

volume 4, number 29

ONE DOLLAR



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NEW! DUMAS DEEPVEES The new class that's got class... a great new way to enjoy RC boating



The three new Dumas Deep Vees are the fun answer for the new RC model boater. They're easy to build, easy to drive . . . and real easy riders when it comes to rough water.

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



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Wing Area—590 square inches / 4.1 square feet Wing loading—(with 8 oz. R/C gear) 9.2 oz. Airfoil (undercamber)– our own design

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Above, you see my shot at R/C sallplanes I have put a tremendous amount of time, thought and tooling into the Hobie Hawk, trying to use the right materials in the right places to give the highest strength-to-weight ratio possible. It's not indestructible, though surprisingly strong I think you'll find the design and construction unique. Even more interesting are the Hobie Hawk's flight characteristics. Elliptical dihedral gives you the best of both worlds of dihedral and polyhedral. The thin undercamber air foil gives high lift and pene-

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Same as wings except both top and bottom skins 1764" plywood

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MODEL/ BUILDER

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1974

volume 4, number 29

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CONTENTS

FEATURES
WORKBENCH, Bill Northrop 4
OVER THE COUNTER, Bill Northrop
R/C SOARING, Le Gray
PLUG SPARKS, John Pond 14
RADIO CONTROL REPORT, Frank Schwartz 18
R/C PYLON, Tom Christopher
CHOPPER CHATTER, John Tucker
R/C AUTO NEWS, Chuck Hallum
CONTROL LINE, Jed Kusik
F/F SCALE, Fernando Ramos
HANNAN'S HANGAR, Bill Hannan
FREE FLIGHT, Bob Stalick
NFFS NEWS 41
REPORT FROM BUCKEYE, Barbara Henon 42

SCALE VIEWS

DOUGLAS O-43A	, Peter Westburg			44
---------------	------------------	--	--	----

CONSTRUCTION

GLENN'S "T", Glenn Cunningham 7
SADLER'S PACEMAKER, Phil Bernhardt
JUMBO SCALE CESSNA AW, Jim Adams 28
PEANUT STINSON TRIMOTOR, Don Butman 35
F4C PHANTOM CATAPULT GLIDER, Dennis Norman 47

Cover: Bill Edwards, age 13, and a member of CAP (Civil Air Patrol) Squadron 1402, Akron, Ohio, with his "Slingshot Thunderbird." Bill constructed the model ... covered and painted it ... while Dennis Norman, a Cleveland attorney and instructor in model building at the local Jr. High School, put on the finishing touches. Dennis, who took this month's cover photo during last year's Cleveland National Air Show, also designed the catapult F4C Phantom II. It is a favorite project of his model building class. See the complete article which begins on page 47.





When does a Peanut scale model become more than just another Peanut scale model? When it has been built and flown in local contests by its owner, Dr. Ralph Brooke, twice R/C World Aerobatic Champion, that's when. The model is a Pietenpol, from a Peck-Polymers kit.

from Bill Northrop's workbench...

• Better late than never should be the theme of this issue! After a little over 12 months at 1900 E. Edinger, the space pinch caught up with us, and we have moved to 1105 Spurgeon, Santa Ana, California (ZIP is 92701). The new location has over twice as much office floor space, and once we get organized (isn't that a familiar tune?) it should hold us for quite some time. Best part is that we're buying the property, so there's no more rent money pouring down the drain. By the way, our phone number remains the same.

Unfortunately, the move had to be made between the Toledo and White Plains trade shows, and at a time when this issue was due to go to the printer! Consequently, it is about 2 weeks later than usual.

There's a bright side to all of this, however... coincident with the move, MB acquired the full time services of Dawn Garrot. As Assistant General Manager, Dawn has taken over complete charge of the office, including subscriptions, dealers, plans services, and Model Builder Products. Chances are, if you give us a call, she'll be answering the phone, so welcome her to the happy group before you get down to business.

While on the subject of new faces in MB, you'll notice that the by-line on our Control Line column has changed. Jed Kusik, well known in speed circles ('scuse the pun), has taken over Dale Kirn's job for an indefinite period. Jed has participated in all types of aircraft modeling at one time or another, and is still pretty much of a F/F scale enthusiast. However, his primary interest is in Ukie speed, and in this category, his experience and knowledge put him within one spot of being on the 1974 U.S. team which will be in Czeckoslovakia this summer to compete in the World Championships. In fact, Jed will accompany the FAI Speed Team on the trip and will bring back a first hand report on the outcome.

By coincidence, the April 1974 issue of M.A.N. carries an article by Jerry Litwak about Jed's model promoting activities at Peralta Junior High, where he is a shop and drafting teacher. On weekends not occupied by flying or helping youngsters to get into the hobby, you'll find Jed churning up the countryside on his dirt bike, as he's actively involved in off-road racing.

One last item of house business... back issues. We didn't have room for our "Oldies But Goodies" ad this month, but if we did, you'd find that several other issues (September '72, December '72, and January '73) have joined Vol. 1, No. 1 in becoming "no longer available." Actually, we are reserving a small quantity of each issue for bound volumes that will be made up at a later date. Meanwhile, efforts are also being made to obtain embossed binders for those who wish to preserve their back issues. More on this later.

A CORRECTION

When we came across the article about Bevo Howard and the black widow spider, which was reproduced in this column last month, we didn't take the time to check it out. Fortunately, some of our readers were kind enough to enlighten us with the actual story. In each case, the writer expressed reluctance at having to face the cold, hard facts. Bevo just plain ran out of gas!

Flying low and upside down, he was circling around to make a low inverted pass when the tank dried up. Witnesses believe Bevo had just about successfully flipped the Jungmeister upright after the engine quit, when he ran into the tree. He had neglected to check the gas supply before going up for his aerobatic demonstration. As one letter writer stated, "I wish that the spider story had been proven true..."

ADVERTISER'S CORNER

Because of a goof on our part, last month's ad for Victor Model Products did not reflect price increases on several items. Out of the resulting confusion came one interesting fact; for a "limited circulation West Coast publication," as one of our contemporaries called us, we stir up a fair amount of ad response. Anyhow, to set the record straight, VMP raised prices on three items, as follows: Tahoe \$35.95, Snipe \$18.95, and Sail Control Unit \$24.95.

* *

And once more with MRC. In the February issue we *tried* to clarify our report on the R/C Aerobatic World Championships in relation to Yoshioka's winning Blue Angel, but only got it half right. The winning engine was an Enya .60 III B using a YS carburetor, a YS pressure regulator, and YS pressure feed system. All of these are items stocked by MRC . . . as is the Blue Angel kit. DID YOU KNOW THAT . . .

According to the present Contest Board Procedures, rules which members may hope to see take effect in 1976 must be proposed on or before June 1 of this year. At best, if a hoped-for change is made, this date may be extended to September 1.

It's really amazing how little many AMA members know about our rules making. We've even had members complain to this writer (always *after* a rule goes into effect) that the R/C Contest Board Chairman ought to "do some-*Continued on page 10*



• Free flighters will be glad to hear that an improved Tatone 1/2A Tick-Off timer will be available about May 15. This timer can be used either as a regular pinch-tube cut-off or as a flood-off type of timer. This is accomplished by combining the winding arm with a disc. Auto rudder may also be hooked in to this unit, and the on-off switch has been redesigned for more positive and easy use.

Fliers are urged to ask their hobby dealers to place orders with distributors. If local dealers don't wish to stock the timer, order direct from Tatone for fast service.

Astro Flight, Inc. is now shipping its AS-W15 kit, which sells for \$44.95. The fuselage is molded in a tough, almost unbreakable plastic which is supplied in 5 factory colors (white, red, orange, blue, or yellow). Wing is standard built-up construction with spruce main spars, and the tail surfaces are pre-cut sheet balsa. Span of the model is 99-1/2 inches, length 43 inches, and flying weight is 40 ounces.

Westcoast R/C Products' kit of the F4 Phantom features an excellent fiberglass fuselage and foam core wings. The Deluxe kit includes, wing sheeting, Kraft-Hayes wheels, scale nose gear, tank, spinner, and a complete nylon accessory package. It sells for \$99.95. A basic fuselage and wing kit costs \$69.95. The model spans 44 inches, has 500 sq. in. wing area, is 48 inches long and weighs 6-1/2 pounds. It uses .60 cu. in. engines.

Westcoast also produces Miss RJ, a 1/4 Midget P-51 pylon racer, which features a beautiful epoxy glass fuselage weighing only 4.2 ounces. The \$44.95 kit includes foam wing and wing sheeting, landing gear wire, torque rods, and machined balsa parts. Span is 38 inches, area 304 sq. in., and weight is 2-1/2 to 3 pounds. Obviously, it's for .15 cu. in. engines.

If you're interested in battery chargers, Westcoast has 4 different units ranging in price from \$13.95 to \$39.95. Write to them at 12088 Woodside Ave., Lakeside, Calif. 92040 for more details.



Astro Flight's new AS-W15 R/C glider, with tough plastic fuselage. Span 99-1/2". Price \$44.95.



Westcoast R/C Products' F4 Phantom for .60 disp. engines.



Miss RJ, P-51 Quarter Midget pylon racer by Westcoast R/C Products.



The Bolkow BO-105 scale R/C helicopter is being imported by Midwest Model Supply.



Marie Williams is dwarfed by Craft-Air's "Leo" Span 12'-7", introductory price \$99.95.

Midwest Model Supply has joined the helicopter set with a kit for the Bolkow BO-105 scale R/C chopper. The model features simplified mechanics, uses standard .61 engines, and has a fiberglass fuselage. Rotor diameter is 65 inches, length 55. Price is expected to be \$399.95, and deliveries will start around mid-April.

Midwest is also importing a 3-scale optical tachometer from Skyleader Radio. Many U.S. modelers know Skyleader is owned and operated by Stuart Uwins, well known English R/C expert.

The 3 scales read engine RPM from 0 to 25,000, 15,000 to 20,000, and 20,000 to 25,000. With the latter scale, it is possible to detect differences of 50 RPM . . . handy when you're trying to get the most from a racing engine. Price of the unit is \$59.95.

Appropriately named Leo, an R/C glider being produced by Craft-Air has been billed as the world's largest kitted model airplane. If you have any doubts about the claim, here are some specifications: wing span 12 ft. 7 inches (151 inches), length 6 ft. 4 inches, lifting surface area 2160 sq. inches. Ranging in weight from 7 pounds to 11 pounds (with ballast), the plane has been flown at wing loadings from 8.5 to 13.4 oz. per sq. ft.

The model is entirely built up from balsa and hardwood, and a light glass cloth treatment is recommended for the fuselage. With a straight center section chord of 15 inches, it would be possible to build a complete Peanut scale framework from one wing rib!

Introductory price of the Leo is \$99.95, and when you consider its size, this price hardly covers the cost of the balsa wood alone. We'll present further details on this one in a nearfuture Products in Use report.

Long-time model manufacturer Hi Johnson is now sole owner of Hi Johnson Model Products, Inc., and has moved his operation to a location nearer his home and his suppliers ... 11015 Glenoaks Blvd., Pacoima, Calif. 91331.

Hi has been experimenting with a new plastic material which is; lighter than fiberglass, stronger than fiberglass, will not become brittle in cold weather, can be bonded with any model cement that contains acetone (such as Ambroid,



One of four battery chargers by Westcoast R/C Products.



Three-scale optical tachometer can detect 50 RPM. Midwest Model Supply.

Duco, Testors, etc.), can be sanded, will take dope and/or most any kind of paint, and can be vacuum formed. It is an ASA plastic.

Using this material, Hi has developed an R/C glider which is 80% plastic and 20% balsa. The "Saloma," as it is called, is practically indestructible. If enough interest is aroused, he may put a kit into production. Write Hi for more details.



GLENN'S "

No exotic materials needed to build this 12 foot span, T-tail R/C soarer. Semi-symmetrical wing section and 0-0 trim offer interesting variety.

• When we first spotted this glider at the 1972 LSF Tournament, we thought it was a Todi. Closer Inspection, how ever, showed it be a much larger model, though of similar design. What really attracted us, in addition to the smooth and majestic lines, was the fact that the model is constructed entirely of conventional balsa, hardwood, and ply materials available at most hobby shops . . . albeit in large quantities!

Also of interest is the semi-symmetrical airfoil and 0-0 incidence setting of the wing and stab. Aerodynamicists can have fun with this, but the ship will penetrate like a bull in high gear or float

Design by GLEN CUNNINGHAM Orig. drwgs. by T. DEVENING Text by BILL NORTHROP



around as lazily as a highly undercambered Nordic. In spite of its size, the "T" only weighs 4 pounds, 11 ounces ... and those ounces are all lead in the nose! Go light on that tail structure!

Incidentially, we're sure Glenn won't mind us telling this, but he probably holds a record for the longest *tethered* R/C glider flight . . . around 3-1/2 minutes! During a takeoff launch at the LSF Tournament, the "T" bounced a couple of times and pounded the hook together, locking the tow-ring in place. This wasn't realized of course, until Glenn tried to get off the line and found he was trapped! After circling for a couple of minutes and making some experimental tugs, he brought the "T" in for a down wind landing, headed directly for the winch and in line with the turn around pulley. The last foot of altitude ate up the slack after which the "T" unwound the line from the drum until coming to a halt. The hook has since been replaced with 3/32 music wire... for obvious reasons.

Glenn suggests one modification if you're going to be flying the "T" in any area with restricted landing space. Add spoilers!

The combination of clean lines and zero angular difference adds up to a

fast, flat approach with no floating and bumping around, in spite of the light weight. Spoilers are almost mandatory for anything less than a football field. "Dumping" isn't very pretty, and is sure tough on the airframe!

FUSELAGE CONSTRUCTION

Sides and top are dead soft 1/4 inch sheet, while the bottom is 1/4 inch medium. Cut all four to shape, making sure to vary the splice positions so they don't all occur at the same location. After making the root rib on one side, align the two sides and transfer the rib location to the second side by jabbing pin holes along the outline.



Glue 1 inch triangle sections and stiffeners to fuselage sides, and then assemble to the bottom. Add bulkheads and dihedralled wing joiners. After installing your favorite pushrod system, glue the top in place. One piece goes from tail to leading edge station, and the rest is in smaller pieces. Finish up the basic structure by adding the nose block, 3/8 inch wing roots, and the fin structure. Now you're ready to attack the whole thing with a big sharp knife and a sanding block. (We like to use a Sig razor plane for final shaping after the big chunks have been hacked away).

During finishing (original "T" is done

FULL SIZE FLANS AVAILABLE - SEE PAGE

in good old dope and tissue . . . open structure and all!). . a layer of Silastic reinforcing is applied to the bottom of the fuselage from the nose to the trailing edge of the wing. Also, to assure a clean joint, Epoxi-Lite (Sig) fillets were added to the wing roots while the wings were in place. (Saran was put over root end of wings, pulled back, and taped, to prevent fastening wing to fuselage during the operation!)

STABILIZER

For reasons mentioned earlier, the stab should be kept as light as possible, consequently construction may seem unusual to some modelers. Begin by gluing a 1/16 square strip along the inside centerline of both the leading and trailing edge pieces of 3/16 square.

Next, pin the main spar and the leading and trailing edges to your building board, over the plan. All three should be shimmed up so centerlines are in the same plane. Now trim and install all the top $1/16 \times 1/4$ ribs, bowing them over the main spar, and glueing them here and at the leading and trailing edges. When dry, turn the stab over, set back on the shims, and repeat the strip rib operation. Voila! A lightweight



FULL SIZE PLANS AVAILABLE – SEE PAGE 72

Workbench... Continued from page 4 thing about it," not even realizing that they're talking to him!

Incidentally, the Nats Executive Committee has changed an earlier decree and specified that Class D (FAI) Pattern will be flown at this year's R/C Nationals.

THINGS TO DO

The "Indy Unlimited" is an IMPBA power R/C boat race which is being repeated again this year by popular request. The race consists of 5 heats, 6 laps each, on a 1/3 mile oval course. All classes of boats will race against each other, with maximum displacement being Class F, 1.8308 cubic inches. All boats must be powered by a propeller in the water. No airboats.

This year's race will be on July 13 and 14. For additional information, contact Leonard Skwiera, 5343 Daniel Dr., Indianapolis, Ind. 46226. The Southern Alameda County R/Cers are again holding a Sport Scale contest in Newark, California (Southeast San Francisco Bay area). AMA Sport Scale rules will be used except that single engine displacement has been raised to .80 and multi engines may total 1.25 cubic inches. Event categories have been divided into WW I (1903-1918), WW II (1919-1946), Racing, and Sport (Includes all aircraft not included in first 3 categories). Contact Richard J. Franco, C.D., 4868 Mauna Loa Pk. Dr., Fremont, Calif. 94538 (415)-657-6888.

The Second Annual National Multi-Wing R/C Championships have been set for July 6 and 7, Omaha Nebraska. This contest, as the name implies, is for airplanes having at least two wings (And that doesn't mean "one on each side of the fuselage!") stab! Don't forget to add the 1/16 X 3/8 anti rib-crushing spars. You will note that the fin is built in the same manner, except that the spar and rudder post are tapered.

Details of the flying stab hinging system are self-explanatory. The main thing here is to avoid slop. The plywood elevator "horn" is firmly glued to the center stab rib, which of course, must be filled in to give firm support. The wire pushrod end is merely bent over in an "L" shape and will not slip out once the brass hinge yoke is fastened to the top of the fin during normal assembly procedure.

WINGS

As the rib section is traight from the bottom rear spar to the trailing edge, the wing panels may be built on a flat ... FLAT ... surface. Take a look at the Quasoar II article in Dec. '73 MB for some ideas on rigging spoilers, because now is the time to install them. Also, we'd suggest capping the root rib with 1/32 plywood before covering. It'll save wear and tear in this area.

The T's wings were carefully designed to provide an extremely light, yet rigid structure. Every chunk of wood is important, particularly the webbing between top and bottom spars. Don't leave any of it out.

Before covering the wings, it will be very beneficial to the glider's performance if you check its balance about the longitudinal centerline. Read our resident R/C Soaring editor's article this month and you'll know what to do. In fact, when your "T" is completed. it wouldn't be a bad idea to go through Le's complete pre-flight check. It'll assure a successful first test hop. Drop Le a note at P.O. Box 187, Sunnyvale, California 94088 and tell him how well his system works. It's nice to cheer up an old man!

Contestants will sign up in two categories; Expert (anyone who has placed 3rd or above in any AMA sanctioned pattern competition in the past 3 years), and Novice (all others, not wishing to enter Expert class.)

Aircraft specs are as follows:

1. Two wings, fixed landing gear, cockpit or cabin, and pilot.

2. No wing less than 40% area of other wing.

3. Minimum of 12% airfoil thickness.

4. Minimum area vs. displacement: 800 sq. in. - .44 to .61 cu. in.

700 sq. in. -.21 to .44 cu. in. 450 sq. in. - less than .21 cu. in.

5. Minimum fuselage cross section area

at cockpit or cabin related to engine sizes above: 23, 20, or 15 sq. in. respectively.

6. Mufflers on all engines .21 cu. in. or greater. Continued on page 71



R/C SOARING BY LE GRAY

The popular bumper sticker, "Do it in the dirt," has no reference to sailplane trimming and adjustment. The success or failure of test flights can be determined before leaving the workshop. Here's how to "up your odds."

• The first test flights of an R/C sailplane are often approached with sweaty palms and other signs of trepidation. And that's kinda too bad. Even more of a shame are those cases where the owner/builder transfers the privilege, thrill and resulting pride of first flights to a "test pilot."

Without doubt, one of the most exciting aspects of R/C soaring is introducing an untried vehicle to its airborne baptism ... nurturing it from a building board, inanimate object to a nearly life-like soaring creature. Test and trim flights with an original design may be one of the ultimate R/C sailplane experiences, but first launches of any design ... from a kit or published plans... cannot be far behind.

Unless he's a true neophyte with his first sailplane, there's little reason for a pilot not to do his own testing. With only rudimentary skills, any sportsman who is worth his weight in balsa should be insulted by the suggestion that anyone other than he accept his challenge.

Now there are those who cry, "My nerves can't take it. I've got too much time in that beauty to risk flying it the first time. I'm too involved and uptight." All that is baloney . . . any way you slice it. But in most such situations, the transmitter is handed to an Old Flying Buddy. Is OFB not supposed to care if he busts up the new sailplane? Chances are he's quite concerned. Well, which would you prefer, to break up your own or smash up a friends pride and joy? The answer is obvious, so why impose such responsibility on someone else? T'ain't fair to the "Conner" or the "Connee."

Possibly a bit of discussion, and certainly some prefield preparation, can go a long way in getting the more timid amongst us in the saddle, so to speak. And an exchange of ideas might fire up some dormant answers in those who prefer . . . or must . . . do their own testing.

Let's kick it around for awhile. There's nothing much on TV, and it's too cold to go flying.

The cardinal rule in testing any aircraft has got to be "don't hurry." Perhaps equally important is to be methodical. And as a general principle, don't do anything at the field that can be done on the workbench.

The initial step in the trim and adjustment of an R/C sailplane is balancing the wings. This should be done before the structure is covered and the equipment installed. Mount the wings and tail components on the fuselage, and ballast the nose as necessary to get a fore-and-aft balance that is fairly close to the design balance point, between 25 and 40 per cent of average wing chord aft of the wing leading edge. The exact position is not critical at this time.

Next, push a large pin into the fuselage on the top centerline, even with the wing trailing edge. Put another one on the fuselage top centerline, even with the wing leading edge. These pins should be securely anchored because they must support the total weight of the assembled sailplane. Tie heavy twine around the pins to make a sling (Figure 1). If pins can't be used, rig some other harness. The important thing is that the fuselage must be suspended so as to have completely free lateral movement perpendicular to the fuselage centerline.

Now, lift the whole mess up using the sling as a handle. Be gentle and raise it slowly until the fuselage just





clears the floor. If any of the harness lets go it's going to drop, so take it easy. With the fuselage clear, note that one wing tip remains in contact with the floor. This is called "unbalance." However, should the wings remain parallel . . . neither one touching the floor . . . telephone your OFB because this is called "miracle," and he shouldn't miss it. A bit of ballast on the opposite wing tip will work wonders in correcting a heavy wing condition. Small lead weights or even some junk from the "Misc. Nuts and Bolts" jar will be fine. Masking tape will hold the ballast in place while you're working for a perfect balance. Trial and error is the only way.

Once the required ballast is determined, the question is "What to do with it?" And we'll ignore all smartalec answers. If the sailplane has nice, fat, balsa tip blocks, dig a hole and bury it. Otherwise mount it on the back of the main spar. Use plenty of epoxy to tie it down. Lead flying out through a beautiful covering can only add to the embarassment of a hard landing.

On a large sailplane ... 12-foot span or so ... wing balancing can require up to a full ounce of ballast. Maybe more. Don't fight it, it must be done in order to have a properly trimmed craft. Next time you're at the field, tape a 1/2-ounce weight to one wing tip of your current soaring pride. A couple of short flights will demonstrate the importance of balanced wings. With one tip heavy, opposite rudder is required to track a straight path. This results in a forward slip where the side of the fuselage is turned slightly into the slipstream instead of that nice, clean nose. That adds drag which increases the rate of sink. This we don't need.

With the bare bones wing structure balanced, go ahead and cover and finish. If you use something other than one of the modern, high priced spreads, recheck the balance after finishing. It shouldn't take much to correct any change caused by uneven applications of dope. But do it.

For a sailplane that is already covered, balance as discussed and then install the required ballast through the lower wing surface. Won't take much touchup, and the sailplane will be better for it.

The next order of business is to balance the completed and covered sailplane longitudinally, with all components and equipment mounted as if for flight. This is the normal balancing routine, where the craft's fore-and-aft weight distribution is determined in relation to the wing chord. The exact point recommended for this longitudinal balance is usually noted on the fuselage side view drawing of most plans. Sometimes maximum forward and rearward balance points are also shown, indicating a safe range. There may be a specific dimension which locates the balance point, but most likely it's identified by just a mark or symbol.

It's a good idea to follow the suggestions of the designer. However, the balance point shown on many plans is for the best soaring flights with the sailplane completely tuned and trimmed. This could be a little spooky for first launches. Everything might not be right. Instead of stumbling into a bag of beavers, it's a better idea to approach the balance problem with caution . . . like 30 per cent of average chord aft of the average leading edge position.

On a constant chord wing the balance position is a snap to locate. A tapered wing requires a bit of measurement and arithmetic. A wing with an elliptical planform can drive ya up the wall. But whatever it takes, do it. This step is too important to bypass. Figure the dimensions for 30, 35, and 40 per cent of average wing chord. Once you've got 'em, mark the points on either the fuselage or the wing near the wing root (Figure 2). A piece of masking tape will accept the necessary marks without marring the fresh finish. (That sounds like breakfast pastry . . . or maybe an impertinent Scandinavian.)

Another sling is needed for longitudinal balance. Sailplanes with two-piece, plug-in wings are easy to rig. Drill 1/16 inch diameter holes on either side of the fuselage . . . within the area covered by the wing root rib . . . that are located at points equivalent to the 30, 35, and and 40 per cent wing chord points. If none of these happen to hit the specified balance point, drill one more set that does. Using heavy twine and two small brads or finishing nails, about 1/2-inch long, make a harness that plugs into the drilled holes. When wing panels are snugged up to the fuselage, the brads will be locked in place and the sailplane can be lifted safely with the bridle (Figure 3).

Locate the brads in holes at the 30 per cent position. This will probably be forward of the design balance point. With an unknown vehicle it's only reasonable to start out on the safe side, so add ballast to the nose (probably) or tail (unlikely) as necessary to get a perfectly horizontal balance of the fuselage when the sailplane is suspended at the 30 per cent holes.

Try lead fishing sinkers for ballast. They're inexpensive, readily obtainable, and available in many convenient shapes and weights. Also, weights of the larger sizes are marked, which makes them easy to identify. Quarter-ounce weights and heavier are suggested. Have several 1/4, 1/2 and 1 ounce units at hand. Even a couple of 2 ounce weights might be usable.

When getting the fuselage balanced out to horizontal, it probably will come about that the last 1/4-ounce weight





New York stock broker George Dartt and his FIRST model airplane, an Astro Flight AS-W17. George brings together two great sport/ hobbies . . . he is also president of the Lawn Tennis Association.

makes the sailplane hang slightly nose down, and its removal lets the tail droop a little. In such a case, use the weight. It won't make that much difference, and nose down . . . that is, nose heavy . . . is the safer way to go.

Now, take all the lead out of the sailplane and weigh it . . . the lead, that is. Record the weight on a "Sailplane Trim Data Sheet (STDS)" . . . or other piece of scrap paper . . . as the ballast required for a 30 per cent CG. Repeat this balancing act for the 35 and then the 40 per cent holes, as well as the design balance holes. Record the ballast for each on the STDS. With this information, the balance can be set at any point . . . or changed from one to another . . . in the field, with no guess work and with none of that funny finger balancing bit.

There's just no way to balance a sailplane accurately without the use of a point suspension system, such as the sling. Also, the balancing must be performed indoors under truly no-wind conditions. Outdoors and with "finger support" may get the job done, but it's unlikely that the balance will be where you think it is. And it's easy to interpret an out-of-balance condition as an out-oftrim situation and never really get the thing adjusted properly . . . though flyable. To appreciate just how inaccurate the finger support method of balancing can be, try balancing one of your sailplanes in front of and then behind the "known" balance point. Chances are you can hold the fuselage fairly parallel with your digits at plus-or-minus a half-inch or so from the true point. It's a matter of muscle control. Yea for a muscle control! Next, try the same exercise in a room in which a fan or furnace is moving the air . . . not blowing at the sailplane. Now where's the balance point?

The last time we used the fingersupport balance method was several years ago. It was with a large, heavy sailplane called "Big Juan." Total weight for first flights was about 7 pounds, including a pound of lead in the nose. Old Flying Buddy Paul Forrette volunteered to do the physical culture bit required for hand launch glide tests.

Well, "volunteered" isn't quite right. Actually, it kinda went like this: "Ya know, I'd sure like to make a few glide tests on this pig before hooking up to the winch... but there's not a man on the field who's young enough and strong enough to handle it." This declaration was loud so that all could hear.

Most of the other old men nodded, "You better believe it, dummy."

The younger fellows started across

the field to check the turn-around for fouled line . . . En masse. But OFB said, "I could do it if I wanted to."

Our shocked response was, "No way, Paul. Forget it." And then this "But I could" was put off with, "Wouldn't think of lettin' ya try." This sort of banter continued until it became a matter of honor . . . and friendship. So, OFB got his way. Was the least we could do.

After a half-dozen top-speed, fiftyyard runs into the wind, it was obvious that even OFB couldn't hack it. Besides, Paul's right shoulder joint was starting to swell. He got Big Juan in the air, but not quite up to flying speed ... though close. That airborne porker sort of squatted back to the ground rather than gliding to a touchdown. The only answer seemed to be more altitude and more airspeed. To the winch, then.

On the way back from their inspection of the turn-around, a couple of the guys helped OFB out of the weeds and to his feet. In fact, they sorta drug him back out of the field. It was noted that he seemed to heave a lot. Probably an inherited weakness . . . or maybe bachelor's cooking.

The winch launch went fine, but once off the hook, Big Juan seemed determined to become "Beeg Pile!" Continued on page 61



Long before Jane Withers started peddling Comet, she appeared in a movie with this gas model. It's the Dennyplane, and was produced in kit form by movie actor Reginal Denny. This version was built by Dr. Dee B. Mathews, who says it flies great but the glide is sorta sluggish.



• Extra! Extra! Publisher wins event! Hey! How about that for a lead-in to the column? Well, it really happened . . . read on, and get the details. WINTER F/F NATS

The title really lived up to its name. Man! Was it a "coolie" Saturday afternoon. The writer stuck it out to the bitter end to get some pictures, but



Claude Ditto (short for DeBeneditto) cartooned his impression of an old timer fan.

really thought this turn of weather was for the birds (dodos, that is!).

Sunday was a complete reversal, as the temperatures were considerably higher to start. Bill Northrop showed up with a Chuck Gill kit of the Taibi Powerhouse, R/C, with an Enya .45 motor. Considerable problems developed with the engine and even the writer was involved in diagnosing troubles. (Dirt in the fuel system. wcn)

Just about the time the writer was swelling up with pride about his "strategy flying" by coming in with a 22 minute flight, our peerless editor recorded an astonishing flight of 54 minutes, 22 seconds. Wow! The writer then personally chased the victor with a pair of pliers, threatening dire results to his virility.

Then, to rub salt in the wound, the weather got so good that Junior Dave McBride put in a 22 minute flight with his little So-Long, and Wally Briggs brought in a 31 minute flight with a Buccaneer C Special. Man! Tool boxes were maxing out!

Needless to say, everyone in the "Harry Lowe Unlimited" event had a good time. At the close of the contest,

Bob von Konsky was still in the air at 15 minutes and going strong. The columnist left before he could find out Bob did 30 minutes. Based on the fun with this meet, it appears the Texaco Event, to be staged by the SCAMPS on April 21, will enjoy a heckuva good turnout.

On the free flight end of things,



Kenny Caldwell, Jonesboro, Arkansas, and his good flying Gladiator.



Ed Goretzka launches his Ehling designed 1938 Elf Biplane in a Maryland field. Too bad there isn't an event for oldie bipes only.



"Lucky" Moody turns loose his . . . what else . . . Korda Wakefield for a test hop. Won first place in OT Rubber at San Valleers, Taft.

R.G. Brickner pulled a real smart move in limiting the events to two on Saturday when the weather was bum. The events transferred to Sunday were thoroughly enjoyed by those who had figured there would only be one or two events to fly.

Chris Christenson, who comes to meets in a bus with a load of contestants and models from Bakersfield, finally scored with a Scientific Ensign, winning Class A with a time of 8:50. Larry Boyer took second in Class A and used the same airplane to win Class B.

Del Rheaume finally silenced the hecklers with a resounding win in .020 Replica. Missed seeing Wallock or Oslan in the final results. Those who have been wondering where Wallock is these days will have to visit him at his home. Gene is still in a steel corset to hold his back straight. The excruciating pain has finally subsided to the point that he has been able to go back to work, but shagging of free flight models is out for the time being.



Dick Johnson, Dallas, Texas, built this nice O & R 23 powered Comet Mercury. Note that he has followed the original color scheme as seen in the old Comet ads.

Sunday's flying was repetitious in that Christenson took a first in Antique, and Boyer placed second in Class behind Bob McBride's Sailplane. (Where the heck did he find the time, what with flying the R/C Unlimited Event?) Lucky Moody rounded out the day's flying by copping first in rubber with a Korda Wakefield. Tough design to beat! Noticed Oslan took second with his three year old Flying Cloud. Some models never quit.

Lesson learned about R/C O.T.: (1) Re-entry of the same model with the same frequency is bad from the standpoint that this action ties up that fre-



The winnah! After 54 min. 22 sec. flight. Bill Northrop and his R/C Powerhouse. Enya.45.



Wally Briggs prepares to fire up his Buccaneer Special for a 31 minute flight that earned him second spot in the Taft Texaco R/C O.T. event. Fuel allotment was 1/8 ounce per pound.





Gerald Donahue, Shrewsbury, Mass. snapped his daughter posing with his ST .15 powered Simplex, a Paul Plecan design.

quency. Others who have not flown, would find they were out of luck. Fortunately, no one was on the same frequency as Bill Northrop (53.3 Mhz) during his 54 minute flight. It would have been a long wait! (2) Flight takeoffs should be cut off at least half hour before the official end of the contest. Taking a flight just before the quit whistle can result in waits up to a half hour or better to finalize the results. (3) While the intention was to impound transmitters, this was not done. Close attention to this is required so that unfortunate frequency interference as experienced by Bob Hunter will not cause bad crashes (this was during unofficial flying on Saturday). In addition a frequency clothespin or flag issuance board should be employed. No flag, no fly! (Model Builder will furnish frequency clothespins for the SCAMPS April 21 event. Old Timers who are new to R/C will find this well-tested system very useful in avoiding frequency conflicts ... and unnecessary crashes! wcn).

Field Notes: Quite a few crackups. Bob Oslan pranged his neat Playboy Sr., but good! Saw a big Flying Quaker pile into the bumper of a car. Pretty bad smash! Christenson, although a heavy winner, busted up a Zipper. Winner of the best crackup award of the day was a thoroughly pulverized Buccaneer C Special . . . Can't remember who it was but had to commend the modeler for the thorough wrecking job.

New Game: "Seagull Pool." A new fun thing has developed when spotting a group of seagulls circling in a thermal. Send your model up into the center of the circle and watch the birds scatter. Just like the opening break of a game of pool! Be sure not to hit a seagull; this is rough on models not to mention the bird.



A Sal Taibi designed Pacer "B", by displaced American Bill Cooksey, now living in New Zealand. Power is an O & R 23.

1974 CONTEST KICKOFF

Hate to report it, fellows, but the initial joint SCIF/SCAMP kickoff contest field at Elsinore on January 27 was blessed with beautiful weather. Early in the morning, it was cold (45, bah!) and wind looked threatening. Luckily, the threats evaporated, leaving the modelers to enjoy themselves.

In reading Jim Dean's "Hot Leads" report, one discovers that Jim's newly rebuilt .020 Interceptor gave him fits. It took an hour to find the glow plug was faulty. Following this, a four second test flight ensued. Jim is now thinking of building a small Playboy.

Best news of the meet was the reappearance of Bud McNorgan and his son, Kit. When Bud took over from Lee Freeman as SAM Director, he really infused life into the organization. The Old Timer Nationals (called the SAM Continued on page 66

J. L. SADLER'S PACEMAKER

OLD TIMER Model of the Month

• Until J. L. Sadler came along with his Pacemaker (not related to the high wing cabin model of the same name by Irwin Ohlsson), low wing models were considered strictly taboo. However, with a combination of low thrust line, small vertical stabilizer, and generous dihedral . . . plus good looks, the Pacemaker, published in the January 1940 issue of Air Trails, proved that it could be done.

But it was only an interlude. Low wing, free flying models never made it in competition until Ed Kazmirski's famous R/C Orion came along . . . and by then, nobody wanted too much stability anyhow . . . it interfered with the piloting of model aircraft that were beginning to depend on electronics, not stability, to keep them in the air. Plans redrawn by Phil Bernhardt



This picture is a repeat from our Feb. 1974 issue, but the only one we could find of a Pacemaker! Built by John Haggart, of England, the wing has beautiful form, as this photo proves.



Dieter and Heidi Schluter, real nice folks. Nosing into the picture is Dieter's newest helicopter, the Gazelle. Write to Aristocraft.

Franz Kavan introduced his new, low price Allouette during an exclusive press dinner. For .19's, it will sell for less than \$200.

RADIO CONTROL REPORT FRANK SCHWARTZ

Frank will have his report and comments on the Toledo Conference next month. Meanwhile, here are a few shots picked up by your publisher's camera that might be of interest.

• Last month you will recall that I commented, and rather strongly, about the abuses on CB (Citizens-Band) and it's relation to the R/C fraternity.

As long as we operate legally, we can, without fear of being put in the same category as the law-breaker, speak candidly about the shameful goings on within the CB frequencies.

Sad as it may seem, many of our R/C'ers seem to be completely unaware of what makes for legal use of the R/C equipment they enjoy so much. It was brought home to me, quite vividly, for the past few years when I worked at the Nationals at registration. Never in all my life have I seen so many people (who should know better) appear with such messed up so-called "credentials." Many who fly and have flown at the Nationals actually did not have proper licensing and were passed through . . . after all (as it was said): "The poor guy came a thousand miles; you can't refuse to let

him fly."

My gosh! This is the most shocking example of turning our backs on rules and regulations I've ever seen. On the other hand, if a flyer has a pylon plane that is as much as one square inch under the minimum requirements, he must somehow add this extra inch as a trim tab or something, or he can't fly. If he doesn't have an AMA license or the proper numbers on his plane, he can't fly . . . and I recall one instance two or three years ago when one of the qualifying Formula One planes turned up with a slightly too thing wing section and was disqualified. This is correct and proper. But, when it comes to FCC (Spelled out, that's Federal Communications Commission) license, flyers are processed and permitted to fly with, in some cases, literally no license at all, or the barest pretense of legality. I've heard such as "He's OK, I know he has a license at home, I'll vouch for him"

and this flyer was permitted to fly. This and the other variances are neither legal nor in any way correct.

Unfortunately, I feel that those who



AMA's Frank "Loophole" Ehling. Still wanted in 38 states for rules evasion!



Hobie Alter, Bob Brown, and Bill Bryce deal out information on the revolutionary new Hobie Hawk R/C glider. Watch 'em come on!



Ron Murray grabs a moment to catch his breath between questions at the Royal Products Booth. Latest kit model Bleriot overhead.



Paul Bender applauds a counterrotating twirling trick just demonstrated by a Canadian tourist while on return trip from Toledo.



Hugh Stock provided the answers for spectators stopping by to see the R/C gliding kits and equipment at the Soarcraft booth.



Smiling Joe "Mahtin" displays his imported lathe. Joe says every home should have one!

should read this probably won't, and although I have made known to AMA Headquarters the facts regarding the FCC licensing abuses, I fear that at this year's Nats the same fiasco will be reenacted.

To be precise: Every flyer must (by law) have an FCC license. There are a number of types. First is the standard FCC Class C Citizen's Band License issued to you in your name. The Citizen's Band Class D (Voice Communications) is not acceptable for R/C, although I have seen instances where a flyer presented a Class D license and insisted that the processors accept it.

Also completely legal is a copy of the R/C Club License, provided you also have proof that you are a paid-up member of that Club, in good standing ... and that the Club License, the copy of which you receive, states the period of time the use of said license is extended to you. Again, I've seen people with a Club License that either belonged to someone else, or they had no way of proving that they were members of that club. The old dodge of someone coming up at the right moment and saying, "He's OK, I'll vouch for him" just won't cut it. Therefore, you should present to the officials at any meet your current AMA License and your FCC license, and if it is a Club License, written proof that you are a member in good standing of that Club. All of the foregoing applies only to the 27 mHz and 72 mHz frequencies we use.

If you desire to operate on the 50 Continued on page 55



For R/C submarines that leak! Futaba's servo worked under water all weekend.



Roy Gelber's hand gives idea of the engine's size. Write to MRC about it!



OK, we'll bite!



Midwest Model Supply's Johnny Osborne and Jerry Nelson (those plaids!) at work.

Aerotique's John Smith demonstrates how he listens to both sides of an argument.



Steve Ellison, Selwyn Kaplan, and Vince Stagnaro (I to r) wear the smile of 1, 2, 3 victories at Whittier Narrows.

PYLON

PHOTOS BY TOM CHRISTOPHER

By TOM CHRISTOPHER

• The year 1974 promises to be a banner one for the R/C Pylon racing circuit! Throughout the country, mod-

elers are busily preparing a racing stable for the coming season. In some parts of the country, the cold weather gives one a chance to build that super, all time record breaking speedster that we all dream about. On the other hand, in some areas there is racing activity the year round. Florida and Southern California enjoy weather like this every month! Now, for those of you who are busy building, we would like to tell you of a fantastic product that we tried on our last Quarter Midget! TRICO Hobby Products, 6007 Washington Blvd., Culver City, Calif. 90230, has formulated a "No Wax" polyester resin that we consider to be ideal for pylon racers! Finishing has always been a hard, tedious, time consuming process for me. Anything that will help in the area of finishing techniques is always sincerely welcomed. This resin has *all* the advantages of *all* previous resins, plus quite a few of its own.



Danny Kane, from Chicago, flew his House of Balsa Shoestring at the Basin.



Ramzi Thomas flashes his victory smile after taking first place in the January races at Sepulveda Basin.



Kraft technician Ernie Allenbaugh, Vista, California, and his "Hot Canary," which flew well at Whittier Narrows.



Al Sheppard, his son Adrian, and Stan Terry (I to r) at Sepulveda, where Adrian flew in his first race! Nice going, Adrian. Stay with it!



Thank Heavens!! Not ALL Quarter Midgets are P-51's. This Brown Special was built by Bob Adams.

TRICO resin has an off-white base that, with only two coats of sprayed or lightly sanded surfaces, will produce a super base for finishing with dope, epoxy enamel, acrylic laquer or what have you! It will remain flexible (really), without becoming brittle, for the life of the finish (or model), and really requires no sanding before painting whatsoever! Engine compartments and hard to get at places aren't a problem anymore. This product, when used on a properly prepared balsa surface, can be painted without the use of a primer, which produces a lighter plane than ever before!

If we sound enthused about the product, we really are! In pylon racing, lightness is very important! This is especially true in QM racing, Eliminating



Winners and fliers at Sepulveda Basin races in January (I to r): Ramzi Thomas 1st, Tom Christopher 2nd, Gary Hawk 3rd, Al Sheppard, and Henry Arrance 5th.



The team of Paul Strencell and Arlen West (I to r) and their Mirage. Arlen is the pilot, while Paul builds and does the calling.

the primer coat, which adds much weight to the model, is a major break-through in finishing resins.

For a supreme finish that might be desired with a little more weight penalty, use TRICO .70 oz. fibreglass cloth in conjunction with the resin. Just use the glass cloth with one coat of resin, with one more added coat for filler, and paint. You will be amazed! We used this resin both ways and achieved fantastic results . . . If you are ready to finish your new beauty, give TRICO a try, you will like it!

This company only manufactures three products . . . the third is called "Second Skin." This is a water soluble lotion to protect your hands, and the finish, when working with resins and epoxies. It is very useful in model building while handling ready-to-paint surfaces. Just apply "Second Skin" to your hands and now you have a protective coating that will not put fingerprints on your model's prepared surface, and will produce a clean pair of hands and fingernails when cleaning up after painting or spraying. We highly recommend these fine products!

Continued on page 69



Basic layout for Charlie Gilbert's scratch-built Hughes "500" which is further described in this month's column.

CHOPPER CHAT **By JOHN TUCKER**



• Reader response this past month has many questionable reports passing abeen great! Lots of letters have come in requesting help in specific areas and the photos show much experimental work is being done with modifications, etc. At least 50% of the letters ask the same question, "Am I wasting my time building the little Du-Bro Whirlybird 505? Most of the guys say it doesn't fly!" Well . . . let me tell you about that little bird! Normally, I'm very reluctant to either praise or knock a product unless I have had an unusual experience with it, however, there have been so

round the flying sites, I just have to take a stand.

Rest assured, the Whirlybird does fly . . . and it flies well! Consider the facts: The initial cost is about onefourth of any other chopper kit on the market and you can have it completed in a couple of days, ready to fly. Because of its small size, it is extremely easy to carry around in the trunk of your car. And, its light-weight structure minimizes damage on those hard landings that are bound to happen. Repairs

are quick and easy, with standard hobby shop parts, and can almost be accomplished "in the field." Now, all that adds up to one heck of a good trainer for my money, and represents a fine investment for the beginning chopper pilot.

What about all those reports that say it can't get off the ground, or it's too squirrelly to fly, etc.? My experience has been that when the new pilot finishes building the 505, he takes it out to the local flying field, starts the en-Continued on page 58



Kim Tucker, 18 year old son of "Chopper Chatter" columnist John Tucker, adjusts rotor head on his ST 56 powered Kalt Huey Cobra. Insignia is Air California, for whom John is Chief Pilot.



John and Kim do most of their flying at a nearby High School lot in San Diego, Cal.



A view of the pits at the First Annual Tangerine Internationals for helicopters, CD'd by Walt Schoonard.

Photo story of the First Annual Tangerine International R/C Helicopter Championships, 1973. By Walt Schoonard.



Ed Walther, 1st in Scale, 2nd in maneuvers, flew a Hegi Cobra.



Tom Drake, 3rd in Scale, 4th in maneuvers, and his Kavan Jet Ranger.



Bill Curtis with Dubro Shark and Hughes "300." Bill took first place in Maneuvers with the Shark, which is Dubro's latest kit, featuring bolt-together construction, O & R Compact engine.



Steve Darlington flew his Kalt Cobra to a 3rd place in Maneuvers and also placed 2nd in Scale.



CD Walt Schoonard (in hat) watches as Don Lowe maneuvers his Kalt Cobra around a marker. Watch out, Don! Them things bite!



One of each in the winner's circle at the first 1974 So. Cal. series races. Mike Morrissey 1st, Earl Campbell 2nd, John Thorpe 3rd, and Don Amedo 4th.

R/C AUTO NEWS

• Just thought I'd let you know that many minds think along the same lines at any given time. I just saw a copy of the Japanese R/C Technique magazine for January 1974. There's an article on R/C car design including aerodynamics, front wheel caster, toe in/out, etc. It almost looks like one of us copied the other guy's drawings (but they came out almost simultaneously). The only problem is I can't read the text. If there's anyone out there who can translate Japanese writing please get in touch with me.

Well, now that we have struggled through all of the various car adjustments in the last several months, which ones are the best to use? Some adjustments are best to make only when you change bodies or car types, and others on a pre-race or in-between heat situations. As pointed out during the course of the articles, we have to consider low speed and high speed problems, and power on or power off conditions. The biggest problem areas are with the power on. Good, non-grabbing, controllable brakes cure most of the power off problems and were covered in the August 1973 MB article. So what we are going to do is list each of the adjustments that can be made, what they do, and then rate them on a numerical basis. The reasons for what the adjustments do have been covered in the preceding articles. The rating which I gave to the relative effects of the adjustments are my evaluation based on the cars which I have built and driven. Your car may be different and you can assign different ratings to the adjustment effects.

When the car handling characteristics are known we can decide what adjustments to make. The more coarse adjustments to get the car working should be made first. Adjustments to use when fine tuning for track-to-track changes or track condition variables (the simplest or easiest to make) are noted. A computer program is shown which can tell you how much you should change a selected set of adjustments. Examples for a beginner's car and a fine tuning kind of situation are presented to give By CHUCK HALLUM

you an idea of how to use car adjustments to improve handling (Of course, all of these comments assume that the nut on the transmitter steering wheel is O.K.).

TABLE 1 - HANDL	ING CHANGE	PER UNIT ADJUST	MENT
	Unit	Handling	Change*
Item	Adjustment	Low Speed	High Speed
lires, Front (+ softer)	One Grade	-4	-2
Tires, Rear (+ softer)	One Grade	+5	+4
Weight,	4 oz.	+2	+1
C.G., Axial Motion	1/4 inch	-1	+1
C.G., Vertical	1/14 inch	+3	-1
(+ higher) Wing Angle	5 degrees	0	+3
(+ more) Wing Motion	1/2 inch	0	-4
(+ forward)			
Spoiler, Front (+ more flange)	1/2 inch	0	-4
Caster, Front (+ increase)	5 degrees	+2	-2
Camber, Front	2 degrees	0	+1
Tires, Front	1/4 inch	-2	-2
Track, Front	1/4 inch	0	-1
(+ more) Track, Rear	1/4 inch	0	+1
(+ more) Wheel Base	1/2 inch	+1	0
(+ larger)			
Carburetor (+ larger)	10 percent	-5	-1
Fuel, Nitro	5 percent	-2	-1
Clutch Slip	1000 rpm	+2	0
(+ more) Gear Ratio (+ higher)	.25:1	-2	0

* Sign Convention: + change of adjustment variable will give an increase in understeer (+), or stability, or oversteer (-), or instability. Performance signs related to general car stability.

All of the adjustments that we've talked about in previous articles are listed in Table I. The order is essentially the sequence they were discussed. Now let's take each adjustment and evaluate the effects on low speed and high speed handling during acceleration (power on) conditions. If we go softer (one grade same compound) on the front tires the car will have more front bite. Since I consider understeer a stable condition, the improved front tire bite gives instability at both low speed and high speed. The numbers reflect a comparative factor to the other adjustments. For the front tires, I feel that the high speed handling is affected slightly more. 1 have assigned -4 for the change in low speed, power on, handling and -5 for the high speed change; both oversteer, or unstable and negative numbers.

Now the rear tires. A softer grade gives better rear bite, will give understeer, and is a stabilizing force. I feel rear tire traction improvement is more pronounced at low speed therefore +5 for low speed and +4 for high speed.

A light car was shown to corner better. So more weight will cause the car to understeer and give stability. The numbers I have assigned here are for a track which has reasonable traction. The unit of weight change is 4 ounces. If the weight is shifted forward (1/4 in.) the low speed stability is a little worse because of less weight on the rear wheels, but there is a slight improvement of higher speed stability.

The vertical c.g. location was shown to be quite important to low speed directional stability in particular. Just as on dragsters, the high c.g. causesweight transfer to the rear wheels to make them stick to the ground better. On my cars I can feel the difference even for a 1/16 inch change. At high speed during cornering, the side weight transfer makes the back end a little slippery.

The next thing we talked about in the articles was aerodynamics. To be most efficient, the wing should be placed as high as possible. But we can still adjust the wing angle and fore/aft position. At low speed, the aerodynamics are almost non-existent, so I have assumed no change in handling. Increasing the wing angle gives better rear traction at speed, or understeering and stability, for a +3 rating per 5 degrees. Moving the wing forward (even a half inch) really improves the front traction at speed. Again more front traction is oversteer and it gets a -4 rating.

The front spoiler which I refer to is part of the slab bumper which extends in front of the car body work. The forward flange gives the high pressure air in front of the car a horizontal surface to act on which results in down force. In the article on aerodynamics the various car bodies were rated for front down

	VARIABLES EFFECT CAR PERFORMANCE	
1)	TIRESF . + SFTR	
2)	TIRESR,+SFTR	
3)	WEIGHT, +INC	
4 2	CG AX +FØRW	
5 1	CG,VERT,+INC	
6)	₩JNG→+FØR₩	
7 3	WINGANG + INC	
8 1	SP01LRF, + INC	
9 1	CASTER, PUS	
10)	TIPESS AND	
11 1	TRACKE AINC	
12.3		
1.0.1		
15.)	CADD . AT DCD	
16.3	FUEL ANT TRO	
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Figure 1. Printout of a computer program. With this kind of information available, ya got no excuses for not winning . . . unless you withheld something from the machine!

force, but here we're talking about adjustments. You can change front bumpers if you're really serious about front down force. A half inch increase in overhang gives the rating tabulated.

The most important of the chassis adjustments is caster. Angling the kingpins back gives positive caster. The positive caster helps directional stability at low speed but gives better high speed cornering ability. So we get +2 for the low speed handling change with 2 degrees positive caster and a -2 rating at high speed. The effects of negative camber (kingpins angled in at the top) are minor but do help high speed cornering some, so 2 degrees of negative camber gets a 0 low speed rating and a -1 high speed rating. (To be consistent in the table, I used 2 degrees of positive caster for a +1 rating . . . same thing just said another way).

The front and rear track (width) affect the weight transfer during cornering and therefore tire side force. Making the track wider decreases the amount of weight transfer and improves front or rear traction. Not much effect can be seen at low speed so that ratings are 0, -1 at the front and 0, +1 at the rear.

Wheel base can help directional stability, mostly at low speed. The longer wheel base keeps the car pointed better (or you could say the short ones let the car skitter around). I assigned a +1 rating at low speed and no change at high speed.

Things that cut power delivery to the rear wheels helps low speed handling. So more clutch slip gets +2, increased gear ratio -2, more nitro fuel -2, and larger carburetor -2 at low speed. At high speed, clutch slip and gear ratio get no change and the bigger carb and more nitro get -1's.

Whoopee! . . . I think we got through the ones that most people can definitely use. Some cars have adjustable spring forces and rates at the front. You could also have it at the rear. In general, anything you do to decrease spring rate, with respect to the other end, will increase tire traction on that end.

As part of a computer class, I wrote up a program to optimize car handling. Really it should be used just to tell you the direction to go. Figure 1 is the printout of the program. The first car *Continued on page 56*



Bill Harney and his 1973 Nationals Open C/L Scale winning Zero. All controls work from cockpit, gear and flaps retract, ST .60 engine.



NORTH VS. SOUTH

We're very lucky here in California; not because we are able to fly all year long with only time outs for occasional earthquakes, torrential floods, or forest fires, but because we have two excellent organizations that look after the controlline flying activities in our state. These are organizations, not clubs. Each is composed of member clubs and represents many modelers in all flying categories. The function of both organizations is to coordinate and standardize activities in their area.

If you don't know by now, we're talking about W.A.M. and S.C.C.A. The Western Associated Modelers is alive and well in Northern California, while the Southern California Control-line Association lives you-know-where.

W.A.M. has its own insurance and licenses and writes its own rules for about a million different categories and events . . . and is very happy and content. On the other hand, the S.C.C.A. utilizes AMA offerings, supplemented with much griping and grumbling.

Both groups co-exist very well (there

are mountains and deserts between them) and even attend each other's major contests. Presently, a North/South contest series is in progress that will continue through the summer, and hopefully will determine, at least for this

year, which end of the state has the hot setup . . . or the most gasoline for driving.

ALL ŠOUTHERN CALIFORNIA STUNT FLYERS ARE EGOTISTICAL SELF CENTERED HERMITS!



The new Super Tigre X-15 speed engine.



"Going away" shot of the ST X-15.

Oh Yeah! Oh Yeah! I know you are all out there hiding, so how come? Nearly all monthly contests in Southern California are exclusively racing and combat. Do you know why? Because the "racers" and "fighters" attend club meetings at all the local clubs and hog the circles on weekends!

Do you know there was only one Southern California entrant at the FAI team trials at St. Louis last summer... and only one entrant at the Semi's held at Los Alamitos before that? I was there. I know what went on. No... I wasn't flying stunt, I was the team race mechanic who had enough time during pit stops to cook breakfast on the outside cowling of his model.

I would like to see all of you stunt aficionados get it on. Go back to your local clubs regularly . . . get stunt back on the bill regularly . . . start flying FAI regularly . . . and let's have an all-California FAI team next time. Now about an all-stunt club or organization here? Maybe even revive the long dead "500" club. The least you could do would be to join P.A.M.P.A. and if that doesn't mean anything to you, go back to your cave.

Personal:

Lucky Pyatt: Can I have my yellow Nobler back? signed, Jed.

SPEED FLYING ANYONE?

(Yes, I know that's your club name, free publicity can't hurt.)

The Super Tigre X-15 speed engine is here . . . and it is exactly like the ones used at the last World Champs . . . and also the one which placed at our last FAI Team Trials. We received six of the little jewels here at M.K.H. (McCollum, Kusik, Hodgkins) several weeks ago.

This new engine is the best piece of .15 workmanship to come from the Tigre factory. We cleaned one up and put it on the block with a test prop and the needle went off the end of the scale at over 25 grand . . . without a pipe.



One complete set of Super Tigre X-15 parts. Note the unusual plug arrangement. Plug sits ON head instead of in it, is retained by threaded ring. Coil exposed by small hole in head.

Incidentally, anyone who runs one of Super Tigre's engines of any type without first totally tearing down and carefully cleaning the bugger, deserves Fox plugs as last place prizes. Rumor has it that the Tigre factory hires only emigrant Polish street cleaners for their final assembly technicians, and they insist on great gobs of grinding compound and metal chips in all engines that pass inspection.

The new X-15 is built on the same case as the current G15RV diesel. The case is split horizontally above the webbing so that the internal milling of the Schneurle ports can be accomplished accurately. The top of the case is a separate die casting, also for machining reasons. Induction is rear disc and has been made deeper to stuff the case. The crank is also changed. The disc ring is brass and very well done. This should end the problem of aluminum crank rings that self destruct. The crank disc is also deeper to stuff the case even more. In fact, the case stuffing is very complete; they cut out only enough for the parts and not a thou more.

The front end freedom is the best Tigre has ever had, owing to the junking of their standard rear bearing and using the same small diameter bearing Rossi uses. After all, if the idea works, steal it. Right fellas? But how come you forgot about that junky front bearing? I hope they fit better than the ones in the diesels that pop out.

Front spinner is standard and familiar. Piston and liner is A.B.C. and very sanitary.

The trick setup is in the head. The combustion chamber is trumpet shaped and offset a mile to the front of the en-Continued on page 52



"I said the inverted man goes low!"



Jim Adams' Cessna AW poses with a Vol. 1, No. 1 to give you an idea of its size. Jumbo monoplanes must span 48" or over, 36" for bipes.

JUMBO SCALE CESSNA AW

If you think Peanut Scale is popular, you should see what draws the biggest crowd when there's a combined Peanut and Jumbo contest! Peanuts are cute, but these big scalers are majestic! By JIM ADAMS.

• The Cessna A-W Monoplane was the first cantilever wing, four place type manufactured and flown at the company's field in Wichita, Kansas. It was powered by a 200 h.p. Wright Whirlwind engine. The plane was also available powered by the Siemens or Anzani engines, as desired by the purchaser.

A close look at the plan shows the family resemblance to the famous prewar Cessna Airmaster and today's Cessna 195. Obviously, the A-W is the granddaddy of all of them. The Cessna Monoplane had a wing span of 40 feet, 6-1/2 inches and length of 23 feet, 8-1/2 inches. The wing was constructed of spruce and plywood, while the fuselage, landing gear and tail group were made of steel tubing. The entire airplane was fabric covered. Outstanding features of the plane included its simplicity and distinctive appearance due to the lack of struts.

Construction of the model is very conventional and requires very little explanation. The most important thing to remember in building a Jumbo rubber scale model is to keep the weight to a minimum. This is true with all scale models, but must be particularly emphasized on the large ones. Extra weight will penalize your model during the climb by forcing you to add more rubber . . . which in turn adds more weight.

The 3/32 sheet stripped ribs (a la indoor style) are not absolutely necessary. If you should desire to use sheet ribs, use 1/16 light sheet balsa and substitute 3/32 square spars on the top and



Entire airplane is tissue covered. Landing gear struts are faired with stiff paper. Ship weighs 8 ounces without rubber.



bottom of the wing in place of the sheet spars called out on the plan. The strip ribs are trimmed to the length shown on the plan by cutting excess length from the rear end of the ribs. Patterns are given, one for the ribs between the center and the rib half way to the tip and the other for the ribs from the midpoint on each wing panel to the tip.

Wing construction is started by pinning the leading and trailing edges down over the plan, and adding the 3/32 square lower ribs (Note: These are located at every other rib location.). Add the spars and then trim and cement the previously stripped upper surface wing ribs into place.

The recommended tail construction is laminated per instructions given previously in Fernando Ramos' scale articles in earlier MODEL BUILDER issues. The material is $1/32 \times 1/16$ inch basswood strips.

Paper surfaces should be water shrunk after covering and given two light coats of clear dope. If you desire color, spray on a very light mixture of flat train paint and clear dope or clear lacquer. Mix approximately 50-50. Be careful



Long tail moment adds to ground and air stability of the Cessna. Original was one of earliest light passenger types to use cantilever wing structure ... no struts.

here, and use pigmented finishes sparingly; this is where the weight can build up.

A technique that I have used for several years on tissue, silk span, and silk . . . either wet or dry . . . is to apply two coats of full strength dope to all framework where you want the covering to adhere, let it dry. Sand lightly, and then smooth on covering, using your dope brush to apply thinner to the paper. The thinner activates the dope under the covering instantly and dries very rapidly. Any blushing that occurs will be removed by the first coat of dope. If you get a wrinkle you can lift the paper by re-wetting the area with thinner.

The lettering is cut from black tissue and applied with sparingly used thinner





Plans show proper location of dummy cylinders. Jim just happened to have one of the old celluloid motors, and you could hardly blame him for using it.



Propeller shaft's eye view of the fuselage interior. Stains on paper from rubber lube. Model is several years old, has a few patches. on a small brush. Too much thinner will cause colored dope to bleed through.

One of the most important requirements for getting good flights is the right propeller and the right rubber motor. Don't be afraid to tackle this job and don't be discouraged if your first prop turns out looking like a butter paddle or an oar from a lifeboat. I've noticed that even model builders who have been flying for years often have trouble with the propeller. Start by cutting the block to the dimensions shown in the plans. Carve the back side first, following the lines formed by the edge of the prop. Don't try to put in a lot of undercamber; just get it at least flat from edge to edge. If some under-



camber is desired, limit it to 3/32 inch max. Next, shape the front side of the blades to obtain an airfoil shape. Keep the leading and trailing edges of the blades fairly sharp and thin, much like a speed job wing. The prop blades must not be thick and blunt if they are to perform as they should. Don't be afraid to sand the blades to approximately 3/32 to 1/8 inch thick ... of course, they will be thicker as you approach the hub, but keep them light.

After you have sanded and balanced the prop, coat it with 3 or 4 coats of dope or wood filler, sanded between coats and topped off with a coat of epoxy or Fuller's Plast. Plast is a polyurethane based bar top finish and fuel proofer that gives excellent flexibility to the finished prop.

The nose block should be drilled with approximately $1-1/2^{\circ}$ of down and $1-1/2^{\circ}$ of right thrust. I made the nose block on my model with a slight taper to the sides that fit into the hollow round hole in the nose-piece. The nose block is wedged into the hole by the tension of the rubber. The down and right thrust can be varied by rotating the nose block to obtain more down thrust or more right, as desired. The block and the nose piece should be marked at the top center line in order to maintain the proper setting on successive flights.

The rubber motor is 14 strands of 1/8 brown rubber 26 inches long. Initial flights should be made with 50 turns, then increasing to 75 and then 100. Once the model demonstrates that it is properly trimmed, you can put in 400 to 500 turns, depending on condition of your rubber and your nerve. The motor will take more, but refer to published charts on rubber capacity before trying to wind to maximum turns. However, before putting in even one turn find a large patch of deep grass and try a few gentle glides.

First add some clay to the inside of the nose piece until the model balances at a point 1/3 of the way back from the leading edge of the wing. Aim the nose of the model at a spot on the ground 25 feet away and give it a gentle toss. Add 1/32 inch thick shims under the front of the stab if it stalls and under the rear if it dives.

The model should have a gentle left turn in the glide; the right thrust will take the model around to the right under power. The left turn may not be noticeable during hand gliding, but should show up during low power flights. The entire rudder is moved to get the proper turn. Small blocks (1/8 square) should be added to the lower side of the stab at the leading edge and spar to index the tail assembly to the fuselage. This will ensure the same setting on successive flights. If your model *Continued on page 71*



Pete Paterson (Boeing Hawks) built this sanitary little profile, or Lo-Cal Peanut Scale Bristol Scout. Photo by his son Jay.

FREE FLIGHT SCALE

• Rib tapes are an important part of the covering process on full size aircraft. They are used to cover the rib stitching which holds the fabric onto the ribs. In recent years rib stitching and tapes have been found primarily on R/C scale aircraft where fabric covered wings were simulated. Free flight scale models have nearly always been void of this extra detail, until two years ago at the Nats, when Keith Ward had this added detail on his exquisite Gere Sport.

One of the major problems that a

modeler can run up against in simulating rib tapes is that the pinking associated with the tapes is very difficult to duplicate in all but the largest of scale. It would appear better to either have no tape at all or use tapes without pinking rather than use tapes with pinking which is too large. The other difficult part is trying to simulate the rib stitching under the tapes. In observing several full size aircraft (mostly homebuilt and antique, since many are fabric covered) the degree to which the stitching and tapes were

By FERNANDO RAMOS

conspicuous was varied. If the builder wanted a super finish, then the stitching was only slightly visible due to the many coats of dope that were applied. On a 1 or 1-1/2 inch, and even perhaps a 2 inch scale model, the stitching would be undetectable. Others wanting to get their full size creation into the air, spend fewer hours finishing their aircraft, so the rib stitching, as well as the tape, is very noticeable. Factory jobs seem to fall somewhere in between.

If you plan to use rib tapes, there are



Andrew Moorehouse, Cambridge, England, has solved the balsa shortage problem; he specializes in 1/32 scale models, such as this Gee Bee R1. "Quick, Henry, the Flit!" Photo by Ron Moulton.



Alan Callaghan, Dulwich, England, and his fine flying Heath Bullet.



Another Andrew Moorehouse 1/32 scale model, covered in yellow Japanese tissue, trimmed in black tissue. It's the Brown racer. Think we should try to get some of his plans?



Converted toy electric motor with gear drive and counter, operated by micro-switch on nickle cadmium battery pack, used by Glen Alison, St. Albans, England. How about that!







Isaacs Fury by Alan Callaghan, joins his Heath Bullet. Fury has had slight bolide.

a few items to consider, so let's look at them one at a time. First, you have to establish whether or not you are going through the rigor of duplicating rib stitching. If so, how far apart are they suppose to be? The chart in Fig. I (extracted from AC 43. 14.1) will tell you the spacing based on the flying speed of the prototype; also, closer stitching is required on all aircraft ribs located within the slipstream, which is generally considered to extend one foot beyond the propeller tip.

To make things more interesting, the stitching must also be on the bottom of the wing. On the real aircraft, loops formed by rib stitching secure the fabric to the wing and also transfers the airload of the lifting surface to the lower capstrips of the ribs. Since the rib is actually a lightweight truss assembly, the load is evenly applied. Now, the completed knot is pulled over to one side of the capstrip, making for a neater application of the rib tape.

Once you've decided that you are going to use rib stitching and you have figured out how far apart they should be for the scale you're modeling, rib



Rib tape 2" wide, when scaled down to these popular sizes almost loses any sign of the pinking. Put away those magnifiers, judges!
tapes are next. If you look at the tape sketches you can see just exactly how inconspicuous the pinking is for various common scales up to two-inch scale. In looking through an ad in a 1928 Aero Digest, rib tapes were available without the pinking. Those that had pinking had 8 "pinks" to an inch (Today rib tape has 5-1/2 pinks to an inch). Available also today is rib tape without the pinking. So, one could get by without pinking on a model providing the right prototype on a homebuilt design was chosen.

Taping is required on the leading and trailing edge as well as the wing tips. Without these, the wing wouldn't look finished. Tail surfaces, too, must have stitching and tapes, as well as the wide expanses of fairly flat-fabriccovered surfaces on the top sides, and bottom of a fuselage which should be rib-stitched to the stringers.

So, you can see that before you decide to use stitching and tapes on your scale model, you better be darn sure you're willing to go into enough detail to do the job accurately.

* * *

As most everyone knows by now, the 1974 Nationals will go for twelve days, starting on Sunday, August 4th through Thursday August 15th. Tentatively scheduled on Wednesday the 7th is F/F AMA Scale. A point of interest is that the Flightmasters and the Scalemasters are going to host two unofficial Peanut contests in a hangar on base during the evening. August 8th is scheduled for the Scalemasters event, and August 9th for the Flightmasters. In part, the reason is to try out a different set of rules for Peanut and get a cross section of opinion from active flyers around the country. The Flightmasters will use the Mooney system for both judging and flying. At the writing I do not know what rules the Scalemasters will be using. The Flightmasters are thinking about sponsoring, along with Peanut, a biplane - only class for indoor.



Nothing like the simple, carefree hobby of flying rubber scale models! Fred Wunsche, Pres Bruning, Jack "Zero Mostel" Russ, and Ralph Kuenz prepare Jack's Jumbo T-Craft for flight.



Frank Scott, Dayton, Ohio, launching his F4U Corsair. Three photos on this page were taken by Russ Brown at last year's Chagrin Falls Erie Rubber Scale meet.

This would probably be models with a wingspan of up to 30". Ralph Kuenz will be scale indoor Contest Director.

Next month I will have some building and flying reports on Tern's Starduster, Flyline's Bellanca Skyrocket, and a most unusual kite, that of an SE-5. This last item is really something, different!

June 16 is the date for the Flightmasters Scale R.O.W. contest at Lake Elsinore. The events will be rubber, both Peanut and regular, F/F gas, R/C and U/C for Schneider type racers.



Andrew Moorehouse and another of his exotic 1/32 scale flying scale models. Note the shovel-like blades on that prop!



Chuck Shobloher built the fuselage of his Pesco Special over a foam core. The use of foam should not be overlooked by scale builders.



... if it flies, it will probably land here, eventually

FREE POWER!

How would you like an absolutely free source of power for your flying models? We've got to be talking about wind, gliders, or kites, right? WRONG! Dr. Morton Grosser, engineer, author, entomologist, historian, and all-around aircraft enthusiast, has discovered a new and unique power source, which has immediate application to our hobby, and wants to share the important news with our audience.

Ever see one of the Polaroid SX-70 cameras that "hand you the picture?" Well, needless to say, something is doing the handing, and it turns out to be ordinary electricity, emerging from a 6-volt Ray-O-Vac battery contained in the film cartridge, NOT in the camera itself.

Well, it seems that this hearty little energy cell is being discarded after each supply of film is used, and thus the free power. Run, do not walk to your nearest camera store, and ask the friendly dealer to save these used cartridges for you. (They go through a lot of them giving demonstrations to potential customers), or if you know someone who owns one, ask him to save the empties The Delta Dartnik. Russian variation on Frank Ehling's famous beginner's model.

вид сбоку

for you.

6° RHH3

According to Dr. Grosser, the battery measures about 87mm x 72mm x 2mm. Check that last measurement again, and you'll see why it is so appropriate for model aircraft use. The unit can be easily contained within a wing section! Experiments so far have been with geared Mabuchi slot-car motors, but doubtless other types could be em-Continued on page 64



Framework photo of Charlie Sotich's 1/10th scale Volksplane.



Another photo of completed rubber powered Volksplane by Charlie Sotich. Note extensive detailing. If it wasn't for that prop ...



Pin-Downs are new injection-molded polyethelene plastic doodads which should become very popular with modelers. The small blocks



can be used to hold balsa pieces down to the board while glueing, and also serve to block up doped surfaces while curing. See text.

doctor isn't "witching" the way it should, give it a shot in the tail area and watch it groove.

A/2 DESIGN FORUM

I've always been impressed with the kinds of models which are developed when several designers put their heads together and come up with a team design. Such a team effort was covered in a recent NFFS Symposium on Wakefield design and the SCAMA group did a similar thing. Now, the boys in Vancouver, B.C. have decided to try this approach with A/2 gliders. The Van-couver Gas Model Club has probably produced some of the most successful teams in International Competition in the Western Hemisphere recently, and so when they put their heads together, they usually come up with something good. Here's how it was reported in the January, 1974 issue of Hot Head:

"A meeting was held for those club members interested in FAI and in particular, the design of a basic A/2 model to be used for the qualifying trials and Canadian Team Finals in 1974. A general discussion pointed to two basic approaches of model design: (1) the ultimate type model with extremely high aspect ratio, and (2) the design providing for strength and reliability.

"Those members willing to commit themselves to build the basic model generally agreed to select a strong and reliable type model. A high aspect ratio wing would provide theoretically better glide times in dead air. However, the wing would be: (1) more fragile, (2) less warp resistant, and (3) easier to



APRIL'S MYSTERY MODEL

break in windy weather and turbulent air towing.

"A lower aspect ratio wing would give theoretically not such good glide time in dead air. However, it would eliminate most of the disadvantages of the high aspect ratio wing. It was also noted that the East European flyers use quite a strong and reliable type of model 'without the extremely high aspect ratios and still do very well.

"In a way, the theoretical dead air time is not so important; as a dog can do well in a thermal and a supposedly 180[°]second dead air design can be down in 60 seconds or less in a downer.

"The following design emerged as time went on, while members brought



Bill Van Dieren with his Chickadee. This model was designed as a team effort in a Symposium type program. Photo by Patterson.



Two Chickadee fuselages. Upper model has Russian style circular towhook. Lower one has standard set up. Jim Patterson photo.



up many items for discussion regarding fine points of design and construction: Stabilizer: Area set at 68 sq. inches Span at 19.5 inches Chord at 3.48 inches Aspect Ratio at 5.76 Area to be 12.9% Airfoil used the same as the Mountie (featured last month) Wing: Area set at 459 sq. inches Chord at 5.625 inches Theoretical Projected span at 81.6 inches Theoretical aspect ratio at 14.47:1 Wing angle related to fuselage at 6 degrees. It was decided that the wing airfoil could be any one of the following: 1. Mountie or Lively Lady

2. B 6356 b

3. B 7457 d²

4. GF-6

"The most favored airfoil was the one used for the Mountie, which is identical to the Lively Lady.

Fuselage: Dimension from wing t.e. to stab l.e. is 25.5 inches

Theoretical Center of Gravity: 63% Actual Center of Gravity: 58%

"The meeting was adjourned early in the morning, after the above design criteria were established. I was the lucky fellow to take all the notes; and thus also the task of preparing a detailed drawing. I also will have to take the blame if other good ideas presented at the meeting were not recorded in this report." (by Bill van Dieren.)

A look at some of the pix in this month's column will show you the results of this symposium on A/2 design. The design, called the Chickadee, is an impressive flyer and will be detailed more in a future Model Builder F.F. column.



Enlarged rudder for Witch Doctor 800. See text.

SOLVING THE WEIGHT OF THE TIM-ER IN POWERED FREE FLIGHT

No, Omar, I'm not talking about the guy standing next to you with the stopwatch. It's the timer you've got attached to the left side of your power ship. Usually this one goes tick, tick too, but if you've got an .020 powered model, you'll notice that the tick, tick type timer weighs about as much as your engine. Want to lop off 2/3 of an ounce of fat? Read on to find out how John Ferrer did it, as reported in T-Bug News:

"Has the weight of a timer on an .020 or .010 got to you? A 1/2 ounce timer is significant compared to the weight of a ship, so let's get rid of it. Also get rid of the tank and the extra fuel you usually carry throughout the flight. No, it's not a medicine dropper. The engine doesn't perform too well with the dropper for a number of reasons:

1. The fuel level changes drastically

and affects the fuel consumption rate just as a change in a pressure system would affect it.

2. The fuel tends to aereate with a really singing engine, which results in erratic running.

3. The fuel level for estimating timing is difficult to read accurately because of the aereating process.

"I have been experimenting on the bench with what I feel is a new approach. The fuel system consists of a glass tube fixed in a horizontal position for convenience in which flexible tubing from each end is connected to a Cox T.D. carburetor and crankcase tap off respectively. Reducing bushings are used on each end of the glass tube, and within the tube is a floating teflon piston, which provides the necessary boundary between the pressure side and fuel. The piston also provides an easily readable edge that is read against a scale laid *Continued on page 53*



"He says I make him feel 'like a string of maxes,' whatever that means . . ."



Steve "Speed Crash" Helmick comes up with unique A/2 models. This one is his "Swizzlestick" A/2 with flying fin. Helmick photo.



NEW TREASURER

The National Free Flight Society is looking for an accountant or someone with a good accounting background to assume the post of treasurer of the society. Our current treasurer, Charlie Sotich, has served us in that capacity for a little over five years and has done an incredibly fine job. This job does not require a lot of time, but it does require a good knowledge of accounting procedures. All interested parties please contact Hardy Brodersen, care of Design Origins, 4605 Delemere Blvd., Royal Oak, Michigan 48073.

OLD TIMER FANS

For those of you who have not yet joined NFFS, I thought I would tell you about a new addition to the Digest. It's called "Historical Notes," and the Editor is the one and only Jim Noonan, from Milwaukee. Jim has been active in Free Flight modeling since 1927 . . . that's almost 50 years! In the latest issue of the Digest he has related the history of IMAC. The Illinois Model Aero Club got its start in Chicago in 1911, under the sponsorship of Walter Dickinson and John McCormick. Since that time, it has continually grown to one of the largest clubs in the country. Jim will be tracing the footsteps (or wing beats) of modeling history in future issues. We all welcome Jim as a contributing editor and thank him for his generosity.

POSTAL CONTESTS

Maxi Postal contest for modelers through age 15. It's called the Spring Thermal Maxi and will be held during May and June. For details, see the January issue of the Digest, or write to: Richard Whitten, P.O. Box 176, Wall Street Station, New York, N.Y. 10005.

WITCHDOCTOR 800 MODIFICATIONS

Jim Clem writes that he and a couple of other modelers tested the 800 using a larger rudder. What brought all this about was the fact that some 800's, especially under high power, were not grooving properly. Many that he had seen fly "wandered" all over the sky. After much testing Jim concluded that the larger rudder was the answer to the problem. All of the ships now using the modification groove properly without any tendency to get off the track.

Sig has incorporated the larger rudder in the 800 kits he's now producing, and Jim would like to get the word out to as many modelers as possible that have Witch Doctor 800's built. This would give them the opportunity to make the modification if they so desired. If you send Jim a stamped self addressed envelope, I think he would send you a full size drawing of the new tail feathers. His address is: Jim Clem, 20 East 31st Place, Sand Springs, Oklahoma 74063. (Note: Bob Stalick gives you the new fin dimensions in this month's F/F column. wcn)

PHOTOGRAPHS, ARTICLES, ETC. If any of our members wish to contribute pictures, articles or anything that might be of interest to other modelers, please send the material to Bob Meuser, 4200 Gregory Street, Oakland, California 94619. You may also send items or suggestions to our contributing editors. Their names and addresses are listed below:

Tech Topics: George Zenakis, 1288 Oak Knoll Drive, San Jose, Calif. 95129

Scale: Ralph Kuenz, 14645 Stahelin, Detroit, Mich. 48223

Toss-ups: Frank Perkins, Box 873, Richardson, Texas 75080

Towline Gliders: Vic Nippert, 6 Douglas Drive, Lake Katrine, N.Y. 12449

Rubber Power: Chris Matsuno, 10132 Douglass Court, St. Ann, Mo. 63074

Piston Power: Ed (Loop) Luparelli, 11 Arcturas Drive, Shrewsbury, Mass. 01545

Indoor: Erv Rodemsky, 1624 St. David St., Danville, Calif. 95616

History: James Noonan, 7454 W. Thurston Court, Milwaukee, Wisc. 53218

Old-Timers: Bob Oslan, 7142 Bluesails Drive, Huntington Beach, Calif. 92647



THE 11th MAX! Bill Hunter launches his Satellite for the 11th of 13 maxes plus a 3:31 for a total of 68:31, a new Class C, Cat. I Open record. Flights took place at the Phoenix Southwest Regionals, Buckeye Airport, on Jan. 19, 1974. Satellite 1300 was powered by a Superrigre 65, Photo by Carter Watts, Salt Lake City, Utah.

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Ken Wagner (hat), who was 5th Overall in R/C Sailplanes watches Hulan Mathies as he prepares his Satellite for a flight.

BUCKEYE REPORT

R/Cers and F/Fers had a chance to watch each other in action at this annual Phoenix, Arizona contest. A report by BARBARA HENON, LSF 250. Photos by DICK SHILLING, LSF 226.

• The 24th annual Southwestern Reg- desert, ringed by distant mountains, was ionals washeld January 19th and 20th in Buckeye, Arizona, in spite of the energy crisis which recently caused the cancellation of another major contest in the area. The Buckeye contest, an AMA Class AAA meet, C.D.'d by Roger Gudahl, featured events for free flight, hand launch gliders, control line, and R/C sailplanes. The contest took place on a large runway of the Buckeye Airport, so there was plenty of space for all the events. The setting in the Arizona

spectacular.

The free flight events were of note in that two national records were established. Penny Johnson, of the Max Men's Club, set a duration mark of 2354 seconds for Category 1 - 1/2A Jr. Gas. Penny, a 13 year old girl whose model bears the name "Max Miss", really outdid the competition in 1/2A Gas, including those in the Senior and Open divisions.

Bill Hunter, of the San Valeers, flew a

Satellite for a national record in Category I Class C of 68 minutes, 31 seconds (4111 sec.). I must confess that I had never seen Satellites before this contest, and was most impressed by their launching techniques and the way they transitioned from the power run to free flight. I can only compare this to launching an R/C sailplane, and imagine that it must be difficult to trim these large models to transition so gracefully without losing altitude in the process. Free flight contestants from a



Carter Watts and his "Top Banana," designed by J. Jackson.



Dave Shadel launches Bud Grover's Nimbus. Ship has ailerons and spoilers, was built from Multiplex kit.





Bob King, Phoenix, Arizona, and his original desin "Magician." Wing has elliptical dihedral and is mounted on a pylon.

Tom Williams, 1st in Precision, launching his White Trash. Tom will be CDing an R/C glider event at the 1974 Nationals. ling the Max Men.



Fred Calhoun Jr. and Sr. working on their Starduster 900.

number of clubs including the Max Men, San Valeers (San Fernando Valley, Calif.) SHOC (Sky Hoppers of Orange County), Thermal Thumbers, Utah State Aero Modelers, and the Phoenix Model Airplane Club, took part in the contest. The weather was gorgeous, with good lift, and the only problem the free flighters seemed to have was finding their models after chasing them across those wide open spaces.

The R/C Glider event was hosted by C.D. Robert von Hellens of the Arizona Soaring Club, Phoenix. Bob was the winner of the Western Soaring Championships held at Mile Square in California last spring. He was ably and graciously assisted by his wife, who acted as registrar and scorekeeper, as well as by other members of the host club.

Although we had some reservations about the distances involved and the possibility of being stranded by lack of gasoline, about nine of us from our club, the San Fernando Valley Silent *Continued on page 70*



Penny Johnson set a Cat I 1/2A Junior record of 39:14 with her "Max Miss."



Randy Secor, his Ultimate Dragmaster, and his ace retriever, Bambi.



R/C Sailplane winners at Phoenix. Top (I to r): C.D. Bob von Hellens, Dave Shadel 1st Overall, Wayne Darnaby 2nd Overall, Dave Smith 3rd Overall, Ken Wagner 5th Overall. Bottom (I to r): Bud Grover 1st Distance, Tom Williams 1st Precision, and J. P. Frignac 1st Duration.



Copies of the original 28 x 40 inch drawings Order direct from PETER WESTBURG, 834 s of the Dougla 4 Seventh St., 1 as 0-43A are available at \$4,50 a set. Santa Monica, California 90403.

MODEL BUILDER



First production O-43A at Clover Field, Santa Monica, May 17, 1934. Conqueror moved forward 15" and cockpit enclosed in canopy.

DOUGLAS O-43A (PAR

• By 1933, development of the Douglas observation parasol airplanes had progressed to the point where the Air Corps decided to buy twenty-four O-43A's. The apparent difference from its Y1O-43 predecessor was the lack of a spinner and the replacement of the exhaust tubes with saxophone exhausts. There were also other changes; the cockpit was made wider and it was completely enclosed in a canopy, and the final vertical tail configuration was changed to one much like the high, peaked tail of the later O-31A's and O-31B. The weight increased, and to balance the airplane, the Conqueror engine was moved forward fifteen inches. On later airplanes, wing flaps were retrofitted.

Of the twenty-four airplanes, eleven were written off as the result of accidents between May, 1935 and February 1942; one was declared unserviceable and scrapped, and eleven were retired to ground schools, the last in 1941. The final production O-43A became the XO-46, prototype of the O-46A, which

(PART 1) By PETER WESTBURG

will be described in the last article on the Douglas high wing observation jobs.

Over the years, the O-43A changed its colors from the familiar olive drab and yellow, to blue and yellow, and finally the silver designated for obsolete airplanes. A few survivors had the olive drab and gray camouflage applied in 1941. At the dawning of the jet age, the O-43A was a real anachronism with its Morane parasol wire bracing.

SHEET 2 OF PLANS, NEXT PAGE



Aft center panel of canopy left open to provide clearance for .30 caliber Browning, which was partially recessed in fuselage.



BUILDER



Painted and decorated in the colors of the Air Force Aerobatic Demonstration Team, this model of the F4 Phantom glides through the air at speeds that make it look very much like the full size jets in action. Find yourself plenty of open space to fly these beauties!

SLINGSHOT THUNDERBIRD

Here's a project that will transition your young modeler from sheet balsa gliders into built-up construction and tissue covering . . . yet it's still a glider, but with a different method of launching. By DENNIS NORMAN.

• One of the most beautiful and inspiring sights in aviation today is the formation flying done by America's aerobatic teams. Both the U.S. Navy's "Blue Angels" and the U.S. Air Force's "Thunderbirds" have thrilled millions with the speed and precision of their flying. This project was designed to recreate the excitement of watching a "Thunderbird" streaking overhead in a low pass. Flight time is always in seconds, but the model's sturdy construction will give you hundreds of flights as rapidly as you wish.

Construction is pretty much elementary, but special attention should be given to the tail surfaces which are made adjustable by the use of aluminum tabs. The wings and fuselage are built entirely from 1/16 inch sheet balsa. A simple profile fuselage may be constructed by laminating three sheet balsa profiles (this was done in our first test model and proved quite satisfactory). The "built-up" fuselage takes more time, but adds considerably to the model's appearance.

WING CONSTRUCTION

Begin by tracing the wing tip patterns onto medium hard 1/16 balsa sheet, making sure that the grain runs parallel with the leading edge. Next, trace the triangular front portion of the wing's center section onto 1/16 sheet balsa, arranging it so that the grain runs from tip to tip. Similarly, trace the rear portion of the wing's center section onto 1/16 sheet balsa.

Having cut the four wing pieces, place

the two large center sections over the wax paper covered plan and glue together, forming one large triangular unit. When this dries, remove the center section from the plan and sand an air foil by rounding the leading edge and tapering the trailing edge. In doing this, be especially careful with the trailing edge tips, since the wood grain will make them very brittle and easily broken. In similar fashion, sand an air foil shape into each of the wing tip pieces.

Having sanded air foil onto the wing, place the center section back on your workboard and pin it in place. Next, take your sanding block and lightly bevel the side of each wing tip which will be joined with the center section. Having done so, glue each wing tip to the center section, making sure that each is propped up 1/2" for dihedral. Construction of the wing is now completed and it should be set aside to dry thoroughly.

FUSELAGE

As mentioned earlier, the fuselage can be built in one of two ways. If you want to simplify things, cut the fuselage's profile from a sheet of 3/16 inch balsa. Having done so, simply round the edges and your fuselage is completed.

To make a more realistic looking model, you need to build up the fuse-



One good way to build this model is to make yourself a pre-fab kit, as shown above. As a class project, many such "kits" can be prepared before construction is actually started.



MODEL BUILDER



lage. Do this by cutting the profile keel, side longerons, and formers, from 1/16 sheet balsa. For maximum strength, an "egg crate" type of interlocking construction is used. The deep grooves in each piece are cut with a sharp, singleedged razor blade. The smaller notches on the formers are for stringers and may either be cut or sanded out. If you don't already have one, you can make a very useful tool for sanding stringer notches by gluing a 1/16 wide strip of medium weight sandpaper onto the edge of a small piece of 1/16 sheet balsa, making in effect, a very small emery board which will "notch" neatly and rapidly.

Having cut and prepared all of the fuselage pieces, begin assembly by slipping the formers for each side onto the appropriate side longeron. Assuring that you have cut the deep grooves properly, you should be able to lay the finished assembly flat on your work table so the inside edges of the longeron and all of the formers are flat on the table. Having completed each side assembly, glue them one at a time to the profile keel.

Once this assembly is dry, you are ready to add the stringers in the usual way. The Phantom is a very curvaceous aircraft and you will find that the stringers bend and dip gracefully over the fuselage. The only area of difficulty will be the sharp curves found in the air intake space between Formers 3 and 4. Here stringers will not work. Instead, take pieces of scrap 1/16 sheet balsa, approximately 1/4 inch in width, and glue them between the notches in this area. When they're dry, you can then sand or carve these pieces to the appropriate curved shape.

The nose is made by gluing four balsa blocks into the spaces formed by the keel and side longerons. When these blocks are dry, they can be carved and sanded to the appropriate streamline shape. In doing this, make sure that you hold the fuselage only on the keel or on the side longeron pieces, since the 1/16 square stringers will break if they are gripped too hard. The pod beneath the nose is also built up from balsa blocks.

Extensive flying of the prototype model showed that its nose flattened after several flights. This was remedied by sawing a vertical 1/16 groove into the center of the nose. The cut was made to a depth of 1 inch, thus removing that portion of the original balsa fuselage keel. This groove was then filled with a piece of 1/16 plywood sheet, which was sanded to shape. A couple of hundred flights have since been made with the reinforced nose, and the flattening has not recurred.

With the nose completed and the stringers in place, you should next take your sandpaper block and lightly sand down the entire fuselage, making sure that any portions of the formers protruding beyond the stringers are sanded



This is how the underside of the Thunderbird jets are painted. The colors are red, white, and blue, naturally. You can also "Go Navy" or put on Viet Nam camouflage!



This shows you how the fuselage is built sort of egg-crate fashion. Hey, guys, when did you last see a genuine egg-crate? Everything is molded foam nowadays!

flat. This will insure a much smoother look to the model when it is covered with tissue.

WING/FUSELAGE ASSEMBLY

The wing and fuselage should now be glued together. Assuming that everything is properly aligned, this will be easily accomplished by fitting the wing into the notch on the underside of the fuselage. Having joined these pieces, set the entire unit aside to dry. When it is dry, glue Part Number II beneath the center section of the wing as indicated. Also glue the 1/16 hardwood power launching pegs in place.

TAIL SURFACES

This model can be built with sheet tail surfaces which are fixed. The prototype glider was built this way and flew fairly well, but aignment was tricky and it was found that more satisfactory results could be obtained by making the tail surfaces adjustable. Several methods were tried, but the best was found to be the use of soft aluminum tabs (cut from .012 sheet) which were laminated between pieces of 1/32 sheet balsa.

Begin by cutting four horizontal stabilizer pieces from 1/32 sheet balsa. As with the wing tips discussed earlier, make sure that the grain of the balsa is parallel with the leading edge of each piece. Cut a $1/2 \times 2$ inch strip of .012

aluminum sheet. Next cut a slot in the rear of the fuselage below the side longerons and through the profile keel just behind Former 10. Slip the aluminum tab through this groove and center it so that an equal portion protrudes from each side of the fuselage. The aluminum tab itself may be fastened to the fuselage by the use of epoxy, household cement or with a glue gun. Rough up the tab in the area to be glued, for better adhesion.

Once the aluminum stabilizer tab is dry, glue one half of each stabilizer in place, making sure that both sides are aligned. When these pieces are dry, take the remaining half of each stabilizer piece and glue it to the other, thus completing the "sandwich". After stabilizers have dried thoroughly, again sand each to an airfoil shape as you did with the wing tips. Finally, bend each stabilizer down to the angle shown to give the characteristic drooped look.

VERTICAL STABILIZER

The vertical stabilizer is built in much the same way as the horizontal stabilizer. The principal difference is that the aluminum tab is sandwiched between the the fin and rudder, making the latter adjustable as needed. Again, the pieces are cut from 1/32 balsa sheet and the *Continued on page 65*

SAILFISH

One of the prettiest Sailboats you ever saw either Free Sailing, or R/C. Construction is simplicity itself. Die Cut Frame, features Plywood for strength and long life. Printed-planked Deck is Die Cut and ready to slip into rub rail, molded into Sleek Plastic Hull. Kit is unusually complete with Die Cut Mahogany Cabin, Brass Chain, Many Cast Metal Fittings, CLOTH SAILS, Rigging cordage, Mast & Boom Material stamped Rudder and Keel with INTEGRAL LEAD BALLAST, Step by Step Plans show simple assembly. Base shown not included.

HEIGHT 321/2" LENGTH 24" BEAM 5"



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C/L..... Continued from page 27 gine. The plug doesn't enter the combustion chamber . . . in fact it doesn't look like a plug! There are no threads and it has a reverse shoulder. The plug fires through a small hole in the top of the chamber and is held in place by a clamp ring.

The final and best touch is the use of socket head bolts to hold the whole thing together. Other engine builders take note and get rid of those trashy slots or Phillips.

The engine comes with a pipe adapter but the pipe is an extra accessory for an additional ten bucks. If you buy the whole works, you will have a speedready setup for a lot less than fifty bucks and there ain't nowhere else you can get a deal like that, folks! ASPHALT FOR COMBAT?

The Valley Circle Burners are really getting it on. The Sepulveda Basin flying site has new circles; A couple of solid pads for racing, a ring or so for stunt, and soon to be grassed (not gassed) combat staging areas with asphalt center pads for the pilots. Everyone get out and fly!

NAVY SPONSORSHIP IN CALIFORNIA

North Island Navy Base is the place to be again this year. The S.C.C.A. has confirmation for two more contests in '74 as a direct result of the successful two day meets held there last year. There are separate painted circles for all asphalt events, with a large grass park area adjoining for combat and carrier. The dates are May 4th and 5th and October 5th and 6th. If you're not there, you probably don't know which end is up.

MISCELLANEOUS GEMS

If you are looking for control components that will stay together for a 200 pound pull and last forever without wear, check into the equipment from Hi Johnson, 1669 Twelfth St., Santa Monica, Calif. 90404.

Need a speed dolly that works, or

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ALL BALSA MODEL PLANE KITS *Ready to Assemble*





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go out and get one or more of these nifty control line models. They're the easiest ones in the world to assemble—all wood, no tissue covering—only 6 to 9 parts, depending on the model (except the Fokker which has a few more, because of the struts). Genuine Nylon motor mount ready to bolt in place—Complete control system (less handle and lines) decals, landing gear, wheels etc.; which makes building a cinch and assembly literally in minutes.



MODELS (

PHILA PA 19144 USA



Mono-Line equipment? Walter Brassell has a list of super trick setups. 4361 Montview Dr., Chattanooga, Tenn. 37411. WHAT A FARCE ... BUT IT WORKS!

WHAT A FARCE ... BUT IT WORKS! R/C Stand-Off Scale is an outrageous concept to old time scale builders and contestants. The idea of building a scale model that is not scale is dumb. When you look at many of the stand-off scale models and see better workmanship and finer detail than many "alsoran" Nationals models of years past, one wonders who is fooling whom.

But it does work, and R/C scale is more popular than ever. Why wouldn't stand-off scale work in control-line? We could really use a gimmick of some sort to build interest in scale. I am not sure how it would have to be done but I am sure it would work. Perhaps somebody can pick up the idea and put together some guidelines that would interest people and make a comeback for control-line scale.

Scale building is a very satisfying part of our hobby, and control-line flying is the safest method of flying wings to your treasured bird. Think about it awhile folks, if you will ... it does seem promising even if it is dumb.

F/F..... Continued from page 40 parallel to the glass tube. The system is filled with a syringe to minimize air entrapment, and the little air that does get into the system pumps out on the first engine prime.

"Bench tests with a tube 1/4 inches O.D. by 10" long give about two minutes engine run. This computes to a fuel consumption of .03 cc per second for the T.D. .020. Timing from a one minute mark, the engine run has been repeatable to within one second. For a 10 second engine run, the piston travel is about 7/8 inches. This is roughly equivalent to the mechanical timer arc length for 10 seconds. Resolution can be increased by using a smaller diameter tube if so desired.

"The glass tube can be mounted in a

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cavity in the side of the fuselage. A system about 4 inches long gives a total engine run of about 35 seconds, which is ample time for adjustment prior to launch. Its weight with fuel is a whopping 5 grams (1/5 oz.). Compare that to a pen bladder or pacifier system. I have smaller and larger tubing for further experimentation. I am convinced that a 1/2A ship of 320 squares can be built at 5-1/2 ounces with room to spare.

"Laboratory pipets come in various sizes of which I have obtained a few. They are convenient in that one end necks down so that an adapter to tubing is not necessary. The tube is graduated so that no additional scale is needed. One needs only to cut the tube to a desired length, wet sand with 320 at the break, drop in a "piston" and if you're lucky, the right assortment of rubber tubing sizes will allow you to make a suitable reducer. The system should be practical for any size engine." UNITED STATES FREE FLIGHT CHAMPIONSHIPS

This annual big do has garnered its share of the spotlight as the contest to attend. This year's big meet appears to be no exception. Scheduled for Taft, California again in 1974, it will be held on May 25 through 27. Added events this year include indoor, such as: Peanut Scale, Penny Plane and Indoor Hand Launch Glider. Night flying events have been moved to Sunday night so that the indoor events can be held on Saturday evening.

Sandy Norton is the Contest Director. The events listing reads as follows: SATURDAY, MAY 25

A Gas* **FAI** Power A/1 Glider* Coupe D'Hiver .020 SCIFS Old Timer 30 Second Antique Old Timer Rubber Night Indoor Flying SUNDAY, MAY 26 1/2A Gas* C Gas Hand Launch Glider* Wakefield A Old Timer **B** Old Timer C Old Timer Gas F.F. Scale Rubber F.F. Scale MONDAY, MAY 27 B Gas Junior BC Gas* A/2 Glider Unlimited Rubber Rocket Payload D Gas (.41 - .65)

* indicates Junior Events

Additional information may be obtained by contacting: Jim Scarborough, Box 293, Lawndale, Calif. 90260.

(Editor's Note: MODEL BUILDER and the San Diego O.T. Group are also co-sponsoring R/C Old Timer events during the USFFC. If you plan to compete, try to avoid using 27 mHz. There is likely to be strong interference on this band. No problem on 72 mHz and 6 meters. See "Plug Sparks" for further details.)

NEXT TO LAST SECTION

For any of you who are still with us, we'd like to draw your attention to the fact that even though many of you wrote to tell about your latest, no one has really forwarded any pictures. Now, why don't you take your camera to the next flying session and try to click a few. Then, send some of them off to M.B. We would really appreciate it. All we need are good clear black and white types - no polaroid, please, and we'll promise to print. Isn't that easy? MODELING WHIMSY

So far, in previous issues, we have dealt with the trials of the motorcycling modeler, a modeller's training program, and free flighters we all have known. We have ignored the model long enough. This month, we propose to rectify that problem, and have done so by reaching (some say retching) into the back issues of WMC Patter, unearthing a piece of technical writing that should be spread upon the free flight masses. Written (but not claimed) by Jack Shafer some years ago, it is presented here for your edification.

AUTOMATIC-MODEL-FROM-TREE-**GETTER-DOWNER**

"As a student of mechanical engineering at Oregon State University, I have long felt a desire to apply my newly acquired knowledge to one of the more pressing problems facing the modeling fraternity, namely how to get a model down from a tree. The result of this desire, plus many hours of analysis, research, and testing are presented herewith:

Operation:

"Collection basket (A) gathers leaves as they fall from tree in autumn. When sufficient leaves have been gathered, their weight overbalances counterweight (B), causing beam (C) to rotate about pivot (D). This motion is transmitted by linkage (E) to match (F) which rubs against sandpaper (G) causing match to ignite. The match in turn lights candle (H), which heats actuator (I) (1.57 to 6.80 dozen Mexican Jumping Beans ... but more about this later).

"Now, we all know what happens when a fire is built under a bunch of jumping beans (If you have trouble visualizing this concept, try imagining yourself in their place). The resulting agitation causes the model to shake itself from the tree and return to the ground. The advantages of this system (automatic operation, no model damage due to sticks, arrows, etc. used in retrieval attempts) should be readily apparent.

Helpful Hints:

"For maximum effectiveness, restrict all flying to the last two weeks in October. This will insure an adequate supply of leaves. Suggested actuator strengths are shown below:

1/2A: use 1.57 to 2.04 doz. beans

A: use 2.17 to 3.41 doz. beans

FAI and B: use 3.41 to 5.00 doz, beans C: use 5.00 to 6.80 doz. beans.

"Increase all amounts by 25% when operation below 37.5 degrees F is contemplated."

Now, all of you hot competitors out there who go to Taft for the US FF Champs in May don't have to worry much about equipping your model with Jack's device . . . There just ain't many (Any! wcn) trees cluttering the landscape.

Well, that wraps us up for another month. Keep us informed on what's happening wherever you are. Put us on your newsletter list. Write us nasty letters. Write us nice letters. Do both.

And, you, standing in the corner of the hobby shop reading this magazine, buy it and make Bill Northrop a happy man.

R/C Report ... Continued from page 19

mHz (six meter) Amateur Band you must have an Amateur License of Tech-



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nical, General or Extra Class. This will legally permit you to operate your R/C gear on the 50 mHz band. Again, this Ham license is only good for this 50 mHz band . . . it does not permit the Ham to operate on the 27 mHz or 72 mHz band of frequencies without the FCC Class license, either in his name or as a properly issued Club Class C license.

With me so far? OK, there is also the unusual, but legal situation of the fellow who shows up at the Nats and local contests with 50 mHz equipment who doesn't have any license at all. He states that Joe Glitch, who does have a ham license and is standing right over there, will turn his equipment off and on

while he flys it. This is perfectly legal, for, in truth, only the holder of an Amateur License of the proper class may legally turn on and off equipment on this frequency. This looks good and in proper form to the processors, and the fellow is permitted to fly. However, ninety nine times out of a hundred, good old Joe Glitch isn't within a hundred feet of our well meaning friend who got in with no license at all. Again, technically speaking, it is the responsibility of the contest director to see that the man who was supposed to turn the equipment on and off is right there at the side of this flyer each time he flys.

I'm sure many of you who have read

Introducing PermaGloss Coverite It looks and feels like it's been painted because it has!

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As for weight (always an important consideration) it is equal to painted silk, and is therefore ideal for all but the very lightest indoor models.

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Now a critical word about the unique strength of all Coverite coverings (Super, Silkspun & PermaGloss): They are the only iron-ons made from DuPont Dacron and woven into a supertough fabric. All other iron-ons are made from plastic film, which can scratch during application, sag later on, and shatter upon impact. When Coverite planes crash, they frequently bounce and can be flown again immediately. We challenge any other covering to make these statements! Try new PermaGloss Coverite and the difference will be obvious!

New PermaGloss Coverite should be on your dealer's shelves now – in pure white, brilliant red, and high intensity yellow. If your dealer does not have PermaGloss Coverite, you may order direct. Send check or money order for \$8.40 per 5-ft. roll to Coverite, 119 York Road, Jenkintown, Pa., USA, 19046 (foreign orders add \$1).

this far are convinced that I'm rocking the boat and making all sorts of waves, but my feelings are this; if the regulations concerning engines, airplane sizes, etc. and AMA licensing are strictly enforced, I see no reason in the world why the Federal Communications Commission regulations (those which permit us to enjoy the use of the R/C equipment) are not just as strictly observed.

To make further waves; I also question the legality of our good brothers from Mexico and Canada who use radio control equipment in this country with just their own country's licenses. I do not think there is a reciprocal agreement between this country and others concerning foreign nationals using equipment in this country on the Citizen Bands. There is, however, such an agreement between this country and, I think, Mexico and Canada relating to Amateur operation, and I feel that it behooves the AMA to investigate this thoroughly and find out *just what is legal*. This matter should be clarified in time to issue public notice for the benefit of foreign contestants planning to enter our Nationals at Lake Charles.

Received a very good Club Bulletin from the Des Moines Modelaires edited by old buddy K.K. McClure and his charming wife, Gwen. Not only did this Bulletin have some very complimentary things to say about MODEL BUILDER (we loved that part especially!), but their Bulletin does a great job of covering the local modelling scene and items of general interest in the R/C scene. The McClures previously lived in Memphis and contributed much service to the Memphis R/C Club. Memphis isn't that far from Nashville and I did get to see these nice folks from time to time. We miss them, and both are, I'm sure, a great asset to the Des Moines Modelaires Club.

The Kansas City Radio Control Bulletin "Contacts", edited by Charley Reed, is another example of a "reely big" bulletin, full of news and such. I receive many club Bulletins, and these are but a few of the fine efforts by local editors all over the country.

Next month we'll have a report on some of the fascinating new stuff seen at Toledo. (Ahem! Frank will also tell you about new products seen at Toledo! wcn).

R/C Cars Continued from page 25

adjustment plugged in is sort of typical (car needs more low speed stability and more front bite . . . negative stability . . . at high speed). I selected two sets of variables so you could see different ways to solve the problem. As you'd expect in first example; caster, moving the wing forward, and raising the c.g., all do things you want to handling. In the second example, the front spoiler and camber help the front enough at high speed so that harder front tires can be used for low speed stability. The third example is possibly what you would do with a beginner's car . . . more stability everywhere. Let the front end push, stick the rear to the ground and cut down the power. If you'd like the actual program (for a GE 600 time share terminal) write to the address given below.

As always, rules are meant to be broken. When track conditions are poor (dusty, slimey track) many of the things we talked about become very important and others less sensitive. In extreme cases the effects seem to reverse. Sometimes it is difficult to be smart enough to convince ourselves that it is really happening. I probably have this problem more than most because I believe I know what's going on. One case in point is when the track becomes, or is, slippery due to dust or oil at the right conditions. When this happens weight is very important. The heavy cars seem to be really better and much more controllable. Tires, fuel, gear ratio, aerodynamics and all that stuff seem to take a back seat. The moral of this story is that a little heavier car is a lot safer in the handling department. From now on I'm going to carry around some lead weights ... and use them too.

This article essentially concludes all

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11



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of the standard adjustments that can be made to an R/C car. What I have said is what I feel happens to my car when I make the noted changes. But your car may be different. You must assign your own values as to the high speed and low speed effects of the adjustments.

One final article on adjustments will appear in a few months. In that article I will present comments by some drivers from all over the country. I hope to have comments from Del Fisher, Arturo Carbonell, Ken Campbell, Tony Bellizi, Mike Morrissey, Don Amedo, Gene Husting, Roger Curtis, John Thorp and anybody else who wants to have a say.

If you missed any of the articles or have any questions or comments drop me a line. My address is Chuck Hallum c/o HRE Inc., P.O. Box 4658, Irvine, Ca 92664. Hope your cars are running super...see you next month.

Choppers Continued from page 23

gine, then suddenly discovers it's all over the place for the first 5 or 10 flights, and he just can't get the hang of it. Immediately discouraged, he hangs it up in a corner of the workshop and mumbles to himself for having spent all that money.

The next phase of his growth in the chopper-hobby is to buy a bigger and better kit. With bushels of "good reports" on this new kit, he undertakes the learning process with the conviction he can do it. (Something he didn't quite have with the 505). Sure 'nuff, his first few test hops are pretty good and he knows it won't be long before he's flying with the rest of the gang. The obvious conclusion is that the 505 was no d - - n good . . . but the new kit is really great! What has skipped his mind is the fact that those earlier 505 flights (no matter how bad) have contributed to his learning process and shortened the time on his new chopper.

No matter which kit he builds, the tyro chopper pilot will require about 5 to 10 hours of experimentation before he gets in a flight which he really considers satisfactory ... and that's a lot of fuel! Had he started with the big kit in the beginning, he probably would have had the same experiences as with the 505. The greater cash outlay, however, tends to keep him pushing beyond the point at which he gave up with the 505.

Without doubt, the Whirlybird is limited in performance; (a) it's not as stable as the larger, heavier machines, (b) learning must be undertaken in calm to light winds, (c) it is not a speeddemon . . . in fact it can become uncontrollable at high speeds. All of the above puts it into the beginner's class of helicopter . . . but, it is an excellent introduction to the sport. Dave Grey is to be highly commended for his design, and Du-Bro for their introduction of an inexpensive, flyable helicopter to the hobby market. I have movies of my son Kim (13 years old at the time) making spiral takeoffs, S-turns, wing-overs and fairly fast circular flights (ala U-control) all under perfect control. Ed Sweeney's "Super-Bird" conversion is a fine "nextstep-up," with minimum extra investment and the performance gains are considerable.

Those of you contemplating building the 505 should follow the instructions exactly, with the exception of the horizontal stabilizer, which many chopper pilots prefer to omit . . . it makes the little bird less susceptible to wind and down-wash. And by all means, read the next paragraph concerning training gear, an absolute must when first learning to fly choppers!

FIRST FLIGHT CONSIDERATIONS

The following information is applicable to all model helicopters and concerns some of the fine points in learning to fly. If you are a beginner, you should not attempt flight without some sort of training gear. All helicopters exhibit a tendency to "rock-n-roll" on the conventional scale landing gears, even when making a good touchdown. This motion is transmitted to the main rotors, 90 degrees out of phase, which can cause



the entire machine to roll over or nose in, with considerable damage to rotor blades and bent main shafts. If I remember correctly, my first chopper made it necessary for me to convert my workshop into a lumber mill! I went through 20 or more sets of rotor blades before I "discovered" training gears!

Ideally, a training gear is a simple installation of dowels or skids which expand the width of the gear to around 50% to 75% of the rotor span. In this fashion, it is next to impossible to tip it over. I won't go into detail here, because you can look at the magazine pictures and adapt any system to suit your own needs. Struts are usually made from dowels, fibreglass arrow shafts, piano wire, aluminum tubing, fishing rods, etc. Regular wheels will permit taxiing, and practice golf balls (plastic) make excellent wheels for unlimited freedom on the ground. The use of floats has also been suggested for training gear. Whatever the style, make them light and strong to stand the terrible beating they will take for your first few hours.

Next step: Specifically check the manufacturer's recommendations concerning center-of-gravity (it must be right on), control movements, oiling or greasing of parts, loose wires, etc. Each model varies, however you should make up a pre-flight check list to be followed each time you fly ... cover all items such as mechanical linkage security, fuel, batteries up to charge, etc.

The last step is to get airborne and down again without "dinging" your chopper! A few manufacturers recommend tethering the model with strings or cables, thus allowing limited movement for practice, yet at the same time preventing it from wandering into a critical altitude. Many different tethering systems are used, ranging from handheld strings, to elaborate pulley/cable arrangements. I have even seen plans in a British model magazine for a counter balanced platform mounted on a lazysusan turntable. Because all of these devices tend to restrict the chopper's movements, I do not personally feel they have as much merit as installing training gear and following a slow, careful learning process. A successful method I have used in the past enables the beginner to check himself out, if he closely follows instructions and adheres to the program, before advancing to subsequent steps. Basically, it involves four separate phases to be followed for each training flight:

1. PREFLIGHT

a. Run preflight check-list as mentioned earlier.

b. Check all control movements before starting engine, by watching swashplate, carb and tail rotor pitch.

c. Re-check all controls after starting

engine in same manner as above. Engine must be adjusted at this point for idle speed just below rotor engagement RPM.

d. Verify rotor tracking at some RPM just below lift-off. Blades *must* track within 1/8 inch or be re-adjusted per kit recommendations. "Out-oftrack" results in excessive vibration and *loss* of control.

e. Check plane of rotation of main rotors when transmitter stick is moved to extreme positions. Rotor tilts forward with forward stick and rearward with rearward stick, etc.

2. TRIMMING

a. Always point the helicopter into the wind for practice lift-offs... no exceptions...reposition the helicopter and yourself for each flight. S-L-O-W-L-Y apply throttle until helicopter gets "light" and "swims" on the ground. Be careful not to let it become airborne...close throttle immediately if model lifts off or becomes uncontrollable!

b. Repeat this step at least enough times (25 - 30) to become familiar with "swimming" characteristics and to develop "close throttle" reflexes. Do not be concerned with any other turning or drifting of the helicopter at this stage. Just keep yourself near the tail at all times, and preferably off to the left slightly (10 feet).

c. Concentrate on rudder control



MODEL BUILDER

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fast until you are ready for it to do so. GILBERT'S HUGHES 500

Last month we published the first half of Charles Gilbert's R/C Hughes 500 design considerations. Here is the conclusion of that article:

"Back to some of the design considerations. I decided that if the machine was to have a chance to fly, it would be necessary to go a little out of scale, but not enough to be too noticeable. I have made the tail boom slightly larger for strength and longer for a better tail moment arm.

"Because of the short moment arm, I would have to either design in a fantastic tail rotor speed or a larger tail rotor diameter. I chose the larger tail rotor diameter. This made it necessary to go larger than scale on the empennage, which I feel is a step in the right direction for a model anyway.

"The final change was to enlarge the tail pipe diameter in order to allow cooling air to exit.

"At first, thought I would use an Ohlsson & Rice engine, with clutch, but without the gear box. A layout showed this to be too cumbersome, so I have since decided to go to what I believe is a simpler system using an O.S. Max 80.

"The engine will be mounted facing aft. A long horizontal extension shaft, bearing supported, will run back to the tail pipe exhaust opening, where a cone on the shaft will be used for starting with an electric starter. The main rotor gear box will be mounted just under the swashplate inside the fuselage. The gearbox will be fitted with a 4 to 1 bevel gear set with the smaller gear aft. A horizontal shaft from the smaller gear will mount a timing belt sprocket and clutch which will be driven from a sprocket on the engine shaft. A small diameter shaft (3/32 inch) will drive the tail rotor gear box.

"This chopper will have a four-bladed main rotor which hopefully will provide enough lifting moment to accomplish loops and rolls! It will be a rigid rotor type with extra flexible blades, and will have full collective pitch capability.

"The main rotor hub, swashplate, and gyro bar pitch links are completed but I have a long way yet to go. I will write more later after it is finished. In the meantime, please wish me luck! I will need a lot of it."

I get the feeling that Editor Bill is going to chastise me for trying to cram in too much information in this issue (No problem, John. Just keep it coming. wcn) so will close shop for now.

R/C Soaring.. Continued from page 13 Full down elevator would almost keep it from stalling. The addition of a tight circle helped keep the nose down to level. So there it was . . . at 500-feet altitude on its way in . . . 7 pounds and 12 feet of honkin'-mean sailplane that required full forward and hard over stick



to kill its violent desire to stall.

It came to mind that landing under these conditions might be a little dicey. Looking around for help . . . advice . . . encouragement . . . sympathy . . , it was obvious that the field was suddenly empty. Sets of eyes could be seen under cars and behind campers, but no one was within shouting distance . . . except Paul. His young retrievers had dropped him nearby . . . and run. To hell with it. It's every boy for himself when "Old Dummy" is up. Paul looked content . . . even comfortable sprawled there on the grass. His eyes were glassy, but there was a hint of a smile on his face. He seemed to understand what was happening. Perhaps an act of kindness would reassure him. There's always time for a friend. "Would you like to fly my new sailplane, Paul?" It looked as if he tried to spit, but he was awfully dry. He just sorta made a "whit, whit" sound. We figured he didn't want to fly it just then.

There is no logical explanation of how . . . and certainly no reason why that sailplane was landed safely. But it was. No skill involved . . . just pure, stupid luck. That is, except for one trick we've learned. When things get really scary, shutting the eyes until the danger has passed sometimes helps.

Big Juan's problem was determined

APRIL 1974



to be a tail heavy condition, but only after very careful checking with other than finger support. We'd checked the balance *that* way before we went to the field. A full quarter pound of ballast was required to get the balance point forward to the proper position. With this addition, there was enough lead in that machine to detune the radio . . . but it flew and handled beautifully.

And now, back to work.

The next step is to check for alignment . . . warps, squareness, incidence settings and that sort of thing. Wing tip washout should be checked carefully. A large table or kitchen counter makes a good surface plate. Each tip should have some washout . . . at least 1/4-inch . . . unless you're expert enough to convince yourself that you don't need it. Some designs don't specify washout as such, but rather, incorporate a progressive airfoil change to accomplish the same results. And some say nothing about anything. If it isn't clear, add a little

washout. It won't hurt and it can always be removed after test flights.

Perhaps more important than the amount of washout... assuming there's some ... is that it's the same in each wing panel. Otherwise the effect is that of a warped wing, and everybody knows that's bad. With the heat shrinkable plastic covering materials, washout can be increased or removed with a hot iron, some held-in twist, and a little patience. Get the wing panels true ... free of twist ... except for a measured amount of washout at the tips (Figure 4). The stabilizer also should be free of warps ... with no exceptions.

Be certain wing and tail surfaces are square to fuselage centerline and to each other. Make measurements. Might keep in mind that one technique of free-flight adjustment is that of turn control by stabilizer tilt. Is fin true to fuselage centerline?

Check angle of incidence of wing and stabilizer. Should be as shown on

plans... if it is shown on plans... and if what is shown makes sense with what's said right here right now. Too many times, plans show the original design concept, NOT what it took to make the damned thing fly. Usually there is a difference. A quality product (has nothing to do with price) will show the design as it emerged from development tests. But some others might not and the buyer doesn't know until after he's test flown his model. That's the hard way.

Angle of incidence can be defined as that angle formed by lines representing a horizontal reference (on the fuselage) and a chord line (connecting centers of leading and trailing edges) of the airfoil (Figure 5). Contrary to what some will say, the chord line of a flatbottomed airfoil is likely *not* to be parallel to the bottom surface.

The actual angles of the wing and stabilizer, with respect to a common horizontal (or other) reference line, are not as important as is the requirement that the wing angle must be greater than the stabilizer angle by at least 2, but not more than 5 degrees. Less than a 2-degree differential will provide very little automatic pitch stability. That is, you've got an arrow on your hands where you point it, it goes. This condition can be handled with a bit of transmitter dexterity, but it's a pilot's airplane, as they say. With more than 5 degrees . . . or even with 5 . . . the stall tendency could keep you busy. If you can make first flights with the wingstabilizer incidence differential adjusted to 2 or 3 degrees, do so. You'll be glad you did. The lower side of the differential tolerance can be used with the "flatbottom" chord line.

The easy way to change an incidence setting or differential is to shim a removable/adjustable stabilizer. Otherwise, you've got a problem. If the design you are building calls for a permanently attached stabilizer, figure out a way to strap it on temporarily until flight tests and trims have been made. Glue it on permanently only after you know exactly what the incidence setting should be . . . from experience, not theory. Of course, the popular all-flying stabilizers take nothing more than a linkage adjustment. However, on conventional fixed stabilizer/movable elevator configurations, don't attempt to correct an improper stabilizer incidence setting by an off-center elevator "neutral."

Never use balsa as a shim material. Use plywood. Have precut pieces in your field box . . . several 1/32 and 1/16and at least one that is 1/8 inch thick. About $1/2 \times 2$ inches is a good size.

In setting and measuring incidence angles, fancy protractors or other exotic engineering instruments aren't required. A simple ruler will do. Just keep in mind that over a 4-inch length, a 1/16inch rise is equal to approximately 1 degree (Figure 6).

Once the incidence angles are measured properly, record the shim thickness and the corresponding angle(s) on the STDS. While you're at it, make notes on the STDS of the shims required for stabilizer settings that are both plus and minus 3 degrees either side of the basic, test flight position. This information, as with the weight and balance notations made earlier, will help during charges in the field. No guesswork.

If you don't have Frank Zaic's books in your library, it might be worthwhile to note that this incidence thing is intended to assure that the wing stalls before the stabilizer does. With the proper angular differential, the stabilizer lift force is increased as the wing approaches its stall angle. This force raises the tail end of the craft, and gets the wing back down and flying again. The stabilizer never reaches its stall angle and thus maintains its effectivity. Conversely, in a nose-down flight path, the stabilizer can create a negative force to drive the tail end of the craft down and thus raise the nose. On second thought, get the books and let Frank explain it. And just think, free-flight guys have done this for years . . . without benefit of transmitter.

Next, check control action for freedom, amount of movement, and direction. No binding allowed. With all linkage disconnected, each control surface should swing to hard-over by its own weight. For first flights, control action should be set for maximum throw. Or nearly so. Remember, ya might need it, but ya don't have to use it! If things, such as elevator control, get too sensitive at the transmitter move your grip on the stick downward toward the gimbal or hinge axis in order to reduce the moment arm. As a guideline, control movement . . . measured at surface trailing edge with neutral considered as zero . . . should be not less than 20 degrees left and 20 degrees right for the rudder, 10 degrees up and 5 degrees down for the elevator.

Hook everything up, set transmitter levers on neutral and adjust sailplane control linkage so that all surfaces are exactly neutral. Make marks, pin holes, or whatever to indicate a reference suitable for mechanical check in the field to verify a neutral elevator setting (Figure 7). A positive and simple check must be easy to perform. "Eye-balling" ain't good enough. Servos can drift off of center; plastic pushrods can and do grow and shrink with temperature variations. Think of it this way. An unknown off-neutral shift gives the same problems in flight as if someone had changed the stabilizer's incidence shims. It just isn't needed.

Get behind the sailplane and check for direction of control action. Use the LEO THE WORLD'S LARGEST KITTED MODEL AIRPLANE



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transmitter. Is "Up," up? "Right," right? Be sure. It's amazing how many sailplanes are busted because an up command at the transmitter results in a down elevator on the sailplane. Right stick and left rudder is even more common. Can be confusing when you are in a hurry to avoid a crash.

The last item on the prefield preflight check list is the tow hook. Get it anchored securely in its most forward position. For first flights, the tow hook should be directly under the leading edge of the wing . . . assuming no appreciable forward or back sweep, in the wing planform. Otherwise, locate it on an angle of approximately 30

degrees ahead of the balance point.

Now all these preflight checks, balances, and adjustments must be accomplished before loading anything into your wife's second car. Preferably, they should be completed the night before the scheduled first flights, and 2 or 3 nights before is better yet. The alternative is to hurry through and make a mess of things.

Whatever it is that you're about to fly, you've spent time and money on it. Maybe a whole bunch of both. It just doesn't make sense to risk the entire project by getting sloppy now, Sorta like not tightening the wheel lugs after buying new tires.





Another thing. Part of the idea here is to reduce the ulcer population by preflight preparation. Great satisfaction and self-assurance comes from methodical make-ready work. With this effort under your belt, you know that the sailplane is right . . . and is ready. It is no longer a completely unknown entity. Everything that has been done has been to assure that all settings, balance points, and control functions are on the safe side of the curve, so to speak. The sailplane is set up to work for and with you . . . not agin ya.

Take your time . . . even if you miss your scheduled flight date. There'll be thermals next week. And don't let anybody or anything goad you into changing your mind or taking short cuts.

Test flights can be a pleasure.

Hannan Continued from page 34 ployed. With the current energy crunch (pun intended), we simply MUST take advantage of this free power!

UKIE CLUB GETS LINE ON INDOOR FLYING

A note from Dan Rutherford, Editor of the Red-Max M.A.C., Bothell, Washington, reports a successful indoor meet held by this usually control-line oriented group. With only a small amount of publicity, they managed to attract 40 flyers and 120 spectators! Events flown included R.O.G. Open Stick, modified Sleek Streek, and, of course, Peanut Scale, which attracted no less notable personages than Dr. Ralph Brooke (of R/C fame) and his son. Dan mentions that the Walt Mooney system of scale judging was employed with favorable results.

HOW'S THAT AGAIN? (AGAIN!)

Some gremlin stepped on our parting punch line in the February edition, in case you failed to see the humor. The thing SHOULD have described Frank Scott's label for the new Brown Junior twin as a $CO_2^{2!}$ There, isn't that better?

AND SPEAKING OF SLEEK STREEKS

It is with mixed emotions that we note the passing from the scene of the venerable North Pacific "Sleek Streek" ready-to-fly models, which according to Russ Barrera have been replaced by "SKY FLYERS," from the same firm. The general configuration is much the same, but the balsa wood is gone. Instead, the motor stick, which is dyed vellow, now appears to be pine, and the wings and tailplanes are of molded blue foam. The new wings, which are of the smooth-skin variety, feature an efficient-looking airfoil. Although we've only performed a few tentative trials to date, the design seems somewhat more critical to adjust, compared to the older, balsa-wood variety. Perhaps some scientific type in our audience will run some controlled tests?

Peanut Scale fans will be relieved to note that the familiar North Pacific plastic prop remains unaltered, although the cost of obtaining one for use in your stick & tissue model has risen, to 49 cents (including the SKY FLYER).

SUPPORT YOUR LOCAL LIBRARY

We think in terms of doing scale research at libraries, but have you considered doing some model aviation public relations work there? Jack Luekin found a ready reception for a display at his local school library, as shown in one of our photos. Librarians often use displays to dramatize some particular types of books, and since most collections include an aviation/aerospace section, it should be easy to arrange a showing of your favorite models, which can be shared with the entire community.

P-38 EN'LIGHTNING

No, it's not just another of our doubtful quality puns, but the title of an exciting lecture presented recently by the San Diego Section of the American Institute of Aeronautics and Astronautics. Featured speakers were Tom Lanphier, who participated in the shooting down of Admiral Yamamoto during W.W. II, and Tony LeVier, who did much of the early testifying of the worldfamous P-38 aircraft. Of particular interest to model builders (many of 'em in the audience), were the discussions of early development problems. Just like the miniatures, the big ships don't always perform correctly "right off the board." Those of you who are frustrated by engine problems, for example, might take solace in the fact that the Lightnings REALLY had powerplant difficulties in the early days of their development . . . little things, like broken crankshafts!

Also covered in detail, was the long search for a solution to high-speed dive problems, which were literally tearing the aircraft apart. One can truly appreciate the talent and dedication of the gentlemen who participated in these tests.



In an informal conversation after the meeting, Mr. LeVier, who is soon to retire, revealed that some of his fondest moments in flying were spent in the cockpits of tiny racers, and that he will shortly be writing a book concerned with one of them, the Keith Rider "FIRECRACKER." We can all look forward to that volume!

PIN-DOWNS . . .

. . . is the very logical name given to a series of new products aimed at builders of small models. These construction aids, designed by Keith Sterner, are injection-molded from polyethelene plastic, which is glue resistant. In many instances, two or three PIN-DOWNS will serve the purpose of a dozen or so regular straight pins usually needed to secure parts to the building board. In addition to allowing more precise alignment, PIN-DOWNS eliminate the dents often caused by pins, which can both weaken the wood and detract from its appearance.

Available in several styles to serve different purposes, type number 102 is illustrated in our photos. These can also serve in warp-prevention, by holding components such as tail surfaces suspended evenly above the work surface, while shrinking or doping operations are in progress. A set of eight No. 102 PIN-DOWNS, including washers retail for \$1.50. We tried 'em and we like 'em!

DELTA DARTNIK

Frank Ehling, designer of the famous "Delta Dart" (AMA Cub, Racer, etc), has been paid the highest form of flattery, in that his idea has been reinvented in Russia! Our illustration shows how similar is the outline. Several interesting changes have been made, the most notable of which is an increase in size. The plastic propeller and prop hanger assembly are not incorporated, probably for lack of a suitable equivalent in the Soviet Union. An alternate configuration is being flown as a towline glider, in addition to the prop-driven example.

One definite improvement has been made: The weakest link in the Delta



Dart, as in most simple models, is the dihedral joint. If correctly fitted, glued, and allowed to dry properly, it will do the job. Unfortunately, the typical youngster seldom has the patience to let glue dry, let alone the skill (or interest) to make the joint accurately. Thus, a catastrophic failure at the wing center-line is an all-too-common occurance (ask anyone who has helped conduct a beginner's building session). The Russians circumvent this situation by using bent music wire joiners at both the leading and trailing edges, bound in place with thread as well as glued. Also, an undercambered airfoil is used in place of the standard flat section of the Delta Dart. Still, we think the adaption of the design represents a compliment of the most genuine sort!

POET'S CORNER

Ralph E. Scott, Sacramento, California sez:

"Dear Bill, There ain't no scarcity of corn . . . in or out of Kansas." And he proceeds to prove his point with the following:

"Ma . . I broke my rubber band!!" I folded my freewheeling prop

I bent my tail

Picked up the wreck with a wail Then solaced my sorrow with thought Didia see that!!

It sure FLEW ... Before it blew!

Get another one . . . In fact, get two!!



Phantom....Continued from page 50 aluminum tab (see plan) is cut from .012 aluminum sheet. The unit is best built flat on your work table. When it is dry, remove it and again sand an air foil by rounding the leading edge and tapering the trailing edge. When this is completed, glue the vertical stabilizer to the fuselage, making certain that the rudder is left free so that it can be moved as needed.

COVERING AND FINISHING

Having completed the basic model, we are now ready to concentrate on covering and decoration. The fuselage was papered entirely with Japanese tissue. If this is not available, a light grade silk span will also do nicely. The amount of curves involved made it necessary to cover the fuselage by using small pieces.

Generally, the tissue was cut to widths no wider than the space between two stringers and was often no longer than the distance between two consecutive formers. This will be time consuming, but will produce a handsome result if the time is taken.

One area where tissue is not used is the space below the side longerons extending from Former 8 to the rear of the fuselage. This area, immediately above and behind the exhaust pipes, is covered by the use of four pieces of





plain white bond paper. No patterns are provided for this as it is really a matter of cutting and fitting as you go... but the first portion should run from Former 8 to Former 10, extending from the side longeron to the profile keel. This is duplicated on the other side and then in a similar fashion, the space between Former 10 and the tip is covered.

Incidentally, the finished model was found to be quite nose heavy and, instead of using bond paper in this area, you might want to use balsa blocks as you did in making the nose. One final note on the fuselage is the addition of the air intake pieces which should be cut from card stock and glued in place as shown on the plan.

With the fuselage completed, you are now ready to begin painting. It took four coats of sanding sealer and a couple of coats of clear dope to thoroughly seal the wood grain. About four coats of clear dope were applied to the fuselage. You may be gasping at the amount of dope put on this model, but weight was really no object, and, as a matter of fact, even enhances the flying characteristics of the finished model.

The Air Force Thunderbirds are basically white and the model was sprayed with two coats of Aero-Gloss "Swift White". Next, the underside Thunderbird marking was painted with Aero-Gloss "Corsair Blue" and trimmed in "Stearman Red". Similarly, the nose, wing tip and tail flashes were also painted. The inboard leading edges of the wing and the area around the intakes was painted silver. The intakes themselves are painted black.

The lettering, "Thunderbird" marking, flag display and national insignias were all taken from the decal sheet of a Lindberg 1/48 plastic kit of the F-100 version of the Thunderbird. The area above and behind the exhaust pipes was painted with Pactra "Steel" enamel, as were the inner portions of the horizontal stabilizers.

The exhaust pipes were cut from pieces of 3/4 inch rocket body tubing and were sprayed flat black and then glued into place. The canopy was made by carving a wooden mold from block balsa and then using a Vacu-form toy. If you do not have a Vacu-form and you do not wish to attempt a molded canopy, a fairly nice result may be had by carving the canopy from block balsa and painting it either light blue or black and gluing it in place. If you make a transparent canopy, you might want to simulate the pilot's head by placing a large white bead in the pilot's position. The interior of the cockpit should also be painted flat black. Once the canopy, however made, is in place, the white framing around it should be added by either painting it directly on to the canopy or by cutting it from white tape or bond paper and fastening it in place. A particularly neat effect is obtained by seeing that not only the framing over the canopy but also, the framing around the edges of the canopy, is added to the model.

FLYING

As noted, this is a "slingshot" slider. It is fairly heavy (our model weighed 1-1/2 ounces when finished), and will not fly well unless substantial power is used. We found best results were obtained by using a six foot pole with one loop of 1/4 inch flat rubber anywhere from 20 to 50 feet in length. As mentioned, the model was initially nose heavy and a considerable amount of modeling clay had to be placed in the tail pipes to get it to balance. If you balance your model at the CG shown on the plan, it should give a fairly long, flat, glide. As always, it is best to trim the model on a calm day over tall grass. If pitching is encountered, adjust the horizontal stabilizers by lifting their leading edges slightly. In doing this, make sure that both stabilizers are moved together, as a difference in their incidence will cause the plane to spiral.

Once consistent small glides are obtained with hand launching, you are ready to proceed with a sling launch. Place the rubber loop on the second (rear) peg and pull until the rubber is fairly tight, but not stretched to its limit. Release the model into the wind and again, check its flight. If the model shows a tendency to roll on its back, the horizontal stabilizers may be a bit out of line. Adjust them until you obtain a level flight. Having done so, offset the rudder a few degrees to the right or left, depending on your preference, and launch the model again. When properly trimmed, you should have flights which see the model climb rapidly into the wind and then turn in the direction desired for a long, flat, glide.

A final word about safety. As noted on the plan, this model has a hard, sharp nose which makes it potentially dangerous. Never fly near a crowd. Always warn others in the area before you launch. If the model flys at you, cover your eyes and head. Hate to end on such a serious note, but a little caution could save a lot of grief. Happy Landings!

Plug Sparks . . . Continued from page 17

Champs) became a reality, and in no uncertain terms, with three days of flying, 12 events, and simply gorgeous trophies.

When McNorgan left SAM to indulge in his other favorite hobby, hunting, he left a hole that the writer found difficult to fill as Interim Director. Bud was a tough act to follow!

Getting back to the contest, this was

TEAM WORK

An honest airplane in the hands of an expert pilot is a tough team to beat. Dave Shadel, of El Segundo, Calif., and his Monterey, have won 19 trophies in their first year together. Dave, an LSF Level IV pilot, also showed his club how to hand launch into a 35 minute thermal flight. (Some guys have all the luck!)

The Monterey, a 100 inch span thermal trainer, is available from Astro Flight for \$34.95... You may obtain one from your dealer, or if you wish, order direct from Astro Flight, Inc., 13377 Beach Avenue, Venice, California 90291. (213) 821-6242. California residents add 6% sales tax.



the first meet to feature the new Precision Flying Scale Event. Based on percent of error, wouldn't you know it, old hot shot Wallock won. This guy is so good in all events, we're gonna have to handicap him. Gene was closely followed by Bob Oslan, Abe Gallas, and Dick Siefried.

In Rubber Commerical, old pro Andy Faykun wrapped up this best supported event. If rubber is available, this event really draws! In the .020 Replica Event, Andy also nailed down first place with a real snappy performing Ranger. Russ Backer took second with a little known George Reich Albatross scaled to .020 Replica size. Don't know why the model should have been such a mystery, this was one of the first old timer plans featured in Model Builder (June '73). "DEFUGILTY DEPT."

Some confusion has arisen over the various R/C endurance events being staged. To clarify things, the Texaco type event limits the model design cutoff date to Dec. 1, 1938. Gas allotment is 1/4 ounce per pound weight of the model. This meet comes off again on April 21, 1974.

The last meet sponsored by the SCIF club in November of last year also featured a Texaco Event. However, the meet just sponsored by Harry Lowe of the SCIF Club allowed any old timer conforming to SAM rules to fly. This meant the cutoff date was advanced to December 1942. In addition, only 1/8 ounce of gas per pound of model was the fuel allotment.

Now, the O.T. R/C meet being cosponsored by the No Name Club and Model Builder is a 20 second type meet, very closely resembling the regular free flight contest. A "max" flight is 10 minutes, with overage in seconds being deducted. In addition, 50 points are given for hitting a spot-landing circle. Cutoff date is for any model meeting SAM rules, December 31, 1942.

So, those fellows who flew Comet Clippers, Buccaneer C Special, So-Long, etc., type models in Harry Lowe's event, will be able to fly in the 20-second May 26 Memorial Day meet, but cannot fly in the Texaco Event. One of these days, we'll get it all together and fly all events on one day. That should be real fun! CONTESTS AND THE ENERGY CRISIS

Taft: Thanks to the efforts of Gene Spence of the Taft Condors, the gas situation in Taft is excellent. Gas is available on Saturday up to 5 p.m. in tankful quantities. In addition, there is one station open on Sunday. For information and location, contact Gene.

Lakehurst: With gas in short supply in the east, several ideas have been generated in bull sessions. During one of these bouts, Guy Underwood suggested the way to go is to rent a DC-3. He knows of one in excellent shape, having undergone several recent checkouts. When pressed, Guy (an old pilot, not a bold pilot) said he would fly direct to Lakehurst NAS. He further stated he would look into the cost of renting and flying back. He estimates 23 seats plus room for all the models. How about that? Write this magazine if interested. Let's see if we can get up a good party.

Secondly, in talks with Spiro Nickolaw, it developed that Jack Jella, pilot and owner of Air Trails, Inc., Salinas, could possibly be imposed on to fly back with a group of six. Spiro is to look into this and give this writer the scoop.







FLIGHT WEIGHT ... 56 Oz. AIRFOIL Undercambered

CENTURION II

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All Soarcraft kits feature instruction manuals, with photos, sketches and drawings. Fuselage shells are completely prefabricated. Canopies are custom molded, with trim lines clearly marked. Wing and stab ribs are precision cut for airfoil accuracy. Hardware packages contain formed wing wires, tubing, hinges, etc. Selected balsa and spruce is individually packaged for ease of construction. Kit components are individually packaged in plastic for identification and protection.

Kits are engineered for optimum performance, and all designs are fully tested, each having a proven contest record.



So far, there has been no mention of a car pool, so flying appears to be a real good way to go! Let's hear from you guys! We gotta know if anyone is interested enough to get this project off the ground.

MAIL BAG

Just about the time the writer gave up on the idea of power reduction, another letter came in this time from Art Thoms, expressing the opinion that a true cross-section has not been obtained, as many of the dissatisfied modelers have dropped out. Hence, no letters.

Art sez he converted his old time models to radio control because ... (as

Art comments) "No more lost models, no more trees to climb, can use small fields, and still enjoy beautiful flights and graceful glides." What else can a guy ask for?

The Old Time Eagles (Woody's Gang) are a great bunch of fellows, according to Art, who has had many a beer with them. After arguing, reasoning, cajoling, and outright begging, the boys still won't back off on the power scramble. Art feels that because of this, potential growth of a super fun event is being stifled. He points up as examples the initial entries of 1972 Experiments. None have returned after seeing the red hot jobs.

Art suggests that the model should be required to fly while power is on as a free flight with no radio signals permitted during the climb. Art sez this would pretty well eliminate the overpowered pressurized bombs masquerading as old timers.

Well, the controversy continues, who is next?

Got a nice letter from Joe Beshar, one of the Contest Directors for the SAM Championships at Lakehurst. Joe is extremely active in getting new members for SAM, exploiting the SAM Champs, and in general, making things comfortable for the contestants. He also sez he is going to throw "Daddy Warbucks" into the lake after the "Fox" gets through with him. Things are liable to be lonesome in the henhouse! Needless to say, no effort is being spared to make this meet the best ever!

NEW BLOOD

Bert Pond, Longmeadow, Mass., sent in a copy of a page from Aerial Age, May 1913, announcing the intent of the Illinois Model Aero Club to establish a national modeling association. The point Bert makes is that this appeal and the appeal today still must be directed to the younger people if we are to perpetuate the model flying fun. After all, we ain't gonna last forever! The writer is open for ideas. Any great thoughts out there in the real world?

NEW IGNITION MOTOR

Ray Turner of Ft. Smith, Arkansas, writes to report that Duke Fox is now bench testing an ignition version of his Fox Eagle 60. The points are at the rear of the shaft reminiscent of the old Claude C. Slate Fox 59. Duke claims the ignition Eagle turns within 1000 rpm of the glow version using low lead gas and 50 wt. S.A.E. oil.

Only problems facing Duke now for production are the accessories. He has located a source for porcelain, to produce spark plugs. His ultimate plan is to package the entire ignition unit of coil, condenser, and nickle cadmium batteries in a small plastic box. Is this ever great! Especially in view of the extreme shortages of methanol and nitro methane. (The engine was displayed at Toledo, wcn)

Ray also reports he has been running his Pro-Line radio set next to the engine and cannot get spark interference until he places the receiver within two inches of the high tension lead. Sounds better every minute!!

BROWN CO2

Bob Reuter of Cleveland, Ohio (North Olmstead really, a suburb) reports he had Bill Brown over to his house for several days. Bob made a few fast deals for Bill's latest CO_2 engines, and 70 cu. mm single cylinder, and a 140 cu. mm twin cylinder. Bob sez these are real jewels of perfection.

Bill is also planning some new en-

gines for Peanut Scale and other small rubber designs. The new peanut engine will be 1/5 the displacement of the present motor and about 1/2 of the physical size. Wowee! How small can you get these little engines? This should be of real interest to Peanut Scalers and possibly the small Replica O.T. flyers.

REVERSE COIN

For those who like 'em big, Lou Perretti is putting out a 2.5 hp engine for models in the 15 lb. bracket. With some of these huge models like the Boehle/Grant, you could almost fly in the model! Price, \$125.00! Prop sizes run from 14/6 to 22/4, take your choice. Large 6" vintage wheels are also available at \$29.95 a pair. If interested, write Aerotec Model Engineering Co., Box 116, Lincolndale, N.Y. 10540.

WRAPUP

During the Winter Nats, we talked with a couple of boys from the Utah State Modelers. They have scheduled the following meets featuring Old Timer Events. Put these on your calendar:

March 23: R.O.W. OT Gas

June 22, 23: Gas, Rubber, Replica Aug. 30, Sept. 1, 2: USA 15th Annual

Received a nice letter from Warren Shipp announcing the eastern dates but he failed to include the info! Oh well, next issue . . . Keep the faith men, that's about all you are going to be able to keep after Income Taxes!

R/C Pylon Continued from page 21

The Quarter Midget racing scene in Southern California is the only racing activity at press time! Formula I racing starts April 6 and 7 at Whittier Narrows, hosted by the San Gabriel Valley Radio Control League. We would like a calenar of the racing in your area so we can publish it nationally. Who knows when some of us or some of you may show up at a specified event! Mercy! Please send us your club's racing schedule!

The Quarter Midget Racing Club of Southern California has co-hosted two races in 1974. The January race was cosponsored with the Valley Flyers of the San Fernando Valley, Calif. The February race was co-sponsored with The San Gabriel Valley Radio Control League. Talk about racing activity! QMRC held 18 QM races during the 1973 season (Wonder how many divorces that caused!)

Observations of the first two races (QM) caused us to realize two important items. 1. The race course as adopted at the Toledo Conference (and now AMA Provisional) is good if used *as specified*, utilizing flagmen and/or light systems for the Number One pylon. 2. The idle rule cannot be modified any more! We either have to apply a more restrictive landing idle penalty (like two points off for dead stick) or idle check before every heat race! Personally, we would like to have the contestant make



MARTIN B-10B was a forerunner of advanced W.W.II bombers, and spanned

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a full stop, engine running landing, rather than a controlled running landing stopped only by the overrun at the end of the runway! The two mile course is too long for QM racing without flagmen at Number One. A more realistic course is 375 foot straights with 100 feet between pylons Two and Three. This course is such that it eliminates the need for flagmen and only requires a pylon judge or judges at the Number One pylon. It would always be a good idea to have two qualified and knowledgeable people at No. 1.

The Valley Flyers of Van Nuys, Calif. hosted the season opener for QM racing Jan. 13, 1974 at Sepulveda Basin in the San Fernando Valley. QMRC ran the event, with John Elliot of Orbit Electronics, as Contest Director, assisted by Don Dombrowski as starter. Don is owner of the House of Balsa.

Sepulveda Basin is the only field we know to date that was designed specifically for a pylon racing event. Needless to say, some twenty-eight contestants, including Danny Kane, all the way from Chicago, enjoyed the event immensely.

RESULTS: Sepulveda Basin, Jan. 13, 1974 QM. (1st) Ramzi Thomas, Stafford P-51, St .15 (2nd) Tom Christopher, Stafford P-51, (1:48.8) ST .15 (3rd) Gary Hawk, Stafford P-51, K&B .15 (4th) Dale Yaney, Bearcat, K&B .15 (5th) Henry Arrance, Miss DARA, K&B .15.

The February race was held at Whittier Narrows, co-hosted by the San Gabriel Valley Radio Control League and QMRC. Dick Burkhalder was the contest director and Jerry Held assisted as starter. The 30 entries provided quite a few exciting heats!

RESULTS: Whittier Narrows, Feb. 17, 1974. (1st) Steve Ellison, Stafford P-51, K&B .15 (2nd) Selwyn Kaplan, Stafford P-51, ST .15 (3rd) Vince Stagnaro, H of B Shoestring, St .15 (4th) Tom Christopher, Stafford P-51, ST .15



HRE components can be used to upgrade your existing car (Associated, Taurus, Thorpe, Delta, Marker, scratch, etc.). Or, you can use Associated, MRP, and/or Taurus wheels, gears, clutches, etc., to complete the HRE chassis assembly, and have fully adjustable front and rear ends to get the optimum R/C race car performance.



(5th) Gary Hawk, Stafford P-51, K&B .15.

Both of these races were held on the two mile course with the best time... a record of 1:48.8 by Christopher with a Stafford P-51 and ST .15 set at Sepulveda Jan. 13, 1974. We suspect that future races hosted by QMRC may use the shorter course!

In earlier articles, we stated that we thought QM racing would be a good replacement for the dying FAI event! Since the time, we have had only one letter objecting to the idea. We really thought that we would be buried with mail objecting to such thoughts. Not so! Twenty letters applauding the idea and only one against it. This particular letter stated that the idea was not "thought out." We disagree! QM racing would be a very good replacement for an international event! When we think of FAI, we think of a .15 size engine. Somehow we relate FAI with .15's (2.5 cc).

Also speaking as one who has competed in all forms of pylon racing to date, we rate QM racing extremely high in just sheer pleasure and fun. It is also extremely competitive because everyone has just about the same racing equipment! Plenty of QM equipment is available to everyone and the planes can be easily transported from country to country. Lastly, QM competitors outnumber FAI Pylon competitors (even including all foreign competitors) almost 11.3 to 1. Oh yes . . . the little buggers run quite well, and will idle nicely on 80-20 methanol and castor mix. One thing . . . at most club races, more entries are present than the attendance at the NMPRA Championships (18) ... WHAT A JOKE! I have yet to hear of any FAI race held anywhere last year that drew more than 34, and that was the AMA Nationals in Oshkosh! That is only slightly more than an average attendance for a standard monthly QM club race! Mercy!!

A few rumors are going around concerning Formula I. Seems as though politics and manufacturers are trying to test our rules again. We think that the question concerning exhaust extensions is silly! The rule is quite clear . . . No tuned stacks in Formula I!! The extension is solely for the purpose of exhausting gases from the engine nacelle! Simply tach the engine with the extension and without. Any sizeable increase means it's tuned! It's illegal! It's amazing, every year the same old rip-off! Let's Race, fellas!!

Buckeye Continued from page 43 Fliers, decided to make the treck. Some of us rented a VW bus and arrived in Buckeye around two A.M. Although none of us came home with any hardware, we all had a very good time and hope we'll be able to make it to Buckeye again next year.

The tasks for this event were 2 minute precision, 1 mile goal distance, and 10 minute duration. The landing area was located to the side of the runway in a comparitively rough area. Points of 100, 75, 50, and 25 respectively were awarded for landing in a series of concentric circles. This event was scored differently than usual in that the point of initial contact within the ring determined the landing score. A few of the contestants were surprized to find their scores were less than expected due to the grazing of low lying bushes located in their flight paths being counted as a touch down. Personally, I found that this scoring method placed too much responsibility on the timer, and the results are less controversial if distance is measured after the sailplane comes to rest. This is, of course, a matter of opinion, and I think it's useful to try new approaches from time to time.

The 1 mile goal distance was interesting in that speed was not considered, but only the ability to finish a 1 mile course and then to land in the circle. Most of the contestants were able to finish the course in spite of a moderate wind of 5-10 knots, which should come as no surprise to anyone who was at last year's LSF contest. Byron Grover of the Soaring Union of Los Angeles (SULA) walked away with first place in the distance event, with two complete rounds and full landing points.

The running of this event presented some problems as is frequently the case when the task requires the pilot to fly the plane at considerable distance from himself, especially if altitude becomes marginal. One problem is that it is almost impossible for the pilot, or his assistant for that matter, to know exactly when his plane has passed the far pylon. It has been my experience when acting as pylon judge for speed events at other contests, that contestants will frequently slow their plane down and hang it into the wind in anticipation of the call, when what they should have done was to maintain speed even if it meant covering more distance than was absolutely necessary. It seems to me that better than usual communication between pilot and pylon judge would be a good idea. This could help to eliminate some of the delay that results when signals are relayed by the pylon judges. This was not a problem at this contest. but it could have been if speed was considered. I have tried to point out some of the difficulties involved in running this type of event, as it is one of my favorites and I would like to come up with the fairest possible way of arranging it.

The 10 minute duration task was a real challenge on both days, but some people managed to do very well. J.P. Frignac, who won the duration event.

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managed two nearly perfect rounds. This was noteworthy as on his second launch his Cumulus nearly bit the dust, but J.P. pulled it out and from 50 feet went on to max out. Ten minutes is a very long max! Dave Shadel of SULA, who was the overall winner of the contest, eked out over 8 munites in what looked like dead air to the rest of us. Dave is the 'chief test pilot' for Astro Flight and flew a stock Monterey to a narrow victory over Wayne Darnaby of the Dallas League of Silent Flight. Dave is an old hand at contests and came in fourth overall at last year's Soaring Nationals at Lockport, Illinois. Dave Smith, from the host club, was third overall. He had a perfect score in one round of the two minute precision event.

In conclusion, it was a very enjoyable and well run contest. The open flight order resulted in a relatively relaxed atmosphere, although the competition was fierce. I have flown in a number of R/C glider contests, but this was the first time I have had the opportunity to observe some of the other kinds of model activities. It is my guess that when word of this top notch contest in a beautiful setting gets around, lots more people will make the trip to Buckeye.

Jumbo Continued from page 30

appears to stall slightly, dipping a wing tip before the nose dips and recovers, it is a common problem with scale models. This is not to be confused with a straight ahead stall that can be cured with more down thrust. It can usually be cured by warping some washout into each wingtip. Washout is added by steaming and twisting the trailing edges up over a tea kettle.

The model is very stable and should afford you many hours of enjoyment.

Rubber Scale Lovers! A beautiful collection of plans published during the '30's, from magazines and kits. Fine line, black on white, printed (yes, printed) on heavy paper. These will be the collection items of the future. Send business size SASE to: J. W. Fitzgibbon, Box 13, Braintree, Mass. 02184. BACK ISSUES: Flying Aces, Air Trails, M.A.N., pulps, etc. List for SASE: AVIATION MAGAZINES, 24248 Crenshaw Blvd., Torrance, Ca. 90505 (213) 325-3640 "DO-IT-YOURSELF AERODESIGN" – Sailplanes, FF, HLG, R/C Sport, Charts, instructions - \$4.95.

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R_x FOR FUNI Miniature auto racing by radio control. Catalog and gift certificate, \$1.00 FREDZ - MODEL RACING SUPPLY. 184 Success Ave., Bridgeport, Conn 06610

Workbench . . . Continued from page 10

The flight pattern will be the normal AMA Class A Pattern plus a 5-maneuver Free Style sequence which is presented immediately after the Class A Stall Turn maneuver. Total time of 10 minutes allowed. The 17 maneuvers are to be judged 0-10, the smoothness of transition during the free-style maneuvers is to be judged 0-10, and the overall presentation is to be judged 0-20, for a possible total maximum of 200 points.

Index to Advertisers

Astro Flight, Inc 67	
Cal Aero-Model 66	
Cloudbuster Venture 69	
D. T. Cerutti Design 69	
Coast Catamaran Corp 1b	
Coverite 56	
Craft-Air 63, 64, 66	
Dumas Products, Inc 2nd Cover	
Flyline Models 65	
W. C. Hannan 64	
Hobie Model Company 1a	
Hobby Capital 1	
HRE, Inc	
JoMac Products, Inc	
K & B Mfg 54	
Kim-Kraft 60	
Kraft Systems 2	
Micro Models 60	
Midwest Model Supply 61	
Model Builder Products 67	
Model Rectifier Corp. (MRC) . 4th Cover	
Walt Mooney (Peanuts)	
Sid Morgan (Vintage Plans) 70	
M & S Ltd 58	
Pro-Line Electronics, Inc 55	
Royal Products Corp	
Sia Mfa. Co	
Soarcraft	
Sterling Models, Inc 51, 52, 53	
Stratton Air Engineering 62	
Su-Pr-Line Products 65	
Tatone Products 65	
Victor Model Products 62	
Vortex Model Engineering 58	
Williams Brothers 69	
TTILLER MEMORIA AND AND AND AND AND AND AND AND AND AN	

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No. 2741 LITTLE TOOT \$4.50 Exact 2-1/2" R/C scale plans by designer for homebuilt bipe. By George Meyer.

Pylon Racing event will be on the AMA Formula II course, and planes must meet the same specs as for Pattern.

Sport Scale will follow AMA rules. "High Noon" Barnstorming event will be a lunch break show in which a contestant may put up a 5 minute "Dare Devil" act for prizes.

For further information on this one, write to Olie Olson, 6111 Maple St., Omaha, Nebraska 68104, (402) 551-4662.

Let's see now . . . what was the name of that club . . . Oh yes! The C.A.R.D.S. (Capital Area Radio Drone Squadron R/C, Inc., Lansing, Michigan) will be holding its Fourth Annual SOAR-IN on July 14, 1974. This contest is ECSS Sanctioned, and points earned will count toward the 1974 season championship. The event will be Task II with scale runway.

Junior, Senior, and Open age categories will be combined into two classes; Standard (under 100 inch span, 2 controlled surfaces, no thermal snifflers) and Open (over 100 inch span, any controls, sniffler allowed). Contact CD Tom Kelley, 2929 Grandell Ave., Lansing, Michigan 48906 (517) 485-4861, for further info. Entry fee to be \$5.00.

The Boeing Management Association has announced the fifth annual Model Aeronautics Contest to be held July 13 and 14 at Boeing's Space Center, Kent, Washington. As before, there will be \$1,750 in scholarships, as well as trophies, to be offered as prizes. For the second year, Jim Thompson has been named General Chairman.

The contest is sanctioned by AMA and the National Association of Rocketry, and is open to any person under 18 years of age. Overall, there are 18 events

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- No. 1273-OT INTERCEPTER \$2.00 An .020 Replica of popular Goldberg design, kitted by Comet. By Wayne Cain.
- No. 11731 BIG JOHN the FIRST \$5.00 Modified prototype of editor's notorious monster R/C biplane. By Bill Northrop.

in 3 categories, including free flight gas, rubber, and glider...control line speed, stunt, and combat ... rocket ... R/C sailplanes ... and design craftsmanship.

Top three winners will receive scholarships in any accredited college in the U.S. or Canada, amounting to \$1000, \$500, and \$250 for first, second, and third places. Many additional events and activities will take place during the two-day affair, making it a real family outing that can be appreciated in the face of the gasoline shortage problem.

For further information, write to The Boeing Management Association, P.O. Box 3707, Seattle, Wash. 98124, Attn: Ted Caputo, Organization 4-1830, Mail Stop 79-65.

TOLEDO

Before leaving the Toledo R/C Conference this year, we learned that next year's affair will be moved to the Toledo Sports Arena. According to Don Belote, of the hosting Weak Signals R/C Club, the arena has 65,000 square feet of display area. For comparison, the Lucas County Recreation Center, conference site for the past eight or nine years, has offered a mere 25,000 sq. ft.!

Of special interest is the fact that serious consideration is being given to move the conference date into early April. Primarily, this change would eliminate the gamble of having a winter blizzard wipe out the whole operation. Paradoxically, though it would also provide better weather for outside flight demonstrations, there are no provisions for this in the vicinity of the downtown located Sports Arena.

We'll relay further information on the dates as soon as it is available. NSPA

The National Sport Pattern Association had its first meeting under the chairmanship of founder Jerry Nelson

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during the 1974 Toledo Conference. Olie Olson, Omaha, Nebraska (see "Things To Do") was selected as temporary chairman and Jerry was named Secretary/Treasurer. Several district vice presidents names were submitted and will be announced as soon as the list is complete.

An early aim of the Association is the establishing of a uniform set of rules that may eventually be submitted to the AMA R/C Contest Board in the form of an official rules proposal. A suggestion was made by prominent National and FAI Team pattern competition flier Ron Chidgey that the AMA Class C Pattern Event could become the Sport Pattern event, while the Class D event would remain as the current FAI Pattern. This move would provide a category for Sport Pattern without actually adding another event to the already loaded R/C program, yet would offer a sharp difference between the now very similar C and D Pattern events. This idea met with immediate approval of those attending the NSPA meeting, and was also endorsed by members of the National Society of Radio Controlled Aerobatics, which met later the same evening. On the strength of this, it is very likely that a proposal will be submitted this year in order to meet the deadline for new rules to take effect in January of 1976. If the NSPA is able to reach agreement on a complete pattern program, and thoroughly tests it through scheduled competitions around the country, it is quite possible that the R/C Contest Board could make it an official event in 1976 rather than having it go through a provisional status.

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1 3⁄4 ″	Spinner\$1.19	\$2.29
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21/2 "	Spinner \$1.49	\$2.95
2¾″	Spinner\$1.59	\$3.15
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2 ¾″							*	•								. \$2.49 p	bair
21⁄2″					4										•	. \$2.59 p	bair
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ROYAL PRODUCTS corporation 790 WEST TENNESSEE AVENUE DENVER, COLORADO 80223

Nobodys Kid Brother!

Never before in Radio Control's history have there ever been so many low cost "sport" type systems available to the modeler. Unfortunately many of these systems are stripped versions of more expensive "competition" rigs; the "kid brothers" of the line. Some offer transmitters powered by dry cells; servos on most use center tapped power supplies providing less power and resolution; some quote low weight ratings (and low flight time) from their 225 mah batteries; practically all have minimal guarantees of a few short months.

Before you're trapped into supporting someone's "kid brother" compare the field with one system that features "sport" system price with "competition" system quality. Nowhere in MRC's new Mark V system can the prospective purchaser find any concession to price-it's all top quality with contest style performance, power, resolution, and reliability. Compare Mark V's low drain integrated circuits; high resolution, high power, low drain 3 wire servos; highly selective, double tuned front end receiver; military spec gold plated connectors; ball bearing pivoted sticks; high power, long range transmitter; quality nickle cadmium cells in both transmitter and receiver; and a separate, isolated charging system. All this with a one year guarantee! Mark V by MRC doesn't take a back seat to any system-sport or competition; it's front line all the way. No one will ever call Mark V any system's "kid brother"!

The Nev MRC MarkV

MODEL RECTIFIER CORPORATION . 2500 WOODBRIDGE AVENUE



Diagram of Jack Shafer's Automatic-Model-From-Tree-Getter-Downer. Sorry we couldn't put the text and the diagram on the same page, but the arm exercise you'll get from flipping back and forth will get you in shape for throwing hand launch gliders this summer!

FREE FLIGHT **By BOB STALICK**

APRIL MYSTERY MODEL

Now, we've gotcha. The past ones month. have been too easy. The Super Phoenix by Ehling was a pushover in January; the Amazon by Sandy Hill was a bonathis month's model. Yes, it's rubber petition. powered and it does have two fuselages. THE MINI-PEARL, ONE MORE TIME Beyond that, you're on your own. The first response to M.B. with the correct nault, designer of the Mini-Pearl thankanswer gets a one year subscription to ing us for the blurb on the M.P. in the my favorite magazine. The first one January issue and suggesting some addiwith the wrong answer will probably tional changes he has recommended to get a case of hives.

March Mystery Model came from Jim M.P. was to extend the wing and stab. Bennett, Webster Groves, Missouri, He's Three such were built. Dave (V.T.O.) donating his free subscription to the Linstrum's flew away at Taft in a trash High Point Senior at the March 31st mover. Henry Spence's son, Stevie, won McDonnell Douglas Indoor Contest, MB second at our last meet with his and I

DARNED GOOD AIRFOILS - - THE SAMANN-BUSSARD II

This is a darned good section for fide snap for February; and last month, Wakefield and A/2. It is not a highly practically everyone recognized Bob undercambered section and is not a Hatschek's Mulvihill Winner from the good section for a dead air machine, pages of M.A.N. But, you're going to but it is stable, with a better than have to reach far back into your mem- average glide. A good all weather secories and your back issues of the maga- tion, it was designed by Gustav Samann. zines to come up with the answer to an early leader in World Wakefield com-

Received a nice note from Bill Chenmake this hot little performer even First correct identification of the better. Bill sez: "Only change to the also donated a subscription to the was third. The wing on these is 6 inches and competitive design. So, if your

Thermaleers Contest held earlier in the longer (more span); 1 inch more in each tip and 2 inches more in each main panel. Stab is two inches longer (more span). The glide is really rewarding."

With the new span on this ship at 42 inches, the area is increased to 252 squares, which just about makes it a big 1/2A model.

Wonder if maybe Bill should change the name from Mini-Pearl to something else, although Mini-Coors just doesn't have the same ring to it.

WITCH DOCTORS AND OTHER FIN-NY THINGS

Also received a note from [im (Witch Doctor) Clem, and he recommends some modifications to the big W.D. 800. Jim suggests that the fin area be increased as indicated on the sketch in this column. This increases the rudder and fin area from 36 sq. inches to 48 sq. inches. This is a whopping 33% increase. but I im says this results in better power control resulting in a more consistent power pattern. Sig is incorporating this change in their new kits of this popular



the final design of the Stinson Trimotor Airliners that had begun in 1925 with the SM-6. Following was the Model T Airliner which was in production from 1927-1930, and with a price tag of \$26,000, was cheaper by some \$50,000 than the Ford Trimotor, both aircraft having the same payload and speed.

With the excellent reputation of both the Model T Airliner and its Lycoming engines, the 1931-1933 production of the Model U Airliner was sold in large quantities to the airlines. Both Ford and Fokker were out of business by this time and the Model U's price of \$27,000 was still some \$40,000 less than its competitor, Curtiss-Condor,

Thus, the Stinson Airliners played a windows. major role in the furthering of the





scale like qualities of any model.

APRIL 1974

Joe Deady demonstrates wing mounting system on his SeaBird A/2. Model features all sheet wing. Photo by Patterson.



Joe Deady's SeaBird A/2 carrying case looks like a styrofoam coffin. Note "fences" on top trailing edge of wing.

The Stinson has nice proportions for a flying scale model.

Without the hand, it would be hard to tell its actual size.

Our quest Peanut Scale editor for this month brings us something just a little bit out of the ordinary. Walt will be back next month with the Miles Sparrow Hawk.



With all props whirring, it should make quite a sight passing overhead. Might make an interesting Jumbo scale project.

Stinson Trimotor Peanut

By DON BUTMAN

• The Stinson Model U Airliner was regular domestic airline services. Their trimotor airliners provided safe, comfortable, economical, fast, modern and profitable air travel during the "Golden Years" of American aviation.

> The model is built in typical sidesand-crosspieces construction. Formers are used only when absolutely necessary. The fuselage stringers should be added after building and sanding the wing root. subwing and nacelle assemblies.

> The side window frames are cut out of 1/32 sheet with .005 inch celluloid glued to it. This is then glued on the outside of the fuselage frame with the celluloid toward the inside. Just prior to covering, use a cotton swab to wipe away the dust from the inside of the

A neat way to install "Les Pilotes"

and passengers is to draw them on pieces of paper which are positioned inside the windows and cockpit. This method was used on the model to avoid the empty cockpit and window look!

The dummy props for the outboard engines came from a plastic scale model and rotate very well during flight. The main prop can be any plastic one of adequate size.

The model was covered with silver Japanese tissue. Three light coats of clear nitrate dope with 10 drops of TCP (Tricresyl Phosphate) per ounce of dope was used to obtain a "pliable" covering.

The flying was successful but not spectacular. However, it certainly does look good up there with all the props turning as it flies by!

With that big prop, takeoffs are a bit rough on the tips. Hand launching is a better way to go.

