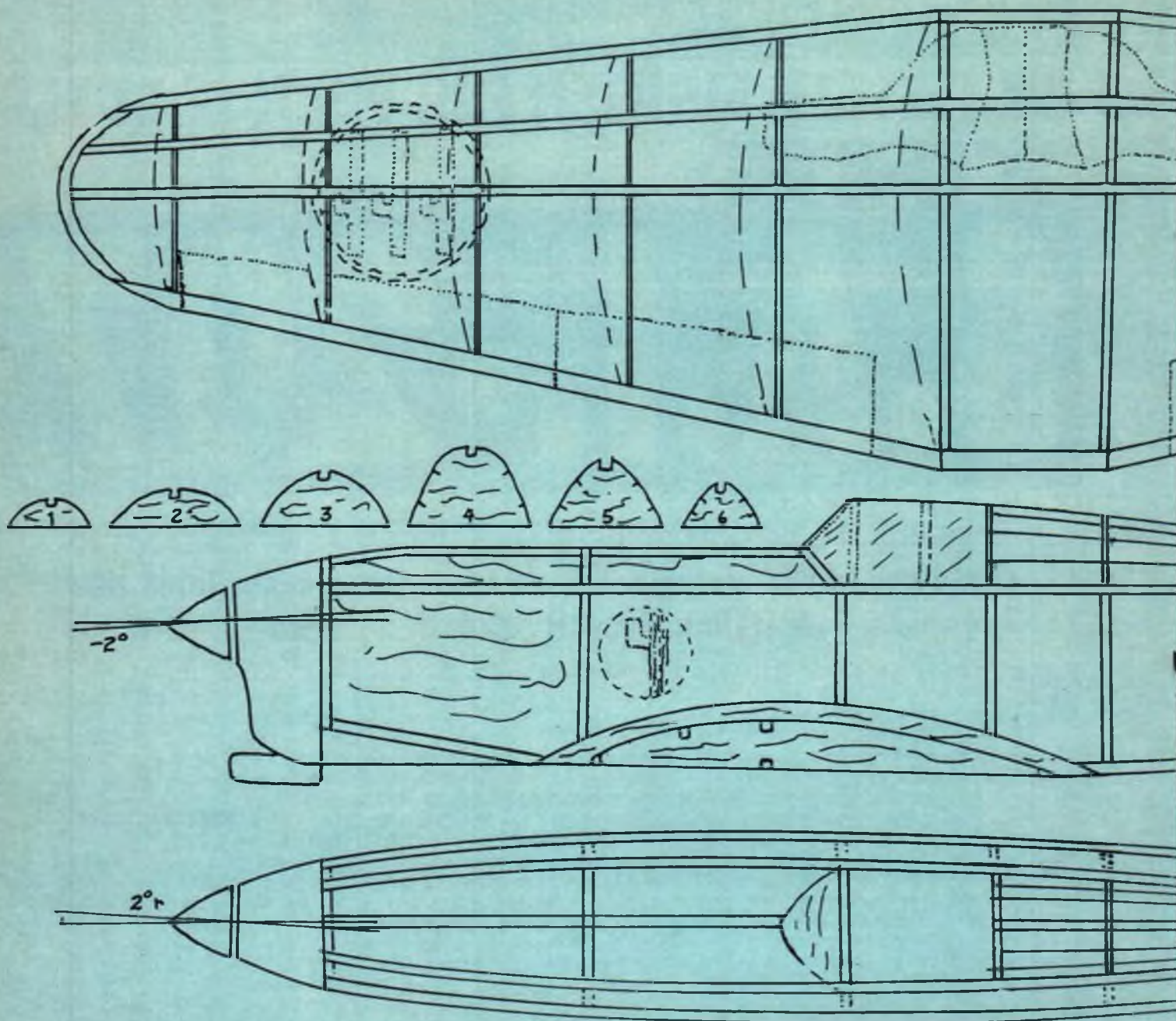
Flight Surfaces:

There's nothing new here for the experienced builder. As always, every bit of weight you can save in the tailfeathers will pay large dividends later. Dig into your balsa box for some of that 4-pound stock you've been hoarding. Unlike many Peanut designers, I use 1/16-inch stock for the leading and trailing edges of my wings. My rationale is that after shaping, the stock will approximate 1/20-inch square anyway, and that particularly in the case of the wing leading edges, a bit of strength is warranted. Incidentally, after years of experimenting with various methods, I've found nothing better for shaping the leading and trailing edges of wings than those disposable sandpaper nail-files. Sometimes, the cheap solution is the good solution!

Fuselage:

There are some features of note here. First of all, please note that the fuselage is not rectangular in section! Rather, it is trapezoidal in shape. I used false-bulkheads to maintain this shape as I constructed the fuselage; you may elect to use whatever even more complex and elegant method you wish. Second, note that the upper longerons meet at the last fuselage cross-member, and become the mount for the





Wing: LE.: $1/16^2$, T.E.: $1/8 \times 1/16$, Spars: $1/20^2$, Tips: 2 laminations $1/32 \times 1/16$, Ribs: (root) $1/20$ sheet, all others $1/32$ sheet.

Tail Surfaces: Structure: $1/20^2$ light, Curved Surfaces: 2 laminations $1/32 \times 1/16$.

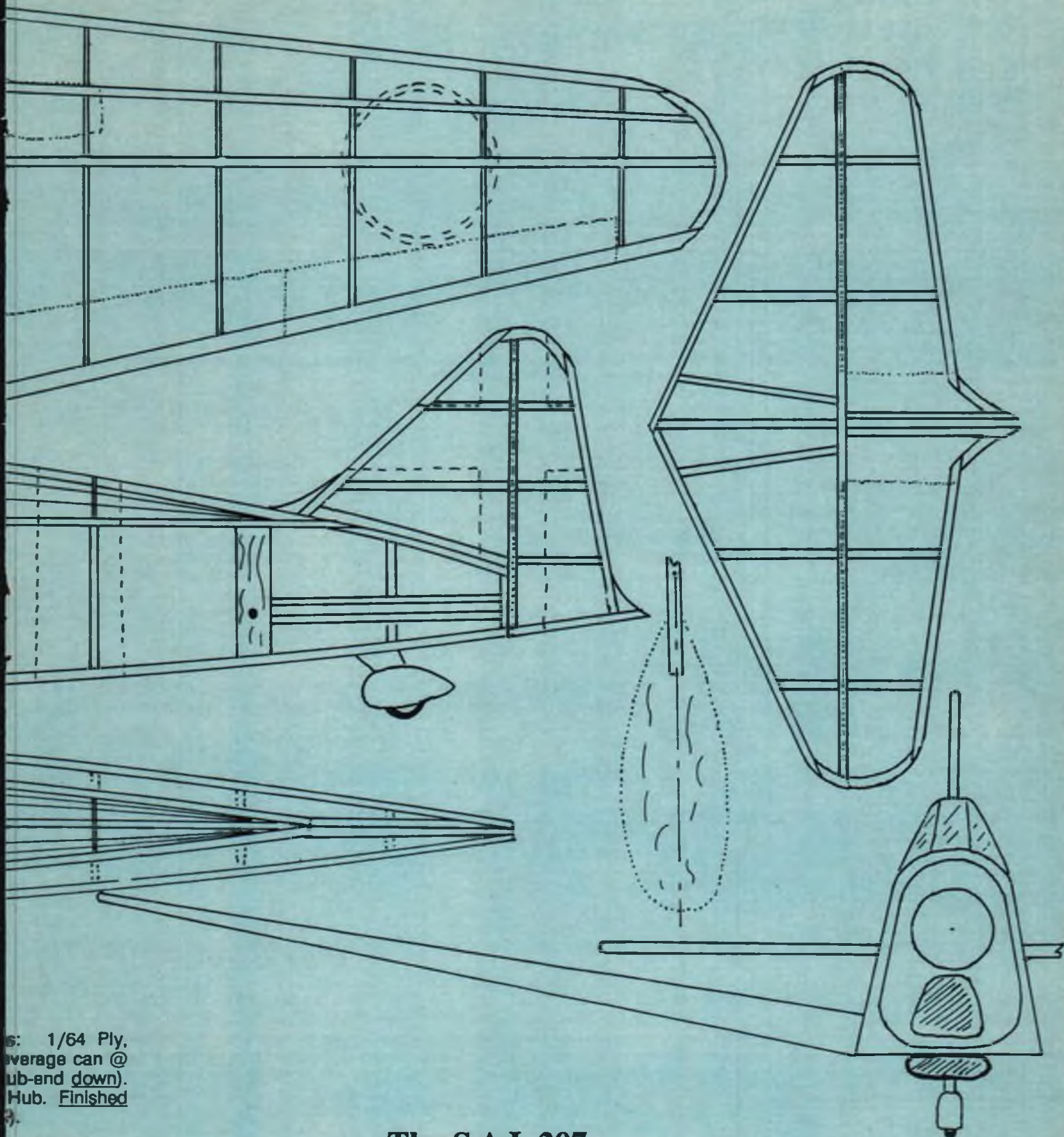
Fuselage: Longerons and Crosspieces: $1/16^2$ (or firm $1/20^2$), Bulkheads: 1-3: $1/20$ light sheet, 4-6: $1/32$ light sheet, Stringers: Top: $1/20^2$, Sides: $1/32 \times 1/20$, Cowl/Nose: $1/32$ light sheet, Lower Nose/Cowl: Soft Block, Nose Block/Spinner: Soft Block or Laminated Soft Stock.

Incidence Angles as Drawn: Stab: -1.5 deg., Wing: $+1.25$ deg., Thrust Settings: 2 deg. Down, 2 deg. Right, Dihedral: $1/16$ Each Tip.

Prop. Design: Hub: $1/8$ Birch Dowel, Blade Geometry: Blades soaked and taped to 12 oz. balsa, 22 deg. angle (angle to left, LE of blade to left, hatched to right). Assembled to hub @ 30 deg. angle 2 inches from hub. Prop.: 5 inches diameter, $7 \frac{1}{2}$ inch pitch (nominal).

Color Scheme/Markings: Upper Surfaces: Olive Drab, Lower Surfaces: White, Wing Insignia: Black Ring, White Fins, Fuselage Band: White, Rudder Cross: White, Device: Light Blue Disk, Brown Fins, Silver Axes.

References: (1.) Rand McNally Encyclopedia of World War I, 1914-1918, E. Angelucci, pp 200, 232-233; (2.) War in the Air, Second World War, Vol. II, Fighters, W. Green, pp 1-10.



s: 1/64 Ply.
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 (sub-and down).
 Hub. Finished
 3).

a Green, Lower
 the Disk, Black
 White, Cowl
 Blade.

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The S.A.I. 207

A WWII Italian Light Fighter

Designed and Drawn By John Berryman

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From any angle, the S.A.I.-207 is one good looking aircraft. Makes an excellent flying Peanut, too. Plan includes color scheme data and lists two sources for scale documentation.

rudder. In other words, the trapezoid becomes a triangle at that point. Third, there are some design/assembly considerations you may wish to keep in mind as you proceed with the fuselage:

• The 207 has a high thrustline (I've actually deviated from scale, and dropped it a bit). The issue here is that a high thrustline provides wonderful opportunities for your rubber motor to rub and bind on fuselage cross-members, or even break them (particularly in the nose). Not good. I've tried to partially address this issue by mounting the rear motor-peg low in the fuselage.

• You'll notice that the 207 features an oil cooler (?) mounted on the chin of the cowl. As drawn, it will almost certainly interfere with your prop. Check clearances carefully before painting!

• Finally, the rubber-motor-rubbing-on-bulkheads bugaboo irritated me so badly that I decided to try another approach. Though the plans show conventional sheet-over-formers construction for the upper cowl, I decided I was willing to pay a weight penalty if, in return, I benefited from better motor runs and less breakage of internal structure. So, in the prototype, the upper cowl is actually a soft balsa block that I tack-glued in place on the fuselage, shaped, removed from the fuselage, and hollowed with a Dremel.

Now, here's the interesting part of the story: The finished aircraft, including two coats of thinned nitrate dope, weighed 6.8 grams—about what my stuff usually tends to weigh. In other words, apparently I paid no weight penalty. In addition, the building process was definitely speeded up by using this method. And finally, the use of a hollow block imparts no twists or torques to the fuselage, as can happen when sheet balsa is "persuaded" to assume compound curves.

COVERING AND FINISH

Based on some probably pretty typical

illustrations in The Rand McNally Encyclopedia of Military Aircraft, I covered the upper surfaces of the 207 in Peck's Superlight green tissue, and the lower surfaces in Peck's Superlight white.

The markings (I made mine from tissue) presented a problem, and perhaps I can save you some misery here. The cross on the rudder and fuselage band are white, and the Peck tissue simply permitted too much green to bleed through. The situation was even worse on the wings, where the Peck tissue faded to a dull gray when doped over the black undercircles.

On my prototype, I addressed this by removing the Peck tissue and using heavier white tissue—but frankly, this solution was still less than ideal.

Personally, given the choice of dinking with frisket paper and airbrushes or being in bed with a high fever, I'll take the fever every time. But I'm afraid that this is one project where being willing to accept the annoying rattle of a compressor along with the mess, smell and overall pain of airbrushing, could result in a superior model.

DETAILING AND FINAL ASSEMBLY

The control surfaces, landing gear doors, etc., were outlined (after the ship was doped) with a Sharpie permanent marker. The canopy was formed on my venerable Model Builder vacuum former, and the canopy structure outlined with painted masking tape: The pilot was fabricated using the time-honored "take some wood and cut away everything that ain't a pilot" method. The fuselage markings (squadron insignia?) were drawn on light bond paper with water-based markers, cut out, and glued to the fuselage with a skiff of Titebond.

I hope you enjoy building and flying your model of this attractive, rare airplane. *Caio, baby! MB*

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Statistics: Wingspan: 78.75", Area: 718 sq. in.,
Weight: 36 oz., Wingloading: 8.5 oz./sq. ft.,
Airfoil: S3021

When you fly your brand new sailplane, you want to be able to concentrate on having fun. And you can, because we've produced a novice sailplane kit that's clearly the best in its category. NSP proudly introduces the new Kestrel. For the beginner, the Kestrel is second to none in performance and value.

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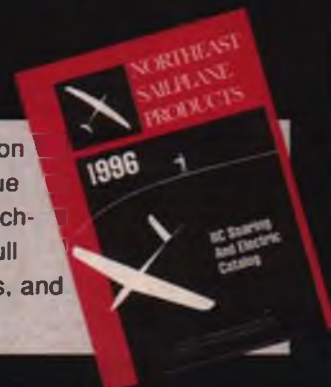
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PRODUCTS IN USE

■ By Art Steinberg

THE ARF "SCORPION" FROM COX PRODUCTS

If your interests lean toward small models, check out this ARF mini-pattern ship from Cox. It's capable of delivering amazing performance, especially when paired with Cox's hot little Tee Dee R/C .09!

Whenever I get my hands on an item from Cox, I expect it to be really extraordinary. This time I was doubly impressed when I opened the box of their latest ARF, the .09 size Scorpion. What I found was a completely built and covered, pocket-sized, taildragger sport pattern plane, requiring only a minimum of assembly. Constructed of balsa and ply, the plane was completely covered in red Oracover (one of the best heat-shrink coverings available), with the bottom of the wing and horizontal stabilizer done up in black for better visibility in flight. Everything was tight as a drum just as it came out of the box.

The wing airfoil is virtually symmetrical, with only a slight hint of flatness to the bottom, which gave promise of excellent flight qualities. The airfoil is basically an SD6060 type with an additional 2 percent thickness at the tips, plus a couple of degrees of washout. All this was quite beneficial to the flight performance, and as I found out later, the Scorpion turned out to be practically stallproof, able to slow down to a crawl without dropping a wingtip.

ASSEMBLY

The first thing I did was epoxy the two wing halves together, trying to achieve the 1-3/4 inches of dihedral specified in the directions. However, the wing halves mated perfectly at only 1-1/8 inches of dihedral, which looked just right. After talking with Cox, they felt that their original specification was for too much dihedral, and that a total of an inch or so was more appropriate. Flight tests confirmed that their revised figure was just right.

Joining the wing halves was but a few minutes' work. I did find that the factory-



Pictured with a toy airplane, the compact size of the Scorpion is really emphasized. Don't let its small size deceive you, though; the Scorpion is capable of full-size pattern plane performance.



Making a high-speed pass, our little model exhibits outstanding stability. Experienced pattern fliers who flew Art's review model claimed they could perform almost any precision maneuver with the Scorpion.

THE COX SCORPION

WINGSPAN 40 in.
WING AREA 285 sq. in.
FLYING WEIGHT 35 oz.
WING LOADING 17 oz./sq. ft.
OVERALL LENGTH 39 in.
POWER Cox Tee Dee R/C .09
RADIO . Four channels required.
SUGGESTED RETAIL \$176.67
**CONSTRUCTION All-wood
structure pre-covered
with Oracover.**

Produced by Cox Products,
475 N. Sheridan St.,
Corona, CA 91720-2004.

installed aileron hinges were not very securely glued, so I removed the ailerons and reglued the hinges. Later I screwed on the landing gear, completing the wing. Incidentally, the landing gear comes fully assembled, with nice lightweight rubber wheels mounted on the axles and tiny wheel collars fastened in place. Even the tailwheel assembly was ready to install.

The next major component to tackle is the fuselage, which I found to be remarkably complete, needing very little work. First, I bolted the glass-filled nylon engine mount to the firewall, which was a cinch, as the blind nuts are factory installed. Next, I assembled and installed the generous 3-ounce fuel tank, which still left room in the tank compartment for the battery.

I then installed the engine and removed the muffler so that the engine cowl could be fitted. It amazed me to find that the cowl was made of fiberglass, not vacuum-formed ABS plastic! I've assembled many ARFs up to and including 1.20 size, but even in the larger models one seldom finds fiberglass



The Cox Tee Dee .09 R/C engine fits perfectly into the molded fiberglass cowl, with a Goldberg spinner completing the installation.

THE COX TEE DEE R/C .09

Little engines tend to be cute, and when it comes to cute, Cox Products wrote the book. Their Tee Dee R/C .09, complete with carburetor and muffler, is so pretty you could almost wear it around your neck like a piece of jewelry.

Little engines also tend to be very fussy about fuel, props, glow plugs, tank location, and just about any other variable you can think of. The Tee Dee R/C .09 proved to be no exception to this general rule; it has definite preferences about the way it's handled..

Take fuel, for instance. Forget your 10 or 15 percent nitro; these little buggers use nitro like the government uses your tax money. Thirty percent nitro is about average, and will get you middling performance up to perhaps 16,000 rpm, but if you want to hit the maximum continuous running range of 19,000 rpm, you'd better think in terms of around 50 percent nitro. And don't forget that the oil content has to be at least 20 percent castor.

Break-in proceeded using both the factory supplied glow plug with and without an extra plug gasket, and then a Cox Medallion .09 glow head. At first the lowest idle attainable was in the 7,500-8,000 rpm range, while the idle speed specified by Cox was down at 5,500. This may sound like a very high idle to those unaccustomed to operating small engines, but I found that anything under 6,500 would allow the Scorpion to sit still on the ground without rolling, and would permit normal descents and landings. I continued to strive for the specified 5,500 rpm, and finally, after a good break-in and patient adjusting of the air bleed, the Tee Dee R/C did achieve a reliable idle of 5,600 rpm with a Cox 7x3.5 prop.

Once this stage was reached, I found the Cox Tee Dee R/C .09 to be extremely powerful, with great reliability and instantaneous transition at all speeds. It proved to be a perfect little powerplant for a Lilliputian-sized high-performance airplane, and if the Cox Scorpion can be called a little jewel, this beautiful little engine just has to be termed a tiny gem.



cows, so this was a real surprise. ABS plastic cowls often begin to get vibration cracks after only a few flights, but this fiberglass cowl will probably outlast the entire airframe. The cowl comes unpainted, so after I trimmed it to fit around the engine, I grabbed a can of red fuelproof paint and sprayed on two or three light coats.

The wing was then bolted to the fuselage with the nylon screws supplied and the tailfeathers were glued in place.

Pushrod assembly took only a few minutes and consists of two lightweight dowels with piano wire fittings bound and glued to each end. The cockpit was then completed by covering it with a precut black vinyl cockpit floor and sticking in place the dashboard with its printed instruments.

RADIO INSTALLATION

Cox recommends that the Scorpion be equipped with four mini or micro servos



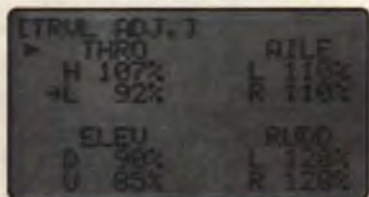
Our author's son Gary shows the belly of the Scorpion and its high-visibility black covering on the wing and stab.

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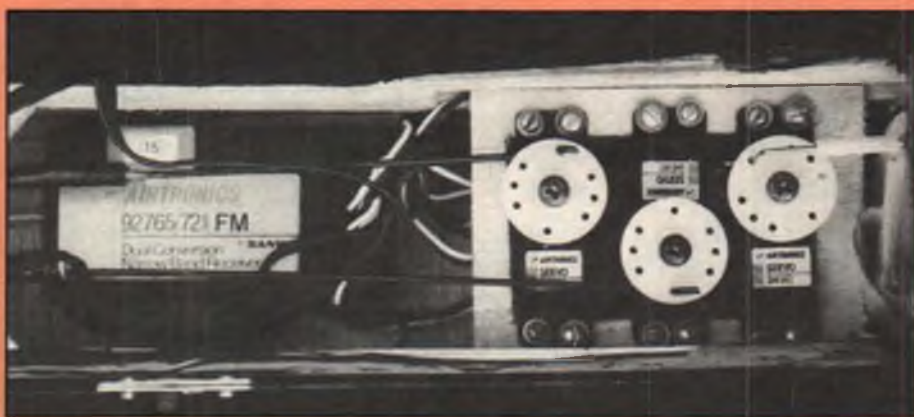
Heli Software

Digital gyro sensitivity - Triple flight modes - flight mode assignable rates, gyro, mixes - triple 5 point throttle curves - quadruple 5 point pitch curves - throttle hold offset - normal/stunt servo mix - 3 programmable mixes (two multi-point) - stunt trim - 3 assignable hover throttle/pitch curve points

Sailplane Software

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JR
feel the difference!



The Scorpion is a full four-channel bird, requiring three servos mounted in the fuselage and the aileron servo mounted in the wing center section. Art used Airtronics 94141 ball bearing micro servos, a 92765 Vanguard FM receiver and a 270-mAH battery pack, had room to spare.

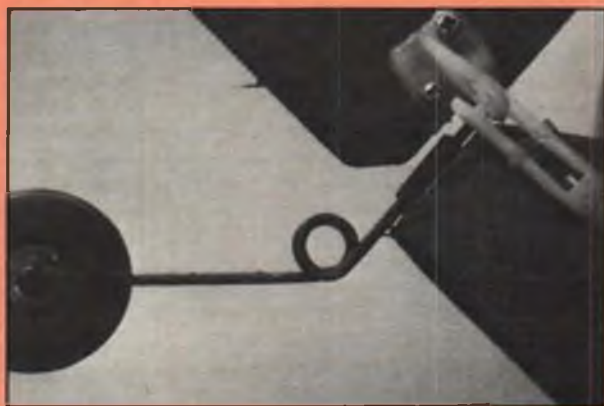
and a 250-mAH battery. I just happened to have a brand new Airtronics Vanguard FM four-channel radio, which I felt would be ideal for the Scorpion. I used a set of four Airtronics 94141 micro servos, which slipped comfortably into the fuselage with no crowding. I could have just as easily used mini servos, and I've even heard reports that the Scorpion can accept standard size servos, but one would be hard pressed to squeeze them into the available space.

The Vanguard receiver was accommodated with room to spare. I installed a 270-mAH battery under the fuel tank and kept it from rattling around by packing it in thin foam rubber. The antenna was run back inside the fuselage, exiting through one of the pushrod slots near the tail, with the excess just trailing in the wind.

FLYING THE SCORPION

The finished airplane weighed only 30 ounces, a figure low enough to promise exceptional performance. As the Scorpion perched perkily in the pits, it drew more than its share of attention, no one being aware that it was an ARF. As a matter of fact, I was showered with compliments praising my building skills!

The prevailing wind was very light, coming right down the runway. I taxied the Scorpion out onto the paved runway, turned into the wind, and smartly fed in full power. The Scorpion moved forward, lifted its tail and held a steady course with no need for right rudder to keep it from veering to the left. Application of a little up elevator took her off the ground in a total of about 25 feet or so, and the climbout was smooth and straight, needing no correction at all. After a couple of circuits around the field at an altitude of about 150 feet, I eventually put in one click of right aileron trim. I'm still not sure if this was really needed or if I was just trying to



Great attention is given to small details, such as the shock-absorbing tailwheel assembly.

counteract a slight crosswind at altitude.

The Scorpion was so comfortable to fly that it felt more like its 50th flight than its very first. Because of the excellent airfoil and overall design, it flew just like a big pattern plane of the Kaos class, going exactly where it was pointed and acting much like a .60-powered model. It didn't take more than a few flights before I realized that the little Scorpion could perform any maneuver in my average repertoire, so I asked a number of advanced pattern competitors to test fly it and wring it out. It was a real thrill to watch them perform their complete pattern routines.

Were it not for the diminutive size of the Scorpion and the high-pitched whine of the Tee Dee R/C .09, the flights gave the impression that a full-size RC pattern plane was burning up the sky. These advanced pilots rendered a unanimous verdict of absolute approval, the consensus being that the Scorpion is an outstanding performer in the hands of an expert, but is also a fine sport plane for an average intermediate pilot. It has inherent stability, responds smoothly to every command, and slows down to a walk when landing. I really am nuts about my Scorpion, and find myself spending a lot more time with it at the local field. Cox Products has really scored a triumph with this great airplane/engine combination! MB

At last there's an 8-channel radio that takes the mystery out of programming. Introducing JR's XP8103.



If you were holding off on an 8-channel purchase until you had a look at what JR would come up with, we have a feeling you'll be glad you waited.

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Simply stated, the XP8103's high resolution screens give you more information and present it in ways that make the information easier to understand.

Some screens, as shown in the photo

at the left, employ pictures or graphs to enhance your comprehension of the adjustments you're making.

Others allow you to adjust the values for up to

four functions in a single display.

Altogether, the 8103's screens let you spend a lot less time trying to understand your radio and a lot more time using it.

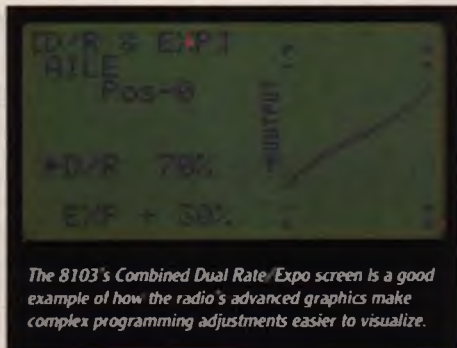
BALL BEARING SERVOS? OF COURSE.

8103-class flyers probably don't have much use for standard-class servos. So the XP8103 is the first radio in its class to be exclusively ball bearing equipped.

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PLUG SPARKS

BY JOHN POND

● John Tatone

● Model of the Month: Wigdor's 1937 "Firebird"

● The Loutrel/GHQ Engine

It was a distinct surprise to this writer to get a call from Mike Clancy, one of the old San Francisco Vultures, informing me that my longtime friend John Tatone had died on Sunday, March 3, from complications following a triple bypass heart operation.

This writer recalls quite clearly meeting John in 1938 and picking him up on the way to a local contest. When invited into his house, I found he was into building ships and boats. Needless to say, the Vultures put an end to that. Tatone's first airplane model was a modified version of the Scientific Mercury. His impeccable work was much in evidence.

John was a jeweler by trade, specializing in rings and bracelets. By sheer accident, he got started in the model timer manufacturing business. Dissatisfied with the erratic performance of the pneumatic type timers, he started tinkering with the German "Auto-Knipps" camera timer, making changes and improvements until he was sure of its reliability.

Once modelers used the Tatone timer, the demand was heavy. Through an export friend, John was able to arrange for the manufacture of timers through a Japanese firm, using his tooling. Of interest is that John took the pains to check each and every timer for smooth operation by cleaning and adjusting. This was the secret of his success, although rejects ran as high as 20 percent at times.

During this time, Tatone continued with his free flight activities, winning many a prize at the Northern California Free Flight Council. He even won a place on the U.S. FAI team. At the World Champs, held in New York City, John ironically suffered several overruns, and despite excellent flights, did not make the finals. Seems like the rest of the competitors had good running Tatone timers!

Everyone admired John's free flight models, but not until he got into control line flying scale did he attain national



The late John Tatone (kneeling at right) was a prolific winner at the tough NCFCC contests. Top row, from left: Walt Ghio, Bill Bowen, Chester Wicker, George Albright, Bruce Hannah, Clark Hahn, and Don Smith. Kneeling, from left: Ralph Miller and his two sons, Gary Pond, and John Tatone.



Classic one-point VTO takeoff by Tatone and his "Frisco Kid." These models were built in all sizes, for Class A, B and C. Photo by June Dyer.

prominence. John liked scale models as this allowed him to exercise his ingenuity; i.e., making door handles (that worked!), an instrument panel that he eventually kitted, and working controls from the rudder pedals and joystick.

John's first serious CL scale model was a Topsy Junior that just about paralyzed the competition for scale accuracy. Encouraged by the scale win, he built a low-wing Meyers with a finish that was just out of this world. Chief judge Russ

Barrera remarked that the finish was so perfect, you could shave by the reflection. Some people claimed the model should have been docked points for an "out-of-scale" finish.

John next hit on the idea of producing aluminum engine mounts that were radially mounted on the firewall. This idea was widely copied. Expanding his accessory line, he produced the "Chicken Stick," a simple wood-handled starting stick with rubber encasement. Tatone also

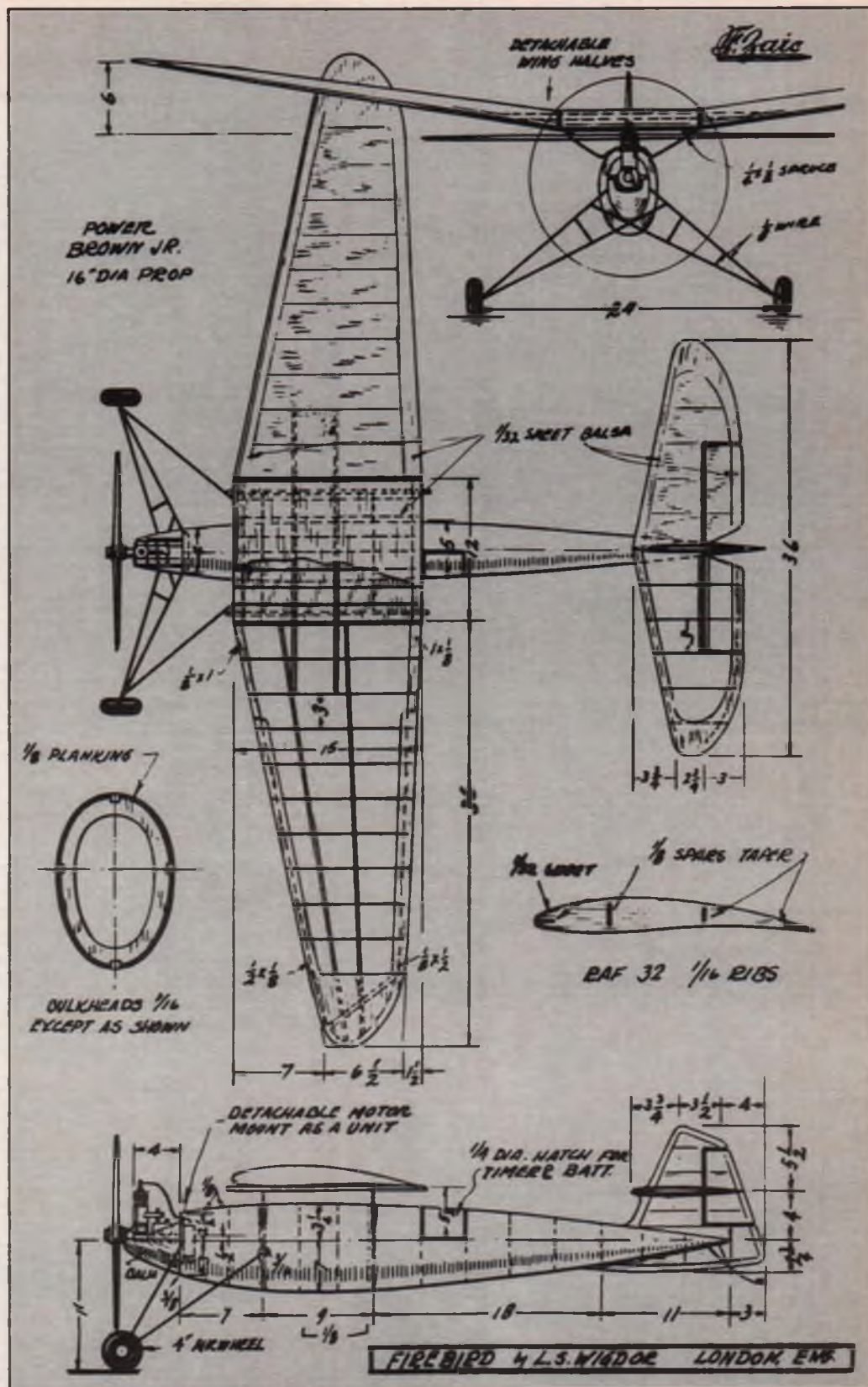
produced the first metal engine testing stand—far superior to the wooden mounts being marketed at the time.

John was always coming up with new ideas such as the reduced size timer for 1/2A models, the "flood-off" type for hot gas engines, and the invaluable DT (dethermalizer) timer that became the major item in bringing thermal-bound models down. It had gotten to the point where most of the engine and flying equipment was being produced by Tatone.

As they say, it was too good to last. A divorce and hard economic times left Tatone with insufficient funds to bring out new items. His business was eventually joined with a car racing company. When the reorganization of the company took place, Tatone agreed to stay on for five years to make sure the business continued to prosper. Naturally, after five years, there was a parting of the ways with the original business moving and consolidating with the C.B. company in Hayward (across the San Francisco Bay).

Tatone then started another company, which he named J-Tec. Located in Daly City (a suburb of San Francisco), John designed and produced in-cowl type mufflers plus several exterior types. This writer used to drop in on John at the new location and noted the steady growth of the company. With his interest in mufflers and the new sound restrictions being imposed by AMA, John developed the new muffler he called the "Snuffler" that proved to be an effective silencer. This new product, along with the soft mounts developed for motor mounts and engines, kept Tatone in the forefront of new ideas.

Lately John's health had begun to deteriorate, culminating in a triple bypass heart operation. This didn't do too much good as John complained of not feeling well. Finally in March, he suffered what was diagnosed as a massive heart attack. Despite efforts to save him, John passed away at the age of 72.



MODEL OF THE MONTH

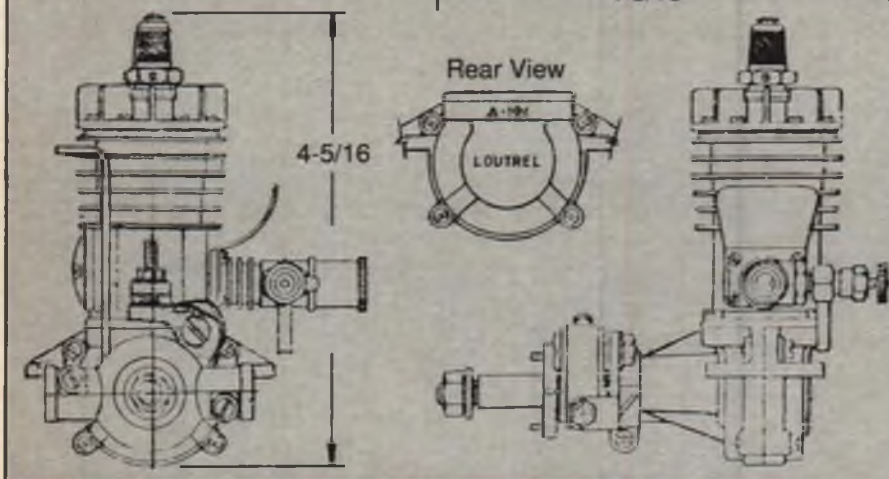
In closing, John Tatone was a very popular modeler, as exhibited by his induction into the AMA Hall of Fame. John was a great innovator in model flying gadgets and designs. His

"Frisco Kid" is still quite popular in the Nostalgia event, not to mention his Atom powered "Atomizer" that has proven to be a winner in the 1/2A Texaco events. I loved to stop by his

shop on School Street in Daly City to compare business notes. Being a good 50 miles away from my home in San Jose, visits were limited to about once a month.

LOUTREL .60

Drawn by John Pond



ENGINE OF THE MONTH

As a lesson to you readers, pay attention to your friends and visit them as often as you can. At 79 years of age, this writer is beginning to feel like the Lone Ranger without Tonto. I do hope this tribute to John Tatone has the desired effect!

"SAVE HANGAR ONE"

Received a most interesting letter from

Otto Curth, well-known Chicago Aeronauts member, announcing a program called "Save Hangar One." The title is derived from the hangar used by the modelers when the AMA Nationals were held at Glenview NAS. The station has now been closed and the property turned over to the Glenview Hangar One Foundation. The brochure received describes the efforts and the financial aid needed to place their museum in operational order.

The sponsoring group is

seeking donations to preserve the original hangar and tower, comprising one structure. Aviation-minded modelers are invited to help restore the hangar that for a long time served the AMA members so well. Readers are invited to write Elizabeth "Liz" Dinsmore, Glenview Hangar One Foundation, P.O. Box 198, Glenview, IL 60025-0198 to offer financial help for this worthy project.

MODEL OF THE MONTH

Received a nice letter from the designer of the "Firebird," which appeared in Frank Zaic's 1938 Year Book. Lucien S. Wigdor enclosed two shots of his original model, the first of which appeared in *M.A.N.*, the second photo being that of the model talking off after release by Wigdor. This photo also shows the magnificent field at RAF Station Northolt. Lucien mentions that Colonel C.E. Bowden also used the area for test flying.

Specs on the Firebird are as follows:

Wingspan—84 in.

Approx. Wing Area—930 sq. in.

Wing Airfoil—RAF 32.

Overall Length—53 in.

Original Power—Brown Jr.

Full-size plans for the Firebird are available from John Pond O.T. Plans, P.O. Box 90310, San Jose, CA 95109-3310.

At the time of the construction of the Firebird, British-born Wigdor was 18 years old, living in Britain. He later worked in the U.S. numerous times after WWII. Wigdor retired in 1984 and is currently living in the U.S.; he can be reached at Indian Point, 213 Little Sunapee Road, P.O.



■ LEFT: John Tatone and his FAI ship, just before leaving for the World Champs in New York City. ■ RIGHT: Tatone and his "Frisco Kiddle," a Holland Hornet .049 powered version of the Frisco Kid.

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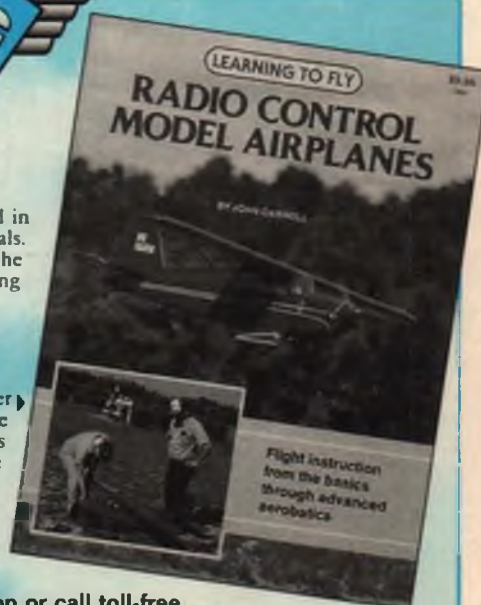
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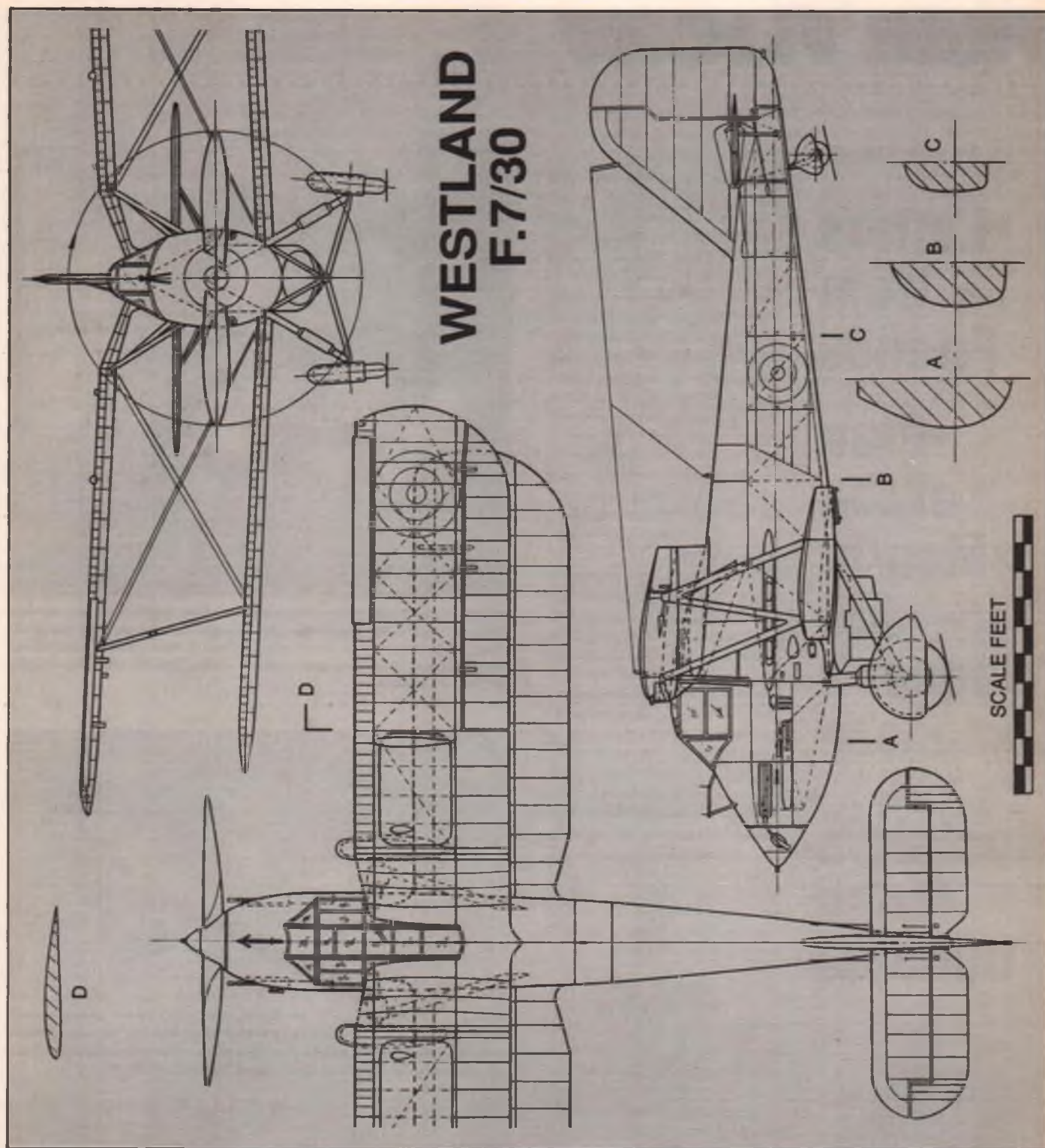
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THE WESTLAND F.7/30

The British do have an eye for designing nicely proportioned aircraft, one exceptionally attractive example to come out of the pre-WWII era being the Westland F.7/30. The prototype, the only one built, was first flown in 1934; it was one of the earliest multi-gun fighter aircraft to take to the air and was designed to an Air Ministry Specification issued in 1930, which called for a high-speed single-seat fighter powered by the 600-horsepower Rolls Royce Goshawk liquid-cooled engine. This engine was unusual in that it had internal gearing and a long drive shaft for the prop; the mass of the engine was actually located back near the CG (note the exhaust stacks exiting the fuselage between the wings), with the pilot and armament—four synchronized Vickers guns, two on each side of the nose—located well forward. Pilot's visibility was reported to be excellent, and most of the mass being situated near the CG made for exceptional maneuverability. The F.7/30 was of all-metal construction, and except for the fuselage from the nose to just aft of the bottom wing, was entirely fabric covered. Ailerons and automatic leading edge slots were in the upper wing only.

Specifications: Wingspan, 38 ft. 6 in. (top), 33 ft. 5 in. (bottom); Wing chord 5 ft. 6 in.; Airfoil RAF 28; Length 29 ft. 6 in.; Height 10 ft. 9 in.; Wing area 370 sq. ft.; Empty weight 3,624 lbs.; Gross Weight 5,170 lbs.; Top speed 185 mph at 15,000 ft.

FREE FLIGHT

BY BOB STALICK

•Letters from Friends

•Plan of the Month: Joe

Wagner's Comanche

•Nostalgia Rules Updates

One nice byproduct of this column is the relationships that are built up over the years. People write letters as though they know you. Many come from readers whom you've never met, but who write as though you were a longtime friend. Sometimes months or years will pass with no contact, then from out of the blue comes a nice letter with information or other bits of news—and the relationship is established once more. Now, with the use of e-mail, it's easier than ever to be in regular contact with others. Relationships can now be rekindled electronically as well as through the usual paper channels.

The recent announcement in the Free Flight column that I was going to decrease the frequency of the Mystery Model feature brought forth just such a spate of letters from old friends. Many sent along their own copies of appropriate subjects for future Mystery Models. Some of them were so good that I now have a nice stockpile of unusual, but guessable, designs that should allow reinstituting this feature on an infrequent basis for the next year or more. So, thanks to all who cared enough to help, and thanks for reconnecting after these years. I enjoyed getting in touch again.

PLAN OF THE MONTH

One of the longtime modelers who recently wrote to provide some grist for the Mystery Model mill was Joe Wagner. Joe has been an active free flyer for longer than I can remember. He designed some of the models many of us recall from our youth. Remember the Dakota? Joe designed it. This model was kitted for Veco and was literally a fool-proof free flyer. It was nearly impossible to build one that wouldn't fly.

This month's featured model is another one of Joe's designs—the Comanche. As with the Dakota, the Comanche was kitted by Veco.



Bill Davis, of Sacramento, is a Dan Sobala model enthusiast. Here Bill holds two of Sobala's designs: a "Seek" (left) powered by a K&B .19 green head, and the more well-known "Geef," powered by a McCoy .19. Bill notes that even though he built the models in the early 1990s, he still hasn't flown them (as of July, 1995). C'mon, Bill, what are you waiting for? They both fly great!



ScienText's latest kit is this 28-inch span Messerschmitt Bf-109B. The rubber scale kit should be ready for release about the time you read this column. Two bucks will get you a complete catalog from ScienText, 48 Whitney St., Westport, CT 06880.

It was intended as a Payload model, but was used extensively as a 1/2A contest free flight during the early 1950s. The plans show the power to be a Wasp .049.

With a span of 36 inches and a root chord of 5-1/2 inches, the projected wing area is around 180 square inches with the tapered tips factored in. This wing area is typically what is used today for the AMA .020 Payload event, so the model could be considered a likely prospect for current AMA

competition. A better use might be the 1/2A Nostalgia event, where it could be flown in the regular Nostalgia class or the special Early Nostalgia event. If flown in the latter, then a Wasp or old OK Cub would be a perfect combination.

For regular 1/2A Nostalgia, a good choice for the Comanche would be one of the Cox 290 engines. These reed-valve .049 engines have a plastic backplate with needle valve but no tank. They are available by the dozens at most model

The Veco

COMANCHE

PAA-Load competition model designed by Joe Wagner in August 1951; kit issued by Veco in November 1951

Wingspan — 36 in.
Projected Wing Area — 183 sq. in.
Stab Area — 75 sq. in.
Overall Length — 26-1/4 in.
Flying Weight — 5-1/2 oz. without "occupant"

Original model powered by a Wasp .049

Full-size plans for this and other designs are available from Joe Wagner, 135 Waugh Ave., New Wilmington, PA 16142; cost is \$8 postpaid

•**WING** — Polyhedral design without spars or L.E. stick; top & bottom sheeting comes together to form unique "sharp L.E." airfoil. Section has slight undercamber in center panels, tapers to flat-bottom at tips.
•**TAIL** — Horizontal stab uses basically the same construction and flat-bottom "sharp L.E." airfoil as wing. Fin is sheet balsa.
•**FUSELAGE** — Flat sheet balsa sides with lightening cutouts, notched for interlocking tabs on bulkheads. No top & bottom sheeting; instead uses 3/32x1/4 "stiffeners" along each edge.

NOT TO SCALE

PLAN OF THE MONTH

The Comanche is a competitive airplane that is simple to build and has very nice lines. I think it's a welcome change to the usual models seen at the field in the Nostalgia events.

engine swap meets for next to nothing.

The Comanche is a competitive airplane that is simple to build and has very nice lines. I think it's a welcome change to the usual models seen at the field in the Nostalgia events. The full-size plans are complete and contain all of the information needed to build a good flying model. The Comanche, Dakota and several other plans are available from Joe Wagner, 135 Waugh Ave., New Wilmington, PA 16142. The cost is \$8 per plan postpaid in the U.S.

AUGUST MYSTERY MODEL

This unusual design was featured in one of the prominent model magazines of the

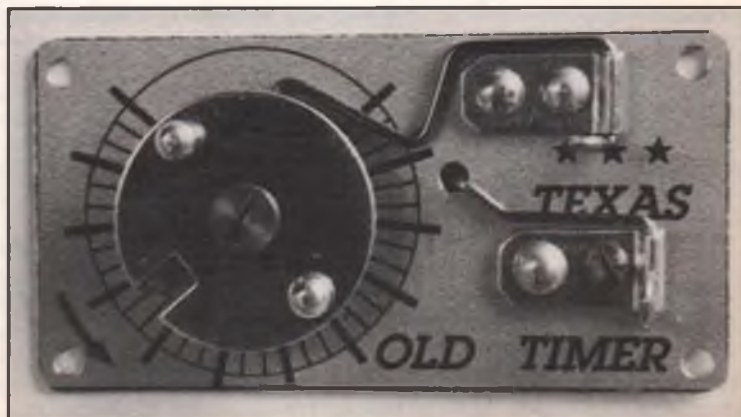
early 1950s. I first learned of it when I moved to Oregon in 1960. One of my first free flight acquaintances here had one that was powered by a Baby Bee engine, and it had a nice straight-ahead climb with an uncertain transition to a left glide—which, as I recall, was pretty fast.

One of the nice things about the model was its compactness. I recall tucking it under my arm as we walked out to the flying area. No rubber bands to worry about. Broken props were, however, a problem that was eventually solved by use of a single-blader.

So, if you think you know the name of this model, write it and your

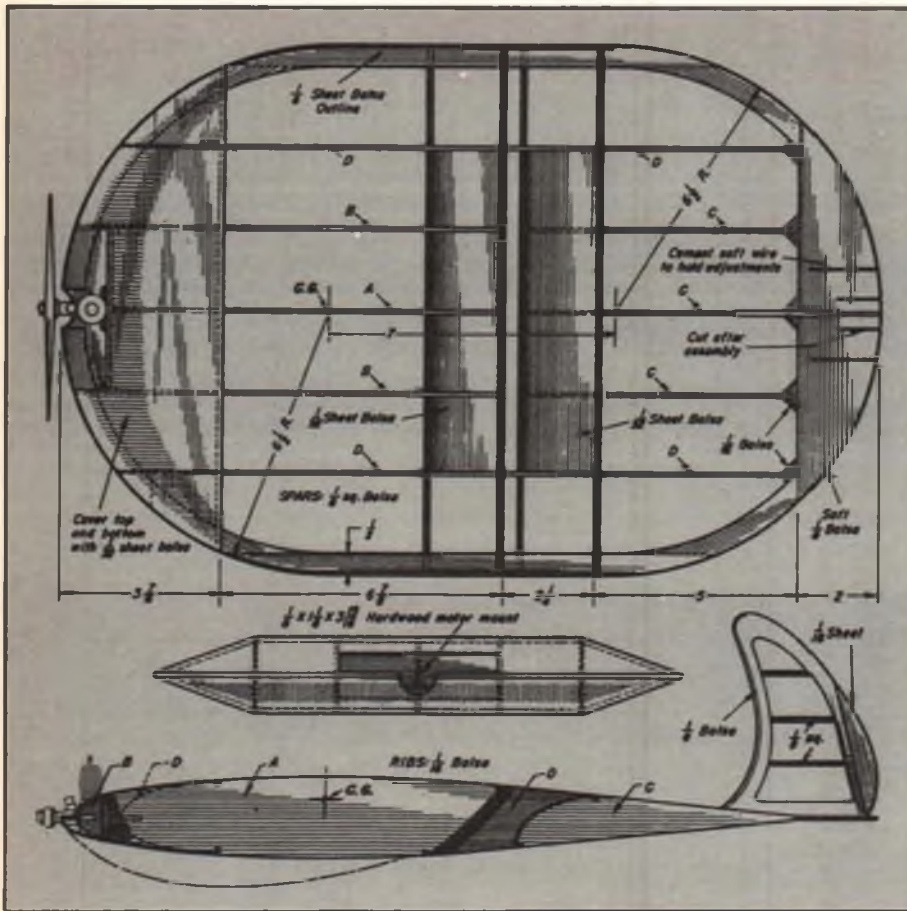
name and address on a postcard and send it to *Model Builder* magazine. (Do not send it to me or your entry will

not get counted!) After a couple of months the winner will be drawn at random from among the correct entries, and will



Hank Nystrom's new Texas Old Timer is an ignition cutoff timer for Old Timer models. Illustrated is the Model A version with the quick-release DT system. More information on this quality item can be found in this month's column.

FREE FLIGHT



AUGUST MYSTERY MODEL

receive a free one-year subscription to this magazine. A good deal, right? If you have some experiences or photographs of yourself with your version of this design, include them. These stories often make good reading for this column.

NOSTALGIA UPDATES

The Early Nostalgia event has become a regular part of the contest scene in many parts of the country. Early Nostalgia is simply a way to relive the past by limiting the "improvements" that have been made to the Nostalgia event by well-meaning but competitive-minded individuals. The Early Nostalgia rules are as follows:

"The competition rules are the same as NFFS 1/2A Nostalgia Gas except:

"1. Scaling of eligible designs is absolutely prohibited.

"2. Only the following NFFS Nostalgia eligible engines are permitted in this event: K&B Torpedo .049; Wasp .049; Holland Wasp .049; Spitzzy .045; Spitzzy Sr. .045; Baby Spitfire .045; Royal Baby Spitfire .049; OK Cub .049 (original model); OK Cub .049A (front rotor), OK Cub 049B; OK Cub .049X. No OK Cub .049 reed valve or

diesel engine is permitted.

"3. Engines shall be equipped with standard vertical coil glow plugs only. No glow heads or flat coil (Glo-Bee type) plugs are allowed. No vertical coil Glo-Bee or Nelson plugs are permitted nor are any customized cylinder heads."

These rules will be printed in the upcoming version of the NFFS Nostalgia rulebook #6, which should be ready for distribution about the time you read this column. For those who haven't kept up with the Nostalgia event, the rulebooks contain not only the rules for all of the Nostalgia events, but also a listing of the approved model designs and engines. Keep reading this column—I'll let you know when book #6 is ready and how you can get a copy.

JIM QUINN

It seems as though every month, I report the passing of another of free flight's leaders. I was informed recently that Jim Quinn passed away on March 16. Jim had flown at the SCAT Annual just a week earlier. He suffered from angina and had a history of heart problems, including more than one bypass surgery. He had gone to the hospital for an angioplasty but compli-

cations set in and he did not survive.

Jim was a longtime member of the Southern California Aero Team and a storied competitor in FAI outdoor events, where he was a successful Wakefield competitor, having made the U.S. team several times. The SCAT club will be publishing a special issue of their newsletter in Jim's memory, just as they did with the passing of Bob and LaVera Isaacson a few short months ago.

NEW FROM TEXAS TIMERS

Are you one of those who still makes his own ignition timers? You know, you make a bracket to fit a microswitch that is actuated by the arm from your clockwork timer, then you run the wires through the fuselage under the timer case, and solder the whole works with most of the parts out in the open air. Is that what you still do?

If so, then you're a ready customer for Texas Timers' new "Texas Old Timer." These units feature the very dependable clockwork mechanism that proprietor Hank Nystrom puts into all of his timers, plus the switch is mounted on the back of the timer, so everything is out of harm's way. The timer is available in two versions—the standard version (Texas Timer B) and one with a quick-DT system built in (Texas Timer A).

So, if you're looking for the best for your latest O.T. project, give the Texas Old Timer your consideration. The A version is yours for \$42, the B is \$39.50. In either case, if you order direct, add \$2.50 for postage. If your local hobby dealer doesn't carry them, order direct from Texas Timers, 3317 Pine Timbers Dr., Johnson City, TN 37604; (423) 282-6423. Send Hank an SASE for full particulars.

INDOOR WORLD CHAMPS

As noted in earlier columns, the Indoor World Champs will be hosted August 5-8 at the Kibbie Dome at the University of Idaho. If you plan to be in the northwest this summer, put this event on your calendar. It could be the last time in this century that such world-class indoor flying will be seen on the West Coast. The event will be preceded by the Second Annual EZB International Championships on August 4, and before that, the Northwest Annual Kibbie Dome Indoor Contest on August 1-3.

It appears that all of the needed officials have been lined up, although we're still looking for alternates to assist with the timing chores. Further information about the World Champs or any of the Kibbie Dome events can be obtained from contest manager Andrew Tagliafico at (503) 452-0456. I'll be there doing the contest director's duties, ably assisted by longtime indoor booster Bud Tenny. Hope to see you there!

AME UPDATES

Last month I noted that I had ordered a fine-thread needle valve assembly from Kustom Kraftsmanship in an attempt to get a more precise setting on my Russian AME .049 than I could get from the stock unit. I've since received the KK assembly and found that although it has the correct diameter for the engine, it's much too long and needs to be customized in order to be installed. I've rejected this unit as unsuitable and am still looking for something that will do the trick.

In the meantime I modified the stock unit by drilling out the center of the needle valve itself to a depth of about 1/8-inch and silver soldered a length of .040 wire into the hole; the tip of the wire was bent over to give a good finger hold. Now I can make needle adjustments without burning my fingers on the exhaust. I've also changed from a surgical tubing tank back to a lower pressure pacifier tank in order to make needle adjustments less critical.

WEBSITES FOR FAI AND OLD TIMERS

It seems anachronistic to have an e-mail address for Old Timer models. Has the world changed so rapidly that coots like me can remember when spark ignition engines were the rage—and now we are accessing instantaneous information about Old Timers through the World Wide Web? The answer seems to be yes. I am completely amazed. At any rate, Charlie Reich, the PR guy for SAM, sends out the message that if you want to know all about the goings-on with SAM, all you need to do is call up their Web Site. It's <http://www.napanet.net/~neda>.

More appropriately, the cutting edge of model aircraft activities, the FAI/CIAM, has its Website too. Information available includes FAI statutes and bylaws, Sporting Code, world records, championship results, calendar of events and other details relating to the air sports. This is an international website, so it covers events from around the world. Keep in touch by calling <http://www.fai.org/~fai/>.

Where will it all end? We may all have to get wired just to keep up with the information.

SPEAKING OF ENDING . . .

It's time once again this month to call the column to a close. I would appreciate it if you would take your camera to the field and use it for some nice action shots. The usual who, what, when and where information should be attached to any photos. Send them to Bob Stalick, 5066 N.W. Picadilly Circle, Albany, OR 97321. MB

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2.0 oz	38"	plain	5 yds +	\$1.75/yd
3.0 oz	38"	plain	5 yds +	\$1.80/yd
3.0 oz	38"	satin	5 yds +	\$2.75/yd
3.0 oz	50"	plain	5 yds +	\$2.25/yd
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6.5 x 5.0	3	3.95	8.75 x 7.5	5	3.95	8.75 x 8.00	5	3.95
6.5 x 5.5	3	3.95	8.75 x 7.50W	5	3.95	8.75 x 8.00W	5	3.95
6.5 x 6.0	3	3.95	8.75 x 7.50W	5	3.95	8.75 x 8.00W	5	3.95
6.5 x 6.5	3	3.95	8.75 x 7.50W	5	3.95	8.75 x 8.00W	5	3.95
7.0 x 6.0	10	3.95	8.75 x 7.50W	5	3.95	8.75 x 8.00W	5	3.95
7.25 x 7	20	3.95	8.75 x 7.50W	5	3.95	8.75 x 8.00W	5	3.95
7.5 x 7	20	3.95	8.75 x 8.00	5	3.95	8.75 x 8.00	5	3.95
8.0 x 7.5	21	3.95	8.75 x 8.00W	5	3.95	8.75 x 8.00W	5	3.95
8.5	4	1.75	8.75 x 8.00W	5	3.95	8.75 x 8.00W	5	3.95
8.5 x 5	4	3.95	8.75 x 8.25W	5	3.95	8.75 x 8.25W	5	3.95
8.5 x 5.5	4	3.95	8.75 x 8.25W	5	3.95	8.75 x 8.25W	5	3.95
8.5 x 6.5	5	3.95	8.75 x 8.25W	5	3.95	8.75 x 8.25W	5	3.95
8.5 x 7.0	5	3.95	8.75 x 8.25W	5	3.95	8.75 x 8.25W	5	3.95
8.5 x 7.25	5	3.95	8.75 x 8.25W	5	3.95	8.75 x 8.25W	5	3.95
8.5 x 7.5	5	3.95	8.75 x 8.25W	5	3.95	8.75 x 8.25W	5	3.95
8.5 x 7.75	5	3.95	8.75 x 8.25W	5	3.95	8.75 x 8.25W	5	3.95
8.75 x 7.0	5	3.95	8.75 x 8.25W	5	3.95	8.75 x 8.25W	5	3.95
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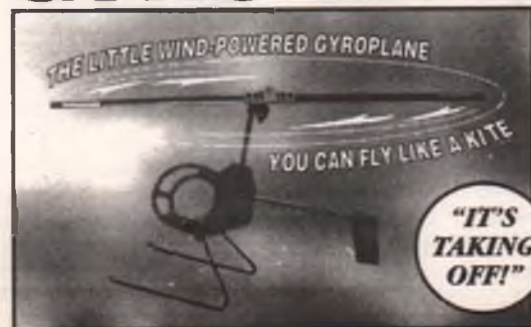
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A REVOLUTIONARY NEW CONCEPT IN KITES

PRODUCTS IN USE

■ By Eloy Marez

THE JR F400 FOUR-CHANNEL FM RC SYSTEM

Horizon Hobby Distributors and JR present their
“back to basics” radio control system in the F400, a no-frills
four-channel system for beginners and sport fliers.

There is little question about the advantages of the many features and functions of high-end radio control systems such as JR's PCM-10Sx, the Airtronics Stylus, Futaba's 9Z series, etc. However, not all of us need or can use such complex radios; there's still a very real need for the simpler, no frills, uncomplicated equipment.

Such a radio is the new JR F400 from Horizon Hobby Distributors. It's your basic four-channel system, yet it is not without some mod-

ern advances that can be quite attractive to the user. The F400 is a two-stick FM system available on all aircraft 50, 53, and 72 MHz FM frequencies.

The first thing that will appeal to the prospective buyer is the appearance—fully professional and high quality. Next will be the feel—the transmitter is built into the same case the JR's XF622, considered by many to be one of the most comfortable fitting transmitters around. Though the total beginner might not recognize its importance, the feel, being the naturalness of the transmitter's fit in the flier's hands, makes a noticeable difference as one's flying skills grow.

After that, though the concept might seem somewhat old fashioned, the circuitry itself isn't. The F400's electronics consist of modern circuitry and assembly techniques, no doubt utilizing many of the lessons learned from the more complex JR equipment. There's nothing unusual

here; good feeling sticks with length adjustments and ratcheted trims in their normal position. The unit is normally furnished in the Mode Two configuration, and though no information is included, a change to Mode One would be simple, requiring only transposing the ratchet and spring to the opposite side. If such a change is made, remember also that the throttle and elevator servo connections on the receiver will be reversed, otherwise all operation is normal.

The transmitter meter reads battery voltage and is clearly marked for reference during use. There's a built-in trainer system, thoughtfully compatible with all other trainer-equipped JR FM equipment. The necessary trainer cord number is JPRA130. A DSC (Direct Servo Control) function is also built in; it allows one to operate the aircraft's controls without the transmitter actually transmitting a signal. Use of the DSC requires both a three-wire switch harness, No. JRPA001, and the DSC cord itself, No. JRPA132. An even nicer switch harness, No. JRPA004, is available; it brings all switching and connections to a single unit generally mounted on the side of the aircraft.

One of the hard-to-do-without features in transmitters is servo reversing—and they are not omitted on the F400. These set-and-forget switches are located under the battery, which in turn is located under the sliding door on the lower rear of the transmitter case.

RECEIVER

The receiver supplied with the F400 is a six-channel unit designated R600, measures 1.43 x 2.06 x .55 inches, and weighs 1 ounce—small and light as far as receivers of this ilk go. It is JR rated for a



If the F400 transmitter seems familiar, that's because it's built into the same ergonomically designed case as JR's intermediate-level XF622 computer system—but without all the bells and whistles.



The six-channel R600 receiver supplied with the F400 system is described as "the size of a credit card, only thicker," and weighs only 1 ounce. Features JR's exclusive ABC&W circuitry for superior noise and interference rejection.



Removing the rear battery cover exposes the transmitter battery; lifting the battery out will expose the clearly marked servo reversing switches—set and forget!



Carlos Rangel, of Bogota, Colombia, builder and flier of many all-metal model aircraft, swears by his JR radios; this is his 1/8-scale, 23 pound, JR X-3883 controlled Pitcairn Porter.

sensitivity of 5 micro-seconds and a selectivity of 8KHz/50Db. JR uses proprietary circuitry listed as ABC&W (Anti-Blocking Cross-Modulation and Windows) for which



The F400 comes with a complement of three NES-507 "standard" servos—enough for your basic rudder/elevator RC glider (still our personal preferred way of getting newcomers involved in RC and an application where a basic radio like this will find much favor), or even full three-axis control on a simple aileron slope glider. But for learning to fly power, Eloy recommends starting out with a full four-channel airplane, hence his recommendation to buy an extra servo when purchasing your F400 system.



A great add-on accessory is the JRPA004 switch/charge/DSC harness; the small side-mounted panel includes all the fittings required for these functions.

I have never seen a schematic diagram and cannot comfortably discuss. However, JR receivers work and work well; they are widely used by helicopter fliers—an environment which is definitely a lot less friendly than in the average airplane.

SERVO

Furnished with the F400 are JR's No. 507 "standard" servos, measuring .73 x 1.52 x 1.32 inches, weighing 1.47 ounces, and rated at 40.3 ounce-inches of torque. Speed-wise they are rated at .25 second for 60 degrees. The 507s are an intelligent choice for most airplanes that this radio would be considered for. Though all of JR's extensive line of servos is plug-in compatible with the rest of this system, I would recommend any upgrades only for the more experienced flier and more sophisticated projects.

In respect to the servos, though, there is one point I can't agree with! The F400 is supplied with only three servos—and I could never see the need for three-channel trainers. The ultimate goal for all fledgling RC pilots is at least a four-control airplane—with ailerons. Why bother to learn to fly without them? At the start, it matters not what

control the airplane turns with, but that the right-hand stick, moved horizontally, will make said airplane turn. With the proper equipment and instructor, the first airplane should last long enough to take the student to the level where ailerons are required, as they are for even basic maneuvers. As a matter of some interest, the weight of the F400 airborne system with four 507s just clears 10 ounces.

Therefore, in my opinion, it would be best to suggest to the beginning radio buyer that he obtain that extra 507 and go for four channels from the beginning.

BATTERIES

The F400 transmitter and airborne packs are 600-mAH Sanyos, which in the transmitter are connected with a secure plug. A dual overnight charger with individual LED indicators is furnished; batteries can be charged individually or simultaneously. The transmitter does not incorporate a diode in the charge circuit, so battery testing can be done through the charge connector. Just remember that contrary to all other brands of RC equipment, JR uses the center of the coax connector as negative—not positive.

Inside the transmitter, mounted on the upper right corner of the circuit board, you will find a 3-amp, 5x20mm fuse; check it if you ever find the transmitter completely dead. And never replace it with one of higher value! Should this fuse go west, after replacing the fuse, I would recommend that the transmitter be left on (antenna extended) for an hour or so to check if the fault that made the first fuse go still exists. If the second one goes, back to Champaign, Illinois for the F400!

The manual supplied with this system is more than adequate for this basic a radio, including such things as a comprehensive description of how to adjust the aircraft's control surfaces. Warranty? One year, with the usual provisos against abuse, altering, etc.

The JR F400 comes with a suggested retail price of \$279.95. However, we all know that street prices for everything you care to mention vary widely; the F400 is actually available for a lot less. Check your local hobby store; and don't forget to include that other 507 servo in your negotiations—you'll probably be pleasantly surprised. The F400 is strongly recommended for first-timers, or for "boring holes in the sky" type of flying, and flying, and flying . . . MB



MODEL BUILDING 101

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BY J.J. LEVINE

A word of thanks to all involved with the MB101 program

Sometimes an event brings you up short. You suddenly recall having neglected to tell someone how much you appreciated them . . . until it was too late.

Thus, a few brief notes, not only to soothe my conscience but also to give credit where it is due.

First, to *Model Builder* magazine, which enabled us to have a national voice for a cause they fervently believe in. It was Associate Publisher Mark Thiffault who accepted on blind faith the fact that our organization was viable, that its concept paralleled his belief in presenting aviation to Middle School students via the building and flying of model aircraft. It is also to his credit that he gambled on our capability to deliver copy that was informative, interesting and on time. Hopefully we have justified his faith in us.

The response we have been getting in both donations and participation seems to have borne out his foresight. More and more, those who have taken the time to stop by our displays, donated booth space at various shows, and tell us that they appreciate our column, also leave us with a warm glow and the knowledge that we are not alone.

We would be remiss if we failed to acknowledge the encouragement and generous financial assistance of RCHTA. For those who do not know, the Radio Control Hobby Trade Association is a group of manufacturers, distributors, dealers and hobby enthusiasts formed to preserve and nurture the lifelong avocation of model building. It was Frank Garcher, President of Midwest Products, who was one of the first to jump in and give this not-for-profit organization the necessary contacts within the industry. Frank convinced the RCHTA board to donate a booth, plus a cash donation, to "get us off the ground." They repeated that generous gesture again this year.

Of course, we cannot forget Ernie Petit, chief honcho at the

Testor Corporation. In 1994, at my request, Ernie donated a sizable amount of his excellent cement for wood models. Literally hundreds of our students have successfully built and flown our Delta Step-1 and Tennyson Step-2 using his cement. Time and again we have called upon Ernie's generosity, and without fail or notice, shipments arrived to satisfy our growing needs. The irony of it, of course, is that Testor no longer has a wood product. Therefore, it behooves us to make a simple request. Should anyone be in the market for the paint or plastic products Testors offers, make the purchase. In addition to getting excellent value, you will also have MB101's and the participating students' deepest gratitude. Neil Testor and Charlie Miller would be proud of you.

Alson G. Smith, President of Guillow's, is yet another prime example of going all out to support a cause he believes in. His generous offer, although still in the formative stage with us, is indicative of the farsightedness needed to work on more than an immediate, bottom-line return program.

What's that hackneyed cliché, "Behind every man there is a devoted woman"? It was over 20 years ago that I persuaded her she couldn't live without me, and now Esther (Kitten) continually wonders how she can live *with* me! As anyone who knows us can attest, without my wife there would be no life.

It was Simpson Middle School teacher Tiffany Green's first experience with our sixth grade Step-1 Delta Program. With approximately 135 students during this five-day

course, Tiffany lost her trepidation about conducting the course and having all of her students successfully fly their planes. Using our instructional videotapes, she guided the building process by further emphasizing the techniques on the blackboard.

Ms. Green had some reservation about getting into the technical aerodynamics, which are an intricate part of our program. However, she taped my dissertation and feels confident that future classes will incorporate these segments. In addition, teachers belonging to our group have the ability to obtain technical and material support, as needed, at any time.

We are now establishing an "MB101 support system" whereby any technical questions the teacher may have difficulty answering may be faxed to us and have an appropriate answer faxed back in time for their next session.

Tiffany is typical of the enthusiastic teachers we have come to know and admire. Delivering to us a stack of "Thank You" letters and over 35 orders for material to enable students to continue building at home, after the course was completed, is really only the tip of the iceberg. It is step one in a student acquiring an avocation and intellectual interest that lasts the rest of his or her life.

Again, in closing, please remember that we can use all the help available, and any donations to our tax-deductible program will be greatly appreciated. All funds are used to further our Middle School Program.

Address all inquires and comments to: Model Building 101, Inc. 1891 Branchview Drive, Marietta, GA 30062. Phone: (770) 973-3598. Fax: (770) 422-2765. MB

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WHERE THE CONTROL LINE ACTION IS, PART 2

Last month John started a listing of flying sites around the country, based on a recent survey of active CL clubs and flying groups. This is the second installment in that listing.

When you visit a new flying site for the first time, remember that there are local customs and rules. Be sure to check with the local fliers about anything unusual about the unfamiliar site. The locals always welcome newcomers and will be glad to tell you anything you need to know about the site or local activities.

The fliers supplying information for this listing of flying sites had several good pieces of advice for newcomers:

- Always check with the local club before using the field. (Contacts are listed with each location below.)

- Use common sense and courtesy. Drive only in designated areas. Don't fly early in the morning if there are neighbors that could be disturbed. Use mufflers if there are houses nearby. Follow posted

rules.

- If confronted by a park worker or police officer, do what they tell you without argument; take up any complaints with the club later, so that the problems can be worked out diplomatically by club leaders and the site owner.

If you know of any sites that have been missed in this or last month's column, send me the information at the address at the end of the column.

• Lincoln Park, New Jersey

The George L. Gaydos Model Airplane Flying Field has three grass circles with paved runways and is available virtually year-round. The field is on Two Bridges Road in Lincoln Park. No flying is allowed before 10 a.m. and mufflers are recommended.

The Garden State Circle Burners meet

on the second and last Friday of every month at 8 p.m. in the VFW Hall on Valley Road in Clifton, New Jersey. For information, contact Mike Ostella at (201) 429-9533.

• Muncie, Indiana

In addition to being the home of AMA headquarters and the national flying site, there also is an independent CL flying site in Muncie's Westside Park that's used by the Muncie Controliners. There are two paved circles plus a grass area suitable for flying. To get to the site, take State Road 32 to Tillotson, then head north two blocks; the park is on the southeast corner of White River and Tillotson. The site is open to flying at any time, but most activity is on evenings and weekends. For information about local activities, contact Dave at P.O. Box 384, Daleville, IN 47334, or via e-mail at 102643.427@compuserve.com.

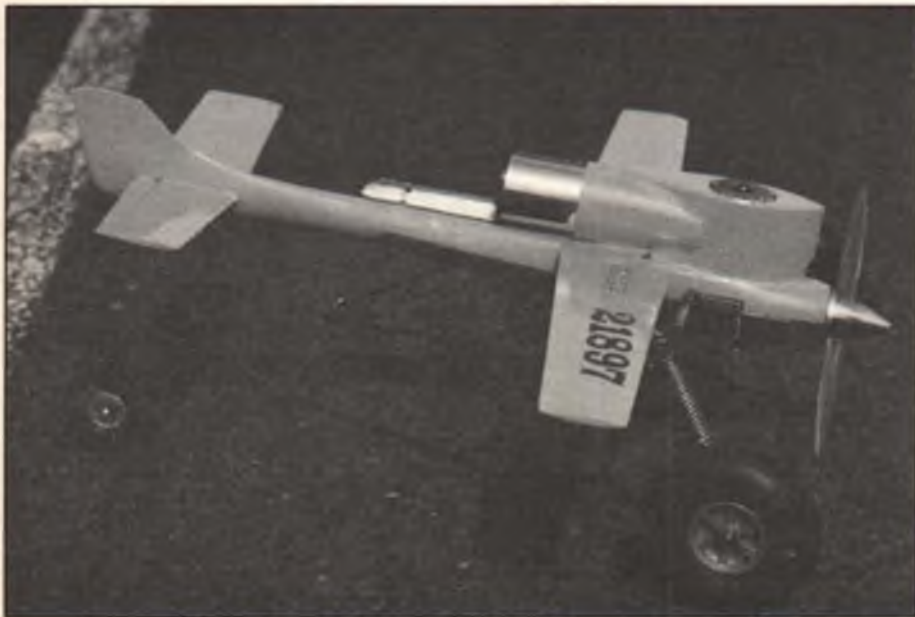
• Omaha, Nebraska

Seymour Smith Park offers one paved circle and two grass circles with paved centers, and off-street parking and restrooms. Take the 72nd Street exit off Interstate 80 in northeast Omaha south for a mile. Look for the north entrance to the park about 100 feet after you pass under a railroad trestle; follow the gravel road downhill to the parking lot.

The weather is generally good May through October, and the Omaha Orbiting Eagles keep the site busy on most Sunday afternoons. Flying is limited to 9 a.m. to 10 p.m. For information about the site and Orbiting Eagles activities, contact Bob Furr, 8147 Read St., Omaha, NE 68122; (402) 571-5641.

• Pearl City, Hawaii

The Paradise Control Line Flyers use a wind-protected area on the east side of Neal S. Blaisdell Park, which fronts on Pearl Harbor. The address is 98-319 Kamehameha Hwy, and it's about a 20-minute drive from Waikiki. It's a



Speed ships are all business. This .68-powered Class D model by an unidentified builder features a fiberglass/epoxy prop and huge diameter mini-pipe. The takeoff dolly, of course, never leaves the ground.



Precision aerobatics models are the showcase for master craftsmen and a delight for spectators. Bill Rich's version of the SV-11 was one of the many gorgeous starters flown at the 1986 Nationals.



Because of its simplicity and excellent performance, the Martin MO-1 is a favorite among Navy Carrier fliers. This is Pete Mazur's Class I model, photographed at the '85 Nationals in Richland, Washington.



The Columbia Basin Balsa Bashers in the Tri-Cities area of Washington state have no dedicated flying site, but have arranged with local governments for the use of several sites for contests; they can use any of the sites for casual flying as long as there's no competing activity. This photo shows the carrier area at Marina Park in Richland, with Todd Ryan's puffin utilizing landing in for an arrival landing at one of the local owners. The paved area in the background is used for speed and racing.

city-designated flying site, with flying allowed from 7:30 a.m. to 5:30 p.m. There's room for two or three grass circles. Winds are usually northeast tradewinds, except for about 10 percent of the year when they blow from the south. The club flies every Sunday, weather permitting, and holds its meetings at the park on the first Sunday of each month at 2:30 p.m. For information about the Paradise Control Line Flyers and local flying activities, call club president Tom Hackett at (808) 734-8303. He can be reached by mail at 3602 Keaolele Pl., Honolulu, HI 96816, or by e-mail at tomh@aloha.net.

•Phoenix, Arizona

The Central Arizona Control Line Club uses a site at Estaban Park, at 36th and Roessner in Phoenix (between Broadway and Southern, west of 40th St.). It's a large grass area with room for three circles. The club obtains official permission for contests, but Sunday flying is done unofficially. Club members usually fly on Sundays, very early in the day during summer months. There are no restrictions, but AMA or club membership is recommended. It is strongly advised that anyone planning to fly at the site contact one of the following club members first: Jim Hoffman, (602) 897-0630; Mark Smith, (602) 877-8968; or Jeff Hanauer, (602) 957-9625.

•Portland, Oregon

East Delta Park has one paved circle and a grassy area that's usually available for at least one additional circle. To reach this city-designated flying site, take the Delta Park exit off Interstate 5 on the Oregon side of the Columbia River near the Expo Center. The flying site is near the softball fields in the east end of the park.

The Northwest Fireballs fly here on Sundays, usually in the late morning or early afternoon. There are no restrictions on park use, but CL fliers sometimes lose the use of the grass area to softball players or ballgame parking. Information about Fireballs activities can be obtained from Scott Riese at (503) 246-8867.

•Richland, Washington

The Columbia Basin Balsa Bashers fly at Marina Park at Columbia Point, just off Interstate 82 where the freeway crosses the Columbia River between Pasco and Richland. They also use the Horn Rapids Athletic Complex of Snyder Road in North Richland. The Marina Park site has a smooth parking lot with room for at least two asphalt circles, plus a grass area often used for carrier events. The Horn Rapids site has room for an asphalt circle and several grass circles on smooth softball fields.

The CBBB holds small contests nearly monthly for a wide variety of CL events. Timely information about Tri-Cities CL activities can be obtained from Paul Rice, Rt. 3 Box 8642, Richland, WA 99352.

•Salem, Oregon

The Central Willamette Valley Flyers are using a brand-new, city-owned site at Salem Airport, known as Bill Riegel Model

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Air Park. The site is reached from Interstate 5's exit 253 west to Highway 22/Mission Street, to 25th Street, and south to the field, which is in front of the Federal Express facility and the airport terminal.

The Western Oregon Control Line Flyers use the new paved asphalt circle, which has a speed pylon and safety net, plus a grass circle with a concrete center. Information is available from Mike Hazel, 1073 Windemere Drive N.W., Salem, OR 97304; (503) 364-8593.

•San Diego, California

Bob Fogg reports that the San Diego area doesn't have any officially designated CL sites, but there are some usable areas for flying. One is the asphalt parking lot of Jack Murphy Stadium, at Interstate 8 and Interstate 15. There's no formal organization, but sport and stunt fliers use the site. Mufflers are required on engines larger than .049. Check-in is required at the stadium office. The parking lot is often in use for other activities on weekends.

The other San Diego site is a dirt/carpet circle at Aero Drive and Glen H. Curtis Road at the Montgomery Field airport. The area is used evenings and weekends by sport and stunt fliers. Mufflers are required. "Bring lots of cleaner," Bob says of the Montgomery Field site.

•Tinton Falls, New Jersey

Dorbrook Park has two full-size circles and one small circle. The park is on Route 527 between Lincroft and Freehold. Take the Garden State Parkway south to exit 109-Red Bank, NJ, bear right and then turn left onto Route 520 (Newman Springs Rd.). Follow that a half-mile to route 527 (Swimming River Rd.), turn left on 527 and look for the site on the left side after about three miles. A dirt road leads into the park; it's a right turn to the CL field.

The park is used by the Bay Shore Control Line Club, primarily on Saturdays and Sundays after 9 a.m. It can be used during the week, but a club member should be present. The site has an excellent lawn maintained by the Monmouth County Parks Department. AMA license is required. Tony can be contacted for more information at 102665.1534@compuserve.com.

•Topeka, Kansas

The Topeka Control Line Association flies at Gage Park, in the southwest corner of the park off 10th Street. There is one asphalt circle and one grass circle. Club members normally fly at the park on Sunday afternoons; there are no restrictions. More information can be obtained from Melvin Schuette at P.O. Box 240, Auburn, KS 66402; (913) 256-2583, e-mail at 73473.1407@compuserve.com.

•Toronto, Ontario, Canada

The Balsa Beavers Model Flying Club, one of the oldest model flying clubs in Canada, manages a nice flying site in Centennial Park, Etobicoke, a suburb of Toronto. There's a 70-foot paved circle, a 70-foot grass circle, and a 60-foot grass

continued on page 76

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HELICOPTER WORLD

■ BY JAMES WANG



CHOPPER CHATTER

This month James goes over a couple of helpful tips on maintaining your helicopters, and takes a look at some new RC helicopter accessories.

Have you ever noticed your helicopter wobbling or oscillating in hover? One of the things that can cause this is play in the main rotor shaft, where the shaft is either a bit too small for the bearings or the bearings are loose inside the bearing blocks. In the case of the latter, a good fix is to sandwich a thin layer of silicone tape between the bearing and the bearing block. I recommend using Radio Shack #64-2336 red silicone tape; a 1-inch wide, 3-foot roll is \$1.99.

If the main rotor shaft is a loose fit in the ball bearing, smear a very light coat of Locktite on the shaft where it goes into the bearing. Don't use too much, otherwise it will be difficult to remove the shaft from the bearing later on. Check for play in the main rotor shaft by holding the helicopter frames firmly, then wiggling the main rotor shaft gently.

• This next tip is offered by my friend Mike, one of the chief mechanics at Sikorsky Aircraft. To prevent the heat-shrink covering from lifting on his models' rotor blades, Mike drills two 1/16-inch holes on the blade tip to generate an aerodynamic suction to suck the covering down (see drawing). Drill one hole from the top to the bottom, then drill the other hole from the tip to intersect the first hole. Air passing by the hole on the blade tip creates a low pressure that draws air from the top and bottom holes. It really works.

• Most model helicopter exhaust systems consist of a header and a muffler or tuned pipe; the two parts are usually joined with a silicone tube. Always leave a small (1/32-inch) gap between the two parts. Then, use a 3-inch piece of 1/16-inch piano wire to attach the muffler clamp to the helicopter frame. Bend the wire into a half-moon shape so it will have some flexibility. Bend an eyelet into each end of the wire so you can bolt it to the side frame. The support should be springy, but not flimsy. This springy support will reduce noise and improve the life of the muffler.

• Check your glow plug frequently. If the platinum element is no longer silver and shiny, or has white powdery crystal formations or a brownish discoloration, change the plug. Horizon



The new .40-size Hirobo GPH-348 helicopter shown at the '96 WFRAM show, the latest in the new wave of high-performance .40-.46 helis to hit the market. James promises more details on this hot ship in a future column.



The Intrapid from Century/Bergen is designed for either a .60 two-stroke, a .91 four-stroke, or a 23cc gasoline engine.

Hobby Distributors recently introduced a special "#3 Performance Heli" glow plug designed especially for helicopter engines. These plugs are made by McCoy Manufacturing and come in a package of two for \$9. They do not have an idle-bar and their heat range is similar to an O.S. #8, an Enya #3 or a

HELICOPTER WORLD



1/16" HOLE DRILLED THROUGH THE BLADE TIP BEFORE APPLYING HEAT-SHRINK COVERING. DO NOT OPEN UP THE HOLES AFTER COVERING

1/16" HOLE
DRILLED FROM THE BLADE TIP
TO INTERSECT THE VERTICAL
HOLE. THIS HOLE MUST BE OPEN
TO THE OUTSIDE AIR

Mike the Sikorsky helicopter mechanic came up with this clever idea for keeping the heat-shrink covering from lifting away from his models' blades. See text for explanation.



Bergen Machine's unique floating axle for the Intrepid and also X-Cell 80 rotor heads. The spherical nylon insert in the middle takes the thrust loads.



Century Helicopter Products' new Hurricane line of .30 and .60 size carbon fiber glass rotor blades.

Rossi #4. I've used them in my .32 and .60 size engines. So far, they have worked very well, and after 20 flights I have yet to burn one out. Their performance is similar to the O.S. #8 but they are less expensive.

NEW HELI GOODIES

•ElectroDynamics Inc. is a firm owned by Mr. Andy Low.

Andy designs and manufactures useful electronic devices to make our hobby more enjoyable. Three of his newest products include a compact on-board battery monitor, a servo exerciser, and an on-board glow plug driver. The EDR-105 digital on-board battery monitor has a bank of one red, two yellow, and three green LEDs. It is designed to be left plugged into an unused receiver channel. Three green LEDs indicate the battery is fully charged; when only one green LED is left on, the battery is getting low; yellow LEDs mean the battery has dropped below 4.8 volts; the red LED means it's time to quit flying. The EDR-105 battery monitor consumes less than 25 mA, which is about the same as a servo at idle. Andy makes the unit in 4.8-volt and 6-volt versions.

Most helicopter fliers like to set the idle adjustment on the rich side so the engine will run rich in hover. The problem with this is that the engine is prone to flooding or quitting if left idling for an extended amount of time because it "loads up" with fuel. ElectroDynamics' EDR-103 Glowlite system is designed to solve this problem. The unit is connected in parallel to the throttle servo. When the throttle stick is in the low position, a user-supplied, on-board 1.2-volt NiCd battery lights the glow plug. The point where the power comes on and off is adjustable. The unit without battery weighs only 35 grams.

The ElectroDynamics EDR-203 Servo-ciser allows you to plug in a servo and control it without using a transmitter. The built-in microchip also lets you set up the unit to move the servo back and forth automatically to let you check for any binding in the control system. There are two buttons for you to control the servo movement.

ElectroDynamics also sells all kinds of servo leads, NiCd batteries, battery chargers and many other devices. Give them a call at (313) 422-5420 to request a catalog. Their address is 31185 Schoolcraft Rd., Livonia, MI 48150.

•Revolution Products, another proprietary product line distributed by Horizon, will be introducing a new fixed-pitch helicopter called the HoverStar. It's aimed at entry-level heli fliers and at experienced airplane fliers who want to give helicopters a try without having to buy a specialized radio and engine. The HoverStar is designed to use a standard four-channel radio and a .40-.46 airplane engine and muffler.

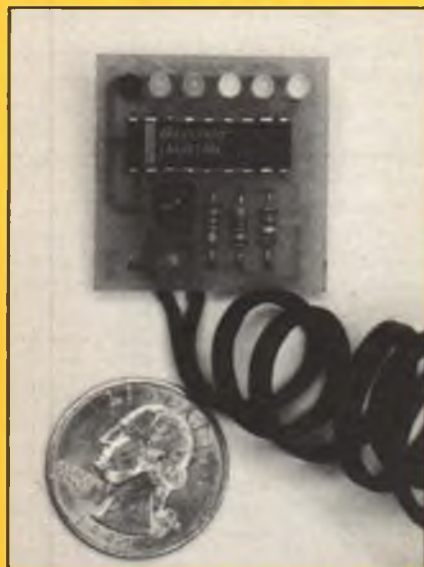
The design is reminiscent in some ways to the old GMP fixed-pitch Rebel, but it incorporates several new features. The sideframes and servo tray, for example, are made from G-10 composite fiberglass. The main rotor head is a one-piece molded nylon unit. The kit even includes a wood dowel training gear and an excellent 40-minute video on to how to build and fly the HoverStar. The street price will be around \$250.

Even though the HoverStar is designed as a docile beginner's model, the video shows it can do loops and barrel rolls. For those contemplating getting into RC helicopters, the video is available separately for only \$10. The tape has some nice original music, too. We will have a write-up on this kit soon.

Revolution has also introduced a piston locking tool for facilitating the removal of propeller or fan hub. It is a small red anodized aluminum rod that threads into the engine's glow plug hole to keep the piston and crankshaft from turning. The tool is designed for .30-.60 size engines.

Revolution's gold anodized aluminum servo arms are now offered in a special five-piece kit that includes the right length

HELICOPTER WORLD



The EDR-105 on-board battery health monitor from ElectroDynamics Inc. The row of six LEDs at the top indicates the charge status of your airborne radio battery.

arms for all of the control functions on the X-Cell 60. I'm using them on my X-Cell Custom, and they work and look great. There are two versions available, one for Futaba servos and another for JR or Airtronics servos. Revolution also carries a complete metal servo arm kit for the Shuttle. The arms are also available individually.

•At the 1996 WRAM Show, Altech/Hirobo introduced a brand new helicopter design called the GPH-346. It has a metal rotor hub with glass-filled composite material blade grips. The canopy is made of a super-flexible material that makes it all but unbreakable. Unfortunately I don't have any more information about it at present, but I'm sure we'll learn more about the GPH-346 when it comes



The top-quality machined aluminum, gold anodized servo arm components produced by Horizon under the Revolution Products line are now available in a set packaged especially for the X-Cell 60 helicopter—see text for details.

out this summer.

•Century Helicopter Products and Bergen Machine and Tool have teamed up to introduce a new .60-size machine called the Intrepid. This is the first helicopter kit designed right from the start to accept a regular two-stroke .60, four-stroke .90, or a 23cc gasoline engine.

The Intrepid uses G-10 composite for the sideframes and servo tray. The main rotor head is comprised entirely of CNC-machined metal components—rare nowadays. All control bellcranks are supported by ball bearings. The canopy is one-piece molded fiberglass. The street price of this kit will be around \$800.

A very nice feature of the Intrepid is the steel floating axle inside the main rotor head. A black nylon ball is fitted in the center of the floating axle; the purpose of the ball is to take the rotor thrust loads. On the X-Cell and Shuttle heads, the thrust loads are absorbed by

two rubber O-rings. The O-rings are supposed to provide flapping restraint only, but they get compressed at the top because the thrust forces are lifting the floating axle up. This special floating axle is also available separately because the Intrepid's main rotor head hub and blade grips are interchangeable with X-Cell parts.

•Century Helicopter Products recently released a brand new line of "Hurricane" carbon/fiberglass main rotor blades—four different .60-size blades and two different .30-size blades. The 550mm .30-size blade is designed for the Shuttle or Ninja; a slightly shorter set is available for the Concept 30 and Enforcer ZR. I've tried the 550mm blades on my Ninja and they fly very well.

I really like the 660mm symmetrical blades. They have a 12mm thick blade root and fit the Concept 60 perfectly. They come with four 1mm shim washers so they can be adapted to the X-Cell 60, Schluter and other helicopters that have a 14mm grip.

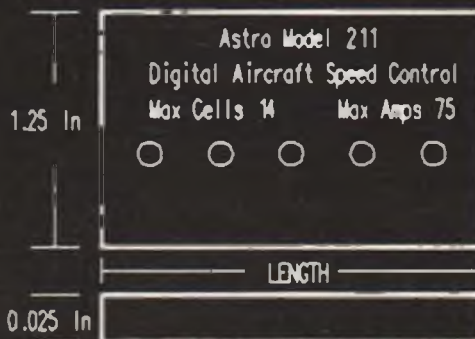
Century has also extended their line of Aerotech wood blades to include 600, 640, 660, 680, and 700mm lengths. The 600mm is for the new wave of .46-size helicopters such as the Ninja-Magnum Pro Master 46, Ergo 46, GPH-346, and TSK 46. The 640mm is for a standard X-Cell 60. The 660 and 680mm are for the X-Cell 60 Custom, XL-Pro, Kalt Alpha, and Schluter helicopters. The 700mm length is for Intrepid, XL-Pro and Kalt gasoline helicopters. Check your hobby shop or call Century/Helicopter World at (408) 942-9521 for details.

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CONTROL LINE *cont. from page 70*

circle. All circles have paved center pads. The field is just south of Toronto's Pearson International Airport. The site is at the north end of the park and is located just south of Eglinton Avenue and east of Renforth Drive. Entrance is via Centennial Park Blvd. Just as you reach the first curve (going south), you will see a sign on your left for the flying circles.

The club flies on Monday and Wednesday evenings and Sunday mornings, with Mondays set aside for teaching beginners. MAAC, AMA or similar insurance is required. For flying site and activity information, contact Chris Brownhill at (416) 255-1289 or Doug Carson at (905) 507-0673.

•Tucson, Arizona

Christopher Columbus Park (formerly Silverbell Park) has two asphalt circles and three grass circles. Exit Interstate 10 and take Grant Road west about a mile to Silverbell Road, then north about a mile on Silverbell. Tucson Cholla Choppers members fly here on weekend mornings, and the site is open at all times except for scheduled events. It's hot in summer and flying early in the day is advised. There are water fountains and restrooms on site, and many motels, restaurants and the local airport are close by. For information, contact Gerry Capuano at 329 S. Norris, Tucson, AZ 85719, or Lou Crane, who can be reached by e-mail at 71675.2001@compuserve.com.

•Vancouver, B.C., Canada

There are several CL sites in the Vancouver area, the most active of which is the Rice Mill Road site in Richmond, B.C., a Vancouver suburb. The field is used mostly on Saturdays and Sundays, and members of both the Pacific Aeromodellers Club and the Vancouver Gas Model Club are active fliers. Heading to the site from Interstate 5 at the U.S. border, head north through the George Massey Tunnel and take the exit immediately after the tunnel. Turn left on Steveston Highway, and left again at the first traffic light on to No. 5 Road. Continue a half-mile to Rice Mill Road and go left a quarter-mile to the flying site. The triangular municipal park has a grass circle and a circle with a pavement takeoff doughnut. Information about the Rice Mill site and other Vancouver area sites can be obtained from Frank Boden, 4791 Shepherd St., Burnaby, B.C. Canada V5H 1L6.

•Washington, D.C. area

Mike Trettel reports that fliers in the D.C. area, members of the Sky Lancers Of Washington and the Northern Virginia Control Line Club, use a couple of different sites. The SLOW club flies at the Goddard Space Flight Center in Greenbelt, Maryland. This site is on Old Beaverdam Road, off the BW Parkway. It has two circles (one grass, one with a carrier strip) and a secondary grass area for 1/2As. Just about every Sunday

from March to October you can find CL flying at Goddard, with anything from slow combat to carrier and stunt. Information about the SLOW club can be obtained from Chuck Buffalano, 9613 Hillridge Dr., Kensington, MD 20895, or from John Vlna at his e-mail address: jrvlna@aol.com. The club meets on the third Friday of every month at the Hap Arnold Center at College Park Airport.

Mike also uses the former Frederick County RC Club site in Maryland, about 40 miles northwest of the D.C. metro area. The county-owned site has room for two grass circles. To get there, take Route 340 west from Frederick (MD) exit at Lander Road (Jefferson), proceed to Route 180, take a left and go a quarter-mile to Old Middletown Road on the right, go up Old Middletown about 3 miles and take a left on Sumantown Road. Go one mile and bear left on Sumantown at the fork. After crossing Catocin Creek (there's a bridge), there's a dirt road on the left, which leads to the site. For information about the Frederick County site, Mike Trettel can be reached by e-mail at trettel@bigdog.fred.net.

Send contest flyers, contest results, club news, photos, questions, technical tips and other items of interest to CL fliers to John Thompson, 295 W. 38th Ave., Eugene, OR 97405. E-mail at JohnT4051@aol.com. **MB**

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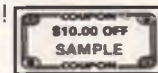
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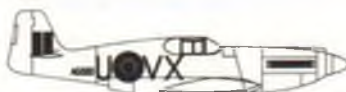
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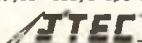


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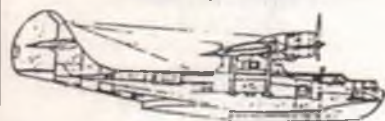
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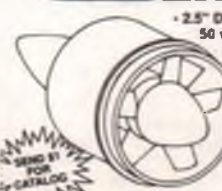


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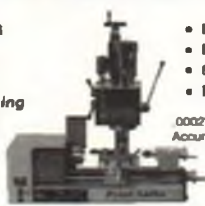
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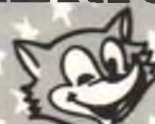
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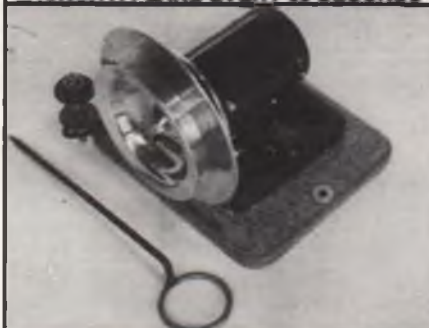
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"Here's a tip on hanging your models on a wall safely, using a holder bent from an aluminum clothes hanger. Unbend the aluminum hanger so that it's straight, then bend it in the middle so the ends meet. Put bends in the last 3 inches of each leg so the airplane can hang on it by the tail. The hanger can be hooked on a stout nail hammered into the wall (be sure to angle it upward so the hanger can't slip off). This tip works best on taildragger models."

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TECH STUFF *cont. from page 14*

kind of minimal rules in most cases. "No limitations" may sound good but would usually be an oversimplification. Anarchy is rarely a good solution to the problem of too much government. The development of optimum, minimally restrictive model airplane rules does take some thought, however. Let's examine the pros and cons of a few options.

First, I do not favor sets of rules which independently restrict several interrelated parameters on the model—power and area, or area and weight, for instance. This almost completely destroys initiative on the part of the designer/builder and prolongs the life of less-than-optimum designs. In such cases the rule makers effectively become the designers.

On the other hand, I have no quarrel with one-design events for groups of "them" whose primary interests are luck in the contest, good construction, and good maintenance and preparation—or flying skills, as we discussed in connection with pattern. They may not have thought much about what they want in their event; but they know what they *don't* want—namely someone designing a better airplane than the one they're flying. Fair enough, but one-design events will be largely "theirs," not "ours."

With regard to detail rules, wing area limits (or total horizontal area) are often used. Not bad. This is one way of limiting the "size" of a class of models, for reasons of cost, building time, ease of transportation and storage, laws, safety, or the effect of model size on performance. Bigger is often better; but in some events, smaller models may have an advantage. Requiring a specific area is probably better than specifying a maximum or a minimum area.

Area rules in the past appear to me to be the main reason why "lifting tail" free flight models with very large stabs were developed (although the dynamics of stability both under power and in the glide may have played a part—I'm rather ignorant in this area). If lifting tails were developed as rule beaters, it was because the rules specified maximum wing area. Creative modelers immediately saw that by using a lifting tail and an unusually large stabilizer they could have more total lifting area, an effectively larger model, and still be legal. Therefore I favor only area rules which specify total projected horizontal area. Let the designer decide whether he wants a lifting tail on the basis of aerodynamic considerations (or decide how much of his area allotment he wants to allocate to the "tail volume" for stability). Don't force him to use lifting tails as a rule beater.

Instead of specifying area, the rules for some events specify a maximum span. The area now becomes a designer option

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because he can get a lot of area with a low aspect ratio (for weight lifting, perhaps), or a low area and low induced drag with a high aspect ratio for a lightly loaded application.

Weight limits might seem like a good way to limit the "size" of a class, perhaps for reasons of safety. But with regard to safety, a big 5-pound airplane is safer than a small 5-pound airplane, because the small "heavy" airplane must fly faster. The kinetic energy of the airplane in flight (the energy which causes damage upon impact with anything) varies as the square of the velocity. A 5-pound airplane flying at 60 mph can do four times the damage of a 5-pound airplane flying at 30 mph. If the goal is safety, limiting the wing loading and/or the engine displacement is much more effective than limiting the weight alone.

Limiting displacement, or having different displacement classes, makes sense; such rules have been used since the beginnings of the "gas model" era. Displacement is not only much easier to measure than horsepower, but displacement limits rather than power limits leave some competitive challenge for those ("us" actually) who are interested in developing better engines. But, as we discussed in MD&TS in November 1992, displacement limits invite the rule beaters to add tuned pipes. Unfortunately, pipes are heavier than an increase in displacement to produce the same power would be. Pipes, like lifting tails, came about largely because of rules which creative people were able to find a way around.

For rubber-powered FF models we could, and sometimes do, limit the rubber weight. This isn't equivalent to displacement limiting, however, because power is roughly proportional to engine displacement, but total energy is proportional to rubber weight. Limiting the size of the fuel tank (or engine run time), or limiting the battery weight in an electric airplane, is comparable to limiting the rubber weight.

I'm against ill-drafted rules which invite the rule-beaters among us to come up with weird-looking configurations in order to avoid the limitations of a rule. (Note that I am against bad rules, not against those of us clever enough to beat bad rules.) But conversely, rules have been made from time to time to try to prevent the development of "weird looking" airplanes, or thoughts to that effect. For the most part I am against such rules also. None of us, including the rule makers, are smart enough to know what an optimum airplane should look like, and we don't need airplane style dictators. Having clothes "designers" imposing expensive style fads on clothes-wearing sheep is enough.

My point is that beauty is in the eye of the beholder; and it depends a lot on what the beholder is used to beholding. Was the Wright brothers' airplane as beautiful as a horse carriage or a bicycle? Probably not to most people at that time, because it was

OVER THE COUNTER

cont. from page 13

company's latest product, a pin vise designed to be used with slow speed cordless screwdrivers and electric drills and which is advertised as being able to hold #60-#80 drill bits. Beautifully made in the USA of brass and heat-treated steel, this handy tool retails for \$15.95 and can be ordered direct from the manufacturer (add \$3 S&H). Alco Tool & Die, 312 Hunter Forge Rd., Macungie, PA 18062; (610) 845-7301.

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continued on page 88

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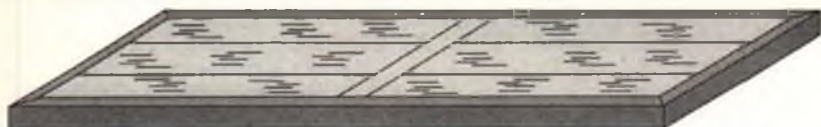
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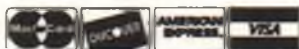
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different than anything they had seen; it was radical, frightening, and therefore ugly. Airplane lovers now are more apt to think that early airplanes have a nostalgic beauty—they are beautiful because they flew, providing a beautiful new function for mankind. I, for one, think that a lot of our latest jet fighters are ugly, probably because their shapes are relatively new to me.

Eloy Marez (our "Electronics Corner" columnist) and I have had a friendly ongoing difference of opinion on this subject. Eloy has said in *MB* on several occasions that he is only interested in building models which "look like airplanes," and he objects to "flying things" and seems to feel that they degrade the stature of our hobby. I ask Eloy what an airplane looks like—a Wright Flier, a Piper Cub, a 747, a Stealth Bomber, or a Flying Thing which hasn't been developed yet? I decline to restrict my modeling to the past.

The designers of new flying things sometimes work in full scale and sometimes in reduced scale. Many of "us" are in the latter class. My flying creations are usually "beautiful" to me if their function is beautiful. Their beauty will grow on other people in time if they prove to be useful. Someday Eloy might even think they look like airplanes instead of flying things.

Now that we have kicked the subject around a bit, please forget my arbitrary splitting of our modeling fraternity. "We" and "they" combine to make an integrated whole, and we get along just fine (if they will just stop making rules which prevent "us" from doing our thing).

ANCIENT ANTICS

In about 1945, when I was a member of the University Gas Model Club/Seattle Guideliners, a soldier by the name of Norm Rosenstock was a guest member while he was stationed in the Pacific Northwest. Norm, who is now a member of the Model Aviation Hall of Fame, recently wrote and sent me a copy of his book, *Tales of an Ancient Modeler*. It is a fascinating book about the early days of modeling, combined with his autobiography. He is a good writer, and in some places his tales are downright funny. Norm gave us permission to tell you about a few humorous events from the book.

When I was a kid, my usual method of getting my gas model a few miles to the local airport, where we flew, was to steer my bike with one hand while holding the 6- or 7-foot model overhead in flying position with the other. Norm, who was raised in the New York City area, had farther to travel to the fields they used; and their usual mode of transportation was the subway.

He tells of a wing getting crushed by a fat lady in a very crowded subway car, and some other things which would be unlikely these days. In one case a fellow flier didn't get his plane finished the night before, so he covered the wing in the subway car on the way to the field. The other passengers

watched with interest during the covering and water shrinking; but later they didn't like the smell of the dope and retreated to the adjacent car, so the modelers had the "model-construction car" all to themselves. The model flew when they got to the field.

Another time one of their group had a new Ohlsson .23 which needed breaking in. Instead of wasting flying time breaking it in at the field, he decided to use the traveling time and ran a couple tanks of fuel through it on the subway car. He didn't get into trouble, so the other modelers fired up their engines in the car also—and they claimed that the thrust they generated was what got the train into the station 10 minutes early.

Months ago, in this column, we talked about tiny model airplanes powered by flies glued to the nose. Norm filled in more detail on those efforts than I had heard. While staying at the Sherman Hotel for the Chicago Nats one year, modelers were flying fly-powered models in the lobby. Tiring of making the miniature models, they discovered that small strips of various colors of Japanese tissue with a fly glued at one end would put on a spectacular show with much less effort. One, with its powerplant, crash-dived into a hotel guest's bowl of soup.

The crowning stunt of this event was when they released, all at once and without notice, a squadron of 20 fly-powered tissue strips from a box in a crowded subway car. Pandemonium!

Norm Rosenstock tells me that this book, *Tales of an Ancient Modeler*, is available from him at 124 Granada St., Royal Palm Beach, FL 33411. He says his special reduced price to MD&TS readers is \$14.95 postpaid if you write the magic words, "Francis sent me."

A LIGHT FLIGHT-BOX LIGHT

Once in a while I need to see deep inside a dark fuselage or wing at the field, but I hate to load myself down with too many bulky gadgets in the flight box. I also like to design and make things. The result of this set of needs, hates and likes is shown in the photos. If you use a portable glow-plug starter cell and have a scrap of the appropriate size brass tubing and a burned-out glow plug around, all it will cost you is \$1.19 for a Radio Shack #272-1174 1.2-volt integral-lens flashlight bulb, and an hour of assembly time.

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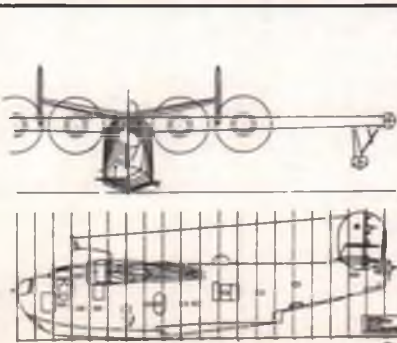
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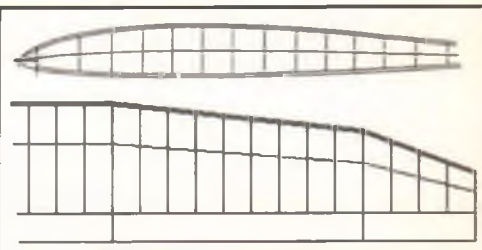
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OVER THE COUNTER

cont. from page 85

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No. 5881 1917 PACEMAKER \$18.00

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originally designed by Robert Youngman and produced by the model division of Orr's Department Store in Kansas. Model spans 36 inches, features twin fins, elliptical flying surfaces and a V-dihedral wing and stab. The Pacemaker is a SAM-approved design and is legal for O.T. FF rubber competition. Our plan was drawn by Ernie Linn (who helped with the flight testing of the original model), the text was written by Larry Kruse.

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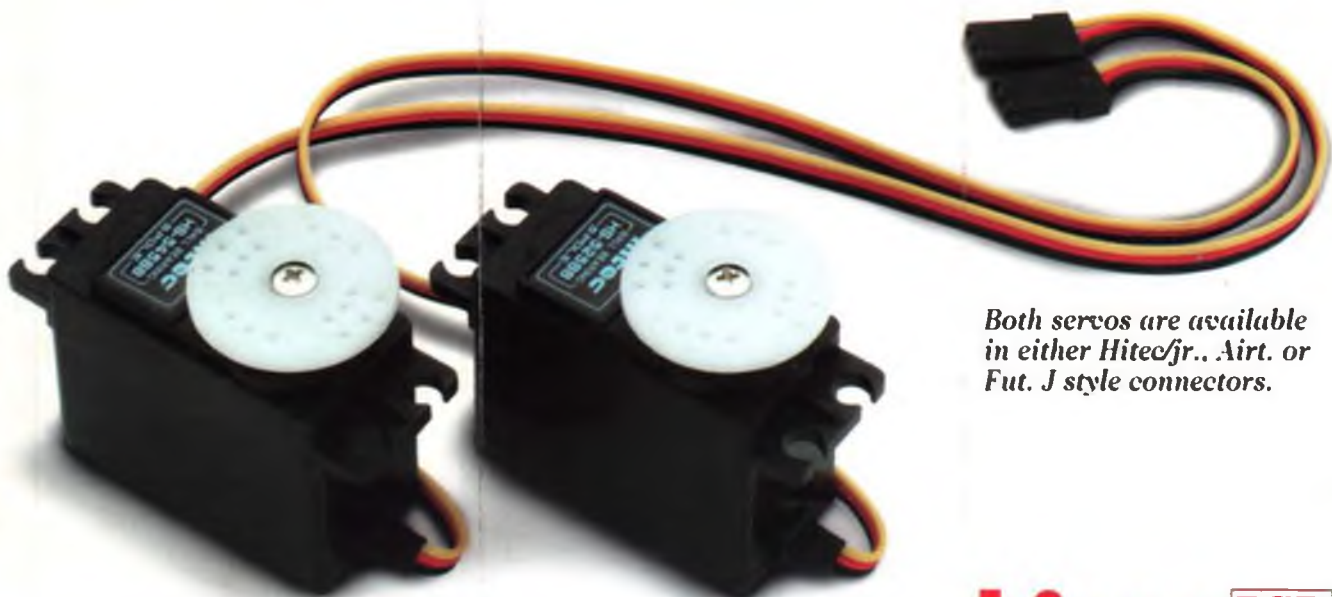
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