

OCTOBER 1975

volume 5, number 46

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ung for .40 or .60 engine.

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A new addition to the standard series. Designed for .049 to $_{-}10$ engines. Mahogany plywood and veneer. 18" length, 6-1/2" beam. Uses Dumas hardware kit H-3 not included. The DV-10 is your opportunity to get into R/C Deep Vee running without a big investment.





Dumas Products, Inc., 790 South Park Avenue, Tucson, Arizona 85719

✓ NEW

Outdrive for Deep Vee 40 and 60 boats (hardware kit H-22). Complete with everything but prop. Features adjustable stainless steel strut with needle bearings. Stainless stub shaft with flexible drive cable for virtually unlimited shaft adjustment. Stainless steel rudder with oilite bearings in stainless steel mount, rudder arm and water pick-up tube. And the price is so right for a super professional rugged unit.

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OCTOBER 1975

MODEL BUILDER presents the presents the MASTER MODEL BUILDER of the month Send all entries to: MODEL BUILDER/PANA-VISE CONTEST 1105 Spurgeon St., Box 4336, CONTEST

Santa Ana, California 92702

COLBERT INDUSTRIES, manufacturers of PANA-VISE, the unique hobby vise which turns and tilts to any position, in conjunction with MODEL BUILDER magazine, is sponsoring a design competition for MODEL BUILDER readers.

This monthly contest will be judged for originality and/or craftsmanship for all types of models (excluding plastic static scale). Entries will be judged purely on the basis of photographs and drawings supplied by the builder of the model. Emphasis in judging will be on originality, technical achievement, and craftsmanship, as found in the submitted material.

A MODEL 301 PANA-VISE WILL BE AWARDED EACH MONTH TO THE WINNING ENTRY



Requirements for entries:

1. Any type model may be entered (aircraft, cars, boats, etc.). Kits may be entered if significant modifications have been made to the stock kit.

2. Do not send the actual model. Send only black and white photos, showing at least three views of the model. Include some familiar object in at least one photo to indicate the size of the model. Try to include photos of any significant details.

This month's winner is TOM WALLER, of Bronx, New York.

The model is the Curtiss-Wright Junior, built from MODEL BUILDER plans (No. 12711, \$3.50). Covering is blue and white Coverite on the wings and fuselage, except that red Super Monokote is used on the rudder, and blue Super Monokote simulates the metal skin around the cockpits. Side stripes are red and white Monokote. Power is a K&B 40 on a Kraft-Hayes mount. Sullivan 8 oz. slant tank. Wheels are 3-1/2 inch Trexler. Control is by Heathkit GD-19 radio. G.I. Joe pilot. Wing struts are fiberglass arrow shafts faired with 1/4 inch balsa, then covered with blue Super Monokote. All-up weight, less fuel, is 4-3/4 pounds. Cost was approximately \$65, less engine and radio.

3. If photos cannot offer sufficient information about the model, the construction drawings may also be submitted. Drawings should be clean, pencil drawings with all pertinent dimensions indicated. A print of the drawing is acceptable.

4. A written description should be included with photos and drawings, explaining in fair detail any unusual features of the design, and explaining any unique technical difficulties that the model may have achieved.

5. Please do not submit any designs that have been accepted for use in another publication. MOD-EL BUILDER requests first option on publishing any submitted design. Payment for published designs will be at our regular rates. Any prizes awarded do not represent an agreement to publish any design.

6. Entries will be judged by the modelers on MODEL BUILDER's editorial and art staff, and all decisions of the judges will be final.

7. Postage must be furnished if return of submitted entries is desired.

8. Deadline for entries in the first contest of the series is July 1, 1975, and winners will be announced in the September 1975 issue. Subsequent entries will be due the first of each month and winners will be announced the second month following each closing.



MODEL/ BUILDER

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1975

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1105 SPURGEON, BOX 4336, SANTA ANA, CALIFORNIA 92702 (714) 547-3963

STAFF

EDITOR Wm. C. Northrop, Jr. GENERAL MANAGER Anita Northrop EDITORIAL ASSISTANT Le Gray ASST. GEN. MANAGER Dawn Garrott ART DIRECTOR Paul Plecan SECRETARY L. Gordon SUBSCRIPTION MANAGER A. Valcarsel

CONTRIBUTORS

Rod Carr Chuck Hallum Bill Hannan Walt Mooney John Pond Fernando Ramos Dan Rutherford Bob Stalick John Tucker

ADVERTISING REPRESENTATIVES

- WEST: Bob Upton, 20626 Clarendon Ave. Woodland Hills, California 91364 (213) 884-2294
- EAST: Walt Moucha, 38 Coppersmith Rd., Levittown, New York 11756 (516) 796-4898

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OCTOBER 1975

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Cover: Richard H. Boutillette, of Harvest, Alabama, built this Sig Liberty Sport, and decorated it in the famous Curtiss P-6E Hawk style. Super and Trim Sheet Monokote was used for the entire covering job, and all molded ABS plastic parts were finished with Pla enamel and an overspray of Polyurethane Varnish. A Super Tigre Blue Head engine and Pro Line radio complete the primary equipment. The only major kit modification was a switch to spruce wing spars. All-up weight comes to just under 6 pounds.





The United States has again won the World R/C Aerobatic Championships! Team Manager, Don Lowe, holds the trophy just awarded at the banquet in Bern, Switzerland. In front, left, is World Champ, Wolfgang Matt, of Liechtenstein, then Dave Brown 3rd, Mark Radcliff 6th, Sally Brown, Geo. Radcliff, Rhett Miller 9th, and "Big Rhett."

from Bill Northrop's workbench

• We want to thank the many, many concerned modelers and manufacturers who made the time and effort to respond to our open letter and proposal to the Executive Council of the AMA.

Some of you felt that although the proposal was logical, there was considerable doubt that it would get anywhere. Well, from the point of view that not one of the council members has written to us on the matter, you could be right. On the other hand, one of our reasons for making the trip to the Lake Charles Nats was to have the opportunity of talking with various council members, and . . . at least on a faceto-face basis . . . get their opinions. Overall, the reception was fair.

Generally speaking, the district vicepresidents who were against the proposal seemed to be mainly concerned that the private domain of their Executive Council meetings would be invaded by a swarm of modelers who "simply wouldn't understand what we are trying to do." This line of thinking is wrong in several ways.

First of all, communication and understanding between the officers and general membership are most needed in order to hold AMA together. We hope the council at least realizes this.

Secondly, if the objecting council members would take a closer look at the proposal, they would realize that the requirements for gaining representation on the council will automatically keep the "invasion" down to a very reasonable number of additional members. Remember, we said that, "...a 'recognized national special interest organization' will need more clarification, but for a *suggestion*, shall include any organization within AMA that (1) represents one or more Official Event Categories, (2) which has a president or chairman, district representatives or vicepresidents, and (3) a national membership exceeding 300." Obviously, the easiest way to stiffen the requirements would be to increase the minimum membership figure.

As we see it, acceptance and application of this proposal might add about five or six members to the Executive Council. The National Free Flight Society certainly would qualify, as would the National Soaring Society, the National Midget Pylon Racing Association, and the National Society of Radio Control Aerobatics. The Precision Aerobatics Model Pilots Association and Miniature Aircraft Combat Association, both control line organizations, might not qualify independently at this time, but possibly could combine forces in order to gain representation.

Several Council members suggested further paring down of the special interest representation; to a total of three ...one for each basic category (free flight, control line, and radio control), and to a total of one to represent *all* special interest organizations! Certainly the latter suggestion is nothing more than an attempt at appeasement, and represents the unfortunate "Daddy knows best" attitude that has caused so much of the membership dissatisfaction in the last few years.

The one-per-category suggestion is a little better than the one-for-all, but still would not provide representation for all special interests. Though free flight could be subdivided into gas, rubber, glider, and indoor, the basic competition is duration, and the N.F.F.S. encompasses all of this quite capably. Current membership is around 1000.

In control line, competition comes in many styles, with combat and stunt being the most popular...by numbers,

and logically enough, PAMPA (stunt) and MACA (combat) are the two special interest organizations thus formed. Membership is currently over 300 and 200, respectively. Based on our suggested qualification requirements, only PAMPA could currently be represented on the council (district VP's could be appointed in short order), but if the two were to combine (PAMPAMACA . . . Heavens!) it should not be too hard to come up with a council member who is knowledgeable in both stunt and combat. Once each can establish its own requirements, the two can split ... if it is felt that separate representation is necessary.

Radio Control also has a wide variety of competition categories, and, having the largest potential membership in its special interest organizations, it is only logical by calculation that it should earn the most representation on the council ... of the special interest organizations.

NSRCA (pattern), NMPRA (pylon), and NSS (soaring) currently qualify for representation, according to our specications, with all memberships close to 500 or better. The GNABA (Gerald Nelson's Aerobatic Biplane Association ... or whatever the organization finally decides to call itself) should probably cast its lot with the NSRCA and provide an advisor to the pattern organization's representative on the council.

All in all, the special interest groups only represent about 10% of the AMA membership, with the ones strictly related to official competitive events amounting to only about 5% of the total. Going by figures alone, it would hardly seem fair for special interest organizations to have a council member/representative for a group averaging about 5 to 600 members, whereas a district VP council member is representing an *Continued on page 86*

OVER THE COUNTER

Ace R/C's new Super Pacer, for .19 to .25 engines and up to 4 channel radio.

• The Pea Pod 36/600 sailboat, originally featured as a construction article in the April 1973 issue of MODEL BUILDER, is now available as a kit from M&S Ltd., P.O. Box 39745, Los Angeles, Calif. 90030. This deluxe kit features a complete sail control mechanism, a complete basic hardware package, and all machined wood and metal parts. This kit, with its detailed instructions and basic course in sailing, would make an ideal starting point for a beginner in R/C sailing. The unique "lace and glue" hull construction goes together very quickly, and makes a very attractive boat. The M&S Pea Pod will retail for \$29.95.

The Trident II, from Probar Design, P.O. Box 639, Escondido, Calif. 92025, is the winningest sailboat design to reach the market in recent years (most recently the 36/600 Class ACCR, sailed by Bill Barton). This sleek trimaran features vacuum formed styrene hulls and decks, and comes with formed mahoghany booms, sewn dacron sails, and a complete hardware package. The instruction manual is reminiscent of a Heathkit manual, where the builder is led through the construction step by step, with many illustrations and detail notes. The hardware package includes molded sheet guides, which serve as friction free bearing surfaces to guide the main and jib sail sheets through the deck. The dacron sails have pockets sewn in to hold the plastic strip battens. The Trident II sells for \$100, providing all necessary hardware with the exception of sail control winch and radio.

Probar has also introduced a sail con-



The Orbit Hawk radio will soon be available in 2, 3, 4, and 5 channel versions.



The "Brokenspar Rossi Stopper".



The revived and revised Chicken Hawk, by Special Edition Plans.



The "Mister E" from Special Edition Plans.





Coupe d'Hiver "Slats" by R/N Models.





Sheet exit guides and sail control unit by Probar Design.



The Trident II by Probar Design, a 36/600 class trimaran.

trol winch which is compatible with all sizes of R/C sailboat. Built up from aluminum stock with brass gears, this heavy duty winch unit has a very fast five second travel time and 40 inch pounds of pulling power. The design allows easy installation . . . all that is required is to hook up the two power leads to a battery pack and connect the winch control arm to the sail control servo. The small, 8 ounce unit will install easily in any hull design. Price for the Probar Sail Control winch is \$50.00.

The ever-growing Ace R/C line of radio control planes, radios, and accessories now includes frequency indentification plates. These attractive brushed aluminum frequency plates are great to stick on receivers, transmitters, flight boxes. Just peel off the backing and stick them on any clean, smooth surface. The 3/8 by 1-1/2 inch plates are available for individual frequencies at 29 cents each, or in sets covering each of the three frequency bands. The 27 and 53 mhz band sets sell for \$1.45. The 72 mhz set sells for \$2.00.

If a little one is good, a bigger one should be better ... or at least as good. That is the idea behind Ace's new Super Pacer. This is a scaled up version of their very popular 1/2A Pacer pattern plane. The Super Pacer is designed for .23 to .25 engines. The 46 inch span plane uses built-up balsa and ply construction to obtain an overall 3 pound weight. The Super Pacer was designed for the pattern flier who is interested in economy, but still wants solid performance. The design has lines similar to several of the popular, large pattern planes. The Super Pacer wing utilizes Hoerner anti-vortex tips and a conventional gear, tail dragger fuselage. Retail price is \$32.95.

Always having trouble finding a good soft rag to polish or clean the fuel off your planes? Are you frequently running out of rags around the shop? Ace Wipes should solve the problem. These large $12-1/2 \times 20$, disposable fabric wiping rags are super-absorbent, lint free, and soft, to prevent scratching. A Package of 10 sells for \$1.19. The Frequency I.D. plates, Super Pacer, and Ace Wipes are all available from your dealer, or direct from Ace R.C. Inc., Box 511, 116 West 19th St., Higginsville, Missouri 64037.

Wanna stop that Rossi .15 dead? The level of F.A.I. free flight competition has gotten to the point where instant stopping allows maximum use of the engine run time. The Brokenspar Brake (from Hardy Broderson, N.F.F.S. Executive Director) allows you to do just that. Employing a coil spring wound in the direction of engine rotation, the brake is released in conjunction with the usual flood-off procedure. The spring is held clear while the engine is running and then grabs the drum assembly when it is released. The unit is designed to conform to the shape of the Rossi spinner 'Oliver' pan. The hand-fitted units are shipped completely assembled. Cost is \$25.00 plus \$3.00 for postage, packing, and insurance. They can be ordered through the N.F.F.S. (which gets a percentage) 1288 Oak Knoll Drive, San Jose, California 95129, or direct from Brokenspar at Box 1104, Birmingham, Michigan 48012.



Waco YMF-3, standoff scale kit from Dave Platt.



Tom Kitty Mk 15, by Jack Stafford Models.



Dual-strut nose gears and Royal-Delmar glow plug are new items from Royal Products Corp.

The Peck R.O.G., from Peck Polymers.

Royal Products Corp., 790 West Tennessee Ave., Denver, Colorado, 80223, has introduced two new items to its line of R/C accessories. One is a dual-coil strut nose gear assembly. The dual struts assure positive steering and straight tracking. The molded nylon steering arm can be actuated from either side, simplifying installation. Available in three sizes, the small sells for \$2.60, medium for \$2.75, and large for \$2.95.

The Royal-Delmar Glow Plug is a unique design which has an 'L' shaped idle bar around which the heating element is coiled. The idle bar acts as a heat sink to help maintain constant plug temperature through rapid throttle changes and also protects the element from shock damages and vibration. The Delmar Glow plug is available in long or short reach for \$.98 each.

R/N Models, P.O. Box 2527, Lancaster, California, 93534, has introduced two new models. One is a Coupe d'Hiver rubber model. The 34 inch span "Slats" features a sheet balsa fuselage, all hardware for the folding prop assembly, and dethermalizer hardware. The kit provides full size plans and selected balsa printwood to build an attractive, yet easy to construct Coupe model, R/N's other new offering is the Shu-Off, a 1/2A pylon racer. This low wing, Goodyear styled racer uses the popular Ace foam wings, together with a built-up balsa fuselage and conventional landing gear, to make a fast, racing competitor. The Slats Coupe sells for \$8.95, and the Shu-Off sells for \$16.95. A complete catalog sheet showing the entire line of free flight sport and sales kits is available

on request.

The Waco YMF-3 was one of the most beautiful of the Golden Age biplanes. This open cockpit barnstormer is now available as a standoff scale kit from Dave Platt Models, Inc., 1300 C West McNab Road, Fort Lauderdale, Florida, 33309. The two inch-to-the-foot scale Waco has a 60 inch wingspan, and is flown with .45 power and up. The kit, for four channel radio gear, will be of the usual high Dave Platt quality and completeness, and will retail for \$79.95.

*

The Peck R.O.G. was designed by Bob Peck to be as foolproof a beginners model as could be kitted. The kit includes a die cut wing mount, motor stick cut to length, all necessary wood, tissue, plastic prop/bearing assembly, light weight wheels, and trim tabs for easy flight adjustments. The kit comes with very complete instructions and full size plans. This should be very good for training the young rubber flier...or refreshing the memory of some of the older ones. The Peck R.O.G. is available from Peck Polymers, Box 2498, La Mesa, California 92041.

The Tom Kitty Mk 15 is Jack Stafford Models' entry into the small, high performance pattern plane market. The .15 to .25 powered Tom Kitty can be built in either a spinner nosed or chop nosed version. Either way, the kit is of all balsa construction. The wing features a progressive airfoil and built-in washout for low speed stability. The Tom Kitty can be flown with four channels of radio control, operating ailerons, eleva-*Continued on page 88*



Engine mount by Midwest Products.



Pea Pod sailboat, originally published in MB, now in kit form, from M&S Ltd.



• My most interesting letter this month was from a gal in Memphis who didn't want her name mentioned. She asked how to handle a modeler who really feels blue about smashing a plane. It's hard for me to relate to this because my husband has an unbreakable spirit as far as planes are concerned. As Emerson said, "We boil at different degrees." What I usually say is, "You can fix that!" It's hard to feel rotten when you are being praised. You might remind him that since it has crashed, he doesn't have to worry any more about crashing it. Don't be concerned that his feeling blue will be a permanent thing. In a recent poll, psychiatrists agreed people who have hobbies rarely go crazy. However, they didn't mention those who live with those who have hobbies.

I almost missed this deadline again, and all because of two bad experiences related to R/C modeling. First of all, I've been very involved in writing a pilot story for a TV soap opera. It's a remarkably simple plot, with radio control people as the main characters. I don't understand why networks have rejected it so strongly.

The basic idea is this: Ace R/C pilot, Hi Undercamber, stays an extra day at the Tangerine Open in Florida and in doing so misses his divorce hearing in Chicago. His wife, Omni, irritated at the inconvenience, throws all of his R/C gear into the city dump. Meanwhile, her brother Guy Hedral, has taken up THE HOBBY and comes to her home,



MB's editor models cut-off dungarees while landing his float-equipped Powerhouse at Lake Elsinore, Ca. Young daughter of personal friends, Danielle Godfrey, models short shorts!

with a new club member, to borrow a stop watch. They all go to the dump to search for the watch but a small boy is wearing it and flying one of the planes ... expertly. In the excitement of the cheering and commotion, the little fella crashes. He steps over to the plane, crying, only to find he has really maxed out because of a direct hit onto a precious roll of stolen Snoopy's Dog House blueprints. These are sold as collectors' items by the happy group, and Pylon Pileup, who is Guy Hedral's sister's nephew's best friend, takes the money and donates it to The United Women For Shortening Male R/C Pilots' Knee-Length Shorts. (Amen! Nothing looks dumber than knee length shorts, especially when worn with knee length sox. Whoopee, 2 inches of knee showing! Actually, Char, it's difficult to find decent length shorts. Most stores sell those dumb, baggy, plaid knee lengthers. I've finally resorted to cutting off old ... sometimes new ... Levis, wcn) He then leaves on his honeymoon with his new wife Cirris, who is the daughter of free flight champion Arie Foil. Cirris insists on spending their first night on the Plymouth, Michigan contest grounds so she won't be late for the Sno-Fli pilots' meeting. Pylon goes home to mother only to find mother has taken up THE HOBBY and is packing for Plymouth! This is where the action for the first day's viewing stops. I suggested two catchy titles: 1) "Edge of Flight," and 2) "Love of Lift." Keep watching for it. I'll send it in again.

The second thing that set me back was the fact that two of my husband's sailplanes were killed at the R/C Soaring Nationals. You know how trying it is to hold a wake in the garage. Bill did a nice job of laying them out and a viewing was held nightly... after it was too dark to fly. His friends said it was better to have the end come quickly. There was certainly no lingering on! They crashed happily, doing what they loved to do, flying competition among good friends!

On a lighter note, I've enjoyed getting your mail telling about happy days at contests all over the states. Thinking back about this summer, the outings were fun for me, too. I'm continuing my research on what non-flying women do at contests to pass time. Of course, we all talk, and most of us sun. But my research goes into the more productive lines of time-passing. This year one out of eight was doing needlepoint. This is slightly up from last year. One in every 12 was hooking a rug. One out of five was reading. Embroidery on readyto-wear was a favorite thing this summer. I didn't see anyone doing a beer-can hat so I guess that's out. Sleeping is always a popular thing to do. Not a bad idea either, when so many of us are called upon to drive home late Sunday afternoon! Continued on page 63



THE "LITTLE ONE" PHOTOS BY THE AUTHOR By DICK SARPOLUS

For something different in fuselage construction, try rolled plywood. It's fast building and rugged. Along with this adventure, you'll also come up with an economy pattern ship!

• This model is the first smaller-than-60 size pattern type ship we have tried in a long time. For serious competition work we are convinced .60 powered aircraft will always perform best. If the rules permitted .80s, we're sure the resulting larger designs would be even better fliers. This naturally doesn't mean that there is not a place for smaller engines and aircraft... their advantages are obvious; lower cost, lower operating expense, ease of transportation, etc. We enjoy flying the "Little One" and lately have been flying it more than the big ones...

except for serious competition. For some types of Fun Fly competition, the smaller model even has an advantage.

In laying out the design for the Little One, we went for a very conventional layout...normal areas, moments, airfoil, etc. An honest airplane. Appearance of the prototype was average, with an upright uncowled engine. The next version had a side mounted, faired in engine, swept fin/rudder, and a forward mounted canopy for a "faster" appearance. The cosmetic changes had no effect on the flying characteristics. The styling was in part dictated by the construction; the rolled 1/32 plywood fuselage, quick and easy to build, does not offer much design flexibility. The inherent sway-back toward the tail is disguised with a dorsal fin, and a faired-in engine streamlines the nose section.

The rolled plywood fuselage is not a new idea, of course. We really believe in it for sport aircraft, and wondered if it would result in a light enough model in this small size. It does... and it is very rugged. A foam core wing was used, for simplicity and speed of construction.







Strip aileron linkage is typical for low wing configurations.

We hate to cut out wing ribs. Full symmetrical section. Tail surfaces are simply sheet balsa. In total, it is about the fastest way to build an airplane we know of, and still get a good looking model. CONSTRUCTION

Starting with the fuselage; the rolled plywood may be new to many builders. Don't worry ... it does not result in a "brick" and it is easy. Cut the 1/32 plywood to shape and assemble as many pieces to it as possible before rolling; this would include the 1/16 plywood doublers, the balsa wing saddles, 3/16 square lower fuselage edge pieces, and the tail block. Wet the plywood on the outer surface center line toward the tail; if it cracks at all, the crack will be covered by the fin. Roll the fuselage and insert Bulkheads 2 and 3. We have used large C-clamps to hold this assembly while drying, later pulling the tail together and gluing. We have also used five-minute epoxy and simply held the fuselage rolled over the two bulkheads until the epoxy cured. The firewall is added, along with bottom fuselage Continued on page 69



Basic components of the "Little One" before finish and assembly. Tapering of fuselage width toward the back automatically creates the upswept profile.



Fuselage construction is fast and rugged. Doublers have been glued to ply blank at left. Masking tape on the outside of the curve at the back could prevent possible splitting.



The so-called "quick and dirty" nose, with upright engine and open cowl. Requires higher tank location for proper fuel feed.



Side-mounted engine with nose faired into 2 inch diameter spinner. Stepped fuselage profile permits proper alignment.



In contrast to the throngs of people that used to turn out for the R/C Scale flying in Chicago, this was a very small crowd at Lake Charles. But afterall, there were only 6 airplanes to watch ... 3 from 8AM to 11, and 3 from 11 to 2 PM!

`REMOTELY SPEAKING...'

• Several years ago, before Sport Scale

became an official event category, Scale

officials decided to provide their own

flight judges for competition at the

Nats. From the point of view that the

Pattern judges could use some help dur-

ing their four-day, dawn-to-dusk ordeal,

it was a welcome change. However, the

pattern judges were not relieved of scale

flight judging as a gesture of help ...

scale officials decided that pattern judges were not capable of properly scoring the flight of scale models.

Scale officials felt that pattern judges, accustomed to watching the somewhat non-scale maneuvers of sophisticated pattern aircraft, would unfairly downgrade maneuvers performed by scale ships, ie., a scale Mustang should pull into a loop from level flight, but an SE5 should

R/C News, by BILL NORTHROP

pull into a loop from a speed-increasing dive.

Unfortunately, for the accuracy of scale flight judging at the Nationals, the official's decision, in our opinion, was not the best. First of all, no kind of a test was ever put to the pattern flight judges to find out if any of them were as much, or more qualified to judge scale flying as compared to the flight





Greg Tiffany, Melbourne, Fla., flew a Quickie 500 in Class A pattern. Julie Woods and Larry Nash judge as Dan Tiffany calls maneuvers.

Bob Wischer's Pober "Pixie" Sport Scale model taxiis by. It was good enough to enter in AMA Scale, even if not to win.



Bill Johnson, pattern judge, did a beautiful job on this Ryan STA from a Sig kit.



Jess Hogan, Sheveport, La. SHARKS awaits the command to start his engine. Flew in Class DN.



Point of no return. It was Sunday, the last day of the Nats, and no other time to fly some two dozen Sport Scale models . . . so the good sports flew their Sport Scale models in the rain, and at times the planes were hard to see in the downpour!

judges selected by the scale officials (for the most part, the flight judges selected were members of the static scale judging force, and many had little or no R/C flight judging experience.) Logically, it should be easier to re-train an experienced pattern flight judge for scale flight judging than to qualify an entirely inexperienced judge. After all, just because a modeler happens to be a highly qualified pattern judge is no reason to believe that he's not capable of knowing the flight characteristics of various types of full size aircraft.

The advent of Sport Scale at the Nationals has compounded the felony, so

to speak. Now the scale judges are faced with the task of scoring a style of flying that comes much closer to the performance in aerobatic competition, where the fine points of precision and realism have to be carefully graded. We are by no means criticizing our many friends who are scale judges, but rather, the decision that put them in this spot. On the average, they are no more qualified to judge Sport Scale flight than pattern judges are to score static scale.

This commentary is partially prompted by some of the scale flight judging we have witnessed at recent Nationals, and particularly since Sport Scale became a Nationals event. This year, for instance, we witnessed a takeoff in Sport Scale, where the ship performed a 90° ground loop during takeoff and left the ground headed at a right angle to the original takeoff heading. The pilot received 10 points for this maneuver! These same judges scored AMA Scale flying, in the year we selected our FAI team!

In Sport Scale, pilots such as Ralph White, with the Flite Glass Mustang he manufactures; Dan Santich, with the tobe-kitted Top Flite P-17; and Harold Perenti, flying a Zero, could practically fly their scale entries in Pattern...in fact Ralph has flown well in Class D at



Hazel Sigafoose taxiis her Clipped Wing Cub prior to takeoff. Maxie Hester is the copilot. Suppose that's a Sig kit model?



What you see, you don't always get! This was outward damage to Don Coleman's plane after mid-air. For the inner damage, see text.



Bob Underwood buttons down his Wittman "Bonzo." Ship is extremely stable in flight. Small prop required to get needed rpm.



S. J. Sauger's Stinson "Station Wagon" had superior detailing in spite of somewhat drab appearance from a distance. Placed 2nd.





Jeff Bertken's Beechcraft "Duke" taxiis past judges prior to takeoff. Ominously, this must be called the "before" shot.

After . . . Ship fell off into a spin from Immelman. Neutral or down elevator might have helped it to recover. It left its mark.

the Nats with his P-51. Flyers of this capability should be scored by experienced flight judges.

We feel that this judging responsibility should be reviewed by responsible individuals, and that hopefully, the job will be given back to those most capable of handling it.

* * *

As we were running thither and yon at the Nats, not having any reporters covering various events (except Dan Dougherty on R/C Pylon and Bart Klapinski on C/L Stunt), we could not develope detailed reports in particular categories. There are always interesting tid-bits, however.

Picture yourself pushing forward on the elevator stick at about 50 feet above the deck to do an *inside* loop! Jim Kimbro, a young technician for Kraft Systems does just this (He'll never touch *my* transmitter!). We didn't have the opportunity to find out how he got started this way, but it can't be all bad... He placed 18th in the Class D qualifications. Hmmm ... just imagine doing a Vertical eight ...

In the Finals, we were really chewing our nails. By coincidence, Rhett Miller and Mark Radcliff always came up to the line to fly at the same time. It was nerve-wracking to watch two of our FAI Aerobatic team members flying back-to-back from the same circle. It would be bad enough if *one* of them had a mid-air just four weeks prior to the World Champs...but with each other ...Brrr!

Fortunately, Rhett flew his pattern closer-in than Mark, so although their aircraft crossed paths on many occasions in each flight, they were 50 to 75 feet apart... most times. Depth perception does funny things!

Don Lowe and Don Coleman were not so lucky. Didja ever hear of a delayed action mid-air? The Dons collided while both were doing inside loops. Don Lowe's Phoenix lost some important parts...like half a wing...and was demolished, whereas Don Coleman's Hummingbird landed with only a notch in one wing leading edge. It was otherwise unmarked. Following an official decision to allow both flyers to re-fly, starting with the Inside Loops maneuver, they took their turn at the end of the round ... Don Lowe with a back-up model, Don Coleman with the same model ... plus a wing patch.

Where does the delayed action part come in? When Don Coleman took off, his model lost contact with the transmitter moments after takeoff and destroyed itself in the jungle at the end of the runway. Apparently the crystal had been jarred in the mid-air (Don had dead-sticked down from almost directly in front of and above the flight line), and engine vibration finished the job as he took off and immediately lost range. Moral: Even if everything *looks* OK after a mid-air...or any type of jarring collision or landing...take off the wing and check things out.

About the only noticeable trend in pattern was a subtle change in some of the aircraft designs to pull the maneuvers down to a smaller size. In fact, it was so subtle as to be unnoticed, particularly in the maneuvers themselves.

Ron Chidgey's "Hummingbird," flown by Ron, and Don Coleman, had large, square "jet" intakes low on the fuselage sides to create drag (Tony Bonetti commented that Ron must have glued the building jig to the fuselage by mistake, so just went ahead and painted it!). Tony himself had fattened up the wing section on his "Triple Trouble."

In our estimation, the only way to reduce the air space needed to fly the pattern will be to change the maneuvers themselves. These alone will dictate what type of model will be built. Even now, if it weren't for the Figure M and Top Hat, the planes would not have to be so heavy and fast, the two factors which contribute to the "large space" maneuvers.

Probably the most satisfying outcome of the pattern event was the winning of the first 3 places by the FAI Aerobatic Team. This certainly reassures the judging at the Rough River team trials, adds confidence to the team mem-*Continued on page 85*



John McDermott, Hickory, N.C., returns to pits just after flying fastest heat of the meet ... 1:18.9. He was 5th overall.



Brian (left), who flies, and Bruce Richmond, who builds and calls, make an efficient Formula I pylon team.





Bob Reuther, just after breaking tie with Tom Baker in 5th round. He won all nine. Champ! Second place Tommy Baker, with son, Bryan. Tom used one nickel pen cell on glow plug to assure a good idle. Hooked it up just during race. Rossi engine.

Quarter Midgets at the '75 Nats

• There were quite a few changes this year, some good and some maybe not so good. One change that pleased most this year was heat racing instead of qualifying. Though fickle Mother Nature rained out most of Monday's flying, nine full rounds were flown over the three days. There were 47 contestants.

Another change was the quality of model. It looked more like Formula I than Q.M. Last year, most planes were Monokoted balsa. This year, they were fantastic epoxy and glass miniature Formula I racers with detailing. One of the prettiest was Steve Sica's D&S (he and his dad make them) fiberglass Rickey Rat. Steve, who couldn't race last year due to qualifying 21st, placed 16th this *Continued on page 64*



Austin Leftwich's Little Gem is 5 years old. How's that for pylon racer longevity? Note legal "half-shell" exhaust getterouter on Rossi .15.



Dave Lane (cap) and Jack Stafford attempt to loosen a wheel on Jack's Brown racer, a pretty little airplane.



Another pretty airplane, Bob Kirkpatrick's scratch-built P-39, with Rossi and Kraft. He's from Charlotte, N.C.



Assistant Editor Taylor Collins' Airtronics "Aquila" drifts by on the silent night air. Surprisingly, that night air can sometimes be full of lift! Reflective tape on the bottom of the wing lights up effectively when hit by a spotlight beam. Night flight is not difficult . . . and it's cool!

R/C SOARING

• The soaring event at the A.M.A. Nationals this year was bigger than in 1974. Nearly fifty competitors, most all from the surrounding states area, competed for trophies, in Standard, Unlimited, and Scale categories. John Lipscomb won the Unlimited competition with his Bert Striegler designed Gulf-Coaster. Ken Cashion, the Picayune, Miss. soaring Chamber of Commerce, was not far behind Lipscomb. Ken was flying his original design "Idleflight." In standard class, John Rimmer took top honors with an original design 100 inch ship.

Jim Simpson, the event director, with the help of the Ft. Worth Thunderbirds,

managed to register 495 launches in thirteen hours of contest time...one launch every minute and half. Two members of the W.I.N.G.S. (the girl glider guider group) were in attendance at the Sulphur, Louisiana site. Pat Sark, the better half of Arthur Sark (who took third in standard class) flew her Olympic 99. Helmer Johnson's wife, Jane, left her Olympic home in favor of serving as official scorekeeper.

Three of the five trophies for Scale Sailplanes (Sponsored by MODEL BUILDER) stayed with the A.M.A., as there were only two scale entries. Bob Elliott's Glasflugel 604 won the event, followed by Connie Jones' Libelle... both Soarcraft kits, we'd guess.

By TAYLOR COLLINS

PHOTOS BY AUTHOR

SCALE 1st Bob Elliott 2nd Connie Jones

STANDARD

- 1st John Lipscomb 2nd Arthur Cayer
- 3rd Arthur Sark
- 4th Leon Kincaid
- 5th Ronald Stanfield

UNLIMITED

- 1st John Rimmer2nd Ken Cashion3rd Stanley Pfost4th Tom Williams
- 5th Bill Haga



Those who came to watch were sorry they didn't bring gliders!



"How do you like my 'night flying' entry?" (NFFS Digest)

We just couldn't leave it alone... not after Jimmy Lee Jones, of the Dallas League of Silent Flight, sent us that story about their night flying contests (MODEL BUILDER, June 1975). The more we talked about night-time soaring, the more intriguing it sounded. Besides that, we had our honor to protect. We had to show those Texans that the moon thermals were stronger in California!

But, like most such projects, Night flying got buried in the shuffle of putting out a magazine ... buried that is. until Pete Bechtel, of Windspiel Models sent us a set of strobe flashers for model use. O.F.B. (Old Flying Boss) Bill Northrop strapped them onto his Dart II and we were off to Taft to cover the U.S. Free Flight Champs. Saturday night, while the free flighters were launching their high powered lightening bugs (See the July '75 cover), we were off in another corner of the field with the flashing Dart. Chrome trim Monokote on the bottom of the wings proved to be ineffective in reflecting the beam of the quartz emergency light, so we taped sheets of newsprint on the bottom of the wings. Except for a good deal of buzzing and fluttering in the breeze on launch, the newsprint worked well as a reflector. But we discovered that the reflective "stick-on" house numbers that Bill had used on the sides of the fuselage glowed brightly in the beam of the spotlight. Even the most staunch supporters of free-flight were envious that night we didn't have to jump on a motorcycle and charge off into the blackness of the Taft night to retrieve our model.

By this point I was hooked. I ordered some of the Cya-Lume chemical lights that the Brookstone Co. sells, and made a demonstration flight at a meeting of the S.U.L.A. club in Los Angeles. Except for hanging my high start parachute on the phone lines at the side of the field, the demonstration was a success. At about this point Bill and I decided that MODEL BUILDER should sponsor the first ever "Howl at the Moon" night soaring contest.

With special permission of Chief Ranger Richard Dyer, of the Mile Square Regional Park, we arranged for the use of the park after their usual closing time. We invited a group of the local glider guiders to fly in the contest (not knowing who would come, or how many to invite), tied a chemical light on our high start parachute, and started the official flying.

We provided chemical lights as part of the entry fee. These little fountain pen shaped plastic tubes contain two chemicals. One of the chemicals is suspended in a glass vial which floats in the other liquid. When you bend the outer tube, the glass vial breaks, mixing the two solutions and presto... the light gushes forth! Light output is very bright for about three hours and then gradually *Continued on page 70*



Jim Wiseman steers his Airtronics "Olympic 99" to a halt in the landing circle. Landings at night were amazingly accurate (No visible distractions for the pilot).



Alan McNay models the latest in night-flying headgear ... most helpful in hunting for launch lines in the dark.



Jim White, of the White Co. (Hi-start and winch parachutes) adjusts the wings on his original design, under the close scrutiny of WCN, who in turn is being scrutinized by Roy Stowers.



Dr. Emery Wayman, chiropracter, applies proper leverage to the sticks which operate his Schluter "Gazelle." Photo by Herb Alden, of the Portland, Oregon Journal.

CHOPPER CHATTER By JOHN TUCKER

• In the July '75 issue of MODEL BUILDER, we ran a quickie review of the Micro-Mold "Lark" R/C helicopter, and at one point talked about the slowrate pitching up and down which is often encountered with a rigid rotor system. We went on to explain how the problem left us, and described various experiments with other heads to no avail. Well, let me report right off that Mr. R.G. Scott, of Micro-Mold, Ltd., was kind enough to send us a couple of "goodies," among which was their new Teeter Head Assembly for the Lark.

Last weekend, we couldn't wait to put it together (it's in kit form), and give it a go. A half-hour after beginning assembly, the Lark was airborne in the back yard and the resulting performance was indicative of the excellent workmanship and design capability of the Micro-Mold personnel. Stability and response was increased to a startling degree. The Teeter Head itself is nicely machined from aluminum bar stock and features a unique dampening system consisting of four interchangable plastic plugs which can be inserted into the head. The selectable "hardness" of the plugs permit the head to be adjustable from rigid to full teetering! They have also produced an improved tail gear cage

which is now fitted with three phosphor bronze bearings. This modification should prove more satisfactory than the brass tubing mod which we described in MB.

Mr. Scott also advises that much of the tail vibration may be eliminated by making the tail rotor blades entirely out of medium balsawood instead of gluing hardwood and balsa together. The reduction in weight probably makes a big difference. Unfortunately, we don't have the prices for the modification kits, however, we would suggest you write directly to Micro-Mold, Ltd., 1-2 Unifax, Woods Way, Goring by Sea, Sussex BN12 4QY, England and order the whole shot ... you won't be sorry you did!

KAVAN JET RANGER MODIFICATIONS

We promised last month to list the modifications to the KAVAN IET RANGER, for the benefit of those modelers which haven't had access to some of the earlier reports in the magazines. Several letters have indicated that the let Ranger won't fly unless these modifications are made ... definitely not so! The stock kit (either the early or later version) as it comes off the dealer's shelf, is one of the best flying helicopters available in the industry today. Of course, there is always room for improvements, and there are always certain things which the modeler wants to incorporate for his own personal touch. Those ideas which seem to work the best have been publicized in the mags and a few have been adopted into later kits. During the first year of production, several bulletins were issued by the factory, giving details of recommended changes, however, a great number of kit buyers never sent in their registration slips and did not get this important data. Nevertheless, we'll try to list them in this issue so you'll be up to date.

1. Spur Gear: The original steel spur gear was rather short and sometimes



Lieut. CDR Graham Hicks, USN, was well known by officials back in the days of Navy-supported Nats at Glenview, Illinois. Now he's stationed at NAS Lemoore, California, and as can be seen, he's still with the hobby, flying this Kavan Jet Ranger.

chewed up the large plastic gear. Factory mailed free gears, which were taller, to correct the problem. All kits now have the new gear.

2. Damping rods: Plans were sent to registered owners showing how to dampen the stabilizer bar movement. Good idea at the time, however, the later control modification makes this one obsolete (see Feb '74 MB for details.).

3. Swash-plate push-rod: The antirotation push-rod leading down from the swash-plate, through the aluminum bracket, and into the wood platform, must be cut to a length so that it cannot be moved out of the hole! A neat solution is to cement a 1/4 inch block of hardwood above the plywood part No. 9 and drill the hole all the way through. This provides more "working area" for the rod. Be certain it does not interfere with the mixing lever below ... try it in *all* control positions to make sure it doesn't touch.

4. Swash-plate: A few swash-plates came apart because of improper fit of the bearing in the plastic ring. Factory exchanged at no cost if found defective. Another idea was to cement the bearings inside the plastic ring with "Stabilit Express" to make sure it didn't come apart.

5. Phosphor Bronze Bearings: Parts No. 3315 must be soldered into the stabilizer bar yoke, *not cemented*. Clean parts carefully and do a good job... lots of stress in this area, and bearings have been known to fly out!

6. Needle Bearings: Parts No. 3304 should be cemented to the see-saw with "Hobby Poxy" rather than Stabilit Express. The Stabilit is too brittle for this stress point.

7. Servo Cleanliness: Recommended that all servos be disassembled at least once a month and cleaned ... lots of oily mist inside the chopper.

8. Tail Rotor Drive Shaft: Recommended that the tail rotor drive shaft be guided through a brass or fiberglass tube about 12 inches long which is anchored in the rear portion of the tail boom, to prevent whipping.

9. Plastic Motor Mount Plate: The plastic transmission plate flexed during hard landings and permitted the cooling fan to strike the fuselage shroud. Fix was to mount 1/4 inch aluminum angle stiffener to top-side of plate. Factory fix was to incorporate a molded stiffener in new plate. Now standard.

10. Weighted Main Rotor Blades: Up to 80 grams of weight could be added to each blade to improve stability. Factory recommends the large lead balls



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(included in kit) be used. See March '74 MB for details.

11. Control Head Modification: Because the Jet Ranger exhibited loss of control during high-speed forward flight during right turns, a new control system was developed utilizing both the Hiller and Bell stabilizing features. Kit to convert to the new control was sent free to all registered owners. Now standard item. It must be stated that the machine flew perfectly without the new control as long as high speed flight was not attempted. See June '74 MB for complete details. 12. Control Arm Modification: A single control rod was redesigned to replace the yoke which straddles the main blade holder in conjunction with the new control system. The yoke adjustment was difficult and operational range was limited. See Jan '75 MB.

13. Redesigned Rotor Blades: As a result of wind-tunnel tests, the factory is now producing sets of "Expert's" rotor blades, No. 3040a. These blades are much like the standard blades, but are 10 mm wider, 2 mm thicker, and 5 cm shorter. The blade axis remains the *Continued on page 60*

Control Head Modifications





MODEL BUILDER

To order full size prints of this drawing, see ad on page 64.



The first Y1B-7 at Clover Field, Santa Monica, Ca., September 24, 1932. Smooth monocoque structure big improvement over corrugated skin.

DOUGLAS O-35/B-7

By PETER WESTBURG

• The O-35 and its sister, the B-7, were noticeably different from the XO-36/ XB-7. The corrugated fuselage skin gave way to a smooth skinned, semi-monocoque structure and the Conqueror engines became geared engines with three bladed props. The prototype XO-35 had a corrugated skin fuselage, but new techniques in the design of monocoque structures obsoleted the old Junkers/ Ford corrugated skin design.

Five O-35's were ordered, along with seven B-7's, all being delivered in 1933 in time to take part in the war maneuvers of that year, centered around Wright Field. The B-7's were painted in the camouflage color scheme being experimented with ... large irregular blotches of dark green, brown and white. They and the Boeing B-9 scored high when they "obliterated" the city of Cincinnati.

The B-7's saw action in the air mail controversy of 1934, flying in the west-*Continued on page 72*



Complete with mud and camouflage, No. 6 B-7 of the 31st Bombing Squadron shows signs of wear and tear. Colors were dark green, brown, and white. USAF photo



This O-35 of the 88th Observation Squadron is exactly like the B-7, except for the wedge under the rear cockpit for the camera. Of course, the insignia was different too. Pete Bowers photo.



Hap Arnold's B-7's carried the mail during the big air mail controversy of 1934. Photo shows the arrival of the westbound mail at Oakland, Calif., on March 21, 1934. Standard Oil photo.





Bill Hunter conducts impromptu "symposium" while waiting for air during the FAI Power event. Doug Joyce's canard in front.

Tracey Dickenson flips the prop on his .051 powered Cl. A Satellite while his father, Ed, provides the anchor. He placed 5th.

BILL NORTHROP SCENE AT THE



Ralph Burnstine's colorful Navy Boeing F4B-4, which placed 3rd in Open C/L Scale.



Don Still cranks the prop on his Sport Scale SE5 as John Pagan takes a doubtful look at the weather. Ship flew at very realistic speed.



Dan Belieff, of the Washington, D.C. "Maxecuters", prepares his big "microflimsy" for a flight in the Lake Charles Civic Center.



Rudy Schuh, of the Chicago Aeronuts, hooks up the rubber on his paper stick job. We didn't flash until he had it on the hook!





Hall of Famer, Sal Taibi, peaks the engine in his O.T. Aerbo before launching for an official.

One of the best in Old Timer competition, Bruce Norman, of Ft. Worth, Texas, releases his Goldberg Zipper.

1975 NATIONALS



 $\ensuremath{\mathsf{C/L}}$ AMA Scale winner in the Senior event, Cathy Burnstine, and her Sig Liberty Sport.



Bill Harney had servo problems with his spectacular Hughes XF-11, placed 4th in Open C/L AMA Scale.



A prop for any season . . . or any something! Charlie Sotich must have forgotten to turn off the machine.



One of several "business twins" entered in Sport Scale was this Piper Navajo Chieftain, by Jerry Bugni.



Guy Larsen placed 4th in the MB sponsored $\ensuremath{\mathsf{Jr}}\xspace{\mathsf{Sr}}$ Rubber Scale event with this Monocoupe.



Louis Rodrigues cranks power into his O.T. Korda Wakefield. This is still a competitive model for any event it can enter.



Orthopedic surgeon, George Hilliard, of Longview, Texas, and his Dick Mathis designed "Hysteria 600."



It is said that if there's a Foote's Westerner around, Bill Burgess, of Muncie, Ind. must have built it. He's here with a Super Cyke engine.



Joe Kirn, his winning Jr C/L Scale B-25, and proud father, Dale, with Mono-Line handle.



Modeler and local entertainer, Jimmy Smith, in a huddle with England's Butch Hadland.



The ducted fan in Dave Platt's Sport Scale Skyray R/C is homebuilt. Flew well.



Imagine having to do this in Lake Charles! The Rain God, alias Brokenspar, fills ROW pond.



Scott Gesner, Woodbury Hts., N.J., 2nd in F/F gas (Jr-Sr) with mod. Sig Liberty Sport,



You might call this a "stark starting rig", but it works well for Dale Mateer.



Casey Hornbeck launches his Forster .29 powered, Class B Brooklyn Dodger, originally designed by Sal Taibi.



Herb Wahl, manufacturer of the 40th Anniversary Brown Jr., releases his Hurleman powered Comet Clipper.



Veteran modeler Dick Johnson, about to launch his Waco SRE Peanut, built from Walt Mooney's plans in MB.



Joe Hildreth flies B Pattern, with father Bob calling. Judges Carl Von Suetter (left) and Joe Bridi (NSRCA Pres.) score the flight.



Hull is direct relation to famous full size boat. Aside from sail number, can you identify?



At times like these, visit your friendly local sailmaker . . . he's on your side!

Fig. 1 Head Fig. 2

"These sails just don't set right!" "That's the last time I order sails from him." These and other complaints are all too familiar to your sailmaker's ears. In 9 cases out of 10, the fault lies not with the sails, but with the skipper who adjusts them and with the spars they are set upon. Though most owners think that nice setting, strong pulling sails are the responsibility of the sailmaker, the fact is that the best suit ever made can be put upon a crooked spar, and then be even further distorted by mis-adjustment. This column is dedicated to presenting the common faults that are found in sails, with suggestions for their remedy. Many sails will have a combination of faults and will fit in more than one category, so curing their ills will require a series of adjustments.

Preliminary adjustments will be made with the boat tipped on its side while ashore. Reeve the necessary downhauls, halyards, outhauls through the sail's grommets, bend the sail to the spars and begin the process of adjustment. Final tuning will be made while the boat is actually being sailed. There are two good reasons for this: 1) Only with the sail full of wind will it take the actual shape you should be concerned with ... the preliminary state uses gravity to simulate the wind force; 2) By sailing with different angles to the wind and the sun, you can view the shadows made by wrinkles, or the shadow cast by the mast on the sails and gain insight into the diagnosis of faults. Sail for a few moments, then return to shore and adjust ... one thing at a time. Then back out on the water to see if you have improved things. For an excellent discussion, see Chapter 17 of Jeremy Howard-Williams' book, SAILS, pub-Continued on page 81



MODEL BUILDER



Jumbo scale Mr. Mulligan towers over a couple of Peanuts, like a mother hen over her brood of chicks. Knowing that the ship has been proved a good flier, future builders could add more details, such as the engine, provided the weight is kept to a minimum.

Ben Howard's Mr. Mulligan

A really JUMBO scale model of this famous racing plane, with a span of 56 inches. Scale is 1-3/4 inches to the foot. The ship has been extensively test flown, and makes beautiful air trips. By TOM HOULE

• It all started with an issue of R/C Modeler. I was leisurely perusing my stack of RCM's looking for nothing in particular (or was it rubber-powered R/C?) when I happened upon a set of Mr. Mulligan drawings which could be had full size (56 inch wingspan) from Harold Osborne.

In a moment of light headedness I saw myself designing a suitable structure, adding a .40 for power, and flying off into the wild blue yonder ... images of Bendix trophy dancing in my head.

Well, I did order the drawings and what seemed like a 10 pound package came in return for my three-and-a-half bucks. The 10 pound package turned out to be a detailed set of Mulligan scale drawings which could easily be converted to a set of working plans.

By now you're probably wondering if and when the R/C Mulligan was ever built... It wasn't... Half way through the plan drawing stage, I suddenly realized: 1) it would cost a fortune in balsa to build an R/C Mulligan, 2) I did not have a suitable radio, and 3) I didn't have the bread to satisfy items 1) and 2). So the project was shelved along with my model building for a couple of years.

Enter MODEL BUILDER. Gee whiz and no kidding. MODEL BUILDER was a distrinctly fresh breeze in the field of model airplane pub's. Look. After reading two issues, it got me going again full steam in aero modeling. Modelers like Fernando Ramos, Hal Cover, Walt Mooney, Clarence Mather and Bill Hannan have (in my estimation) made great strides into the so-called Sunday afternoon relaxed flying thing.

These guys have shown the lesser knowledgeable people like myself, how to build and fly low cost rubber powered sport and scale aircraft. And, gentlemen, with the cost of building materials escalating as it has, I maintain that these guys (and MODEL BUILDER) have made one hell of a contribution to the hobby.

The upshot of the whole thing was



Structure is light weight but strong. Flight tests gave final settings of; 5° right, 1° down thrust, stab $\cdot 5^{\circ}$, wing $+1^{\circ}$. Right-left pattern.



Though ship is quite stable in flight, Tom suggests that an extra half inch of dihedral per tip might make it even better.



that after reading several Ramos, Hannan, Mooney, Mather and Cover articles, I was convinced that I could build a rubber powered Mulligan from scratch . . . light enough to fly, i.e., 10-15 oz.

I shot for 10 oz. but ended up with 13 oz., less rubber. This was my fault because I didn't cut lightening holes anywhere, and I used reasonably firm wood throughout except for the wing ribs, which were super soft. In fact, so soft that several began to buckle when the covering was shrunk!

Just a few hints before discussing the actual building. Use an alphatic resin glue such as TITEBOND or SIGBOND throughout for maximum strength. If you can't get 1/8 inch spruce squares, I'd suggest using hard $1/8 \times 3/16$ balsa, or better yet, 3/16 square hard balsa longerons with $1/8 \times 3/16$ uprights. Remember, this is a big airplane and the rubber load and landing stresses are amplified accordingly. And be patient! The Mulligan is a lot of airplane and will not go together overnight.

Also, like most scale models, you must keep the rest of the fuselage light. Choose your wood carefully here ... light yet firm.

For the judges in the audience, the model is exact scale, with the exception of the wing and stab airfoils, wheel pant and tire width, and the strut attachments. In fact, my wing struts were added mostly as an after thought, since my Mulligan was intended for sport flying. We have no jumbo rubber scale contests in Wisconsin!

STABILIZER CONSTRUCTION

Cut all stab ribs from firm 1/32 sheet and notch per the plan. Next cut out either a full stabilizer outline or 1/2 stab from corrugated cardboard (balsa is too expensive). Cover this outline with Saran Wrap and pin to your building board.

This outline will serve as a mold for wrapping four $1/32 \times 1/8$ water soaked and glued balsa laminations around the form. The Saran Wrap makes it easy to remove the laminations from the form after the glue sets. Let the pinned bent



strips dry overnight before removing from the cardboard form.

Once dry, remove stab and build up in a conventional manner over the plan. Dope the stab outline and center section, let dry overnight, and then cover the bottom of the stab with your favorite light white tissue. I used Marlowe Engineering's white tissue. Water shrink and pin to board while drying. Next dope tissue with one 50/50 thinned dope coat and allow to dry.

Cover the top of the stab in the same way except do not cover until you've doped the bottom at least once. This procedure eliminates potential warping. You'll be amazed at the covered strength of the stab and fin.

RUDDER CONSTRUCTION

The rudder outline is formed, as the stab, around a cardboard, Saran Wrap covered form. However, due to the symmetrical ribs used, it must be built on the airplane. The easiest way is to wait until the fuselage is finished, stab inserted in its slot, and then cut and glue the rudder post and molded outline to the fuselage. Then build up the fin from there. Make sure the rudder ribs are square to the post. DO NOT glue on the rudder post until after the stab is inserted for the last time. Once the post is in, the stab is locked in.

WING CONSTRUCTION

The wing, unlike the real Mr. Mulligan, is built with dihedral and a flat center section. Start with one outboard panel...right or left...on an absolutely flat building surface at least 40 inches long and 12 inches wide. Pin down the bottom 1/8 square spar and the straight inboard section of the T.E. Notch the end of the T.E. that joins the laminated portion as shown on the plan to ensure a strong joint.

Now install all ribs in that panel. Make sure that all ribs are glued in vertically and that the bottom 1/8 square spar runs straight and true. Also install the 2 dihedral braces, fore and aft, and allow to project beyond the panel. You can make these two braces from either rock hard 3/32 balsa or 1/16 plywood. I used hard balsa and have had no



No, Tom is not a midget, that Mulligan has a 56 inch wingspan! Ship was designed directly over Hal Osborne's 1-3/4 inch-to-the-foot scale drawings (March/April '72 MB).



Phil Bernhardt revised Tom's drawings to show the scale wing tips, which tapered upward from the bottom. In effect, this added some tip dihedral. Scale stab offered no stability problems.

structural problems.

At this point, you can install the laminated portion of the T.E., the laminated L.E., and the 1/8 sheet wing tip. Strip three $1/16 \times 1/8$ balsa strips from 1/16 sheet balsa stock and soak in hot water for a few minutes. These strips are then laminated and glued to the aft end of each rib and the notched portion of the solid T.E. piece. Cut and fit the tip piece to fair into the three laminated strips.

Three 1/16 x 7/16 strips need to be stripped from balsa sheet stock, laminated, and then glued to the front edge of each rib. I found that pin pressure alone was sufficient to hold the wetted and laminated strips to the ribs and still maintain the 1/8 inch or so space between the building board and the bottom of the L.E. Space your pins about every inch and you will not have a problem.

Install the top spar (1/8 square spruce), the diagonal webs, and all gussets next. Allow the whole works to dry overnight with the spruce spar extending beyond the wing tip. When dry, cut the tip where shown on the plan, sand in the required angles on the L.E. and T.E., and glue back together with the tip raised to fair into the 1/8 inch square spruce top spar as shown on the plan.

(Note: We took the liberty of slightly modifying the tip section of the wing, using tapered depth ribs, to avoid the break in the smooth line of the leading and trailing edges which can be seen in several of Tom's photos. wcn)

Build the center section next, starting with the two dihedral braces pinned securely onto the board. I blocked up the finished panel to take the load off the center section. When the center section is pinned down, ensure that the already assembled panel is absolutely parallel to the center section. Add ribs, L.E., T.E., gussets, wing hold down dowels, etc., and again allow to set overnight.

Next build the other outboard panel, tying it in to the dihedral braces extending from the completed center sections. At this point I got in trouble. I found that in checking dihedral on the completed wing that one panel had more dihedral than the other. I had to completely remove the bad outboard panel and reglue it! Now if you have ever tried to dissolve TITEBOND alphatic resin you'd know it hurts! Don't duplicate my mistake!

You are now ready to cover your wings. I did so by block sanding everything first, tapering the T.E., removing glue blobs, etc. Next, I applied a thick coat of dope to all surfaces to which I would stick the tissue. This does not include tops and bottoms of ribs except at the dihedral breaks. Then dry, tissue was applied by putting on another coat of dope and sticking the tissue to it. I've never tried the thinner method, although the white glue method should work well, particularly in light of the large surfaces required to stick the tissue.

By the way, I used five large sheets of Marlow Engineering's white tissue to cover my Mulligan. So buy enough to start with, or you'll end up trying to patch holes with two different tissue weights.

Do not forget to glue and gauze in two wing hold-down hooks to the T.E. strip in the center section. If you do forget, and cover the center section (like I did), it's no great shake to remove the bottom center section covering, install the hooks and re-cover.

If you like to play with wing incidence on your scalers, then reverse the positions of the holding dowels and hooks. With the hooks at the front under rubber band tension, you can easily shim the L.E. to increase positive incidence. I felt my way was a bit stronger but take your pick and don't forget that the stab is adjustable too. FUSELAGE CONSTRUCTION

I thought long and hard about the best way to build a fuselage that in the C.G. area was roughly 7 x 8 inches in cross-section. I was very apprehensive about being able to design a structure strong enough to handle the fully wound rubber load and still be reasonably light. The structure shown on the plans is slightly modified from my first effort, but it is a replica of the fuselage I am using after a season of flying. In other words, don't try to reduce wood sizes or pieces. It won't work. If anything, you might want to add a few more cross-pieces and gussets. The problem lies in the tremendous width of the fuselage. Even at the rear peg the fuselage is about 4 inches wide!

Start by laying out the two fuselage upper sides, using 1/8 square spruce Continued on page 74



Tom Verzy presented Ben Howard with a hardwood solid model of his famous "Pete" and then took this photo, just a few months before he passed away, in the early 1970's.



Simplified cowling can be built with more detail, if desired, since the flying ability has been proven.



Opening in fuselage permits wide adjustment of stab incidence. Glue it in place after trimming, if you so wish, but rubber bands provide flexibility ... just in case ...



Bob Gieseke, Open Stunt and Walker Cup winner for the second year running.



Junior Stunt winners, Joe Musumeci (left) 1st, and Dave Fitzgerald, 2nd



Gerald Emmons, Washington, D.C., 3rd in Jr. Stunt. His first Nationals.

C/L Stunt at the Nationals

PHOTOS BY THE AUTHOR

• Sunday August 3rd, saw us arriving at Lake Charles aboard a Cherokee-Six, ably piloted by Ralph Cooke, of Orange, California.

After transfering our models to Chenault Air Force Base, we discovered that the past week had seen much rain, which left some dark clouds in my mind. I was imagining how difficult it would be to run the Nats Precision Aerobatics event during adverse weather. Official flying wouldn't start until Wednesday, however, and I kept high hopes of seeing blue skies and gentle winds.

Later that same Sunday, I met with Keith Trostle, who was not only the P.A. event director, but who is also the P.A.M.P.A. (Precision Aerobatic Model Plane Assoc.) president. This is a new and very fine organization dedicated to the promotion and advancement of the art of controline stunt flying. If you wish to join PAMPA, read on.

I was complimented when Keith asked me to assist him, but had little to do, as he had everything well organized, down to the smallest detail.

My fondest hopes were honored as Wednesday morning was beautiful enabling the eight junior flyers to show their best effort. Barring a couple of mishaps, they did quite well. It would be great if some experienced flyers would make contact with these young men, as they put a lot of heart into the event and a a few of them showed much promise for the future.

When the flying was over. Joe Musumeci, of Richardson, Texas, repeated his 1st place win of last year. He does much of his flying with Bob Gieseke, so naturally he flew the well known Gieseke Nobler. His plane had a built-up wing and was powered by a Fox 35 sent by Duke Fox himself. It was modified to take a muffler with pressure tap. The plane weighed in at about 43 ounces and was finished with both Sig and Aero Gloss dope. He flies with an "EZ"-Just handle and 60 foot lines. Joe is a really good flyer...a warning to all of you Seniors!

Following in 2nd place was David Fitzgerald, of San Mateo, California. This was Dave's first time at the Nats and he flew a stock Sig Banshee, finished entirely with Monokote. Power was a cleaned-up, muffler equipped Fox 35,

By BART KLAPINSKI

swinging a Rev-Up 10 x 6W. He uses Sig 10% fuel.

In 3rd place was Jerry Emmons, of Washington, D.C., flying a Sig Mustang.

On Thursday, the Seniors took to the air and out of the twelve contestants, it was Doug Stout who showed the way. His 53 inch span "Apparition" was powered by a Larry Scerenzie-reworked Fox 35. This was Doug's 3rd year at the Nats and it is interesting to note that he flies like the famous Bob Palmer. The top line on his control handle is actually the down line (!).

The 2nd place man was Mark Sullivan, from Morristown, New Jersey. His 60 inch span "Centurion" had the Genesis look and used a Control Specialties foam wing. It was finished with Randolph's dope and a Super Tigre .46 powered the model. Mark uses a different venturi and spray bar.

Marty Phillips, from Mercer Island, Washington, finished 3rd, flying his Sting, which is actually a very-close-tostock Novi VI designed by Dave Gierke. The most notable change was the dihedral in the stabilizer.

On Friday, the weather was still great,



Senior Stunt winners (I to r): Mark Sullivan 2nd, Doug Stout 1st, and Marty Phillips 3rd.



Mark Heideman, Saginaw, Michigan, with his BW (Bill Werwage) Special.


Val Britton, Deerfield, Ill., was 4th in Jr Stunt with this profile King Cobra.

and Open qualifications started at 8:30 AM. A real story started to unfold earlier, however, as at least seven pilots were to realize total loss of their ships, or have other serious problems.

Lanny Shorts was one pilot who, for reasons unknown to us, totaled his stock Dumas "Thunderbird." This was his first Nats and we surely wish him better luck next year.

Jim Armour damaged his landing gear during practice, but repaired it for the qualifications. His Miss Kell, designed by Bob Whitely, was O.S. 35 powered and sported a dope finish.

Bill Fitzgerald was also to lose his ship during qualifications, when his plane hit the tarmak during the bottom outside loop of the Clover Leaf. This put Bill out of the contest, and I don't know if his ship was repairable.

While practicing for the qualifications, the adjustable lead-out guide broke on Rich LeRoy's "Miss Poppy," and caused damage to the landing gear when he hit a tar strip on the runway. Thanks to several helpful competitors, Rich made the repairs to his plane.

Les McDonald was extremely fortunate. While in level flight his lead-out eyelet broke. The model suffered moderate damage to the landing gear and cowl. His repairs were satisfactory, though, as he was this year's 2nd place winner. His 59 inch span "Stiletto" was



Terry Crocker, who had fuel tank problems with his Ringmaster Sportster.

Tigre .46 powered, with muffler pressure. The Control Specialties foam wing plane was very nicely finished with Sig dope.

Ted Fancher, from Foster City, California, had bad luck, not only once, but twice. During practice he hit a tar strip, resulting in a broken prop. His vibrating engine caused the entire nose to shatter into many pieces. His 57 inch span "Cavalier" appeared to be a total loss. However, stunt fliers, being the gentlemen they are, soon surrounded Ted and toward the end of processing night, the ship was repaired just in time for the weigh-in and appearance judging. Ted was to have more bad luck, though, as the next morning while flying, the push rod gave way and the Cavalier was no more. Ted is one of those individuals who people enjoy being around, and we sure hope he is back next year.

Last, but not really last, because he ended up first, was Bob Gieseke! He was practicing on Friday morning and had trouble involving his safety thong. His plane hit the ground with enough force to seriously crack the nose at the leading edge of the wing and break twothirds of the left wing completely off. After much convincing, he borrowed some 5 minute epoxy and put the heavily damaged Gieseke Nobler back together. After some re-trimming, it was flying well by late afternoon.



Mike Greb flew this modified Nobler in Sr Stunt. Anyone ever build one unmodified?



Chuck Olmstead placed 5th in Sr. Stunt with Texas Flash, designed by Bill Rutherford.

On Saturday the weather was, would you believe, still very nice and the 18 finalists were ready to do battle. Most pilots seemed a little nervous or maybe over-practiced, as this reporter feels that many flights were not as good as earlier flights. Maybe it was the pressure.

Listed below are the 18 finalists in order of finish.

Bob Gieseke repeated his last year's win, flying his famous Fox 35 powered (repaired) Gieseke Nobler.

In second place was Leo McDonald, of Miami, Florida. His 59 inch span Stiletto was powered by a Supre Tigre .56, which turned a Rev-Up 11x6 E.W.



Les McDonald's Super Tigre .46 powered "Stilleto" which placed a close second in Open Stunt.



Lew Woolard's Fokker Eindecker. Fox .40 powered model placed fifteenth.



Bob McDonald placed fourth in Sr. Stunt with his Taurus. He's from Michigan.

Bob Whitely designed Miss Kell V, placed 8th in Open Stunt. Super Poxy finish and OS .35 power.

prop. He uses muffler pressure and K&B 100 fuel. The model was very well finished with Sig Dope.

Third went to Al Rabe of Irvine, Texas. His well known Sea Fury had a new wing this year with more span and more chord on the flaps. The 62 inch span model was powered by an S.T. .60 with a few modifications, including a fuel pump. He re-carved his Rev-Up prop and also mixed his own fuel. The airplane, excluding the new wing, has over a thousand flights and still looks almost new.

Tied for 4th place were Bill Werwage and Jerry Pilgrim. I couldn't obtain information sheets on either of these flyers but I do know that Bill Werwage flew his world championship model. It spans about 62 inches and I believe it's powered by a Super Tigre .46 with muffler and muffler pressure.

Jerry Pilgrim flew what appeared to be a "Shark" with standard type landing gear. I have no other information but, his plane was awarded the most appearance points, and deserved it.

Close behind in 6th was Bob Hunt, who hails from New Jersey. His "Genesis" spanned 60 inches (Control Specialties foam core) and was S.T. 46 powered. Jim Lynch came from Memphis, Tennesee to place 7th. His stock Rabe Bearcat was well finished with Sig dope.

In 8th was Bob Whitely, of Fountain Valley, California. His 54-1/2 inch span Miss Kell is O.S. .35 powered.

Ninth place went to Dennis Duvall flying his S.T. 46 powered "Miss Dora." He uses a Grish 10x6 three blade prop and TCP fuel. The wing was by Stott and the model was finished in Hobby-Poxy.

Wynn Paul, of Lexington, Kentucky, was 10th, flying his PAMPA Special.

The next eight places, in order of finish were: Richard Le Roy, Tom



Jim Lynche's Grumman Bearcat, powered with stock Super Tigre .46 engine. Nicely finished model placed 7th.



Arlie Preszler, Lodi, California, designed, built, and flew this Fox .35 powered "Phase IV."



(I to r) Ray and Jan Ogle, Theo Georgiadis, all came from Australia to participate in our Nationals!



Solorzano Reynoso (left) and Alphonso Rodiles, from Mexico, with their Aries and Nobler stunt machines.



Roger Barrett built his O.S. powered F-14 Tomcat in only 4 weeks. (No, it doesn't look it!) He placed 13th.

Dixon, Roger Barrett, Remel Cooper, Lew Woolard, Dave Hemstrought, Bob Harpe, and James Smith.

Before signing off, I would like to mention several more items. I must give a very special thanks to those visitors from out side the continental United States, who came to compete.

From Mexico, there was Alphonso Rodiles who flew a close-to-stock Nobler. He didn't specify the engine, but uses Rev-Up props and Nitro-Tone fuel. The ship was finished with lacquer-based paint.

Then from Hawaii there was Francis Chinen and Herbert Chung. Francis flew a Gieseke Nobler, which was well built.

Francis and Herb don't get the "distance traveled" record, however, as from way down under in Australia came Theo Georgiadis, and Ray Ogle and his wife Jan, who supplied us with much laughter and moral support.

Theo flew his own "Super Roo"40. His built-up 62 inch span model sported a removable wing and was powered by a Fox 40. The pull was from a Top Flight 11x5 prop and the "oomph" was from K&B 100 fuel. The acrylic lacquer fifinish was beautiful.

Ray's modified "Super Master" had a built-up 56 inch wing, and was pow-

Highest appearance points and a tie for 4th place went to Jerry Pilgrim, from Texas. th was well built. wered by a Merco 35. The muffleron't get the "disequipped engine was set up around however, as from K&B 100 fuel and a Top Flite 10x5

> prop. A special thanks to those who came so far to be with us.

> Now, those who wish to become a part of PAMPA, please contact; Stunt News, c/o Wynn Paul, 1640 Maywick Drive, Lexington, Kentucky 40504.

> I would like to mention that the L.M. Cox Mfg. Co. of Santa Ave., California sponsored a Half-A stunt event with beautiful trophies through 3rd place. Look for the same event next year and let's see more entries. It's fun!



Francis Chinen, holding his Nobler, and helper Herbert Chung, came from Hawaii to attend the Lake Charles Nationals.



Keith Trostle and Bill Fitzgerald, with their 1/2A stunters for the Cox-sponsored special stunt event. Lotsa fun!



Bob Hunt's 6th place "Genisis." Foam wing and Super Tigre 46 power.



Richard LeRoy, Placentia, California, and his OS .40 powered "Miss Poppy" earned 11th place in the finals.



Phil McCary, Sweepstakes winner at Denver, had a rare Lindberg designed Puddle Jumper (even rarer wheels!) scaled to .020 Replica size.



• Greatest Old Timer National Championships ever! If you attended last year's binge at Lakehurst NAS and thought that was great, then you should have been at the bash put on by the Model Museum Club of Denver. Headed up by Tim Dannels and Bob Schleim, the meet was run to perfection. Matter of fact, the Model Museum Club even arranged with Jupiter Pluvius to have near perfect weather, with only one short thunderstorm interfering on Wednesday.

For those who have never attended a SAM Championships at Denver, one has to be there to appreciate the size of the field. Located off Highway 40 (I-70) at East Colfax Airport, the field is situated far enough away from any traffic, on a grassy plain, to suit the most finicky free flighter. About the

by John Pond

only drawback was the dust arising from the dirt road leading in and out of the field. Just about every automobile, contestant, equipment, etc., suffered from the constant movement of vehicles being used to retrieve models.

Actually, the one rainstorm that occurred was a blessing in disguise. Those modelers who retired to have a beer and wait out the rain were treated to some excellent hot sunshine and even more spectacular thermals. Several of the events were won after the majority had given up.

To show the enthusiasm at this outstanding meet, 123 contestants produced 457 event entries! This meet is starting to rival the National Free Flight Championships at Taft for size. Tim Dannels reported that 40 states plus Canada were represented!



A Hank Orwick "Speedcraft". Will the builder please identify himself?

Pointing up the tremendous interest that has been aroused in the .020 Replica event, 73 entries were recorded for this one! Surprisingly, some of the hot shots like Oslan, Taibi, etc., had to take a back seat to Bob Bicknell, a retired Navy Commander now operating out of Albuquerque. The biggest surprise was that no one "maxed across the board." Imagine, 73 goofs!

THE START

The best place to start talking about this well organized meet is to begin with the Model Engine Collectors Assn. "Collectogether," held at the Voyager Motel, on Monday, July 28. The entire banquet hall was completely jammed with displays, collectors, and spectators.

Very few of those who came to acquire what they wanted in the way of motors and parts went away empty handed. Hank Hilscher, the head honcho of MECA, had a most interesting display consisting of a simulated engine tree. Some of the lucky winners got a branch loaded with goodies.

Among some of the new production engines displayed were samples of the 40th Anniversary Brown Jr. motor being produced by Herb Wahl in conjunc-



Warren Avis, New Jersey, won Antique at Denver with this Lanzo Record Breaker (MB plans available).



Tom Alden came down from Vancouver, Canada, with this rare Best-By-Test "Sensatherm" rubber job.



Ted Patriola, Massachusetts, scaled Sailplane up 3/16 in order to use .40 in R/C.

tion with Bill Brown. Test runs at the Collectogether indicate great performance. Even Herb was amazed. He carefully fit the five engines together, set them up, choked the engine twice, and in two flips the engine was running like a champion. So get yours now! Orders will be accepted to October 31, after which the production run will be set. No new ones will be made after that, but parts will be available to those who purchase the engine. As long as Herb's Model Motors is in business, these motors and the Hurleman engines (which he also produces), will be serviced and repaired. Orders filled strictly in rotation, no R.H.I.P. this time!

Mark Fechner, who does an outstanding job of converting old green Torpedo engines to his excellent Klondyke Motor, showed up with 50 motors. The writer showed up late and got two engines only because they were reserved six months previously! Mark stated he could have sold twice as much, but seeing that this is only a part-time job, treasurer/wifie, sez that enough is enough!

As a fitting wrapup to the Collectogether, President Joe Beshar, noting that the Annual Bean Feed had not



Harold Hadley checks needle setting on Don Lamkin's motor in Shereshaw "Cloud Cruiser". Don was 2nd in Antique R/C.





The notorious "Fox," shown with its builder, Joe Beshar. Had a super-hot .29 for power. He is SAM president.



Danny Sheelds brought a large number of models to Denver, including this GHQ Loutrel Sportster R/C (MB plans available).



MODEL BUILDER

FULL SIZE PLANS AVAILABLE – SEE PAGE 88

been planned for the field, immediately ordered a catering service. In less time than it takes to tell it, the word was passed around very quickly, and all contestants who had not visited the engine display were summoned for the very pleasurable get-together.

A quick executive caucus was held in the cocktail room, with the writer conning President Beshar into buying the first round. Gottum where it hurt the most! Regardless, Joe was most gracious, and the few details left of the meet were quickly ironed out that night. The writer cannot commend the aggressive President too highly for taking care of *all* items.

THE ACTIVITIES

Didja ever take your wife to a contest and then feel sorry for her? Well, this time the Denver Club women members, under the leadership of Mrs. Wally Leiper, arranged all sorts of trips and activities for the women. Beginning with the excellent tour of the Coors Brewery on Tuesday night, the women had a variety of action, including one stage show production. Might mention the Adolphe Coors Brewery tour was one of the best this writer has attended. It seemed the Coors people left no stone unturned to please the visitor.

With the Holiday Inn East Colfax being the focal center of things, swimming and sun bathing were also a part of the plans. Of course, the usual socializing among the women was the order of the day, but scheduled trips to points of interest, plus planned shopping tours, took up most of the ladies' time.

THE FLYING

Probably the biggest shock to the modelers who were attending a SAM Champs at Denver for the first time, was the remarkable drop in engine performance. The fuels and propellers used at sea level were of little avail at five



Betty Dannels checks in contestants at Denver. Left to right, they are Sal Taibi, Al Hellman, and Larry Clark. Larry's Albatross is a beautiful design by George Reich (MB plans available).

thousand feet. (They don't call Denver the "Mile High City" for nothing!). Those who had participated in Denver meets previously were considerably better off. Higher pitch propellers, increased propeller diameters; these were all part of the methods used to maintain performance.

The most shocked fellow on the field was Larry Clark with his Ohlsson 23 powered Diamond Demon. This Bay Ridge design would fly beautifully at Taft, but at Denver it refused to take off! Finally in desperation, Larry hand launched the model only to see the plane slowly *descend* under full power. And Larry worked so hard for this contest!

Finding that his Orwick powered Sailplane was not performing, he told Sal Taibi he had another Orwick engine in reserve that was a real goer. Upon firing up the newly installed Orwick motor, Swaney found little to choose from! Maybe it was just as well, opined F.L., as his eyesight compels him to stay practically underneath the model while on his motorcycle. A couple of models did get away, but luckily were found and returned.

While mentioning "Lost and Found," Herb Wahl finally got his Comet Clipper ticking real good. Matter of fact, in the wind, the model got too far ahead of Herb to accurately pinpoint where it had landed. Herb went up and down *Continued on page 65*

F.L. Swaney had the same problems.

Louis Garami's SKYLARK

OLD TIMER Model of the Month

Designed by: Louis Garami Redrawn by: Phil Bernhardt Text by: Bill Northrop

• Louis Garami was one of the most famous of pre-World War II model designers. The majority of his gas model designs were small... primarily sport types, using the Atom engine and featuring inovative construction, such as rolled sheet fuselages. The Molecule was probably the best known of these. His Stratostreak design is still winning in Old Timer and .020 Replica.

The Skylark was a departure for Continued on page 68





Pardon the intrusion of C/L into the F/F scale column, but work such as this cannot be restricted by formalities. The master, Tom Dean, has come out of retirement with a vengeance!

FREE FLIGHT SCALE By FERNANDO RAMOS

• Where does the time go? It seems it was just yesterday that I was sitting at the typewriter, pounding out last month's article. It could be that I have been enjoying my summer off, and you know how time flies when you're having fun. Mostly, I have been busy working on my full-size MA-5 Charger biplane, with the anticipation of having it ready for Oshkosh '76, I'm very close to having the wings and tail ready for covering, and the plan is to have the rest of winter and spring to finish the fuselage. At any rate, it has been truly an educational experience with many new skills learned in the process, and what could be better than building a model at 12" = 1' scale?

Fortunately, I still find time to do quite a bit of modeling, with the latest

project being a Thompson racer, the Folkert's Toots, for the Flightmasters Speed Contest. The test flights have been very rewarding, proving out so far that the airfoil I used was more than satisfactory for this type of model design. I plan to cover this fully in next month's article, which will give me more time for testing. In the meanwhile, I have some ideas that I would like to pass on to you this month.

While finishing my Folkert's, one area that I left for last was the mounting of the dummy exhausts. This has always been a chore for me. I suppose I get lazy at this stage, with the thought of flying the model my primary concern. The help of Ken Hamilton in knowing how to lay out the exhausts, plus a



Wouldn't you know that Tom Dean's newest project had to be a crop duster? This time it's the captivating Grumman Ag Cat. It'll be a shame to cover that framework!

couple of gimmicks of my own, has helped me greatly in this matter. Several years ago, Ken showed me the trick of dividing any odd distance into any number of even spaces, positively and accurately the first time. Here is an example: (see illustration)

Let's say you want to space six exhaust ports along the fuselage nose, spanning 3 inches. That's 5 spaces into a length that won't divide by 5 unless you have a decimal scale. So, here is how you do it. Mark off the 3 inches on a piece of paper. At an angle to it, mark off the six points (5 spaces) using a convenient measure such as 1/2 inch per space. The first point must be at one end of the 3 inch mark. Connect the last point to the other end of the 3 inch mark, making a triangle. Keeping parallel to this line, draw lines from the other four points over to the 3 inch line, and you will have six equally spaced points, or 5 equal spaces on the 3 inch line. Keep the angles between the lines as open as possible for best accuracy, and choose measuring increments of appropriate length to assist in this. Easy, eh?

After I have determined what the spaces between exhaust are, I draw this pattern onto a piece of 1/8 inch plywood. I then check the drawing to see what angle the exhausts protrude from the fuselage. This same angle can be carried onto the plywood by propping up one side of the plywood with the right size wedge before drilling. The holes are then drilled (usually a size that aluminum tubing comes in). Next locate the plywood template on the fuselage, and once this is done, it is temporarily taped in place.

Before proceeding, I'll take some aluminum tubing that will be used for the exhausts, and I'll sharpen one end of it by using a pyramidal shaped stone. A few twists of this stone will really put an edge on the tubing. This tube now becomes the cutter for the exhausts openings. The plywood template not only spaces the exhausts correctly, but it also gives you the proper angle from the fuselage. All I have to do now is to insert the sharpened end of the tubing into each opening and twist back and forth until I have cut through the balsa completely. When finished there are (in this case) six neat and straight holes along the side of the fuselage.

By this time I can usually tell whether or not my model will be nose or tail heavy. Typically it will be tail heavy. If this is the case, instead of using aluminum, use brass... or, cut the aluminum tubing extra long with the thought in mind of loading them up with some ballast. I'd much rather see it inside of, an exhaust tube than dangling under the chin of the cow!. At any rate I have found that the neatest way to permanently install the exhaust is to use Hot Stuff, Zap, or equivalent. Once the exhausts are put into place and aligned, I'll take some Hot Stuff and place it on the tube just above where it makes contact with the fuselage. Capillary action carries it into and around the entire joint, with none of the Hot Stuff coming in contact with a painted surface. If you try to place this type of adhesive onto the joint itself, there is a chance of smearing the finish around this area. At any rate, you can see how easy this task can now be.

And as long as I have mentioned ballast for the correct balance point, here is another idea that could help trim out that next model without the obvious use of weight. Once in awhile, a model will turn out nose heavy. Usually you don't find out until the model is completed. What I do is to leave the tail plane strut bracing (from the fuselage to the underside of the stab) off until 1 make this determination. If it looks as though I will not need too much weight to bring the balance point where it belongs, I will use aluminum tubing. If more weight is needed, then brass is chosen. If this still doesn't seem to do the job, I then stuff the brass tubing with piano wire. This usually does the trick. There are several different combinations that could be used until the right amount of weight is found. Of course, not all airplanes have tail struts, but many certainly do.

Adding clay has been one way to change the balance on a model for years, and it is still frequently used for this application. However, one product that is readily available is far better than clay. It is generally referred to as "dumdum." It is used by auto repairmen as a type of caulking. It is more pliable and sticky. It doesn't have the mass of clay, but Pres Brunning has a way around that little problem. He takes some real small gun shot and mixes it with the dum-dum. This combination for nose weight is particularly good, especially if you can conceal it inside of the cowl area.

One other way to beat the tail weight problem on a rubber model is to carve a prop from hardwood. I do this quite often, but the only hardwood that I have used for this application is basswood. Many of you are familiar with its properties when it is used for laminating tail surfaces, etc., but I want to tell you it is out of this world for carving props as well. It takes a little longer than when using balsawood, but the end result is a very strong propeller ... one that can be made much thinner than balsa. Just this past week I bought a 2 inch x 8 inch x 6 foot plank, which is enough to carve props from for years. Around here the price is \$1.45 a board foot. Not cheap by any means, but certainly worth consideration, particularly if you continually break props or build tail heavy models.

Continued on page 58



Doc Martin, from Miami, Florida, tries to wind another rubber for his Fike after many were destroyed by the meciless Lake Charles sun and heat.



Vic Larsen's diesel powered ABC Robin put in excellent, smooth, scale-like flights, but just didn't stay up long enough.



Bruce Mathews was first in Jr-Sr Rubber Scale (Sponsored by MB) with his exceptional flying Douglas Observation bipe.



"Flight without feathers is not easy"



A Peanut Scale model of the rare 1912 Farman monoplane, by Christian Frugoli, of France.

• Our lead-in line (sub-heading) this month is a quote from PLATUS (254-184 B.C.), and was found in the Royal Air Force Museum, Hendon, England. SO WHERE DO WE FLY?

Don Typond sent us an article from "National Wildlife" magazine, documenting the windiest cities in the United States. This information has taken on renewed importance since the energy crisis, because windmills are receiving fresh attention as a possible solution to generating electricity without burning petroleum products. Based on readings taken over a ten-year period by the National Weather Service, here are some of the breeziest places, in descending order (windiest listed first):

Fargo, North Dakota Wichita, Kansas Boston, Mass. New York, N.Y. Ft. Worth, Texas Des Moines, Iowa Honolulu, Hawaii Cleveland, Ohio Chicago, Illinois Seattle, Washington Detroit, Michigan Denver, Colorado Washington, D. C. New Orleans, La. Miami, Florida Salt Lake City, Utah Tucson, Arizona and least windy, of those listed:

Los Angeles, California! Funny, we would have expected Washington, D.C. to be windiest of all! Significantly, there are active free flight model groups in all of the above cities,

according to our past mail.

Continued on page 78



New Bedford whaleboat model by Don Typond (See his Polish PZL 104 Wilga C on the Jan. '75 cover of MB) measures 15 inches long (1/2 inch scale), took 200 hours to build. Photo by Don.



Blackburn Monoplanes won the first three places in Model Builder's first Parcel Post Proxy Peanut contest, Pioneer Class, and John's was First!

1912 Blackburn monoplane

This month's Peanut took first place in the Parcel Post Proxy Peanut contest, Pioneer division. In fact, similar models by other builders took second and third! Build this winner for yourself. By JOHN BLAIR.

• Not many pioneer aircraft make suitable peanut subjects . . . their awkward moments, "sparrow strainer" rigging, and multiple odd surfaces present some real challenges! The sturdy, graceful 1912 Blackburn, however, is a most happy exception. It is a "natural"; a clean, nicely proportioned plane that trims easily and flies beautifully.

England's famed Shuttleworth Trust maintains a Blackburn in flying condition, so photographs and magazine articles are available to aid the modeler. One good example of such an article is in the February, 1974, issue of the English magazine, "Scale Models." The photos accompanying the article are especially useful in figuring out the rigging pattern.

The first step in building the Blackburn will be to prepare some odd-sized wood. A balsa stripper is needed, but not absolutely necessary. An accurate straight edge and a sharp modeling knife (*uber Skiver*, of course! wcn) can do the job with a little care. First, cut some $1/32 \times 1/16$ strip for wing spars and fuselage crossbraces. This stock can also be used for tail surfaces, unless you trust yourself to work with 1/32 sq. Some $1/32 \times 1/8$ will be needed to fair the landing gear legs. Strips of $1/32 \times 1/16$ basswood are needed for laminating the wing tips. If desired, the tail surface outlines may be 1/32 sq. basswood. Finally, sand some 1/32 sheet down to 1/64, for wing ribs and fuselage decking.

The fuselage presents the only real construction problem, so let's start with it. First, cut out all fuselage and cowling formers. Because of its odd cross *Continued on page 77*



Close-up of the nose shows the pine prop, engine detail (it freewheels on the shaft), and the white tires.



Best flight at the contest, proxy flown by Walt Mooney, was 25 seconds. With more fiddling time, it could have done better.



FREE FLIGHT

By BOB STALICK



Henry Spence launches "Suspence" during FAI Power event at 1975 Nats. Separate timers were used for checking engine runs. Timing is touchy when speed of sound is considered.



Winner of 4th place in Senior Class B at the Nats, Joan Calhoun launches her Satellite 450. She had 3 maxes when ship was lost and not found in time to put in additional flights.



Mark Wood, Phoenix, Ariz., launches own-design "Lo-Bo-1", ST .29, in Senior Class B gas.

· By the time you read this, the Nationals are history and so are the FAI FF Semi-Finals. The 1975 NFFS Symposium has been held and the Model of the Year Awards have been made. If you were there at any of these events, you have formed your own opinions. If you weren't, you'll be able to share in the Symposium by ordering your own personal copy of the 1975 Report. Copies are available from NFFS Plans and Publications, 5641 Diamond Hts. Blvd., San Francisco, CA 94131. The cost this year is \$7.00 plus 50¢ postage. With the largest Report ever printed and the additional cost of paper and printing, even this price is a bargain. So, here's your chance to participate ... at a distance and after the fact.

OCTOBER MYSTERY MODEL

When this series began, I had set a tentative limit as to how far back into modeling history I would go in order to present challenging designs for your consideration. That was tentatively set at 1945, in order to bypass John Pond's domain, however, this month's model doesn't quite meet that limit. As presented in the model press, this 400 sq. incher is built primarily of hardwoods (pine and bass) in order to preserve precious balsa for the war effort. Built to accommodate either the O&R .19 or .23, it was supposedly remarkably competitive, even with its weight (18-1/2 ounces). With an underslung stabilizer, it is reminiscent of the Fu-Bar, and may even be a predecessor of it, and since these were the days before uniform DT systems, it really didn't matter anyhow.

Be the first in your nation (or internation?) to send the correct identification to Good Old Bill and he'll send you a nice prize. While you're at it, see if you can identify the designer, who was a famous West Coast correspondent to the modeling press just a few years ago. 3-VIEW ... HOT LUMBER B-C

It's always flattering to receive nice letters from the readers, but when one comes in praising the merits of one of your own designs, it's even more pleasurable (I call it a warm fuzzy). Bill Hale, from Columbus, Ohio, sent in the following note:

"I ordered a set of your Hot Lumber plans when they first came out several years ago (NFFS Plans Service). Put one together with just a few minor changes (never build anything exactly like the plans), and I want you to know that it has been the most consistent model I have ever built, and I've been at it since the late 1930's.

"It has placed in the top three at every meet I have flown it, including first at Indiana in 1973, first in "B" and first in "C" at the KOI last December, and first at Lexington, Kentucky in May of this year. You can't ask much more than that of any model. I will probably build another one this fall, so I won't have to keep changing engines for B and C. Have been flying with S.T. .29 and .35 F.I. running on pen bladder fuel systems."

The Hot Lumber was designed as a quickie model intended to utilize existing spare parts...like wings and stabilizers. So, if you've got a spare set of Starduster 600 wings and stabs, or the same from an old Spacer, or a new Scrambler, or anything close to these in size, the Hot Lumber may fill the bill for you. If you don't, the 3-view provides an alternative wing and stab structure which can be used.

On this model, wash-in is critical. Add wash-in to existing wings so that the equivalent of 1/4 inch exists in the right main panel. Using a trailing edge "kicker" as detailed in the May, 1975 issue of MODEL BUILDER Free Flight would also suffice. Balance at the trailing edge of the wing (100%).

Balance point is obtained by completing the fuselage except for the engine





MYSTERY MODEL FOR OCTOBER



Bob Meuser (left) and Hal Cover at the NFF Championships, Taft, California, with their electric entries. Bob's is powered by Astro Flight 020, Hal's by the VL Products Hy Tork unit.

Go 796																	
STATION	0	1.25	2.5	5	7.5	10	15	20	30	40	50	60	70	80	90	95	100
UPPER	3.6	5.6	6.6	8.0	8.9	9.7	10.7	11.5	12.0	11.8	11.1	9.7	7.9	5.8	3.3	2.0	0.6
LOWER	3.6	2.0	1.4	0.7	0.4	0.2	0.1	0	0	0	0	0	0	0	0	0	0.2
Go 795																	
STATION	0	1.25	2.5	5	7.5	10	15	20	30	40	50	60	70	80	90	95	100
UPPER	2.4	-	4.4	5.3	5.95	6.45	7.15	7.65	8.0	7.9	7.4	6.5	5.25	3.85	2.2	1.3	0.4
LOWER	2.4	-	0.9	0.5	0.25	0.15	0.05	0	0	0	0	0	0	0	0	0	0.1
																	-

DARNED GOOD AIRFOILS – Go 796 and Go 795

OCTOBER 1975



MODEL BUILDER

installation (on 3/8 inch sq. maple bearers), strapping on the wing and stab, and then sliding the engine forward or back until the specified balance is reached. Then the engine location is marked and things such as cheek and cowls and the like are installed.

The original Hot Lumber used Spacer surfaces and a K&B .29. Weight was 24 ounces. Flight pattern is right/right, using slight right rudder tab and stab tilt. Entire model is covered with tissue.

The name? Well, it seems that some of the Seattle area boys (notably Don Dodd) were bragging about the hot machines that were flying up that way, and further, that they were going to bring these machines down South (to Oregon) and show us country-kids how their "Hot Lumber" flies. Not to be outdone, it seemed appropriate to design a ship that would scare them, at least in name if not in flight ... As it turns, out the ship lives up to its name.

BMA SCHOLARSHIP CONTEST RESULTS

Each year now, for several years, the Boeing Management Association has sponsored a contest for young modeelers under 19 years of age. This year's meet, held at the Kent (Washington) Space Center, took place on July 19 and 20. Over 100 contestants were present, competing in 6 control line events, 6 "specialty" events (including indoor hand launch glider and EZB), and 6 outdoor free flight events (1/2A Gas, Unlimited Rubber, Hand Launch Glider, A/1 and A/2, Cargo, and Helicopter). The winners for 1975 were Marty Phillips (\$1,000 scholarship), Keith Martin (\$500), Kevin Delaney (\$250).

The BMA has also announced that the scholarship contest will be held next summer, so plan to attend and compete. It's probably the best contest in the country for the younger set. This year's meet drew contestants from up to 2,000 miles away, so it's not just for the locals. TISSUE AND SILK

The availability of good quality tissue for free flight modeling has been a discussion point (some say a sore point) with free flighters for the last year or so. From Sig Mfg. Co. comes the word that they have just received a large shipment of tissue and silk from Japan. Since the Japanese have been the only real producer of high quality tissue and silk, and since their tough new anti-pollution laws have all but shut down their factories, it is not known how long this quality product will be manufactured, so the time to get it is now, while the supply is there. (Look out, Sig! wcn) Tissue is now available in white only, but with some creative uses of dyed clear dope, it can be made nearly as striking as the original colored tissue. DARNED GOOD AIRFOILS ...

Go 796 and 795.

Normally, this feature is closer to the front of the column, but due to the



Doug Joyce with a Half A version of his well known canard design. This will be featured in a future MODEL BUILDER construction article.



Lose your model? Want to get it back? Plaster your name over everything and mention the word "REWARD." It works wonders!

following treatise, I have held it back as a concluding item. Last month, I promised a run-down of the Goettingen-MVA airfoils in the months to come. Here 'tis.

In 1962, Aeromodeller magazine printed a translation of an article by Werner Thies entitled, "Is Undercamber Necessary?" During the next three issues of MODEL BUILDER Free Flight, I intend to excerpt portions of the original article for your interest. In addition, there will be a couple of airfoils presented each month for your consideration... airfoils which were those tested for the article.

Earliest types of airfoils closely resemble our "modern" model sections of the curved plate variety. In his book on aerodynamics, the British scientist, F.W. Lanchester, tells of the models which he used during 1895-1905 for his experiments, some results of which are still *Continued on page 85*



Marty Phillips, winner of BMA \$1,000 scholarship, cranks while his dad holds on.



The Hijacker wheels rapidly along a slope in southern California.



At rest on the ground, the Hijacker looks for all the world as though it were a pattern ship with the gear retracted. Hmmmm ...

PRODUCT\$ IN U\$E

T&H "HIJACKER" AND EK "RANGER" ... By Taylor Collins

• Hijacker! In this day and age, that name seems to imply international intrigue and espionage. I don't know about the espionage, but I'm certain that a lot of people will feel that the Hijacker should be outlawed from slope racing. This plane is nothing short of greased lightning. Yet, with all that speed, it is an easy plane to fly. It handles like a well trimmed pattern plane. It goes exactly where you point it, without any tendency to do anything surprising or nasty.

The very thin symmetrical root section on the wing progresses out to a flat bottom section at the tip. This gives the plane a great deal of slow speed stability. So much, in fact, that the plane never really does seem to stall...it just mushes along until the control surfaces lose all effect. I planted the Hijacker in the side of a sandy cliff one day finding this out. The robust construction took this indignity quite well. After ten minutes of struggling through the bushes to get to it, we just gave a gentle tug and squoosh...out it came!

The Hijacker goes together quite rapidly. The white gel-coated fuselage comes with a strip of 1/8 striping tape over the center seam. This makes for a fuselage which is absolutely ready to go ... no painting, sanding, filling... nothing.

The solid balsa tail feathers are simply carved and sanded to shape. After installing the bellcrank for the flying stab, the tail post can be epoxied into the fuselage. When the tail post has cured, the rudder hinges can be installed. The tubes for the stab wires are epoxied into the stabs and the tail of the bird is complete, except for finishing.

Up front, the wing wires are bonded to the fuselage with a micro-balloon and epoxy mixture. I waited until the tubes were installed in the balsa blocks in the wings before mounting the wing rods. This allows using the wings themselves as a jig to insure that everything lines up right. There's nothing more frustrating than wings that don't quite fit on the rods!

The wing cores are sheeted with 1/16 balsa that is supplied. I used Wilhold Spray Adhesive 54 to secure the sheeting. Rather than carve the balsa tips supplied in the kit, I used a flat plywood plate type tip. This extends down far enough to provide a wing tip skid as well. The wings and tail surfaces were covered with Super Monokote, although you could resin them and finish with one of the epoxy enamels or acrylic lacquer.

The aileron linkage was built as shown on the plans, except for the Quik-Link connection to the aileron rods. I used a molded Du-Bro adjustable link rather than the flattened brass tube supplied. This gave me a wider range of throw for the ailerons. As it turned out, I am using a 1/2 inch up throw and a 1/4 inch down, measured at the trailing edge of the aileron at the wing root. This gives me adequate throw for smooth rolls. If you want to do really violent maneuvers, this aileron throw can be increased. But be prepared ...

I mounted the servo tray for the EK Ranger on top of two plywood half bulkheads. The bulkheads were secured to the fiberglass fuselage sides with Dow Corning RTV 732 Silicone Rubber. This rubber material, incidentally, seems to grip fiberglass much more firmly than the more common "Silicone Rubber Sealants" that are sold in hardware stores. It costs more, but the difference is worth it.

The canopy attaches with a wooden key to hold it in place at the rear and a rubber band through a screw eye in the front.

Flying weight, with the three servos, receiver and 500 mah battery, is 52 oz., resulting in a wing loading of 12 oz. per square foot. This puts the Hijacker into the strong lift category, but penetration with the thin symmetrical wing is excellent. Although I purposely set mine up conservatively for racing (that's the chicken way of saying I can't keep up with anything wilder!), the Hijacker can



"Add glue and shake well!" It's not quite like that, but a lot of the time-consuming work has been done.



Flying stab and plenty of rudder area make for a very maneuverable glider. Flight of the Hijacker is fast and positive.



The EK Ranger receiver, a two-deck configuration with plug-in decoder board at top.



Inside of Ranger transmitter, showing adjusting slugs for varying the amount of stick tension, from "feather" to "hernia."

be very aerobatic. It is capable of doing nearly all of the A.M.A. power pattern maneuvers. It is . . . I'm not! The balance point is at 30% of the wing. This is accomplished with 6 ozs. of lead in the snoot.

Flying is not difficult, if the control throws are kept within reason. It is even possible to hand-glide the Hijacker. Just get somebody with a good stout arm to throw it like a javelin, grasping the fuselage behind the wing. Due to the notquite-shoulder wing, not-quite-low wing configuration, it is somewhat difficult to throw. In demo films at the T&H Booth at the recent Seattle R.A.M.S. show, our editor saw Randy Holzapple's technique for launching . . . throw it off inverted! there is lots of fuselage to grab ahold of above the wing. The Hijacker is available from T&H Enterprises, 7025 N. Stevens, Spokane, Wash. 99208. Retail price is \$59.95.

The EK Products Ranger Three Channel was brought out for people who don't need six, seven, or eight channels, but still want independent receiver and servos. The system uses the E.K. Super Mini Servo, together with a receiver utilizing a double-tuned front end and one tuned RF stage, followed by three 455 Khz I.F. cans. Whatever all that means, the system does one thing that is important. It works reliably! Mechanically it is well thought out. The receiver has a terminal block in one end to accept the power cord and three servos. The servos are rotary output (linear output servos available as an option). Four 450 mah battery packs are available, as well as one 225 mah pack and one 550 mah pack. So "no matter what shape your stomach is in" or your airplane's, E.K. has a nickel cadmium battery pack that is adaptable. The basic Ranger system comes with a 4-cell dry battery pack.

The transmitter is housed in a quite compact case. Normally, the transmitter is delivered in a dry battery version (using one 9v. No. 276 battery). Nicad operation is available as an option. One complaint I had was the length of the control stick, but E.K.'s genial Jim showed me that the molded knob on the end of the stick could be removed and stick could be cut to a shorter length. I fly with my thumbs (some people say I'm all thumbs...and feet) and I couldn't get my long digits up high enough to work the stick comfortably. A few turns with a tubing cutter corrected the situation.

One of the more desirable features of the system is E.K.'s service warranty. For the first three months you own the radio, they'll fix it free...no matter what happens. If you crash it, drive over it, or your dog Phydeaux chews it it up...they'll fix it free. For the next three months the maximum they will charge you for repairs is \$25.00. And for the following six months the maximum repair charge is \$35.00. And after a factory tune-up, the warranty is re-



Radio installation in Hijacker. Round output servo drives ailerons (outer rods) and rudder (inner rod). Straight output servo operates elevator. Uses EK servo/switch mount and outside arm.

newable for a second year.

Adjustable control sticks is another handy provision on the Ranger. Each axis of the stick can be adjusted for centering tension, independently of the other. This is accomplished by screwing or unscrewing the Allen-head set screw which compresses the tensioning springs. Since the two adjustments (in this case for rudder/ailerons and elevator) are independent, it is possible to set up the control "feel" to suit the pilot. On the Hijacker, I found that I had a tendency to feed in too much elevator control on racing turns ... so 1 tightened up the elevator centering and cured the problem. The increased tension gave me positive "feel" and let me know just where I was with the elevator control.

E.K. offers a complete line of accessories for the Ranger. Both linear and rotary output servos are available, as well as several different configurations of servo trays for each. The E.K. receiver *Continued on page 69*



The EK Logictrol Ranger 3 ch. transmitter. A logical and popular unit for R/C soaring.





Howard, Marty, and Betty Phillips. Taken at BMA contest where Marty cleaned up! Trailer was built just for taking to the '75 Nats. Fantastic people. Photo by Dirty Dan.

Marty again, just after winning Slow Combat at BMA contest. M&P Mongoose, Fox 36X.



• By the time you read this column, it is all done up and inserted in a very nicely prepared, professional magazine. It looks so nice that you might get the impression I write the column from my office, where I have all of my material close at hand. Wrong! First off, I don't have an office. I have a model building room just like yours, only a little messier. And I am writing this particular column in a motel room in Kennewick,

WA. Yes, there really is a town called Kennewick.

Motel rooms are not the best places to bang out a column on the old (ancient, actually) Smith-Corona. At least the motels I stay in aren't suited to this kind of activity. The table is much too high for comfortable typing. The TV (good reception, lousy color) takes up over half of the table, and is very solidly bolted down so that I can't move it or steal it... assuming, of course, that I would even want a TV with lousy color. The chair has seen too many motel parties and wobbles a lot. I'm getting seasick. There is a very large mirror on the wall directly behind the table. Every time I pause to think about what to write next, I look up and there I am looking back at myself. I'm getting nauseous. Just noticed that I really should trim my beard a little. No wonder



Dirty Dan with flying MB billboard. Nemesis with pacifier fuel system. Hat holds a six-pack (including head?).



D.D. again (hope this will hold him for a while) with favorite winning Goodyear "Johnny Reb," Model D. Sanitary toolbox to be featured.

people laugh when I eat ice cream cones. Kennewick is about 200 miles from home, I haven't been home to see the wife and kids, or build for the next contest, for two days. I'm getting homesick.

That ought to take a little of the polish and glamour off of any impression that you may have that writing a column for a magazine is all kicks and jollies. I'm a model builder just like thousands of others out there in toy airplane land. Only difference between you and me is that I get to B.S. the world on a monthly basis.

I want you to take another look at the pictures in this month's column. That there kid will all of the trophies is Marty Phillips, one of the very finest kids (teenager, young adult...whatever) that I have ever known. And his folks, Howard and Betty, rank very high on my list of favorite people. On a scale of I to 10, with my own parents getting a 10, Betty and Howard get a solid 9-7/8. That's how I feel about the Phillips family.

The trophies were won in the '75 version of the annual Boeing Management Association Scholarship Contest. Besides all of the trophies, Marty won overall, and this netted him a \$1,000.00 scholarship. Marty tried for three years to win the BMA contest, and finally did it in '75. Congratulations, Marty. You couldn't deserve it more.

Marty and his dad started flying with our club, The RED-MAX M.A.C., about four years ago. At first, it was Sport Flying only for them, but soon they were into C/L competition. We do a bit of F/F in our club, and they also got started in some F/F competition. About three years ago, they went to their first BMA contest, and Marty entered more for the experience than anything else. The BMA contest is a two-day affair, When the trophies are given out, everybody is ready to go home. But as soon as the trophies were passed out at that '72 BMA, I heard an engine start up. Marty and his dad were over doing some practice flying. After a two day meet! Dedication.

Sportsmanship has been a trademark of Marty's right from the first contest he ever entered. I have never known him. or his folks, to go out just to beat somebody. They go to contests to have fun. If they win, OK. If not, they had fun anyway and learned something to boot. In fact, one of Howard's favorite phrases is "We're not out to win. We're just learning. And having fun." You would not believe how many times I have heard Howard say that. But Marty is getting so good that Howard is going to have to drop the "We're just learning" part of his favorite phrase. In a recent F/F contest, Marty tied Jim Walters (No. 1 man on the U.S. Nordic Team to Continued on page 75



Bob Burch, a member of the Polish Pit Crew, showing off his Poland shirt. Jim Sima holding plane. Photo by Tom Southern.



Typical N.W. combat fliers . . . names withheld by request! Ship is T-Square. Aft end of bladder tied to rudder. Sheeting bulges from too much expanding foam. Beaten down! Mike Thayer pic.



The Pup proves that it's not necessary for a simple profile stunt model to look dumb. Ship is designed for .29 to .36 engines.

SUPER PUP' C/L STUNT

By MICHAEL PARENTEAU... This C/L profile stunt model is so simple to build that no instructions are really needed for the average "scratch builder." Wood sizes are stock, and the requirements are meager. If you've never tried a "non-kit" model, here's a good one for your first effort.

PHOTOS BY THE AUTHOR



The author's plane is powered by a Super Tigre G35 with a 10/6 prop.



Original ship is decorated in a white base, with dark blue on the forward part of the fuselage, light blue on the rest, red stripes.





The completed Heath test set shows 5 serves because it will be used to control a giant Old Timer R/C model, the Clinton DeSoto Cub, spanning 13-1/2 feet. A serve for each aileron.

PRODUCT\$ IN U\$E

HEATHKIT GDA "PACK-17" RADIO CONTROL SYSTEM

By Otto Bernhardt



Layout of parts includes only one servo and one stick assembly. No technical electronic knowledge is required to build the set, just follow the thorough instructions and use basic tools.



The hinged circuit board makes evrything easily accessible. Note 3 unused channels.

• In April, 1968, the Heath Company came out with its first 5 channel digital proportional radio control system, known as model GD-47, available only in the five frequencies of the 11 meter (Citizen's) band. The transmitter was equipped with Bonner control sticks, and circuitry designed by Kraft. The servos were also Kraft. The receiver was large in comparison with other manufacturers, being 2-7/8 long by 1-5/8 high by 2-1/4 inches deep and consisted of a total of 168 individual pieces and a net weight of 5 oz. Complete airborne system weight was 20 oz., consisting of one receiver, one receiver battery, and 4 servos.

In 1969, the Heath Company updated their line by coming out with its new 5 channel digital proportional radio control systems, model GD-19, available in a total of 15 frequencies in the 27, 53 and 72 mHz bands. Kraft control sticks were used in the transmitter, improving the trim characteristics. Control circuitry was basically the same as the GD-47 transmitter, although rearrangement of some of the components was necessary to allow room for a new style of battery pack. Servos were similar to



The receiver and RF module. You can build as many frequency modules as you desire, switch frequency and/or band instantly.



Transmitter frequency module is factory-built, and simply plugs into top of transmitter. Complete frequency set costs \$29.95.

the earlier model, except for internal circuitry improvements. Each servo weighed 2-1/2 oz.

Greatest improvement was in the receiver, which was reduced in size to 2-5/32 high, 2 wide, and 2-7/32 inches deep, consisting of 138 parts and an assembled weight of 2.3 oz. Complete airborne systems weighed 16.6 oz., consisting of one receiver, one receiver battery, one switch, and 4 servos.

In the spring of 1975, the Heath Company came out with its latest model 5 channel digital proportional radio control system, incorporating the latest improvements in this state of the art.

The Heathkit model GDA-505-D is a 5 channel digital proportional radio control transmitter. It is a solid state "dual control stick" unit using digital techniques to provide 5 channels of simultaneous proportional control.

Seventeen accurately calibrated and sealed plug-in radio frequency modules are available, and one module of your choice is supplied with the kit. Other modules may be purchased as desired.

The transmitter is housed in an attractive brown vinyl-covered aluminum case with a black nylon top and bottom. A 4-1/2 foot whip antenna telescopes into the case then the transmitter is not in use. A relative power meter is provided to monitor the strength of the radiated signal.

Two control sticks provide control of four servos. One auxiliary lever control allows operation of one more servo. Four trim tabs allow you to make fine adjustments to the first four channels without changing the position of the sticks.

Most of the transmitter parts are mounted on a hinged circuit board, which makes assembly easy and simplifies any service that might be needed. Each plug-in RF module is assembled at the factory. It is calibrated to FCC requirements, then sealed to insure operation at the proper frequency.

Operating power for the transmitter is supplied by a rechargeable 9.6 volt nickel-cadmium battery pack. A separate transformer charger is provided that connects to both the transmitter and to the receiver battery to charge both batteries at the same time.

The transmitter has been designed to operate as a "trainer" when it connected to another GDA-505 or to a model GDA-1205 transmitter. This allows the experienced operator to take over control from a "trainee" or beginning operator. The operating frequency of the two transmitters need not be the same.

The Heathkit model GDA-1205-4 miniature digital proportional servo is a compact electro-mechanical unit that measures overall 1-5/8 high by 15/16 wide by 1-9/32 inches long. Thrust at the rotor is 3 inch pounds minimum with a total travel time of 0.6 seconds. Rotation is 90°, and new weight is 1-3/4



oz. The servo has been designed for long life and trouble-free operation and has an extra heavy gear train. An integrated circuit provides a stable and accurate output and takes the place of several transistors and their associated resistors and capacitors. The feedback element consists of a variable control. The servo, including a glass epoxy circuit board and nylon gears, is housed in a compact, moulded nylon case.

The companion receiver for our five channel transmitter is an eight channel modular R/C receiver, model GDA-1205-2. This little unit features separate RF modules, which allows you to operate on any of the 17 available R/C channels without buying complete receiver and transmitter systems. Ouick changes in the field permit you to operate at almost any time without the usual tiresome wait for a clear channel. The quick-change, plug-in modules come in 17 frequencies, permitting you to change to a new band or to an unused channel in just a few seconds. A total of eight transistors, one integrated circuit, and three ceramic IF filters are used in the receiver. All parts are mounted on two glass epoxy circuit boards; the receiver module circuit board and the RF module circuit board. The outputs for the eight channels are supplied to the individual servos by a space-saving connector block located inside the receiver case.

Supply voltage for the receiver and servos is by a compact, rectangular 4.8 volt nickel-cadmium, rechargeable battery pack, Heathkit model GDA-1205-3. The completed receiver and RF modules are housed in two small attractive molded nylon cases, which when combined, measure 1-3/4 wide by 5/8 high by 2-1/2inches deep. You can charge the receiver battery without disconnecting it from the receiver. Net weight of receiver and RF modules is 2 oz. and consists of a total of 113 parts. Complete airborne system is 13-1/4 oz., consisting of one receiver, one battery pack, one switch, and four miniature servos.

Construction, thanks to the step by step procedure and large clear pictorial



drawings, is easy, fun and fast. The transmitter, receiver, and each servo is packed separately in a larger box. One package at a time is opened and completed before the next is called for. This avoids confusion and the possibility of mixing parts. Another "first" for Heath is that they include a precision alignment circuit that allows you to easily check servo centering to an extremely fine degree.

A few important things to remember while building any highly precision piece of equipment;

a. Read and understand the instructions *before* you start putting anything together. Heathkit instruction manuals

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are second to none, and it is almost impossible to make a mistake.

b. Don't work while you are tired. This is usually the reason for sloppy workmanship.

c. Don't hurry. This is supposed to be a relaxing hobby!

d. Keep your soldering iron clean. Over 90% of malfunctions are usually traced to faulty solder joints.

The Heath company has over three dozen service centers throughout the United States ready to help those individuals with assembly problems. A direct phone line to the service department of its Michigan plant is also available for advice. Heath company's promise to their customers is "We won't let you fail," and they mean it.

The following observations and suggestions were made during the assembly of the GDA-505-D transmitter:

1. Battery box assembly screws should be 6-32 instead of 5-40. The receiver battery box is identical and used a 6-32 screw.

2. Some diodes are not properly marked on the positive end. Two of the diodes supplied with the kit had no markings at all. Replacement diodes obtained from the local Heath service center were very plainly marked.

3. Meter bracket screws should not be tightened until meter has been in-

stalled. Leave off emblem until this has been done.

4. Installing control stick assembly screws is very difficult. I used a short piece of close-fitting aluminum tubing to guide the screws into position and then inserted a screw driver through the tubing to tighten the screws.

5. All wires leading to charging plug No. P101 should be soldered to the plug with the plug removed from the case. This will eliminate the danger of burning the insulation of other nearby wires.

6. Installing and removing the rear cover of the transmitter is very difficult, so build it right the first time, and then you won't have to fuss with the cover ... except when bragging to your buddies about your excellent solder connections!

F/F Scale Continued from page 41

Years ago I used to receive at school a publication called Classroom Clipper Science Series. These pamphlets had a great many interesting projects, and one that I remember, will be of interest to those of you who enjoy experimenting. This little set-up is used to check the efficiency of various airfoil sections, without going through the trouble of making a complicated smoke tunnel, etc.

Set up the equipment as shown in the illustration so that the airfoil being tested is secured to one pan of the platform balance and facing directly into the airstream. It may be necessary to tape the block of wood, on which the airfoil is strut-mounted, to the balance pan, or you may wish to imbed the strut in a large enough lump of modeling clay or plaster of Paris. In any event, measures should be taken to keep the test object from blowing off the pan. Balance the platform balance before turning on the fan and, after the fan is turned on, bring the pans back into balance by removing weights. The amount of weight removed is a measure of the lift produced.

When doing the angle-of-attack experiments, the angle can be adjusted by mounting the strut into holes that have been drilled at appropriate angles in the mounting block. For this to be made easier, choose a large enough semicylindrical piece of wood, or make a similar shaped object out of plaster, and drill the holes therein. The same effect will be gained by sticking the strut in modeling clay, although the accuracy of the angle will suffer somewhat and may not be maintained as faithfully when the air-stream is flowing across the airfoil.

This little contraption can give some rather interesting results for those who are considering an airfoil other than the venerable Clark Y for that next scale job.

Vince Costanzo came up with this next handy idea. Vince always uses a tube through the fuselage (and surrounding the rubber) while winding his models. *Continued on page 63*

MODEL BUILDER

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Designed and built by Boeing Aircraft Company, the legendary B17 Flying Fortress was "the guts and backbone of our aerial offensive" as General Hap Arnold put it. The tremendous fire power of its thirteen 50 caliber Machine Guns and the special formation flying, enabled the Squadron to penetrate enemy territory without fighter escort. Our Model is a faithful and highly detailed replica of the Prototype Frame members are accurately Die-Cut from finest quality Balsa and every part numbered to insure fast accurate assembly as shown on the Step-by-Step Plans and instructions. Many highly detailed and Plastic Parts simplify assembly. Included are Chin Turret, Nose Canopy, Top Canopy, Navigator's Bubble, Top Turret, Ball Turret, Tail Canopy, Tail Gunner Enclosure, Cowlings and Nacelles Also included is Covering Material, Formed Wire Parts, Wheels, Authentic Decals, Hardware (that includes Control Line Parts) etc. etc. Kit can be built many ways. Rubber Powered (as supplied), Gas, CO, Engine, or Electric Motor For Free Flight, Control Line or Radio Control or Static Scale.* Any version makes a Museumlike Model



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This 1883 Barkentine is the last Square Rigged Ship of the Portuguese Fishing Fleet, which yearly sailed to the Grand Banks. It is now a part of the Philadelphia Maritime Museum, and is permanently moored at its own Dock, Pier 15 North, Delaware River. Our Kit is relatively easy to build and features Step-by-Step Assembly, as well as Rigging. Plans guide you unerringly thru hours of pleasure. Exquisitely detailed Kit contains Printed Cloth Sails, Machine Carved Pattern Grade Pine (or similar) Tapered Masts and Yards, two colors two sizes Rigging Cordage, Authentic Decals and Flags, beautifully detailed Cast Metal Fittings, Mounting Pedestals and Base etc.

HEIGHT 8" LENGTH 14"



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Choppers.... Continued from page 19 same (17 mm from the leading edge). The Expert blades give much greater lift, therefore relieves the engine and improves the entire power range. Maneuverability is greatly improved and this modification is highly recommended.

Another "spin-off" of the wind-tunnel tests was the development of larger, wooden stabilizer damping blades, No. 3318a. Size and weight of the new paddles are matched perfectly to the new rotor control system and results in more direct and sensitive response. The new blades should be mounted exactly like the aluminum ones, except they should also be epoxied to the stabilizer rod. See March '75 MB.

14. Aluminum Servo Plate. The aluminum plate drawings were modified in the newer instruction manuals to show different servo arrangements and elimination of fifth "pitch" servo.

15. Redesigned Main Rotor Head: A new main rotor head has been designed, but not yet released by Kavan, which eliminates the "bird-cage" appearance of the hub. Very simple in operation and does same job function as latest control head. See May '75 MB.

16. Wash-out Device: This new accessory, No. 3329, is installed on the main rotor shaft, in place of the push-rod



guide which is no longer necessary. Its function is that of keeping the stabilizer damping blades (paddles) in a horizontal position regardless of changes in the pitch mode of operation. Up and down movement of the swash-plate is absorbed by the wash-out control and such movement is not transferred to the stabilizer as in the past. This results in the least air resistance to forward flight and a gain in power response as collective is applied. My personal experience has shown that sensitivity is increased in hovering to the point I had to shorten the servo moment arms to compensate for the faster response. See May '75 MB for details.



I might add that the swash-plate must have a fourth ball fixed to the inner ring, if not already attached. All new kits have the latest swash-plate, however, your old one may be exchanged for the newer model at nominal cost. (Item No. 3213a).



17. Main Rotor Blade Tongue: Recommend that the metal tongues supplied in kit be substituted with 3/32 plywood tongues to prevent main blade splitting on impact. Plywood tongues will break away and are easily replaced.

18. Timing Belt Tension: Shims should be placed under the engine lugs, if necessary, to assure the belt is a snug fit. The belt should have approximately 1/16 inch deflection when a light finger pressure is applied to the belt between pulleys.

19. Modified Rotor Airfoil: The latest instruction manual indicates how the main rotor blades may be constructed in a slightly different manner to produce more lift at high altitude airports.

20. Symmetrical Horizontal Stabilizer:



Latest instruction manual calls for changing the stabilizer airfoil to full symmetrical for increased maneuverability at high speed. Not mentioned, but becoming popular, is controlling the

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MODEL BUILDER



horizontal stabilizer (just like an elevator) with an additional control rod coming off the normal "back cyclic" control. This is said to be beneficial in loop recovery.

21. Vertical Stabilizer Offset: It is recommended that a small balsa or hardwood wedge be installed between the vertical stabilizer and the fuselage so as to assure an "offset" of 7 degrees as measured against the fuselage centerline. This offset adds left turning forces during high speed flight, and appears to be desirable. The higher the speed, the greater the corrective force to the left.

22. Engine Cooling: Hot days and/or high altitude flying require an adequate

heat-sink (Kavan unit is excellent) and possible addition of aluminum enclosure plates to direct the air flow directly over the engine and under the cylinders. Don't forget that the engine is cooled by the fan drawing air out of the box, and any leaks or openings will reduce the cooling efficiency accordingly.

23. Clutch-spring Modifications: There were a few reports that indicated "clutch-slipping" under heavy air loads on the power train. One recommendation was to remove the clutch-spring and stretch it to a relaxed length of 4-3/4 inches, so that the shoes engaged easier. Stretching the spring also permits clutch engagement at a lower engine



RPM, so be sure you have a problem before stretching the spring, otherwise your main rotor will engage even at very low engine RPM.

24. Main Rotor Rubber Damper: Early magazine reports recommended that the rubber damper be shortened considerably to provide greater control. Although



the theory is correct, the model became more unstable in practice since the rotor was now almost "full teetering" in principle. On the other side of the coin, were the proponents who wrapped the main drive shaft with 4 to 6 layers of vinyl electrician's tape and forced the rubber damper over the tape to reduce the teetering effect, hence increasing the stability by "tieing-in" the rotor more rigidly to the fuselage. This modification appears to be one of personal preference.

25. Stabilizer Paddle Adjustment: The "third" control rod from the swashplate to the modified control head should be adjusted so that the paddles are at zero degrees angle of attack (horizontal) when the helicopter "lifts-off" into hovering flight. This adjustment can only be determined by having a helper note the throttle position at lift-off, mar-

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king it, then make the adjustment with engine off and throttle position set at the position so marked.

26. Rotor Head Mixing Lever Adjustment: The two main control rods from the swash-plate to the stabilizer bar mixing levers should be adjusted in length so that the mixing levers (inside the rocking head) are horizontal at the lift-off throttle setting. This is accomplished in the same manner as mentioned in No. 25 above, and both may be done at the same time. When the engine is at idle RPM, the referenced mixing levers should be slightly below the rocking head.

27. Main Rotor and Tail Rotor Adjustment: The initial settings for the main and tail rotor blades are made at the engine idle RPM. This means that the throttle stick is full back, and throttle trim is full forward. With the controls thus set, adjust the control rods from the swash-plate so that the main blades are at zero angle of attack (horizontal). Use the spirit level to make sure they are both parallel to the ground and to each other. At this same control setting, the tail rotor blades should also indicate zero angle of attack (parallel to fuselage centerline). This adjustment must be made with the short control rod (in the tail) which connects the bell-crank to the sliding bushing on the tail rotor shaft.

28. Tail Rotor Shaft: Based upon many requests from Jet Ranger owners, Kavan has redesigned a new, heavier tail rotor shaft, shown in the drawing.



You will note that the new shaft is not stepped directly behind the bearing anymore, which should eliminate much of the bending upon impact. It does, however, require a special ball bearing to accommodate the stronger shaft. At present, the assembly No. 3404b is available as a complete unit for the modification. The shaft only is also available (No. 3404c) in case of later requirements.

29. New Bell Cranks: These pitch arms have been strengthened as shown on the drawing. Due to the reinforcement,

the springiness has been eliminated and control actions are now more positive. (No. 3505a).



30. Ball Joints: New ball joints (missing links) have been designed with heavier outer rings for strength and durability, and a smaller bore for better fitting of the push-rods. These mods have improved the ball joint considerably and should be installed as soon as possible (No. 3324).



31. Window Mounting Channel: If you are like most model builders, who can't cement the windows without smearing cement all over the place, then the window channel is for you! This "S" shaped channel is attached to the window cut-out, and held in place with Hot Stuff. The window is then slipped into place, or removed as desired. In case of crash (and we do have them once in a while) the window usually "pops out" without damage. Sixteen feet of channel per package. (No. 132).



32. Plastic Tail Cone: This tail cone is molded from high impact plastic and has a built-in lens cap for the navigation light. Sure beats making one out of wood. (No. 3913).



33. The last items are probably old hat by now, but we'll list them so you'll be up to date with the rest of us:

a. Second edition of Assembly and Flying Instruction; contains advice and modifications ... many new drawings and miscellaneous info. (No. 3057).

b. Cockpit Instrument Panel...highly recommended for that scale appearance. Also scale, hand painted pilots to complete the scene. (Nos. 3911 and 3912).

c. Flashing Navigation Lights ... Lights can be arranged to flash in different modes ... electronic module and lights included. (No. 3904).

d. Fuel Warning Lights ... Invaluable for indicating when fuel is low and you can't see the tank. Lights flash on-andoff to provide warning at any pre-set fuel level. (No. 3906).

e. Gyro... the best device invented for R/C model helicopters. Takes the work out of flying and learning. (No. 3901).

f. Training Gear . . . Same as regular

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landing gear struts, except much longer, to provide the needed "wide-stance" for learning. (No. 3018).

I can't think of any other ideas or mods to the Jet Ranger, except those of a personal preference, so will make my final approach for this issue. It looks like the next project will be a review of helicopter flight basics and elaboration on the initial adjustments, trimming, and flight training techniques for those model builders who didn't get into the act at the beginning. Next month we'll report on my German vacation.

F/F Scale Continued from page 58 When the winding is completed, the tube is removed, and then the front end is attached. In case a rubber motor breaks, it does so inside of the tube instead of ripping the fuselage apart. Vince's idea is not novel in itself, but rather what he uses for the winding tube. He uses model rocket tubes, which are very durable. To complement this set-up, Vince uses these same tubes for making the "thrust button" (See illustration). The nose block then neatly accommodates the rocket tube for winding, since the thrust button and the rocket tube for winding, since the thrust button and the rocket tube are of the same size.



Costanzo's "thrust button"

A couple of other sources for winding tubes, which incidentally aren't all that easy to find, include large heat shrink tubing and acrylic plastic. Also, many brands of windshield wipers come in neat plastic tubes of various lengths.

In the What's New department, the only thing I have to share with you this month is Flyline's *outstanding* new kit of the Stearman C3B. This has to be Flyline's best kit and effort yet, and all of their other kits are super. This model is designed for an .049 power plant, with a 35 inch wingspan. It is intended to be an R/C model, using the light two or three channel radios now available. However, it would also make an ideal F/F model as well.

What really gives this model class is the dummy Whirlwind J-5 engine up front. This can readily be made by using the William Bros. 1 inch scale J-5 cylinders. The engine recommended is the



Cox .049 Golden Bee, which is beautifully concealed among the cylinders.

The quality of the wood and other materials are first rate, and are not of the rock-hard balsa variety either. The other item of major consequence is that this is NOT a \$24.95 kit...a price common to many other kits of this size ...but not quality. No, the Stearman is priced at \$12.95. A price that all of you will agree is extremely reasonable in this day and age.

Just a reminder that the Flightmasters 26th Scale Annual will be held on October 4th and 5th. The judging takes place for the first time this year at Trident Jr. High School, on the 4th, at 7 to 11 pm. Trident Jr. High is located at 1800 West Ball Rd., in Anaheim, about 5 minutes from Disneyland. The flying will take place at Mile Square Park, in Fountain Valley, from 8 am to 2 pm.

Ms. Only Continued from page 8

Getting back to the R/C Soaring Nationals in Lockport, I want to say I was delighted with the warm response and genuine encouragement the WINGS received there. WINGS is an acronym for Women in National Glider Soaring. They are chartered as a club in Springfield, Illinois, which is also the home of their president, Margaret S. Gill and Secretary/Treasurer Helen D. Olsen. The WINGS three-woman entry team at the Lockport contest consisted of President

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Margaret, Lila Stamm of Grandview, Missouri, and Barbara Henon, of Pacific Palisades, California. Lila is Vice President of the group, which is proving to be an active and dedicated bunch of girls who come from all over the United States, Both Margaret and Helen told me the group is seeking new members and they feel WINGS can perform a real service for women who are seriously interested in building and flying gliders. Margaret's address is 216 Stutely Lane, Springfield, Illinois, 62704. Helen's address is 700 Durkin Drive, Apt. 349, Springfield, Illinois, 62704. Get in touch! Unite!

I can't really say I understand why these girls like to fly. I do know the WINGS members I've met are a varied and interesting breed. I'd like to ask the WINGS, and all women who fly, these questions. How did you become interested in flying? What happened, or didn't happen, to make you want to take this step into modeling? Did husbands and boy friends introduce you to this sport or did you happen on it by yourself? Let me know. Womankind is very proud of you.

Another woman I want to tell you about is Joyce Good (Walter's wife) who I met at the Dansville, Michigan glider contest. We were parked next to each other. She was doing colorful em-



broidery on the yolk of a blue shirt. I introduced myself and asked her to share a few experiences with me about being married to a famous and dedicated modeler. In case you don't know, it was Walt and his twin brother Bill who advanced and refined R/C flying with a science project when they were students at Kalamazoo College in Kalamazoo, Michigan. Joyce met her husband at his brother Bill's wedding. She was already friends with her future mother-in-law and had heard, first hand, a few stories about the boys. During their whirlwind courtship. Walt gave loyce a rubber powered model instead of the usual candy or flowers. As my husband Bill puts it, "That was sure fair warning!"

loyce and Walt moved back to the United States last Christmas after living and working in Heidelberg, Germany for two years. Walt was active in the LSF program there as European Coordinator. The Goods attended glider contests in both Italy and Holland. And hear this! They have attended the Power World Championships since 1965. These contests are held every two years in such colorful places as Sweden, Corsica, Germany, and Italy, Now the Goods are back, living in Maryland, where Walt works in research in the Applied Physics Laboratory at Johns Hopkins University. Joyce says Walt has built and flown R/C models all of their married life. One can just imagine the staggering amount of contests Joyce has attended. She said their two grown children were about nine years old before they realized there was anything else to do on a Sunday afternoon.

I asked Joyce if she had ever been interested in flying R/C. She said she received an R/C boat kit from her husband one Christmas. Yes, she built it herself with some help and encouragement. And, yes, she did pilot it on the water. But when interest lagged, she noticed little parts of it disappearing and then reappearing on airplanes around the house.

I saw Joyce and Walter again at the Nationals in Lockport, smiling and friendly. They're a good advertisement for the clean living and fresh air of the contest trail.

Know what happened to that first R/C plane the Good brothers built in college? It's in the Smithsonian Institute in Washington! Next summer, if my soap opera sells, and my husband finds a contest near Washington, D.C... and gets a little bit of good air ... I'll have a chance to see that plane.

QM Nats Continued from page 15 year. The plane was bright yellow epoxy with ornate lettering and "rat" for decoration.

A change which may or may not be a good one was the new Rossi .15 engine. Several protests were lodged against its being legal but they were disallowed (It is legal, according to the rules. wcn). The lack of familiarity with this new engine showed up in many flyer's scores, as it has been available only 6 or 8 weeks. Pipes, tuned and otherwise, showed up on the rear exhaust Rossi. Ed Rankin, former NMPRA President, and the C.D. for the meet, solved all objections by not allowing any pipes at all! I must applaud his good judgement on this point, because the rules say no pipes. I must also take issue with another decision (my opinion only) he made, however. The whole purpose of careful

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rules to prevent reworking engines were dealt a severe blow because there was no real idle check on takeoff. On the first round, the engine speed was dropped and run back up, with the caller holding the plane in place, and with no check on how low it went. This is not an idle check—it is a servo check. Enough said on that.

The man of the day for three days running, was Bob Reuther, flying his new Hobby World Shoestring kit model. Bob won every race and is truly our National Q.M. champion. The wildest heat of the three days was between Bob Reuther (who else!) and Tom Baker. Both planes were unbeaten to that point (4 heats) and each closed in on the pylons with every succeeding lap. Tommy cut and Bob eased off. Bob would have cut the next lap if he had kept closing his course. But, IF doesn't count and Bob was relatively unchallenged for the rest of the meet.

Tom Baker walked away with second by winning all his other races. Bob Royal was third, with perennials Gale Jacobson and Greg Doe placing fourth and fifth, after a flyoff.

The wildest flyoff was for 14th and 15th, between Austin Leftwich and Ted White. Ted played it straight for one lap while Austin settled into "his groove," about 20 ft. high and 2 feet outside the pylons. Seeing he was outclassed, but not to be outdone, Ted cut inside, but that lead didn't last, so he cut inside again. He kept cutting his course short 'till he was doing small circles between the pylons while Austin played straight man to the clown act by going just as fast on the full size course! The onlookers whooped and applauded this last race of the Nats.

Let me take a second to editorialize a bit. The new hundred dollar engine (Rossi) has obsoleted everything else, (And the HGK is coming. wcn). There was much talk at the Nats, and a vote is being taken by the NMPRA on limiting cost of engine and availability time (such as, "All .15's produced by January 31 are legal for that season."). Send your comments and your club's comments to Bill Cooper, Q.M. Vice President, c/o NMPRA. Let's not allow this event to get lost to the sport flyer, as some others have. Q.M. has been good on a local club scale. Will your club members buy a \$100 engine for Q.M., or will they race against it with their older engines? You must decide and speak out.

Go sure, go consistent, go outside for 10 laps and THINK QUARTER MIDGET!

Plug Sparks... Continued from page 39 roads only to find that most east-west roads would dead-end (North-South retrieval roads were good). Thoroughly exhausted from wheeling up and down one road after another, Herb spotted a farm house and decided to start inquiries and rewards for the whereabouts of his model. He wheeled the car into the front driveway, was about to approach the door when he looked to the left and there was the model sitting right on the lawn!! Some guys have all the luck!

Zippers are good fliers but are also notoriously wild fliers when slightly out of trim. Zippers always provide fun in this respect and wouldn't you know it, one wild looking Zipper hit one of the fiberglass out-houses full tilt. The fiberglass sides rang like a bell and a few seconds later, out stepped Wally Leiper with the most dazed look on his face. Wally claimed he was real gun shy for the rest of the meet.

The writer was no exception, providing a considerable amount of amusement for President Joe Beshar and others, who were giving all sorts of advice on



how to get some revs out of his new (not broken-in properly) Fox 45 Schnuerle engine. It was one of those days where everything was going wrong. While minding his own business, over came Jim Robinson's Dodger under full power and proceeded to check up the Sunduster's tail. Back to the bench and the hot glue real quick! The ironic situation was that the columnist had just previously helped Jim off-load his airplane box.

There must be something to Al Schwankert's method of flying, as he won no less than three first places against some particularly tough competition! Al flies all his models on his knees, carefully watching cloud formations for thermals. There must be something to this praying posture!

Best flight of the day was Jay Beohm's Powerhouse, entered in the Fuel Allotment Event. For 30 minutes, the model cruised in the North, drifted east, and then finally reversed its direction to disappear in a southwesterly direction. What a beautiful flight to watch!

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SAM Championship from a free flight standpoint. Despite the reduced performance at this altitude, the writer has yet to see so many well adjusted models fly. Crackups were far and few between, all the good flying.

The writer could talk all day about that, but this column is limited. So, if you feel slighted, it wasn't intentional. Just like women, all flying was good, just some wuz better!

With the contest going so well, this is a good time to stop and recapitulate some of the other doings. ANNUAL SAM BUSINESS MEETING

Talk about a hot time in the old town tonight; over 100 SAM members attended the business meeting to express their viewpoint ... AND DID THEY EVER!

The writer observes this as healthy when members are concerned enough to attend the meeting and express their opinions. To summarize the meeting under the able leadership of President Joe Beshar, the following actions were taken and/or noted: 1. Tim Banaszak reported over 900 SAM members and over \$3,000 in the treasury! Joe Beshar was a little unhappy over failing to meet his Presidential pledge of 1000 members, but at the present rate of growth, it shouldn't be long before this is attained.

2. All new free flight rules that were approved by the membership in the recent Rules Change Vote, were suspended by general vote and committees formed to come up with suitable solutions. Of particular concern was the new rule requiring pre-1950 engines in Antique Models. The idea of making the .020 Replica Event was held up as there was simply too much conflict with the *basic* rules. The committee for determining the age and authenticity of old timer models was firmed up with the addition of two regular SAM members in addition to the participating SAM officers.

3. A special committee, headed up by Bruce Chandler, to look into converted glow engines, was appointed by Beshar to come up with recommendations on which motors should or could be used. In addition, the committee was provided with copies of 1939 NAA Free Flight rules by V.P. Pond in an effort to have a uniform matchup of engines to plane size.

4. The next SAM Championships are to be held at Bong AFB, or somewhere in the Midwest, as per the proposal adopted at Taft two years ago. V.P. Pond presented a proposal by the VAMPS Club to hold the next SAM Championships at Las Vegas. Despite the attractiveness of the proposal, it was felt that the present schedule of SAM Championship locations be maintained in all fairness to all sections.

5. The proposal by Lee Renaud, of Airtronics, to sponsor the Towline events

(both F/F and R/C) at future SAM Championships was accepted by the membership contingent upon the ability of the host club to stage the meets. Present SAM rules were to be used, with no changes contemplated.

6. Clarence Andre reported his bibliophile on old timer parts, plans, services, etc., is almost complete and will be ready for printing in several months. This project will answer the needs of those modelers new to the Old Timer movement, not to mention those fellows out in the boondocks who are out of the mainstream of information.

THE WRAPUP

How about 198 attendees at the Annual SAM Victory Banquet! Wow!! Nothing succeeds like success. Each succeeding year sees a marked increase in all SAM activities. As AMA president Johnny Clemens (who flew up from Dallas just to attend this contest) said, this group is just the kind of group he is going to organize when he retires from the Presidency. That should give old time control flying a much needed lift.

The usual high jinks prevailed, with Phil McCary receiving a set of womens panties (to match his hair, according to Roy Turner), Pond receiving a set of Junior Birdman wings from Beshar, and a beer award (placque) from Marvin Mayo of the Kansas City Group.

Following an excellent dinner, arranged by Colonel Kaiser of the Lowrey AFB (whatta great feed and arrangement), A.M.A. President Johnny Clemens was introduced, and the audience treated to one of John's inimitable speeches. After acknowledging all VIP's at the head table, SAM President Joe Beshar turned over the awarding of trophies to Tim Dannels. With trophies and merchandise being awarded to sixth place, this did entail a considerable amount of time. It was suggested in the future that the event winners be called up in a group and properly acknowledged, somewhat in the style of the Olympics Awards.

RESULTS 9th ANNUAL S.A.M. NATIONAL CHAMPIONSHIPS

July 29, 30, 31

	ANTIQUE R/C (19 Entr	ies)	
1.	Al Schwankert	17:06	
2.	Don Lamkin	15:13	
3.	Harold Hadley	15:01	
4.	John Pond	13:45	
	TEXACO R/C (14 Entri	es)	
1.	John Pond	18:17	
2.	Don Lamkin	13:05	
3.	Al Schwankert	12:37	
4.	Bill Turner	8:48	
	CLASS A R/C (10 Entrie	es)	
1.	Mark Patrollia	11:08	
2.	Jim Clark	10:28	
3.	Woody Woodman	8:19	
4.	Joe Beshar	7:23	

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MODEL BUILDER

	CLASS D. D.C. (12 Entries)	
	CLASS B K/C (12 Entries)	06.00
1.	Al Schwankert	26:09
2.	Joe Beshar	22:42
5.	Al Place	18:29
4.	led Patriola	18:18
	CLASS C R/C (22 Entries)	
1.	Al Schwankert	15:19
2.	Ted Patrolia	14:10
3.	lack Strickland	9:09
4	Al Place	8:59
	CLASS D BYLON (41 F	
	CLASS B PYLON (41 Ent	ries)
	S	econds
1.	Phil McCarey	498
2.	Sal Taibi	459
3.	Mitch Post	445
4.	Ed Riley	439
5.	F.L. Swaney	423
	IOWLINE (14 Entries)	
1.	Les Payne	207
2.	Geo Morland Jr.	176
3.	Chet Burkowski	144
4.	Bob Smith	138
5.	Jack Jella	125
20	SECOND ANTIQUE (33 Er	trioc)
1	Manage A. S	624
1.	warren Avis	334
2.	Jay Boenm	438
3.	Sal Laibi	447
4.	Iom Alden	355
5.	Herb Wahl	278
. (CLASS C CABIN (47 Entrie	s)
1.	Herb Wahl	472
2	Mark Fechner	426
3	Karl Snielmaker	416
Δ.		111
5	Col Taibi	300
э.	Sdi TalDi	590
C	CLASS A PYLON (42 Entrie	es)
1.	Bruno Markiewicz	443
2.	Bill Hale	412
3.	Larry Bover	387
4.	Mitch Post	384
5	Bill Schaffer	380
-	CLASS A CADINI (21 E-1-	
	CLASS A CABIN (31 Entrie	es)
1.	Bill Hale	454
2.	Jim Robinson	448
3.	Wayne Cain	414
4.	Les Payne	400
5.	Hank Hilscher	319
0	MBINED RUBBER (26 Ent	ries)
1	Bob Oslan	1275
2	Phil McConv flyoff <	1275
2.	Dammy Shields	1140
Э.	Tam Aldan	423
4.	Tom Alden	418
э.	Chet Bukowski	330
0	LD TIMER SCALE (9 Entr	ies)
1.	Phil McCary	867
2	Bruce Chandler	638
3	Al White	263
4	Bill Hale	155
5	Don Lamkin	93
5.		1
(LLASS C PYLON (30 Entri	es)
1.	Guy Kirkwood	540
2.	Bob Oslan	512
3.	Ted Patrolia	463
4	lim Robinson	450
5	Toby Blizzard	448
~		1
C	LASS & CABIN (21 Entries	1
1.	Bill Hale	490
2.	Al White	332

NEW Grand	Banks Dory
All colors preprinted on coa cardboard parts. I with illustra	ted heavy paper. All die-cut Easy assembly, in 6-8 hours, ted step-by-step instructions. Building an authentic scale model of the Grand Banks Dory is an exciting learning experience for teenagers and adults. The con- struction technique involved is similar to that of full scale boats.
	Learn of the dory sinistonean use and development. The Grand Banks Dory's measurements are: LOA 10%*". Beam 3-1/16". The complete kit price is \$2.49. Available through hobby dealers and distributors only.
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3. Larry Boyer 304 4. Jim Belson 284 5. Bruno Markiewicz 280 FUEL ALLOTMENT ANTIQUE (30 Entries) 1. Jay Boother 1800	 PERPETUAL TROPHY WINNERS Ernie Shailor Memorial Trophy: Phil McCary Pond Antique Fuel Allotment Trophy: Jay Boehm Grand O/T Champ: Phil

McCary (SCIFS)

CONTESTS

1054

867

617

263

513

474

428

425

424

F. L. Swaney
 Warren Avis

4. Herb Wahl

5. Al Hellman

2. Ed Collins

3. Bob Oslan

1. Bob Bicknell

4. Al Rasmussen

5. Donn Linton

.020 REPLICA (73 Entries!)

As promised in this column, we try to carry the latest contest announcements. Ya gotta remember, fellas, this columnist needs at least 45 days advance notice. At the SAM Championships, the writer received the following notices: S.P.O.T. First Annual O/T F/F &

R/C Contest, Sept. 28. Note this is the



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new date! (Moved to accommodate other contest activity.) They (Jim Clark and Howard Carman) will be running Classes A, B, C, and Antique. Of special interest is the Fuel Allotment event which only allows 1/8 ounce of fuel per pound of fuel per pound of model, as compared to the Old Texaco rules of one-quarter ounce per pound. This may introduce a trend, as the writer has noted the tremendous altitudes the Texaco Event Models have been reaching with resultant high times.

The SPOT Contest will be held at North Branch Park in Somerset County, New Jersey. Note that mufflers are required on glow engines! Plenty of prizes, and as a special inducement, lunch will be served by the ladies. How about that? ENGINE OF THE MONTH

About the time that Brown, Atwood, and Ohlsson were starting to make names for themselves, a rather obscure fellow by the name of Righter produced several prototype engines that started and ran well.

About this time, the movie actor, Reginald Denny, also an aviation buff, got interested in the idea of marketing model airplanes as a business. Acquiring the rights to manufacture the engine, the motor was dubbed the "Dennymite" (in honor of the sponsor) and immediately became a good seller.

Made primarily of cast iron, the Den-

nymite was a good durable engine that ran quite well, considering the little known fact that it was only a .56 cu. in. displacement engine. Points were left open, giving it a rather crude appearance, but no modeler could ever complain of not being able to adjust the points on a Dennymite.

The Dennymite engine enjoyed its greatest success when it was paired with the Dennyplane (a Fletcher design) and sold either as a package, or in some cases, a completely ready-to-fly. In his days as a hobby dealer in Milwaukee, Walt Billett (now deceased) reported he always had a Dennyplane on hand and one or two building. It was a great combination, as the Dennyplane with its large cowl looked very much like a Bellanca.

In later years, the Dennymite was used in race cars with a so-called Berg conversion. These cast iron engines then showed their true mettle (metal?) as they were able to stand the high wear rate imposed by the higher rpm required in race cars.

Eventually the engine rights were sold off, with several variations appearing, such as the PAC, the Kleiner, and even Ohlsson bought them up and produced Dennymite engines for a period of time! The Dennymite can truly claim to be one of the early successful motors that made this hobby as we know it now.

MORE EASTERN ACTIVITY

Right on the heels of the 1975 Easttern States R/C Championships, Leon Shulman, C.D., which unfortunately does not feature old timer events, the Old *Time Eagles* will be staging a big three day contest at Lakehurst NAS. (Yes, they still have good Navy connections!!)

Inasmuch as the O/T Eagles are liberally sprinkled with free flighters, the meet will feature all old timer activities; free flight, radio assist, and controline. Events will be run by C.D. Al Schwankert over October 11, 12, and 13th. Shades of the SAM Champs held last year at Lakehurst!

Somerset Signal Senders announce their first O/T R/C Contest on October 26 at Somerset County 4H Field, Milltown Road, New Jersey. Things are really popping in New Jersey, according to C.D. Jim Clark. With all the scheduled contests, everyone should win at least one trophy!

This is another contest that requires mufflers for all glow engines above .10 cu. in. The writer heartily commends this, and will push in the future for quieter motors. Makes things a lot more pleasant.

COMING ATTRACTIONS

If you think that all the fun was at the Denver SAM Championships, wait until you read next month's column on the "Unofficial" Old Timer Events held at the Lake Charles National Model Championships over the August 3-10 week. We will be reporting on the R/C and F/F activities plus the 12th Annual Old-Timers Reunion Banquet. *Real fun!*

Skylark..... Continued from page 39 Garami in several ways, though still a winner in the "clever design" category. It was developed for either Class A or B competition, using an Ohlsson 19 or 23, and carrying 320 sq. in. of wing area (It's interesting to note that the latest 1/2A Satellite also has a 320 sq. in. wing!). The fuselage is a faired diamond section, being built up from a flat frame crutch, and the wing is slightly gulled, with the leading edge of the inboard panels curving in to a shorter chord at the center section.

Plans for the Skylark appeared in the September 1940 issue of Air Trails (drawn by Paul Plecan!). Like many plans published years ago, no balance point was shown, nor did Garami mention balancing in the accompanying article. Considering the lifting stab, we'd suggest starting at 50%, or about 4-1/8 inches ahead of the trailing edge, and adjusting from there.

In terms of R/C, the Skylark should be a peachy little design with about an Enya .09 R/C on rudder, elevator, and throttle. Put in two 3/16 aquare rudder spars and add an extra "rib" just above R-1, going aft. For an elevator, draw a line perpendicular to the centerline about 1-3/4 inches ahead of the trailing edge.

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Install a 3/16x1/2 spar at this point and then add built-up or solid split elevators. Add a wire skid to protect R-5, and finally, move the balance point a little more forward.

By the way, we'd like to hear from O. T.-ers regarding preference for sport or all-out competition oldies. We think they're all great, but you may have a preference.

Hijacker/EK.. Continued from page 51 is set up so that it can be mounted on an E.K. tray with rubber grommets. By standardizing the control set-up on different airplanes, this would make switching radios from plane to plane very easy.

The accessory Expanded Scale Voltmeter is a somewhat misunderstood item. This meter is intended to measure only one thing ... the remaining power reserve in a flight pack. It is set up to measure between a range of 4.4 volts and 5.2 volts. When a receiver pack is fully charged it will read nearly full scale deflection on the meter. After only a few minutes running time it will drop to a nominal 4.8 volts. For the next couple of hours of operation in the plane, the voltage will remain fairly constant. But when the battery finally nears discharge, the voltage will drop quite suddenly. At this point the meter will show a marked drop from the nominal voltage. Since the meter places a load on the batteries, and the circuitry provides very accurate measurement between the 4.4 and 5.2 volt range, the E.S.V. can be used just like the gas gauge on a car, to give you an accurate idea of the remaining "juice" in your flight pack.

The E.K. Ranger system has proven to be reliable and lightweight. With the exception of modifying the stick length, the Ranger has been completely satisfactory right out of the box. And in a plane that is as fast as the Hijacker... any problems would show up real quickly!

Little One Continued from page 11 planking.

We mount the nylon nose gear block with flat head bolts so the radial engine mount ... Kraft, Tatone, or Edson ... will mount over them. A Sullivan SS-6 or SS-8 fits well. We considered retractible landing gear, but the weight increase might be a bit much on a small plane like this. With the engine mount installed with engine, cowl blocks can then be shaped around the engine, faired into the spinner.

Foam core wings are pretty common now; most clubs seem to have a member who can cut them to order. If you can't find a foam cutter locally, write me at 32 Alameda Ct., Shrewsbury, N.J. 07701

and I can help you. Going to a built up construction could be done if you really want to ... with the tapered wing, probably sandwiching balsa blanks between a root and tip rib pattern and sanding to shape would be the easiest way to go. We inset hardwood landing gear blocks into the foam core with a length of 1/2inch dowel at the torque leg end. Edgejoin 1/16 balsa to make up wing skins; sand before contact cementing to the foam. Use any contact cement sold for hobby foam use; why take chances? We have seen some contact cements melt the foam away, one case overnight after the wing was completed. (Wilhold's new Super Latex Contact Cement works areat and is easy to apply. wcn) Add leading and trailing edges after the skin is on, and sand to shape. We butt glue the halves together and wrap the center section with a 4 inch wide fiberglass cloth and epoxy. Ailerons are standard 1 inch tapered stock; wing tips are shaped from soft blocks.

The tail surfaces are simply 1/4 inch balsa sheet.

Everyone has their own personal technique on finishing. For lightest weight, Monokote the wing and stab, paint the fuselage. We don't like to Monokote fuselages. For painting, we use automotive lacquer primer and finish with butyrate dope. To each his own.

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Check alignment carefully before test flying. Very little control surface deflection is needed, except for the rudder, which can use plenty of throw. My trimming "technique" is to set aileron throw so full movement is just enough for the three consecutive roll maneuver, elevator throw just enough for good loops (more up elevator only if needed for spins) and just enough rudder throw to insure a good spin. Balance point is moved to the rear until we can do three consecutive rolls with very little down elevator when the plane is inverted. This is all to suit individual style . . . we also use strong centering springs on our transmitter control sticks and fatter knobs on them. Again . . . to each his own.

Why the name we used? Among the dozen or so planes currently in the hangar, this was always referred to as the little one. So now it's official. Good Flying.

R/C Soaring... Continued from page 17 diminishes over the next twenty-four hours. We discovered that it is possible to freeze the light and halt the chemical reaction (and the light output). When the tube thaws...sure enough it starts glowing brightly again. (I guess this would limit night-time snow flying contests somewhat?????) So, by freezing the lights, you should be able to get a couple of evenings flying out of each light.

Remembering Bill's glowing house numbers, we found that auto supply stores carry reflective tape (for marking bicycles, fence posts and such) that works well as wing reflectors. When an automotive emergency spot light is directed at the tape, it reflects extremely brightly. But, please don't depend totally on the spotlight... it is only as reliable as the person who is doing the 'tracking' and moving sailplanes are pretty difficult to 'hit' with a spotlight.

If you want to go a step further, the 3M company manufactures reflective sheeting material under the brand name "Scotch-Lite." This is available in about a dozen different colors (including black!). It is backed with a pressure sensitive adhesive and can be cut with an Uber Skiver knife into fancy designs (or the MODEL BUILDER logo as we did). With a chemical light on each wing tip, and reflective tape or sheeting on the bottom of the wings, night flying is no more difficult than flying in the day time. Just be sure to douse the guy manning the spotlight with insect repellant ... the bugs really love that bright light! Meanwhile, back at the contest . . .

The name of the game in night flying is "Be Smooth!"

There is no tolerance for jerky turns or stalling or diving. The thick, moist evening air will support a glider for quite a while, but your plane has to be trimmed for minimum sink. As some areas of the ground cool more rapidly than others, there is even some lift. All of that heat that the ground absorbs during the day has got to go somewhere, and that somewhere is up. But the night time thermals are very soft, gentle, and smooth.

For purposes of our first contest, we flew three rounds for a cumulative duration of fifteen minutes, with no flight points for more than seven minutes on any flight. Bonus points were awarded for spot landings. The longest flight in the contest was by Roy Stowers' Javelin II. Roy stretched 5 minutes and 28 seconds out of the cool night air. Al Taylor, a Pacific Soaring Association member, took first place overall with 14 minutes and 20 seconds (a scant forty seconds short of the fifteen minute target time). Al landed his Windrifter as well as he flew, and posted three landings over seventy points each (within ten feet of the spot). The quality of the spot landings was quite surprising. Most fliers almost seemed to score higher on the night landings than they normally did in daytime competition. This may have been due to the lack of a lot of 'visual interference.' With only the two lights on the airplane and the one light on the landing spot, there wasn't much else to distract the pilots. Another explanation may have been the lack of

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Marana Air Park, Tucson Arizona November 28, 29 & 30, 1975

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EVENTS:

		ENTRY AND PRE REGISTRATION (Please Mail by Nov. 10, 1975)	I FORM		
TUCSON WINTE	RNATIONALS			AMA No	
c/o Chuck Taylor	r, CD		Class	Pattern	MHz
1401 S. Brown A	ve.		Qu	arter Midget	MHz
Tucson, Ariz. 85	710		Sta	nd-Off Scale	MHz
	NAME				
	ADDRESS				
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Pre-Registration Form and Fees.



low level turbulence that accompanies a warm, daylight contest.

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FAST "TACKY GRAB"

Rick Norwood, president of the S.U.L.A. club, volunteered to serve as scorekeeper. When he saw how much fun the other fliers were having, he started sniveling about having left his plane at home. To pacify him, this contest director let Rick fly his Aquila and he promptly took second place with it (the nerve of some people!) Ray Downs, who owns Colonel Bob's Hobby Shop in Costa Mesa, Cal., brought out his Todi and took home third place honors.

Although we had only twelve pilots who actually flew, there were a lot of daytime competitors standing around gawking and muttering things like, "Golly... I sure do wish I'd brought my plane ... grumble, mutter, curse ... !" Nighttime soaring activity is growing all over the country. If you haven't tried it yet ... Do!

Talk about tough acts to follow! Le Gray, soaring's old man of the mountain, has returned to his mountain for an open ended vacation. And, as I have a habit of doing, I stood up when I should have shut up. Suddenly I find myself being called 'soaring editor.' Gee . . . now I've got a column to write ... once a month ... every month. Somehow I think I liked it better when they just used endearing terms about me, like "Albuquerque Turkey."

So, enough about my problems. In surveying the problem at hand, I have decided that if I'm going to be writing this column on a semi-permanent basis, I may just as well do some material that you silent (????) flyer types would like to see in print. I don't really think anyone wants to read about the last thermal I flew in, or about my last crash (boy you should a seen da pieces fly!). Being somewhat of a devout coward and faint of heart, I don't want this column to become a battleground for rules proposals, or an open forum for what's wrong with the Trans-Tijuana Soaring and Acupuncture Guild. And I don't really want to get into the contest report rut. So what's left?

One thing I hope to do is cover some of the basics for beginners. I am hearing more and more stories of newcomers showing up at flying sites with their shiny new "Wondertronics" radio, and their crooked, heavy, but brightly painted "Trashward Freedrifter" ... usually with the controls hooked up backwards, the C.G. on the leading edge (of the stabilizer), the tow hook somewhere behind the wing, and the battery pack hanging overboard from its wiring harness. Armed with some good basic information, that beginner might not have to return from his first fifty trips to the flying field with his plane in a brown paper bag.

some emphasis on, is construction techniques. Soaring is graduating out of the stick-and-tissue era. There are lots of new materials, new adhesives, and new techniques for building lighter, stronger, and better flying gliders.

I also intend to spend some time on what I call "monkey motion machinery." This includes mechanical linkages for operating V-tails, flaperons, flaps, spoilers, dive brakes, wheel brakes, releasable ballast systems, wing attachment methods, and so on.

I'm also planning to get into flying techniques. (No, not my own clever, "circle in violent downdrafts, followed by a semi-crash landing a mile downwind.") I hope to be able to coerce some of the hot contest pilots around the country into sharing their expertise with MODEL BUILDER readers.

Another area that needs covering is a method of teaching a beginner to fly. I'm anxious to hear from anyone who has some good ideas on how we can eliminate the "school of hard knocks" approach to learning R/C soaring.

But most important, I want to cover material that you, the reader, wants to see in print. Please let me hear from you. I'd like to know what you are flying, what equipment you are using, what your field is like, and what your problems are. Feel free to send in pictures of your club activities. I'd like to know who is winning your contests, and what they are flying. I'd like to see original designs, and know how well they are flying. Like I said in the beginning ... it's a tough act to follow. I don't have Le Gray's know how ... but you do! Won't you please share it with me? Write to me in care of MODEL BUILD-ER, P.O. Box 4336, Santa Ana, California, 92702.

Next month ... The 1975 L.S.F. Tournament.

Scale Views . . Continued from page 21 ern mail zone under the aegis of Lt. Col. Henry "Hap" Arnold. One B-7 on a practice flight, stalled and spun in on a low altitude turn during a snowstorm while circling an emergency field, killing the lone pilot.

When the B-7 was not fitted with bomb racks, it was almost impossible to tell it from an O-35. The only difference was a flat bottomed, tapered blister on the belly under the rear cockpit of the O-35 for the camera installation.

The B-7 and the B-9 were quickly obsoleted by the matchless Martin B-10 that also appeared in 1933. It appeared suddenly, like a conquering hero, and just as suddenly, every bomber and pursuit plane in the world was obsoleted.

Late in its life, which ended around 1940-41, the B-7 had the standard blue fuselage which replaced the old olive drab.

Another area that I'd like to put

72

3-1/2

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WAN	T TO WIN?
Pearls Tak Team Cha	re U.S.F.F. mpionship!
Pearl Team #2 won the pres Freeflight Championships at Day Weekend. In addition, C record of 43:31, using his FA flights after he damaged his	atigious team honors at the U.S. Taft, California, over the Memorial Buy Kirkwood set a new Class A Al Midi-Pearl to make four flyoff own "A" ship.
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Mulligan Continued from page 31

longerons and 1/8 hard balsa uprights. I highly recommend that you use spruce as specified. Do not install the wing saddles as yet. Install the rear peg gussets as shown and after the two sides are dry, add the 1/16 plywood inner rear peg facings. Note that these go on the inside of the fuselage, right and left sides. I feel that it's a lot easier to drill the 1/4 inch holes for the rear peg at this time rather than completing the fuselage and then drilling.

While the sides are drying cut the cross-member sets and all former pairs. Glue up the former pairs and add a $1/16 \times 1/8$ cross-member to each former. This cross-member keeps each former true and aids in psoitioning each former in the fuselage.

Pin the two sides upside down on the

plan top view, allowing for the 3/32 square outside stringer thicknesses. Add all cross-members and formers. I installed a couple of temporary cross-members in the cockpit area to facilitate a true finished fuselage. Make sure the sides are square to the building board, using a drafting triangle or small square. If the formers don't exactly coincide with the uprights, shift them back and forth slightly until they do. It really won't be noticeable in the finished product.

Install the 3/32 square balsa bottom stringer from the rear post to F-3 and extend a 3/32 spruce square from F-3 to 1-1/2 inches beyond F-1. You can now bend and install the complete landing gear system . . . all three pieces are 1/16 music wire. Thread, bind, and heavily glue the front and rear struts to 1/8 square spruce. I did not show the rear strut since it will probably vary slightly from model to model and it's easily fitted once you have the front strut in place. The center shock strut passes through a 1/32 music wire eye epoxied to the bottom 3/32 spruce stringer at F-2.

I used silver solder at the eye and the juncture of the front and rear struts (this point was first wrapped securely with soft wire). You might wish to make F-2 and F-3 of 1/16 plywood. I cannot stress enough the strength required of the landing gear. The all up flying weight is close to one pound with rubber. Somehow the landing gear must transmit the landing loads up to the spruce longerons, the backbone of the fuselage. I did it with gussets and the 1/16 sheet skin over the belly area.

The former just behind the cowl (F-0) hangs in space during assembly. It's initially attached to the two spruce longerons and the bottom 3/32 spruce stringer. From there you add a short 1/8 spruce square from the top of F-1 to F-0. Following this, and ensuring that F-0 is square to F-1, $1/8 \times 1/2$ strips are cut to length and glued to the outside of F-0 and F-1. Allow a 3/64 or so shoulder at F-1 to enable 1/16 sheeting of the belly area.

You can now take soft 1/16 sheet cut into 1 inch wide strips and plank the belly area and fuselage sides. Also install the 1/8 sheet wing saddles, 1/16 sheet over this, and the window uprights.



Check your wing saddle openings to ensure adequate clearance for your wing.

Build up the cowl by laminating the front pieces and cutting out the 1/16 sheet aft cowl former. All cowl formers are perfect circles. Install the 3/16 square framing pieces between the front and rear pieces. This framing transmits rubber loads from the nose plug to the spruce longerons. Rocker arm fairings (18 required) are carved from soft 3/8 sheet and added after covering the cowl with 1/16 sheet. When the cowl is completed, glue it to F-0, making sure it's centered.

I used 3/32 square balsa outside fuselage stringers spaced about 1-1/2 inches apart all the way around the fuselage. Scale spacing is about 1/2 inch apart, which I felt would be too heavy. I'll leave that one up to you. If I had access to 1/16 square spruce, I would have used them and the 1/2 inch spacing.

As for the landing gear strut fairings, after trying several ways, I ended up with what's shown on the plans. The Bristol stock is light and flexible and it can't crack . . . which is what happened to my 1/16 sheet balsa fairings. I made my wheel pants removable for flying (also the wing struts) by epoxying a 1/8 brass tube to the inside face of each wheel pant. The shock strut is bent upward where it meets the axle and simply plugs into the wheel pant. You'll have to keep your wheel axles short enough to enable the wheel pant to slip all the way over the wheel. I cut a notch on the inside of the wheel pant to clear the axle.

The l inch balsa tail wheel and fairing are glued to the fuselage and bottom of the rudder after cofering.

You can now cover the fuselage, after first giving the entire framework a good sanding, ensuring that the 3/32 stringers are tapered into the 1/16 sheet fuselage skin.

FINISHING

As to painting the entire model white, it's up to you. I didn't because of what I thought would be a weight penalty. My lettering was all hand painted, using Testors gold and flat black PLA paints. I first lightly drew in all outlines, using a soft dull pencil and straight edge. Take your time and from five feet away you'll swear it's a decal. Apply three or four coats of 50/50 dope before painting any lettering and allow the dope at least a few days to set up.

Do not apply clear dope over your hand-lettered license numbers. The dope will loosen and smear your lettering. FLYING

I used a 16 inch prop with freewheeler and 16 strands of 1/4 inch Pirelli (Fellati) 30 inches long. The Mulligan seems to fly equally well to the right or left, but just to be safe I cranked in quite a bit of right thrust. It flys well to the right in flat, 100 foot circles.

Discussions with the local experts have led me to believe that 18-22 strands

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would be more appropriate. However, in the interests of keeping the model on the field I have held down the power. As you up the power, however, watch the downthrust. Start with limited turns and preferably ROG the model.

I'ts a fact of life that if a model of this size comes in for anything other than a 2 or 3 point landing (those points being the landing gear ... wcn) it means bent airplane, no matter how strong you build it. I found this out the hard way ... believe it or not, this model cannot or should not be hand glided. It's just too damn big and awkward to glide it easily to a spot 50 feet in front of you. I split the cowl and tore out the landing gear before I finally realized that powered test flights are to be preferred.

Set the balance point where I've shown and shim the stab for best glide *after* motor run. If you're fortunate enough to have a paved or salt lake type flying surface, use 150 turns and ROG takeoff for your first flights. If you don't have such a site, use 100 turns and hand launch. Work up slowly to full winds (500 turns on the motor above).

I found my best hand launches consisted of holding the fully wound prop in my left hand and holding the fuselage from underneath with my right hand at the rear peg. Once you've got this down pat, you break into a fast trot holding the airplane high and parallel to the ground. Next release the prop and a second later (you're still running) heave (and 1 mean heave!) the model straight out in front of you. With this launch technique the model will climb right from release.

You have got to see a 56 inch wingspan Mr. Mulligan in flight to believe it. It is an absolutely majestic sight. You would swear that Benny Howard's ghost is flying by again. If you have any questions on building or flying your Mr. Mulligan, write me: Tom Houle, 11333 Lake Shore Drive, Mequon, Wi. 53092.

Control Line . . Continued from page 53

go to the World F/F Champs) in Jim's strong event, A/2 Nordic. The Phillips' learn fast. And very well.

I once saw Marty give a rematch in Fast Combat when the other flier was disqualified because he cheated. That's sportsmanship! Marty won the rematch, incidentally.

Didn't mean to take up so much space with my comments about the Phillips family. But fine people like this deserve recognition. We could use a lot more just like them in this hobby of ours.

In a future column, 1 will have full details on the '76 BMA contest. Right now, just let me tell you that any Junior or Senior is eligible to enter. The contest has events in C/L, F/F, R/C and Rocket. Trophies are given class winners, plus a total of \$1750.00 in scholarships. The BMA contest is held in mid-July.



I've got a little item here that I am going to throw out jsut to see what happens. At last year's NATS ('74) a Senior won an event. There were a couple of questions about his entry, but nothing was made of it. He was presented his first place trophy and went back home the best at the '74 NATS. Six months later he received letters from Big Brothers Jean Pailet and John Worth that posed very serious questions to him as to whether he rightfully won the trophy, questioned his keeping the trophy, and threatened cancellation of his '75 AMA license.

The Senior in question, after getting the first letters, checked his rulebook and found that a protest must be filed within three days of the Nats to be effective. As it was six months after the Nats, he chose to ignore the letters. Why not? I would have told them to bite on a bullet 'till the pain went away. But they kept after him. So he made copies of all the letters he had received. wrote one of his own, and sent copies of the whole ball of wax to all members of the CLCB and the Executive Council. A bunch of people got pretty mad about the way the situation had been handled. Letters were written. Petitions were being signed.

Didn't read anything about it in any AMA literature, did you? There were two lines written about it in the AMA Monthly Mailing, No. 102. The two lines were so incomplete on details that you had to be totally aware of the problem and what was going on to even know what they were about. The last line said "Previous contest board and HQ actions were upheld." I'll bet. If there was a vote on whether or not Worth and Pailet were handling this matter properly or not, I would sure like to see who voted and how they voted.

I didn't like the way it was handled and would like to see something done to insure that it never happens again. How do you feel? If you don't care, go back to sanding that little beauty you're building. If my rather brief outline of what was going down bothers you, drop me a note, care of MB.

If your reactions support the powersthat-be, I'll say so in this column. If your reactions are against what happened, we're going to get into this thing right and proper and see if we can't get something settled. A lack of response will indicate that you would rather just forget the whole thing, which is just what AMA HQ wants to do. Until next time. A lack of response will also get an apology from me. I'll have to apologize for the amazing apathy that readers of this column have.

On to better things. As of this writing, K&B has just released their new Racing 40. I have looked at a couple of

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the engines and they look good, but I haven't seen one run yet. The prototypes were real jets, so say my Pylon Racing friends, so it should be interesting to see if they work in a Rat. I have used a number of K&B 40's in Rat. All had good power, but were hurting when it came to restarts. I always figured the Dykes ring to be the culprit here. But the new 40's are ABC motors, and both of the motors I looked at had a good piston/cylinder fit and lots of compression. Only problem with the motor is the rear exhaust. Buy one to try and you are going to have to build a new Rat. If I get a chance to try the new K&B 40, I'll let you know how it works. Or you let me know if you have already

got one and have run it extensively.

In last month's column I spread around a rumor about a new glow plug that is being developed. Most of my info was wrong...it turns out. Sorry 'bout that. The new plugs are called Glo Bee's, are not advertised as blow-proof, and are going at 2/\$6.00 instead of \$12.00 each, as I reported. Can't win them all. I haven't tried the plugs yet, so can't say whether they are good but expensive, or just expensive.

Have broken more glow plug clips than just anybody I know. I was sure glad when Pylon introduced their new clip. The Pylon clip is advertised as unbreakable. In fact they guarantee it and will replace, free, any of their clips that break. I have not dropped mine into a running prop yet to see if the clip really is unbreakable, but I have stepped on it a number of times. No, I did not step on it on purpose.

Sure is good to see a manufacturer come out with a needed accessory and to charge a reasonable price for it. The Pylon clips sell for 50¢ each. How can you beat that?

(Got news for you, Dan. I've had a Sullivan...'scuse me...Pylon clip strapped to a 4 amp nickle cadmium for about 10 years. The clip is particularly great because the lower "jaw" has sharp points that make good contact through all the schlock on the cylinder fins, and the upper "jaw" has a partial hole in it so that the clip won't slip off the plug with the first burst when the engine fires.

It really shakes up the "youngsters" when I walk out with my plane and transmitter, but without lugging a big field box complete with 12 volt battery electric starter, 1-1/2 volt battery, and glow plug clip lead. Just pull the starting battery/clip out of my pocket [no other metal in that pocket, unless you want to go up in somke!], clip it on, flip the prop, and stick the battery back in my pocket. Some guys still think I'm running diesels! wcn)

Now that we have Matty Sullivan's

attention: The Sullivan (Pylon Brand) lines are really nice, especially when you see the junk lines used in other parts of the world. But the "Instant Use" lines are only rarely cut to the right length for use in competition. I have seen out-ofthe-box Pylon lines that were almost five feet too long for use in Combat. As long as we are paying a little extra for ready-made lines, I feel that they should truly be ready for "Instant Use."

Even though Pylon lines are rarely cut to the proper length, I have never seen them cut too short. So; maybe I shouldn't complain too much, as it is easier to shorten a set of lines than it is to lengthen them!

It's all over but the shouting. And there is going to be a bunch of shouting, I'm sure. Rat is on the way out. I really don't see any way to make Rat an attractive event for your average "I'm a gonna go racin' " flier. The gung-ho Rat fliers who have been racing for quite awhile will still run Rats, but even the gung-ho types are running out of pilots who can handle a honkin' Rat going 150 plus mph. With Slow Rat and Goodyear available, the guys who want to race without a big hassle will just be spectators at the Rat circle.

Here are a few thoughts from Charlie Johnson concerning Rat: "Rat ... How many guys out in Ratland can really fly a 150+ Rat? There's a big difference between fly and hang-on for 140 laps. Even if enough guys are strong enough (Rat's supposed to be the HE-MAN event) few could fly with three in a circle. The event we're looking for should have three man races and be just fast enough to make it interesting, say the 120 mph or 130 mph bracket. What changes will accomplish this? Fuel won't. On FAI fuel, a clean Rat will fly 140+ even without an alky head. Bigger lines? Not a chance. You'd get to watch your plane chase you through the pilots circle. Change to restricted type 40's (non-Schnuerle) or smaller size? The guys with a big investment in hot Rat 40's would just love this. Airplane? Something patterned after the Unlimited Racers or a bigger Goodyear size? Sure would make it easier to build."

More from Charlie: "An International Alternative; B/TR is making a real comeback in many parts of the world. England, Sweden, France, South Africa, New Zealand and Australia are but a few places flying this event. Basically the planes resemble the Diesel TR you're used to seeing, with slightly different minimums throughout the world. They all use 29 type motors and 30 cc fuel tanks. A compromise will probably be reached anyway because of the limited number of good 29 motors available. A workable set of rules could be developed in the next couple years. We might have a second International Racing Class. You 'olde timers' might rem-

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ember that B/TR was quite the rage years ago in the USA, but was dropped in favor of the more simple Rat. Think about it."

I'm thinking about it, Charlie. And I don't think I would like to fly an event where there is a restriction on fuel tank capacity. When you are restricted to 30 cc of fuel, you have to play with all kinds of fuel mixtures to get the good compromise between mph and mileage. I have enough trouble getting my motors to make horsepower, let alone get good mileage besides.

Back to Rat and what is going to happen to the event. I honestly feel that it is going to just fade away. Too bad. It used to be the best of the Racing events.

A lot of the shouting that is just around the corner will concern ways to save Rat. Slow it down this way and slow it down that way. Who will be first to suggest the use of 11-8 props? Or 3-1/2 inch wheels? Or how about one man heats? Yeeeccchhh!

I see only one way to modify Rat so that more will feel like flying (or be able to fly) the event. And that is to go from 60 foot lines to 70 footers. The longer lines will slow the turn rate down considerably. And the extra 10 feet of line will slow the planes down by 8 to 10 mph. I have flown a Rat on 70 foot lines and was actually able to relax a little. The particular Rat that I flew lost 12 mph by going from 60 foot lines to the 70's. The plane still felt fast (there is no way to make a good Rat feel slow!) but not so fast that three man heats would be out of the question.

Going to 70 foot lines is hardly the perfect answer. It will no doubt cut down on the number of sites that can handle Rat. The two best paved Racing circles here in the N.W. were laid out with 60 foot lines in mind. If we went to 70's, we would have to pit the planes out in the grass, and that is no fun.

Peanut Continued from page 43

section, the fuselage is built crutch fashion. Pin down 1/16 sq. longerons over the top view, including the short "ears" at the nose, which will support the oddly shaped cowling. Glue the 1/16 x 1/8 landing gear and wing mount support pieces on top of the longerons, and install the top halves of formers 1-A through 9. Two formers "2" are required. Fit the top decking in place next, between formers 2 and 4. The slight taper in the deck area will require two pieces for proper fit. The $1/32 \times 1/16$ turtle deck stringers may be added next, and the assembly allowed to dry before removing from the board.

Next, glue formers 1-B, 2-B, 3-B, and 9-B to the bottom of the crutch. When dry, install the bottom longeron (1/16 sq. on edge), the $1/32 \times 1/16$ uprights, and the 1/16 sheet rear motor support. Note that the bottom longeron carries



a slight "belly" from 3-B to the stern. Now the 1/64 sheet can be applied from 2-B to station 4, grain vertical.

This brings us to the engine cowling, which is tricky. Glue $1/32 \times 1/16$ uprights under the front former 2, and add the tiny gussets to form the exposed engine mount. After gluing the 1/8 plug to former 1, install the 1/16 brass tube shaft bearing and put former 1 in place on former 1-A. Glue former 1 lightly to the crutch ears only, as it must be cut away later.

Glue cowling formers A, B, and C together and notch into place at the front of the crutch. Note that the cowling extends 3/32 below the crutch. The cowling, from former A to former 2, will have to be planked with small pieces of 1/32 sheet, because of its compound shape. After final sanding, the cowling is carefully cut loose between formers 1 and 1-A. Granted, this is a complicated way to get a removable nose unit, but the odd shapes involved don't allow

much choice.

The seven-cylinder, 50 hp. Gnome Monosoupape rotary is made from thread-wrapped 1/8 round (cylinders) and a scrap balsa crankcase. Pushrods are bent pins or scrap wire. A 1/16 brass tube is used for the shaft bearing. The engine is not pinned to the prop, but allowed to rotate freely. This way, it adds no load to the rubber motor.

The landing gear promises to be a bear, but it's really not. Take it in sequence, and it goes right together. First, bend two main leg units (plan shows true length). The skid extensions and axle hangers are bound in place with fine soft wire and epoxied or soldered. The wooden skids are shaped, grooved, and glued over the wire. The four legs can now be faired with grooved 1/32 x 1/8 strips, sanded streamline. Leg units are cemented into notched fuselage sides, and 1/16 round basswood spreader bars added to complete the landing gear structure. Scale type shock action is pro-



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vided by securing the 1/32 wire axle in the hangers with a short length of rubber band. Wheels are shaped from balsa disks and bushed with 1/16 tube. For an authentic pioneer touch, tires should be the off-white color of natural latex. Black rubber tires were not used in 1912.

Tail surfaces are built directly over the plan. The outlines may be 1/32 sq. basswood, with 1/32 sq. balsa for the remainder. These are very delicate structures. It will be best to shrink and dope some tissue on a separate frame, and then transfer the prepared covering to the tail units. The original airplane sported a single-surfaced tail, which simplifies things considerably.



The wing is quite uncomplicated. Leading edge is 1/16 sq. on edge. Spars are $1/32 \times 1/16$, and trailing edge is $1/16 \times 1/8$. Tip bows are laminated from $1/32 \times 1/16$ basswood. The center stubs are very soft 3/16 sheet, shaped to rib contour top and bottom.

Covering is superfine tissue, applied with thinned white glue. The engine, cowling, and sheeted portions of the fuselage are dull aluminum. Fabric panels were clear varnished, unbleached cotton, which gave a translucent amber color. Experiment with a few drops of brown dope in some clear to give a slight tint of color to your model.

Numerals and insignia are easy... there are none. Some brown trim around the cockpit rim is the only color decoration needed.

Rigging points are indicated, but some good photos are needed to keep the diagram straight. The magazine article already referred to is very good. Steel gray polyester sewing thread makes very good cable. Before gluing the rigging permanently, make sure that each wing panel has 1/16 washout.

My Blackburn sports a hand-carved pine prop, but you can use a plastic one if you prefer. If you have held the weight below 0.5 oz., your Blackburn should fly on a loop of 1/16 rubber. If 1/8 rubber must be used, try a long (12 inch) loop, to cut down on power and gain endurance. My model, when balanced as shown, flies with no thrust off-set and just a British "tweak" of up elevator.

Hannan Continued from page 42 BOAT MODELS, ANYONE?

Also from Don Typond, is this month's photo of a New Bedford whaleboat. Don, who is more usually known for his fine aircraft models, has taken up scale boats as a diversion, and reports that they require the same sort of research and dedication as aeroplanes. He offers some interesting tips: With care, 1/16 inch square wet bass wood ribs can be bent to shape over a hot soldering iron. CLOUDBUSTER RACE WINGS

neat little coil if it is first soaked in watered-down white glue. For that seasoned look, add a bit of tea or coffee to the mixture. Pins and weights are useful for holding the coil in place over some waxed paper until dry. A small amount of glue will secure the coil to the boat's deck.

Another idea, useful to either boat or aircraft modelers, is to add microballoons (such as K&B's) to Titebond glue. The resulting concoction will dry to a matte finish, thus eliminating the highlights which usually give the "gluedon" look to small detail parts. Don employed this method to secure the oars in the oarlocks, with very satisfactory results.

BABY BULLET BROCHURE

We recently had a chance to examine the offerings from The Thomas Studio. Melville, New York, relating to the Heath "Baby Bullet" Racer. Flying model drawings, in choice of two scales are offered, and in addition, a truly outstanding booklet of historical documentation. By itself, this gem would provide a nearperfect proof-of-scale presentation, which would satisfy even the most critical judge. Produced by aeronautical artist Gene Thomas, these items are obviously "labors of love" that must certainly represent many hours of painstaking effort. A dollar will bring you descriptive literature, and the buck may be applied toward any purchase: Thomas Studio, Box 681, Huntington Station, N.Y. 11746.

THOUGHT FOR THE DAY

How can oil create so much friction? NEW SOLUTIONS BRING NEW PROBLEMS

Or so it would seem. Since publishing the items relating to Xeroxing plans and parts. We continue to receive mail on the subject. Several people have pointed out that certain brands of copying machines slightly enlarge the image, while others reduce. Sears B. McCorrison uses a Xerox machine in his local library to an advantage, pointing out that repeated copies-of-copies can produce an enlargement of 3-views! Other readers have cautioned that some machines enlarge

"Rope" cordage will lie down in a

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(or reduce) more in length than width, so caution should be exercised if exact accuracy is your goal. Grandville D. Miller claims that the Minolta copier produces dimensionally identical copies, which he uses to produce rib and bulkhead patterns to be rubber-cemented directly to balsa sheet stock. After parts are cut to shape, the pattern is simply peeled off. (Like our Stick'em Patterns. wcn)

NEW "OLD FASHIONED" R.O.G.

Ever tried to design a model for beginners? Not as easy as it may it appear. At one time or another, most of the well-known model designers have tried their hand at it, and most have admitted they encountered much greater difficulties than initially expected. At one time, virtually every miniature aeroplane company offered some sort of simple, rubber-driven "basic trainer." Sadly, only a very few remain on the market, so we were pleased to see that Bob Peck, of Peck-Polymers, has accepted the challenge! Many months of effort have gone into the development of this little R.O.G., and it appears to be as foolproof as any flying model can be. Why not pick one up for that neighborhood youngster who keeps showing interest in your model aircraft? It might just start him (or her) on the road to a lifetime of hobby satisfaction. Price of the kit is \$1.39 plus postage, from Peck-Polymers, Box-2498, La Mesa, Calif. 92041, or ask for one at your local dealer.

RANDOM THOUGHTS ON THE PEANUT PROXY EVENT

Now that the Premier Peanut Parcel Post Proxy is Past, a brief review seems in order. By and large, we considered that it was an outstanding success, especially for a first-time event. But, without doubt, improvements will be made next time around, based upon our experiences. Incidentally, Peanut Proxy Participation is still possible in many other contests. For example, Walt Mooney's little Renard R17 has just placed 4th in a "concours" held in Fayence, France. And your author's prototype Farman Mosquito is still flying actively in English indoor events, according to Aeromodeller columnist, Eric Coates. Thus one could be getting in some advance practice for the next "really big" Postal Peanut.

But getting back to reflections... PILOTS: Lots of variety and creativity in this category. Several entrants actually crafted from real peanut shells, which are quite light in weight. Many paper profile types were seen, including a

goodly number of Piecan's, and more than a few comical examples, such as Dave Linstrum's King of the Arabs, flying a Cougar with the markings K-OIL appropriately displayed. Then there was Ensign Donald Duck at the helm of Robert Neulin's Navy Bellanca, plus the inevitable Snoopys.





was Dennis Norman's "Zero driver," which, though perhaps less than a 1/2 inch in height, was startingly life-like and definitely Japanese in character.

PROPS: Great diversity here, ranging from virtually every known brand of plastic, modifications of same, bent sheetwood, to carved block types. Efficiency seemed to have very little relativity to appearance, with some quite primitive-looking "clubs" delivering surprisingly good performance. Conversely, some beautifully shaped and finished airscrews seemed particularly ineffective. Of course, a few of the models were so light, that prop efficiency, in terms of propulsion, was perhaps secondary. Their prime function seemed more in the nature of a governor, to keep the rubber motor from running down too rapidly!

In our humble opinion, propellers still remain entirely too near the "black magic" stage. Published articles seldom make satisfying reading with their reams of formulas, and shortages of practical demonstrated comparisons. More experiment and reporting is sorely needed! (Youjust put yourself on the spot! wcn)

WEAKNESSES: Three categories of failure were in evidence during the contest, some of which were mentioned in Fernando Ramos' column a couple of issues ago. First, many of the models seemed not to have been adequately



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tested prior to sending. Although lastminute decisions about entering and/or mismanagement of time prior to the deadline may have been important factors, the point is that unadjusted models are at an extreme disadvantage. The majority of *consistently* good flying models gave solid evidence of having been well prepared.

On the other hand, it seems like that at least a portion of the models may have been in good, flyable trim at the time they were mailed, but accumulated warps or shipping damage before being flown in the actual contest. The unexpected long delay in obtaining use of a suitable flying site was at least a partial contributing factor, beyond the control



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of the contestants. But, a few of the models left proxy fliers wondering if they were in fact serving as first-time test pilots... that is to say, the aircraft gave obvious indications of having NEVER been flown!

We would like here and now, at the risk of tarnishing our "West Coast image," to point out that while there are extremely skillful, patient, and experienced modelers in this part of the country, none are actually magicians! Thus, to expect them to extract competitive performance from a completely untested model (*particularly in the short time available per model*...wcn) is asking a bit much, although in some cases, that was apparently accomplished.

In some instances, as many as four different fliers tried their hands (and talents) at qualifying a particularly difficult model, and a number of seemingly "hopeless cases" were in fact qualified, if even by only a small margin. The dedication of the proxy fliers was unstinting, and "above and beyond the call of duty" efforts were extended.

In the interest of constructive criticism, we'd like to offer the following suggestions, for those of you who may plan to enter this or other postal contests:

1. Send in a well-adjusted, dependable model. 2. Make the landing gear strong! Too many models suffered failure under relatively mild impacts. Repairs soak up valuable testing/flying time needlessly.

3. Make the removable nose plug or block as large as possible. Some entries defied efficient winding and motor changes.

4. Make the thrust bearings, nose plugs, and tail pegs strong and without slop. A wobbly prop shaft prevents effective thrust-line adjustments, and a loose tail peg can slip out under full power with dire consequences.

5. Include adequate directions to the proxy flyer, and ready-made spare rubber motors. Some directions received were superb (Steve Walton's were even illustrated in cartoon form, as seen last month). but many were along the lines of a simple "lotsa luck!." Most frustrating of all were directions to proxy flyers which specified that the aircraft was not to be damaged! One could scarcely expect total efforts to exact maximum performance with such admonishment.

6. PROOF-OF-SCALE: While the rules did not require elaborate presentations, some entries were accompanied only by construction plans. Thus it was difficult for the static-scale judges to properly evaluate the models. Although a Nationals type presentation was not required or suggested, it was obvious that some do not realise the importance of furnishing the judges with some form of documentation. This becomes particularly true in the situation where several models of the same aircraft are entered. And, in cases of unusual model types, it's certainly not a bad idea to include at least a brief "tip-off," so that the judges need not hunt through several drawings or photos trying to determine exactly the design being modeled.

Perhaps the most satisfying aspect of the contest, speaking from a strictly personal standpoint, was the priceless opportunity to examine at close range, examples of Peanut Scale models from all over the world. It's all very well to look at photographs in the magazines, but there can be no substitute for seeing

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them first-hand. The variety of approaches to solving universally encountered problems was astounding. In the final analysis, we are all really beginners in some respects, and there is a great deal to be learned from each other. While there were only relatively few prizes, we would like to think we were all winners in the sense that we were able to participate in a truly international competition, and were able in some small way to strengthen the bond that exists among aeromodellers. We hope that you will all take part again next time, and we'll do our best to conduct an even better contest.

VTO CHECKS IN AGAIN

World traveller Dave Linstrum, who does such an outstanding job with the free flight column in Model Airplane News, is now living in Saudi Arabia, near Dhahran. He reports high winds virtually all of the time (Don't tell AMA, they might buy it for a "museum"! wcn) which forces him to do the majority of his model flying indoors. On the other hand, he certainly has no problem getting fuel to drive to the flying site. Gasoline prices are, believe it or not, only eight cents per gallon!

Sailing Continued from page 26 lished by John de Graff, Inc., Tuckahoe, New York. I have used this as the basis of our presentation.

MAINSAILS

The principal faults which are found in mainsails, in order of frequency are:

1. Leech problems: slack, falling away, motor boating, tight.

2. Creases: wrinkles, hard spots, and pleating.

3. Fullness: placement of draft, amount of draft, backwinding.

4. Size: too large or too small.

Leech falls away: Halyard needs to be pulled up snug in order that the luff of the sail be set up and the flow drawn forward, tightening the leech. One can sometimes see the entire roach of the sail, from the leading edge of the battens aft, fold away (Fig. 1). This can be a combination of a slack leech and a roach which is too large for the battens to carry. Generally, a batten will be able



roach, but only 5 inch battens, are especially prone to this problem.

The leech will also fall away if the leech has been stretched. In a model yacht, a few 16ths of an inch of stretch is enough to ruin the whole sail. This is why one should always slack off all tensions on a sail that is being stored between sailings. The continued tug along the leech will lead to a creep in the fabric. That, along with the breakdown of the resin in the cloth, caused by flogging in heavy air, will produce a sail which is longer from clew to head than when it was built.

The third cause of a slack or falling away leech is the simple problem of too much mast bend aloft. Most sailmakers will tell you that the sails are cut for absolutely die-straight masts. Excessive backstay tension, which is not counterbalanced by jenny stay tension, will allow the head of the mast to bow aft, pushing extra cloth into the leech, which slackens and falls away. You will also often see a healthy crease develop from the clew, running somewhat forward toward the middle of the mast somewhere (Fig. 2). This tendency to strain the backstay is the reason that some sailmakers will arbitrarily cut a slight S-shaped curve into the mains'l

PARK RIDGE, SUPPLIES **ILLINOIS 60068** luffs. I think it is really trying to compensate for a skippers lack of understanding of his equipment, and since mast bend varies from boat to boat, one curve will not cure each boat's pro-

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Tight leech: The result here is that the wind does not leave the sail parallel to the centerline of the boat, and therefore imparts a rearward component of drive that acts as a brake on the boat. A tight leech can be the result of a sail that is too full and the attempts to flatten it have finally made the leech taut. It can be the result of too much mainsheet tension which has finally removed all the twist that exists between foot

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and head. It can also be the result of trimming the main boom too near the centerline. The mast shape which has taut jennies will bow forward at the head, this will cause the leech to be strained, and is another reason for recommending that the mast be kept straight under all conditions until you are experienced in tuning. MAINSAIL CREASES

Creases from the clew: Possible cures are: 1) More luff tension. 2) Reduce roach. 3) Straighten mast. 4) Reduce foot round (Fig. 2).

Creases from Tack: If it runs parallel



to the luff for quite a distance, it may be excessive luff tension which has pulled the draft too far forward. In no case should you have a bolt-roped sail which does not slide easily in the slotted mast. The method and angle of attaching the downhaul may produce creases. Be sure that the downhaul leads away from the tack in a direction opposite to the luff, ie., parallel to the after side of the mast (Fig. 3). Tampa Cut mainsails will often have 4 to 6 inches of bolt rope removed so that the luff of the sail can come out of the slot in order to take on a smooth foot contour. In such cases, an extra

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restraining loop of sheet line material should be fitted around the mast to prevent aftward movement of the tack under the pressure of the wind. Some wrinkles can be the result of too much strain having been placed upon the tack grommet, or the result of using too light a cloth for a gusset at the tack. FULLNESS

Unless you have decided to carry spare rigs for every 3 to 4 knot change in the wind, your sails will be called upon to work in a wide range. As a result, most model yachts sails are made full enough to give good light air performance. They are then flattened as the wind increases by tightening the foot, using the outhaul, pulling the draft forward as increasing wind pressure blows it aft by tightening the halyard, and flattening the head by carefully letting the head of the mast bend aft in a controlled way. As a last resort, the lower shrouds are let go so that backstay tension will throw the lower third of the mast forward, making it match the luff curve cut in the sail, and returning the cloth to the flat surface it was when it lay on the sailmaker's cutting table. Such techniques only work in a limited way on paneled or broadseamed sails like the California Cut. Cuts like this, where shape has been built in by shaping the panels, do not have the wide wind range capability that the single panel does, though they may be excellent in their limited velocity span. SIZE

Considering the different conditions under which sail area measurement is done; from careful laying out on tables to "eyeball" measures done at lakeside, one generally finds that sailmakers will cut the sail from 1 to 2% undersize. This insures that nobody gets ejected from a regatta due to oversized sails, and the area loss is really minimal when we consider how much unmeasured area is sneaking in under a rule like the 50/ 800 Class. Since the typical skipper does not relax the tensions on his sails after he is done sailing, he starts the year in a windy regatta, stretches his sails out





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during the next two or three weeks of stressed storage, and spends the season with sails that are just about the maximum allowable dimension, but are somewhat devalued in the shape put there by the sailmaker. In one-design classes, the sails are generally 1% small for the same reason, but every loophole is exploited to get free area, such as the excessive roach mentioned for the East Coast 12-meter class. I would hope that longer battens will eventually be allowed therein. HEADSAILS

Basic faults occur with these sails much the same as with mains. The additional problems arise due to, a) the reality that the luff will set upon a stay which will sag to some degree, and, b) that the leech tension will be the result of the jibstay tension acting on a Class 1 lever with the jib swivel as the fulcrum. The former, stay tension, needs to be maximized in order that decent sail shape will result. A sailmaker will usually cut only a little luff round into a jib since the amount of sag will push extra cloth back into the sail increasing the draft, especially in the middle sections.

We have pleaded for easily adjustable jib swivels in order that the lengths of the jib club forward and aft of the swivel be chosen to produce the proper leech tension. The distance from the front of the club to the swivel should be directly proportional to wind strength, getting longer as the wind picks up. The jibstay tension not only tightens the leech, it also produces a force which tends to return the jib to the centerline of the boat. This is exactly contrary to what we would like the jib to do when going downwind in light air. The solution has been tried by Ray Ihlenburg, of Richmond, who equipped a HUSON 36 with a backstay which was attached to the sail control unit arm. Upon letting the sails all the way out, the backstay was slackened and the jibstay became rather loose. It was then easy to get the wingand-wing configuration, but a tight leech would be automatically returned when closehauled. The system must work well, since the boat so equipped won the 36/00 DIVISIONAL EASTERN CHAMPIONSHIP this year.

So you see, it is really all up to you. The sailmaker has provided you with

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what you need for a good setting suit of sails. It is your job to take the necessary time to adjust them, to get to know them, and above all, to take care of them to avoid stretching and creasing. TRAVELER

Ray Ihlenburg was nice enough to give us permission to reprint his traveler track design from the April issue of the Richmond MYC Club Newsletter. He has used it on his 50/800 YANKEE and has the advantage that it doesn't require expensive extrusions and can be made from chunks you find in your junk box. All that is required is some time to insure that it works smoothly and is well attached to the deck. We should have something to say in our next column on the effect travelers have on the performance of the STAR 45. One has been installed to help control the gigantic mains'l on that model, and we will



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test it in the ACCR to make sure we have a good trial. CLUB NEWS

I'm happy to note the birth of yet another AMYA Sanctioned Club. The INDY R/C Model Yacht Club has already held its first regatta. You may contact Ted Brindle, 8338 East 36th Street, Indianapolis, Indiana 46226, for further information on club activities, classes sailed and so on.

I'm also informed that a club may be forming in the Charleston, West Virginia area. If you are interested, drop a note or call John Niedermeyer, 3 Peyton Avenue, St. Albans, W.Va. 25177.



I'd like to urge all clubs that have newsletters to take the time to share copies with other clubs, as well as writers like me. The flow of information can be a great help from club to club. Chances are the older clubs (5 yr.) have already found solutions to the problems you are just now having with scoring, buoy construction, judging, site maintenance, and so on. Nobody will ever benefit if you never mail a copy out of town. With the grumbling I have been hearing from California about the lack of coverage of their activities in this and other publications, I can only say that the EI Dorado Club is the only one which sends a newsletter my way, and even as big a liar as I am ... I won't make up things to say about events and activities which I have no knowledge of.

Next month we'll have reports on the 50/800 ACCR, the AMYA General Meeting and the STAR 45 ACCR. 'Till then, remember to send your dues into AMYA Secretary, Bud Salika, 3917 Sunnyside Ave., Brookfield, III., 60513; it is the best \$5.00 you'll ever spend. And for up to date information on R/C sailing make sure that you subscribe to MODEL BUILDER. Write to me in care of this magazine, or directly to Rod Carr, 7608 Gresham St., Springfield, Va. 22151.



MODEL BUILDER



Remotely Continued from page 14 bers, and lets the other countries know that we're ''loaded for bear'' at the World Championships in Switzerland.

Funniest story out of the Nats, in our opinion, occured Friday morning at the Formula I R/C Pylon site.

Occasionally, during this hot, 150 mph competition, a car would venture down the runway, to be turned away by officials out by the pylons. However, there was one mid-60's model Chevrolet with Louisiana plates, that returned several times, within no-man's land of the No. 1 scatter pylon.

Finally, Nats Executive Committee member Jan Sakert, who was helping with the running of Formula I, stopped the contest, strode out past the apron, and waved for the driver to cut across the course and come toward the command center. Jan, who is a retired Marine combat officer, and though a very friendly guy with a sharp sense of humor, is no one to be stepped on. He met the car half way, and from where we stood, though we could not hear the conversation, it wasn't too difficult to imagine what Jan was saying.

Suddenly, Jan grabbed the driver's door and yanked it open, and for a moment we thought we were going to witness a very short and one-sided tussle. However, the driver, a middle-aged man, moved over and allowed Jan to drive the car out of the area, past the spectator barrier, and back to where all the cars were parked.

Moments later, Jan returned to the officials tent, picked up the mike he had been using to call pilots to the ready boxes, and explained, with intermittent chuckling, what had happened:

The Chevy driver was employed by Red Ball Freight Trucking Company that had a loading warehouse next to the entrance to Chenault Field. It seems that he drove to work that morning, bombed out of his gourd, made the wrong turn, and ended up on the usually deserted runways of Chenault. For almost 3 hours he had been trying his saturated best to get the hell out of



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there, and no matter which way he turned, he ran into whole bunches of people who were all looking into the air. When Jan climbed into his car, got him past the crowd, and found someone to lead him back to the entrance gate, he was worn out, confused, and almost out of gas!

F/F Continued from page 49

valid today. The majority of his models featured very thin and heavily cambered airfoil sections. Apart from the method of construction, this airfoil shape is nearly identical to the one advocated by the late Ing. F.W. Schmitz. His study of model aeronautics proved the point that at low Reynolds Number, i.e., at the speed at which models fly, thin and cambered airfoils will yield optimum flight performances.

For almost twenty years, between 1920 and 1940, thick airfoils were the vogue, following the general trend of full-sized aircraft of that period. The era of these thick airfoils came to an abrupt end when Schmitz' book was published. His study offered completely new aspects for the design of model airfoils. Professor Alexander Lippisch underlined the importance of Schmitz' work by publishing wind tunnel results of the well known Goettingen airfoils MVA 301 and MVA 123. These results



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were published in the Technical Reports of the Flugzeugmeisterei Adlershof, Vols. I and II.

While studying these reports, Lippisch found that these two airfoils would yield extremely high performances if used in model gliders. In fact, the introduction of these airfoils resulted in a marked improvement in performance and led to the development of a large number of similar airfoils, such as the Go 417, Go 495, and the popular Benedek developments.

The high performance of relatively thin and highly cambered airfoils results from two properties. (1) Because of

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their small nose radius, they fly in supercritical conditions even at small Re numbers (i.e., 50,000 to 60,000), and (2) they achieve high lift coefficients. Since, apart from wing loading, sinking speed is governed by the so-called power factor alone, and as this value achieves its maximum at high lift coefficients, i.e., at high angles of attack . . . and these airfoils appeared to satisfy requirements . . . systematic research and tests of thin, flat-bottomed airfoils were neglected.

When author Werner Thies compared the airfoil charts of the Go 795 and 796, compiled in 1956-57, with those of the Go 801, 803 and 804, which had been tested by Schmitz, he was shocked to find that the results of the flat based airfoils were much better than those of the undercambered ones at Re numbers of 50,000 to 100,000! This contradicted all previous results, and demanded a more thorough investigation of the matter.

The Go 795 (8% thickness) and the Go 796 (12% thickness) were tested in the 1950-57 period in the Goettingen wind tunnel, as part of a series of flat bottomed airfoils of different thicknesses. The results for these airfoils and the earlier mentioned ones have been corrected for an aspect ratio of 10, this being a value very often used in aeromodeling. A Re Number of 75,000 was

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chosen, since it can be assumed to represent actual conditions on a model wing at actual model speeds with adequate similarity.

Lowest drag values are offered by the Go 795. The three other airfoils in turn seem to be nearly identical generally, considering inaccuracies in measurements and airfoil contours, excepting the maximum lift coefficients of the Go 801 and Go 803, which are higher than those of the flat bottomed sections.

GLIDE RATIO

The simplest way to make qualitative studies is to compare the glide ratio of airfoil sections. The glide ratio, which modelers often call glide angle, is the ratio of the altitude loss to the distance flown. As the result is a fractional value, the reciprocal value is commonly used for convenience's sake. This represents the flown distance divided through the altitude loss. Aerodynamically, the glide ratio represents the ratio of the drag of either plane, or wing, to the lift obtained from it, or the ratio of the drag coefficient CD to the lift coefficient CL. Hence the reciprocal glide ratio is calculated by dividing the lift coefficient by the drag coefficient in question.

In order to make things more understandable, the glide ratio, corrected for aspect ratio 10 model wings, are compiled in Fig. 1. At first glance, it is noted that the Go 795, with the L/D ratio of 20.4 excels, and even the thicker Go 796 is still much better than the two other airfoils. He who wants a fast model with good penetration should, hterefore, select the Go 795. But he should not overlook the fact that the lift/drag curve of this airfoil has a very pointed contour. In plain words; the optimum glide ratio is restricted to a very limited and narrow range of angles of attack, this in turn requires very careful trimming. (To be continued in November.)

And we will be back in November with even more good stuff in MODEL BUILDER Free Flight-stay with us.

Workbench . . . Continued from page 4

average of about 5,500 members! (Based on a 60,000 total membership). On the other hand, the special interest council member is representing the hard core element of modeling...the competitor, developer, rules maker, innovator, active modeler...the backbone of AMA upon which the whole thing is built. This backbone is just as important as the rest of the AMA body, and from that point of view, numbers don't count.

The AMA needs an Executive Council that represents the leisure modeler and the competition modeler. So what if the numerical ratio is 10 to 1, or whatever? The competition modeler may just contribute that much more to the total picture of the hobby, and *this* could be what representation should be based on.

Speaking of contributions by com-

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ATTENTION SERIOUS 1/2A FLYERSI If you need the extra power an .049 or .051 can give you, try a highly modified KIRN-COX Tee Dee engine, available in several configurations. . . including RC versions. Many other useful 1/2A items, such as; KIRN piston/rod reset tools, super-fine adjusting needle valve assemblies, pressurized backplates, stock and modified Tee Dee engine parts, TORKY proto speed kits, tank kits, lines, left hand props, etc. Send self-addressed, stamped envelope for FREE 8 page listing to: Jim Clary Racing, 2931 S. Main St., Dept B, Santa Ana, Calif. 92707.

R/C SAILPLANE PLANS: "Osprey 100." 1974 N.S.S. Standard Class champion, open age class. \$4.00 per set. By Ray Hayes, N.S.S. 71-029. A.M.S. Inc., P.O. Box 9368, Ft. Wayne, IN 46809.

R/C RACE CARS AND ACCESSORIES CATALOG. 1/8 scale U.S. Nationals Champion. Delta Manufacturing, Box 27, Lorimor, Iowa 50149, (515) 763-2220.

WANTED – Will buy multi-cylinder model airplane engines. In particular, the older spark ignition and certain glow ignition. All letters answered. Russel Sprague, 8800 Green Lane, Randallstown, Md. 21133.

P-47N R/C Plans. Blackline, 700 sq. in.,.45 up, full stunt, see MAN 10/65, \$4.50. T&J Schellenbaum, 6109 Ponderosa, N.E., Albuquerque, N. Mex. 87110.

"ANTIQUE RADIO GEAR" (Babcock, etc.) and "Grid Leaks" available for trade for engines, kits, magazines. D.A. Renken, P.O. Box 1503, Ann Arbor, Michigan 48106.

petition modelers ... If you haven't picked up a copy of NMPRA's Pylon Racing Book, you should do so right away. Not only is it an excellent, 66 page, soft cover book on all aspects of R/C pylon racing, including its history; it is also an outstanding piece of reference material on the fine points of; getting started in pylon racing (by Bob Upton), stability and control (by Ed Rankin), types and characteristics of wings (Jack Fabbri), construction (Dave Lane), radio installation (Cliff Weirick), finishing with epoxy, butyrate dope, and acrylic lacquer (by Bror Faber, Ray Downs, and Terry Prather), pressurized fuel systems (George Aldrich), and all about engines (by Clarence Lee, Cliff Telford, and Bill Wisniewski). In addition, there are 6-view (!) drawings of 17 Formula I racers by R.S. Hirsch. See NMPRA's ad on our 6th cover. THING TO DO

The Southmost R/C Flyers, Brownsville, Texas (they certainly are southern most in the USA!) will be holding an R/C World War II Sport Scale contest in conjunction with the Confederate Air Force show. The contest takes place at the Texas Municipal Airport, San CUSTOM FIBERGLASS KITS: "Spirit of '76", w/Mach I foam cores, \$64.95; Kuda or Californian w/wing cores, \$59.95, Skymaster, \$124.95. Add \$15 for contest balsa. Color picture and info, 75d. R B Products, 1874 N. Landen, Camarillo, Ca. 93010. Phone (805) 482-8130.

ILLUSTRATED CATALOG RUBBER PLANS. Peanut, Jumbo scale, intermediate scale, sport. S.A.S.E. to: AERO ERA, c/o Tom Houle, 11333 N. Lake Shore Dr., Mequon, WI. 53092.

SAILPLANE DESIGNER'S HANDBOOK: Design instructions, 180 airfoils, 63 designs, 3rd printing, \$4.96. Eric Lister, 953 Klockner Rd., Trenton, N.J. 08619.

ORIGINAL AND CLASSIC PEANUT, Sport, and Scale rubber plans. Send S.A.S.E. for list of 76 plans, or \$1.00 for list and sample plan. Fallston Plans Service, Box 133, Phoenix, Maryland 21131.

Model airplane plans. Peanut, rubber, CO₂, gas. Free list. Send self addressed, stamped envelope to Modernistic Models, Box 6932 Burbank, California 91510.

Speed Equipment: Cars, R/C, planes, boats, Hop-up, chrome, ultrasonic cleaners. SASE plus 50d. Franny's Chrome, 513 Vesta Place, Reading, Pennsylvania 19605.

BUYING, SELLING & TRADING Old model airplane kits and engines. Would like to hear from those interested. Will be appearing at Antique Train & Toy Show, Sept. 21, International Hotel, Kennedy Airport, N.Y. P.O. Box 331, Bellerose, Jamaica, NY 11426.

Benito, on October 11 and 12, and the winner will stage a flight demonstration on the 12th, during the air show.

For further details, contact Russ Imper, 45 Acacia Lake Dr., Brownsville, Texas 78520.

The Peterborough (Ontario, Canada) Radio Control Club has again been asked by the R/C Scale Committee of the M.A.A.C. (Model Aeronautics Association of Canada) to host a Scale Symposium on November 8 and 9, 1975, in Peterborough. The symposium features lectures, work shops, and demonstrations. Contact Ted Sharp, 212 Brock St., Apt. 507, Peterborough, Ontario K9H ZPS, (705) 745-1234, regarding symposium contributions and/or further information.

AND IN CLOSING ...

Dave Thornburg sent us this earth shaking tidbit. It seems that Buzz Averill, of Albuquerque was flying his little Coupe, and on one flight, a Cadillac ran over the model before he could retrieve it...Not worth mentioning, except that it may be the first recorded case of a Coupe De Ville giving the Coupe de Grace to a Coupe D'Hiver...

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SEND TO: MODEL BUILDER PLANS SERVICE 1105 SPURGEON, BOX 4336, SANTA ANA, CALIFORNIA 92702

Counter... Continued from page 7 tor, throttle, and rudder. The Navy Tomcat fighter styling, and the Stafford engineering know-how will make an airplane that performs well and looks great. The Tom Kitty Mk 15 is available for \$36.95 at your dealer, or from Jack Stafford Models, 12111 Beatrice St., Culver City, California 90230.

The Orbit Hawk radio system will be soon available in 2, 3, 4, and 5 channel versions. The new miniature transmitter configuration ($5 \times 5 \cdot 1/2 \times 1 \cdot 3/4$) uses the new Dunham sealed, "open gimbal" sticks. This stick assembly gives the precise, friction-free "feel," of a true open gimbal stick, yet is sealed to keep dirt and oil out of the electronics. The transmitter case is clad with a leather grained vinyl covering that allows for easy cleaning. The systems will be delivered with the PS-9 rotary output servos and rechargeable battery packs. Prices have not yet been announced. Ted Strader's Special Edition Plans Co. has returned to the radio control market with two revised kits. One is 34 inch span "Chicken Hawk." The single channel pulse proportional version performs nicely with a standard reed valve .049 or two channels of digital proportional radio can be installed with a Tee-Dee .049 for power. The kit features complete die-cut parts, die-cut plywood, and formed dural landing gear.

The Chicken Hawk uses a short span lower wing, and has a cabane block instead of struts, eliminating any difficult wire bending. There are no struts, which should provide a biplane for people who don't want to go to the time and trouble to build one with the usual struts and wing alignment problems. The Chicken Hawk is available through hobby dealers, or direct from Special Edition Plans, P.O. Box 2555, Schenectady, New York, 12309, for \$15.95. The "Mister E," from Special Edition Plans, is a 50 inch low wing sport racer that is intended as a multi control trainer. The conventionally geared Mister E can be flown with three channels, operating rudder, elevator, and throttle, or a fourth servo can be added for ailerons. The kit provides die-cut balsa and plywood, including all formers and doublers.

Formed wire landing gear, as well as material for the optional ailerons is included in the kit. Retail price, from hobby dealers or direct, is \$29.95.

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A new idea in motor mounts is being offered by Midwest Products Co., 400 S. Indiana St., Hobart, Indiana 46342. The mounts are bent from sturdy aluminum stock, and then glass reinforced nylon blocks are sheet metal-screwed to the bearers. The mounts appear to be extremely rugged, and afford engine or thrust change flexibility not ordinarilly found. Four sizes are available.

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Entrants flying at Sig Field the weekend of June 14th -15th were plagued by high velocity cross-winds, low temperatures and intermittent drizzle. The bad weather conditions failed to dampen spirits and a lot of good flying took place. The turn-out and enthusiasm for biplane aerobatics makes this new event look like the coming thing in RC flying. Contestants were taken on tours of the SIG plant Saturday evening. Maxey Hester served as Contest Director.

The winners in NSPA Sportsman Class were:

- 1.) Roger Schlenker, Des Moines, Iowa
- 2.) James Catlin, Hinsdale, Illinois
- 3.) Marvin Heitmann, Council Bluffs, Iowa
- 4.) Skip Brown, Omaha, Nebraska
- 5.) Gene Jones, Hazelwood, Missouri
- In NSPA Advanced Aerobatics, winners were:
 - 1.) Bill Heger, East Peoria, Illinois
 - 2.) Don Condon, Janesville, Wisconsin
 - 3.) Jewel Ness, Cannon Falls, Minnesota
 - 4.) Jim Bonanno, Des Moines, Iowa
 - 5.) Jerry Nelson, Chicago, Illinois

AMA Sport Scale results:

- 1.) Don Condon, Janesville, Wisconsin
- 2.) Jim Bonanno, Des Moines, Iowa
- 3.) Ralph Brown, Omaha, Nebraska
- 4.) Jim Catlin, Hinsdale, Illinois
- 5.) Bill Benton, Salix, Iowa

Heading photo: Don Condon and his 2nd place Skybolt. Left: Ralph Brown flew this well detailed Liberty Sport in Sportsman Class Aerobatics.

Below, left: Jerry Nelson, originator of the biplane stunt concept and spark plug, of the National Sport Pattern Association didn't have much time to fly because he volunteered to help run the contest and did a fine job supervising the ready line.

Below, right: The ready line is an important ingredient in biplane aerobatics since the next model to perform must be in the air just outside the aerobatic zone ready to enter and begin a pattern as soon as one is completed From the front: Heger's Knight Twister, Brown's Liberty Sport, Schlenker's Aeromaster, McClure's Hawker. Bottom row, left: Hazel Sig presents Roger Schlenker with a trophy, cash and a Skybolt kit.

Bottom row, right: Arnold Schmidt (Charles City, Iowa) had this double aileron Skybolt. The kit may be built with either single or double ailerons.

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