

MODEL BUILDER



DECEMBER 1976

volume 6, number 60

\$1.50



We have a field day every time we build a 765.



SERIES 765
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EDISON, N.J. 08817



NOW! THE IMPROVED SIG KADET THE IDEAL RC TRAINER EVEN BETTER!



NEW INSTRUCTION BOOK

In recent months we have been updating the Kadet kit and incorporating suggestions made by some of the thousands of modelers who have learned to fly RC with it. The final touch has now been added to current production - - an enlarged, illustrated instruction manual. It tells a beginner how to proceed, step-by-step.

Here are some of the improvements over the original Kadet that are now in the kit:

- * Stronger Fuselage
- * Stronger Wing
- * Ply Dihedral Brace
- * Strengthened Firewall
- * Larger, Stronger Motor Mounts
- * Beefed Up Main Landing Gear Installation
- * Big, New Instruction Book with Photos and Isometric Construction Drawings



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WEIGHT: 4 lbs.
ENGINES: .19-.35

SIG
KIT RC-31
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WHY RUDDER CONTROL?

Some expert fliers think beginners should learn to fly by starting with an aileron-controlled model. Maybe this will work out if an instructor pilot is available to make the takeoffs and landings and stand by every minute of a flight, ready to take over if the student gets disoriented, until his pupil gets skilled enough to manage by himself. But this process takes a lot of flights. Most beginners do not have someone willing or able to spend so long a time with them.

We think a stable, rudder-controlled model is a lot less likely to get a novice into trouble from overcontrolling or not controlling. If the flier freezes up momentarily and can't decide what to do next, a flat bottom sectioned, high wing model — like the Kadet — will right itself, or partially do so, if the sticks are allowed to snap back to neutral, giving him time to think. Most aileron-controlled models need immediate and proper corrective control movement to make them recover, an automatic reaction that a beginner has not yet developed.

Many club instructors and hobby dealers have told us that two or three check-out flights on a Kadet are sufficient to allow a student to practice fly and learn without constant attention. And we know of modelers in isolated areas, with no one to help them, who have taught themselves to fly with the Kadet.

So remember—you may dream of darting around the sky with a sleek P-51, but first you must have some flying time with our boxy buddy, the dependable Kadet. It's the standard trainer-nationwide!

LEARN TO FLY RC THE SIG WAY STARTING WITH A KADET

Skybolt Takes 1st, 2nd & 4th At '76 Multiwing Champs

Advanced Aerobatics winners using Skybolts were: 1st Don Kadous, 2nd Paul Edmunds and 4th Bud Pierson.



WING SPAN: 51 in.
LENGTH: 42-1/2 in.
WING AREA: 790 Sq. in.
ENGINES: .45 - .60
KIT NO. RC-34

Read what Art Schoeder, the editor of MODEL AIRPLANE NEWS, said in the October issue about the spectacular performance of the Skybolt at the Omaha contest.

direction and turbulence. A credible show. Advanced class (flying an identical pattern as Unlimited) was handily won by Don Kadous (302.5) with an excellent Sig Skybolt. This aircraft has been around for a year now, and we've seen many examples, all of which have been very fine flyers. The Skybolt is beginning to give Aeromaster and Pulsar a run-for-the-money. Its flight characteristics are outstanding with no vices, and when properly powered, it is highly pattern-capable. Interesting quality of Skybolt is its eligibility for Sport Scale as well as Pattern—a most worthwhile project and a credit to the Sig organization.

Runner-up in Advanced was Paul Edmunds (244.5) with another Skybolt.

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1976 World Scale
Champion

Lower left 1976 NATIONALS CHAMPIONS
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Expert Winner
JAMES DANLEY
Advance Winner

RHETT MILLER
Master Winner
CHARLES RAMSEY
Novice Winner

Lower right
RHETT MILLER
Four-time Nationals
Champion

Upper right
JOE BRUZZESE
International Class C Hydroplane
R/C Boat Record Holder

Pictured above are six recent R/C champions. All but one use Kraft radio control equipment. Talent, skill, and practice played a large part in their achievements, but a crucial factor is the selection of the right equipment. They wanted the best in reliability and performance. We're proud they chose Kraft.

Whether you are a long-time R/C'er or just joining the sport, you too can experience the value, quality, and dependability that make Kraft part of the winning picture.

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Championships.
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December 1971
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75" span, for .40's.
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Volsplane 3V-1
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"wire" wheels.

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January 1972
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Schmidt.
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R/C soarer.
Peanut Ord-Hume.
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Fokker E-III R/C scale.
Al Vela's E-Z Boy 1/2A
E-Z Boy 1/2A, Al Vela.
Peanut Ford Flivver.
Fiberglassing over balsa,
by Le Gray.
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Yankee Gull R/C glider
8' to 12' span.
Miss Cosmic Wind, QM
R/C Pylon racer.
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Mr. Mulligan 3-views.
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Peanut Fokker V-23.
Whetstone 1/2A U/C
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Mongster QM biplane
R/C pylon racer.
Calif. Coaster R/C
glider. Sheet wing.
Three profile Peanuts.
Deperdussin 3-views.
Pesco Special 3-views.

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July 1972
Fairchild 51, 1" scale,
R/C or F/F.
SAM-5 A/2 Nordic.
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R/C, by Editor.
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August 1972
Bonzo stand-off R/C
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Counter-Attack
A/C scale.
Shc R/C QM.
P Taylorcraft on
boats, also big one.
Fairley Delta 3-views.

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Feb/March 1973
Profile F4U Corsair C/L
stunt, .40 power.
Beecroft's Satan, Class A
free flight.
Indoor Ornithopter.
Peanut Travelair 2000
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R/C gliders.

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R/C sailboat.
Briegleb BG-12, scale
R/C soarer.
R/C Spirit of St. Louis,
semi-scale, .049-.09.
Peanut Volsplane
Finish painting of rub-
ber scale models.

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3channel, .19 power.
Woodwind A/2, all sheet
covered wing.
Slope soaring technique.
Teakettle, twin-boom
CO₂ pusher.
Peanut Monocoupe 110.
Aerbo, .020 Replica, OT

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MODEL BUILDER

DECEMBER

1976

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621 West Nineteenth St., Costa Mesa, California 92627

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Cover: Czechoslovakian modeler Laddie Mikulasko poses with his scale model of the "Don Quixote", a Polish homebuilt, against a beautiful Canadian background. If the popularity of our other parasol pusher scale designs (Curtiss-Wright Jr., Dec. '71 MB, and Woody Pusher, Aug. '74 MB) is any indication, this 86 inch span, .60 powered scale model will become a favorite. Ektachrome by Jack Rousseau.



from Bill Northrop's workbench

...

• The year 1976 has been pretty well recognized as the 200th birthday of the United States. In fact, it would be safe to say that, commercially, the Bicentennial has been beaten to death.

Model airplaning also celebrated the year 1976. AMA recognized the efforts of numerous pioneer modeler/historians and established the Dayton, Ohio Nats as the 50th official National Model Airplane Championships (although it started in 1923, World War II caused us to miss a few).

Now we're about to come upon another 50th year celebration which is also important to model airplaning. In 1927, one man did something that suddenly brought aviation to the undivided attention of a heretofore disinterested public. Along with it, model airplaning enjoyed an overnight surge of interest which has never faded. Of course, we're talking about Charles Lindbergh's famous solo flight across the Atlantic on May 20, 1927.

No doubt there will be numerous special modeling events during 1977 in memory of this feat, and *Model Builder* is getting into it right away. In keeping with our emphasis on the foundation of model airplanes, rubber powered scale, we have added a special event to our Third Annual Parcel Post Proxy Peanut contest. Naturally, it will be an event for Peanut Scale models of the "Spirit of St. Louis" only.

You've heard the expression about "great minds . . ." At the very moment that we were putting together the Peanut "Spirit" announcement, Dennis Norman, of Lakewood, Ohio, telephoned and said, "Since next year is the 50th anniversary of Lindbergh's flight, why don't you . . ." We concluded the remainder of the sentence in two-part harmony.

The rest of the idea fell together within minutes. Dennis had already started drawing a Peanut "Spirit", so the project became a crash program to get the article into this issue in order that anyone interested would have model drawings and documentation 3-views available. See the Peanut contest announcement for other details.

Undoubtedly the most significant modeling recognition of Lindbergh's flight has been proposed by Frank Zaic, and we are wholeheartedly in favor of it, particularly, as Frank suggests, if it is kept free of commercial exploitation. Here is Frank's proposal:

"While I was visiting my family in New York, my brother John wondered why we did not have a Memorial Award honoring Charles Lindbergh. When we think of it, only those of us who were model builders before his 1927 flight to Paris, realize the tremendous impact his achievement had on the future of model aeronautics. While we counted ourselves in thousands before 1927, now

we are millions. A Lindbergh Award now seems so timely that one wonders why it was not proposed before.

"On my way back to California, I stopped at the Nationals. I spoke about the Lindbergh Award to everyone I met. The response was enthusiastic. Everyone was for it. The ever-practical Frank Ehling said that we would have no trouble finding a sponsor . . . our trouble might be finding or selecting a recipient. But this can be solved when the time comes.

"At the moment, our objective should be to determine whether or not we want a Lindbergh Award (should there be a doubt?), the method of financing, and finding an artist/sculptor who would do justice to our subject (We want something comparable to Collier and similar awards now in existence). The trophy should be ready for presentation by May 20, 1977, the 50th Anniversary of Lindbergh's Non-stop Flight from New York to Paris in 36 hours.

"It is my personal belief that the sponsors of the Award should be the Model Airplane Enthusiasts of America. The Award should be presented to the person(s) who made a major contribution to Model Aviation. The presentation should be made in Washington, D.C., by a dignitary, so that the event will receive national attention every year on May 20th.

Continued on page 110



OVER THE COUNTER



Earl Stahl's Howard DGA-8, now being kitted by Flyline Models.



Stahl's Rearwin Speedster, by Flyline Models. Both rubber powered.

● A very unique and useful article, the REMOCALL, has just been introduced by Model Rectifier Corporation, 2500 Woodbridge Avenue, Edison, NJ 08817.

This light weight (.75 ounce) device plugs into your R/C receiver, and will emit a high volume audible tone upon loss of the transmitter signal. The suggested uses include a warning that the airplane has been inadvertently turned on. It can be used as an aid to range checking . . . when you have walked too far and out of range, the signal will sound. It can be used as a crash locator, if you are unfortunate enough to go down in other than a clear area.

To use it as an interference monitor, turn on the receiver first. Since it is triggered to remain quiet upon presence of a transmitter signal, it will do so even if the signal being received is from a transmitter not your own. If the fre-

quency is clear, it'll do its thing, and stop as soon as you turn your signal 'ON'.

The REMOCALL will plug into any MRC system, and comes with instructions on how to connect it to other types of R/C systems.

Available from all MRC dealers.

* * *

What do you use for bait when you are after guppies? Well, if it is the Ace "Guppy" you want, \$8.95 will catch one every time.

It's a low price to pay for this latest catch from Ace R/C, which should bring lots of fun flying hours to the beginner and expert alike.

The "Guppy" is a 34 inch span rudder-only glider, powered by an .020, and designed for the pulse Commander Baby or Baby Twin radio system. Utilizing a foam wing, and simple, but



Sullivan's clamp-type motor mount.

attractive and rugged balsa fuselage, the kit builds fast and accurately.

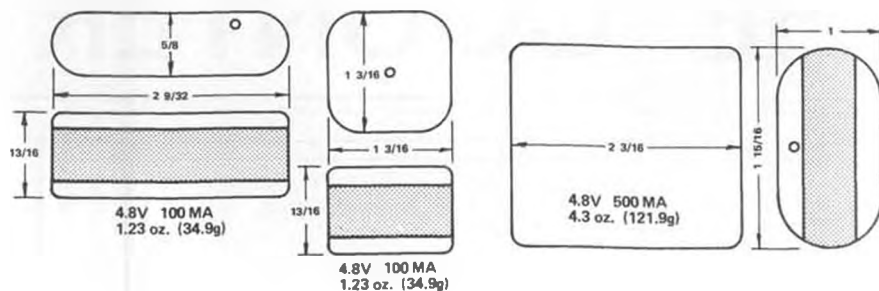
Total ready-to-fly weight is 8 ounces, on 160 square inches of wing. Price is



Flyline Models' 39 inch wingspan Kinner Sportster, for .049 and small R/C.



Carl Goldberg Models markets DJ's Multi-Stripe.



GE battery packs, specially engineered for vibration conditions, marketed by Ace Radio Control.



The "Guppy" is a 34 inch span powered glider for rudder-only R/C, Ace Radio Control.

less engine and radio.

The latest GE batteries, composed of cells specially engineered for high vibration environments, are also available from Ace. Sketches show the case sizes, and capacities, conservatively based on a one hour rate. Actual capacities are claimed as consistently 15 to 20% over the rating. The 500 ma size is the one most often used with the four or more channel system; the 100 ma size should be in your 1/2A airplane if you are still flying around with a larger and heavier battery.

Check your favorite hobby shop first, or order direct from Ace R/C, Box 511, Higginsville, MO 64037.

* * *

The ever-popular SIG Kadet kit, used by many as their first trainer, is now available in an improved version. Some

of the improvements have come about from the actual builders and flyers of this great model.

The new kit boasts a stronger wing and fuselage, including larger, tougher engine mount and landing gear installation.

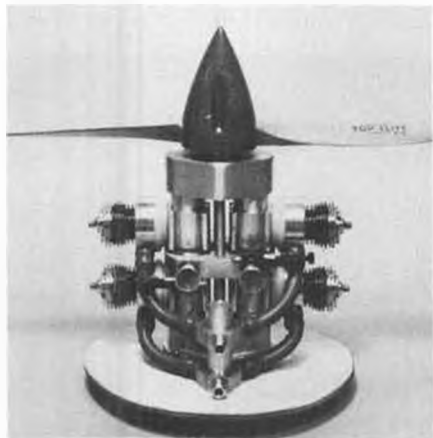
The final touch is an enlarged, illustrated, instruction manual, full of photos and isometric construction drawings.

Following the complete step-by-step instructions, the beginner greatly increases his chances of success at this critical starting phase of his R/C career.

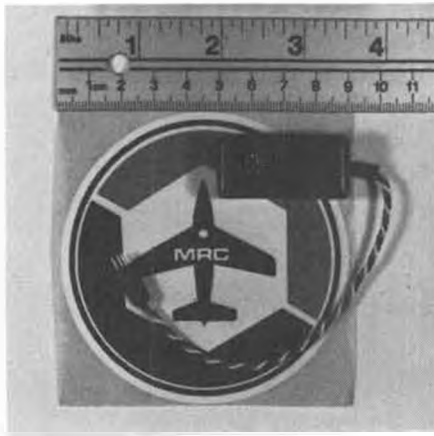
At your nearest R/C supplier, or direct from SIG Mfg Co, P.O. box 1, Montezuma, Iowa 50171.

* * *

It seems that the gang at K&B



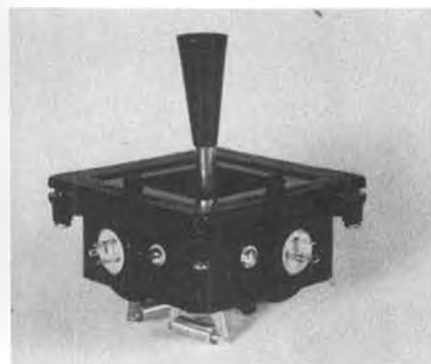
Four cylinder engine by Brice Machine Specialties.



REMOCALL radio warning device by MRC.



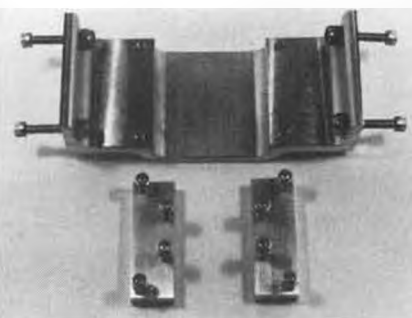
Single stick unit by D & R.



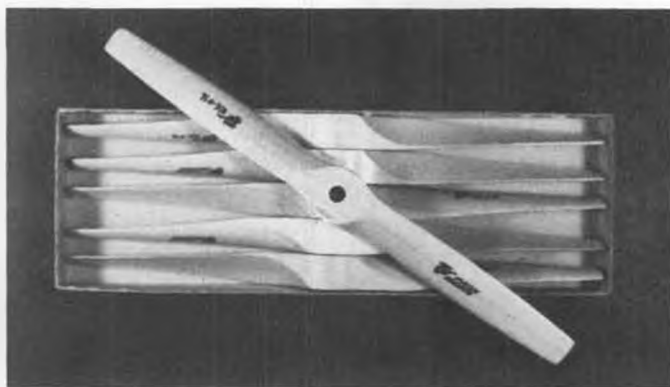
Two-stick control unit, by D & R



JoMac's radio, designed especially for R/C cars and boats.



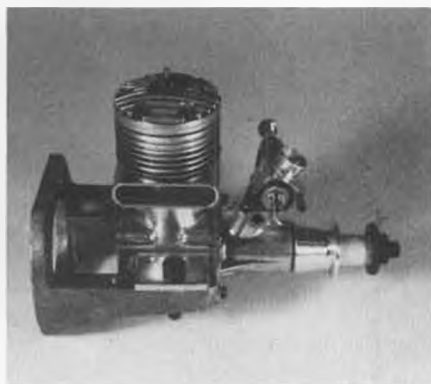
Boat motor mount by Steve Muck.



Top Flite Racing Props.



Messerschmitt '163' Komet, 1/2A R/C by Big Art's Models.



K&B's new plain-bearing .35, to replace the much-lamented "Stallion".

has hollered "Uncle" and succumbed to the numerous requests for continued production of the "Stallion" .35 type engines. However, it is no longer a "Stallion" or even the same engine, as the original tooling was no longer able to produce the desired quality after being used for 165,000 engines.

The new Model 7861 .35R/C and 7860 control line and freeflight engines are new from the ground up. The heavy iron piston has been replaced with a light aluminum piston equipped with the Dykes ring so successfully used in the front rotor Model 8011 .40. The crankcase block is also the same as used with the .40, with long wearing bronze bearings. The same carburetor that worked so well on so many Stallions is also used.

Other features include a "squish

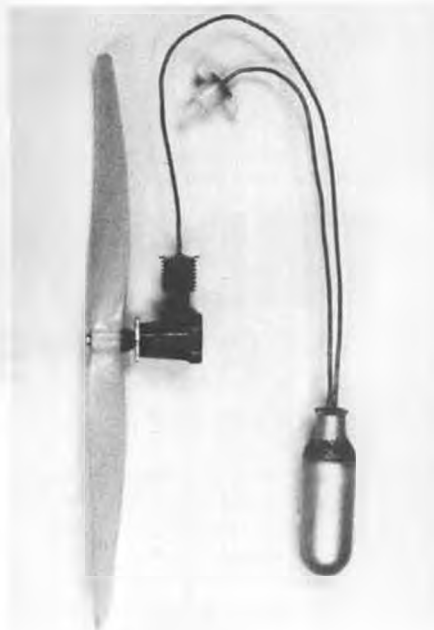


The Davis D-Varnishing Brush.

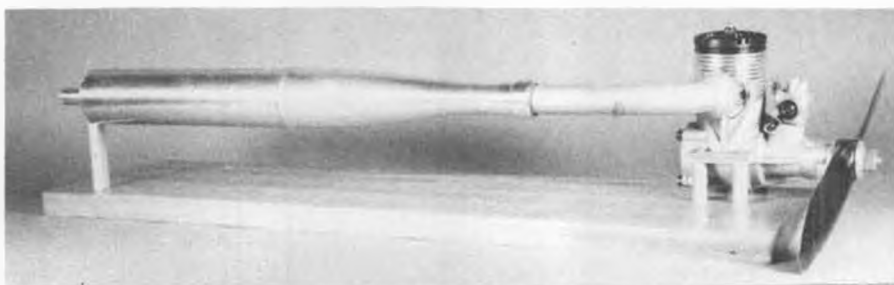
band" racing head for extra power, and a safety crank stud that practically eliminates breaking or bending of the crankshaft.

Economically priced at \$34.95 for the R/C, and \$29.95 for the standard model, the new K&B .35 is available

Continued on page 85



Telco's .003 CO₂ engine now being distributed in the USA.



Rossi 60 R/C, with pipe.



Sig's R/C "Kadet" trainer kit has been up-dated.



MRP's 1/8 scale Alfa Can Am.



The MRC 775 system comes in this neat molded plastic case. Great for storage of your radio, it can be used as a small field box, or for your do-it-yourself brain surgery instrument bag!

THE MRC 775

R/C SYSTEM



A PRODUCT\$ IN U\$E report by ELOY MAREZ

• There are radios, and there are radios. All of which share some pretty basic electronic and mechanical features, regardless of manufacturer. Some of these features are insisted on by the buyers, and others, especially the electronics, are in wide use because they have been proven reliable through the years. After the very basic requirements are taken care of, R/C systems start to get specialized; for example, the two and three channel types designed mostly for the glider fans. At the other end of the line, we find the so called 'Super'

radios, designed for the very expert competition flyers.

We class the MRC 775 System as a no-frills, advanced and competition flyer's radio. We find all the electronic and mechanical design features necessary for precise and reliable control of your model, leaving you and the airplane as the weak link. The roll buttons (yeeck) and some of the other gimmicks are not present.

While we definitely class the MRC 775 as out of the beginners class, we do not hesitate to recommend it for the

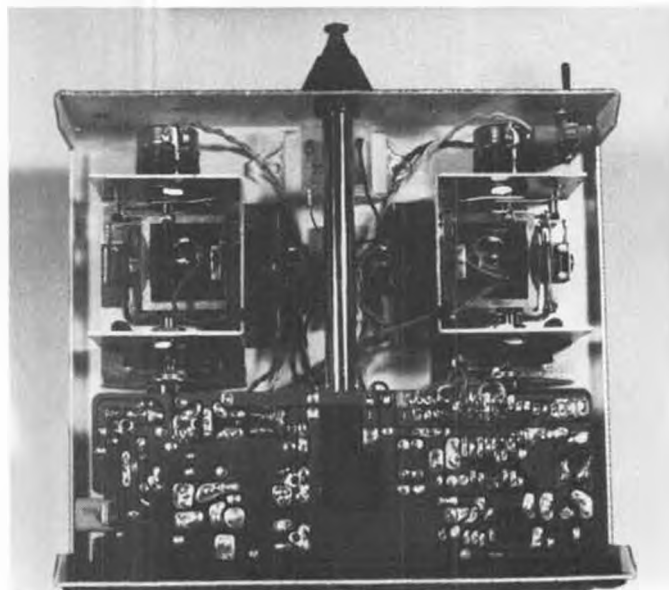
not-so-expert, or even as a very first system. The reliability and quality that assures the better flyer of successful operation also means that the beginner can concentrate more on the learning process without worrying about his radio working properly. Recognizing the fact that there is good electronics and there is cheap electronics, but there is no such a thing as good, cheap electronics, our general recommendations, when it comes to radio systems, has always been to buy as expensive a basic radio as you can afford. The extras to be considered then become a matter of the exact use intended for the radio.

TRANSMITTER

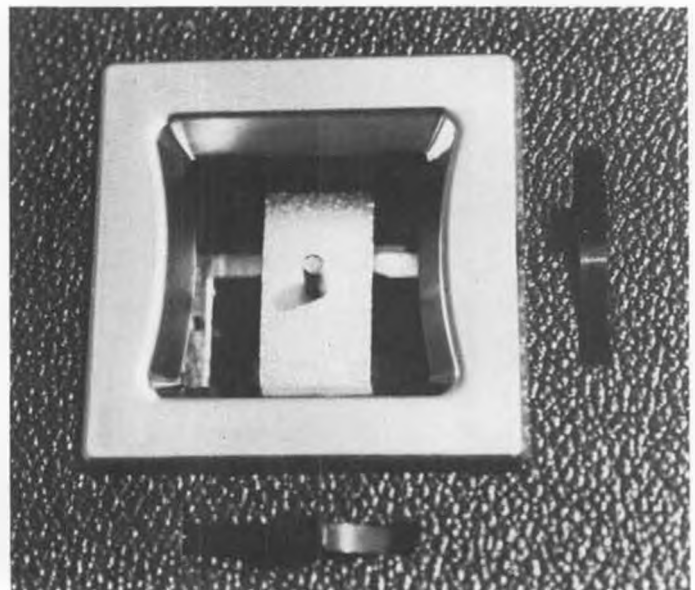
The transmitter is of average size and weight, and finished in a very attractive fine-grain black vinyl. Contrary to common practice, it is wider than high, whereas with most transmitters, the greatest dimension is in height. This configuration combines with a slightly bottom-heavy package that sits better with less chance of falling over, especially with the antenna extended. There are rubber feet on the bottom as well as on the rear back cover, to protect the vinyl finish regardless of how the transmitter is placed on the ground.

The all-metal, two-stick, open gimbals will be the first thing to impress you, both with their fine looks, and with their smooth operation. Nothing new in design is apparent or claimed, just a well manufactured mechanical device with no play in neutral positions. The pots used are conductive plastic, presently considered the ultimate in the industry. A fifth retract gear switch is located on top of the case.

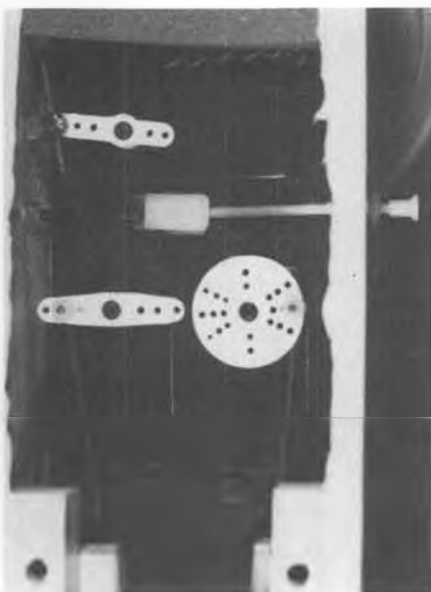
This system is available on all standard 27 and 72 mhz frequencies, as Mode One and Two stick configurations. Currently, a single stick type 775 is not available. Flyers who prefer that type of transmitter are referred to MRC's Model 7661.



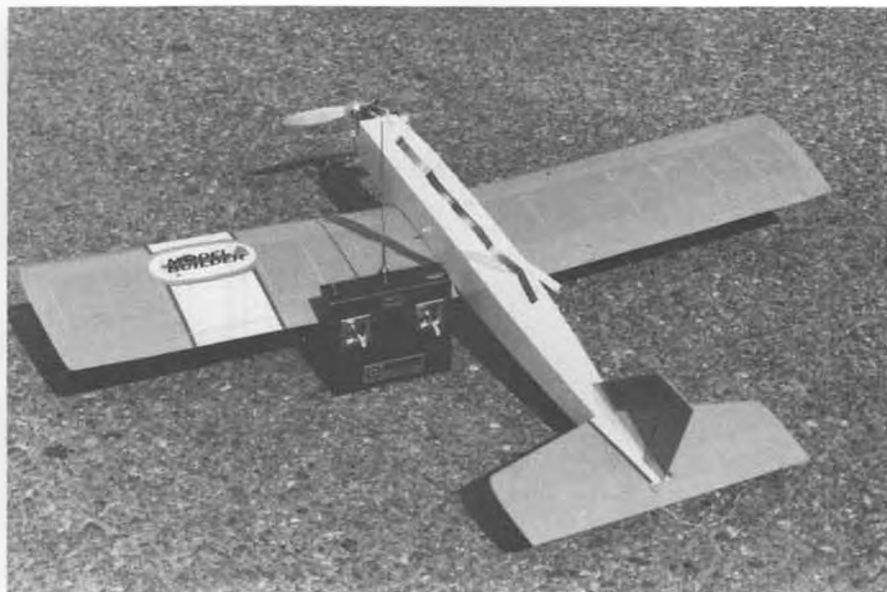
Inside of the transmitter reveals a minimum of wiring, as the PC board contains all of the electronics. Antenna completely retracts.



The all-metal, two-stick, open-gimbals provide smooth, precise operation. This one shown with stick removed. Electronic trims.



Quickie 500 installation, using the 2-by-1 servo tray. EK switch extension.

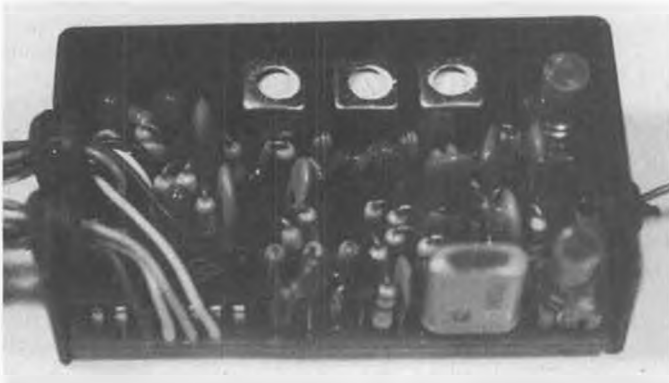


The MRC's test bed is this Spickler's Quickie 500. Ship has been flown in heavy frequency traffic, and by many different pilots . . . all without a glitch. Read about other range tests.

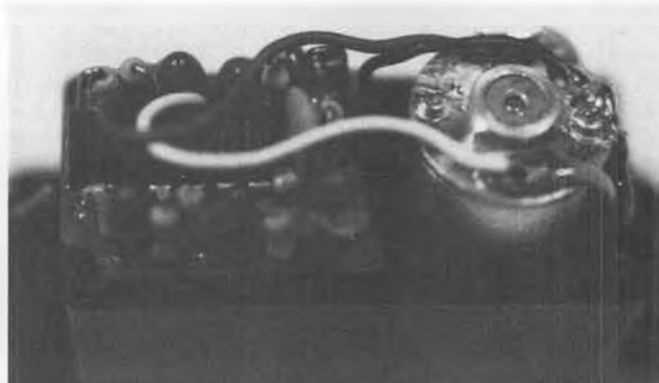
Separate electronic trims are located in the normal position; below the gimbals for the horizontal controls, and inboard for the vertical controls. They have a very fine ratchet, which we thought were the windings inside a low resistance wirewound pot. Not so . . . there is actually a 22-position ratchet device built into the trim levers. At first, we were somewhat doubtful about this,

thinking that maybe the adjustments would be too coarse; our previous transmitters did not have this arrangement. In actual practice, however, the increments are small enough to permit fine airplane trim, and an additional bonus soon becomes evident. In competition flying, when you don't have time to trim in the air, it is nice to have references to come back to if the trims

are bumped. With two airplanes being flown with the same transmitter, (primary and backup), it is nice to trim fly and not have to juggle pushrod adjustments to get both flying right with zero-zero on the trims. Just note the trim positions as "elevator, two clicks down"; "aileron, one click left", etc, adjust prior to flight, and you are ready to take on Terry Prather. *Continued on page 98*



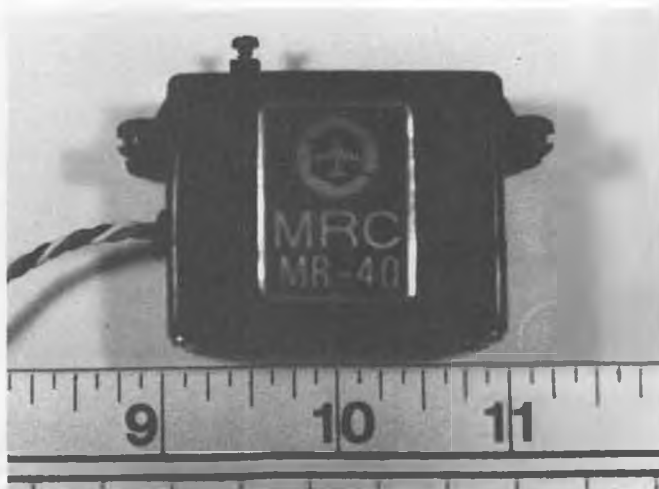
The single deck receiver is housed in a sturdy aluminum case, and weighs 2 ounces, including antenna and wiring harness.



The MR-40, one of several choices, weighs 1.7 ounces, has output torque of 36 inch ounces, and is sized for average installations.



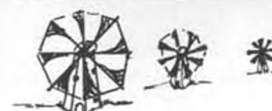
Receiver is 2-1/2 x 1-3/4 x 3/4 inches, and well built.



The MR-40 servo is 1-3/4 x 7/8 x 1-3/8 inches, and gives 3/8 travel with normal output radius, plus trim. Longer arms are provided.



DON QUIXOTE



Designed and built by LADDIE MIKULASKO, as told to JACK ROUSSEAU . . . Truly an international project, the design is by a Czechoslovakian now living in Canada, and the Polish aircraft was named after a Spanish nut who rode around the countryside on horseback, knocking out windmills!

• "Don Quixote" is a Polish homebuilt design which I first saw in the Polish publication *Skridlada Polska*. I fell in love with the shape of the plane right then, but couldn't get any more information until about two years later, when a friend from the C.S.S.R. sent me the Polish model magazine *Modelarz*, in which were published three-view drawings and pictures of the airplane.

I started the plans and drawings that same evening, and had the model finished a month and a half later.

The model looks quite unusual in the air, but the controls are easy and landings are slow and gentle. On the first flight, she took right off, with no trim changes needed at all.

After a long and happy flying season,

I sold the model and built a new, slightly improved version. This is the airplane presented in this article.

The model should be built in this order: Fuselage and vertical stab; Engine and Wing Mounting Pylon; Wings, Horizontal Stab, and Movable Surfaces. **FUSELAGE**

The fuselage is all-balsa with plywood bulkheads. First, cut out all the plywood bulkheads, and the balsa sides (59) from 1/8 balsa. Cut out the cockpit area doubler (60) from 1/8 balsa, and (61) from 1/32 ply.

When all these parts are cut, take a piece of 1 inch dowel and roll with light pressure over the balsa sides from nose to bulkhead location "E", to give the balsa a natural curve roughly the shape

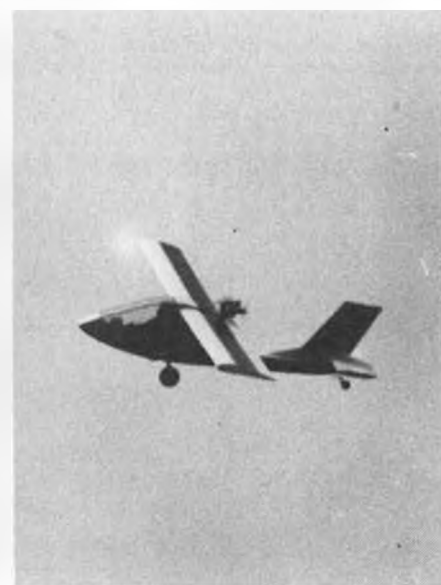
of the airplane's nose. Do the same thing to the balsa doublers (60). Note: Don't forget, one is left, and one is right side!

Now you have to make the jig for getting the exact curve of the nose of the airplane when laminating the fuselage sides. The jigs can be made from scrap balsa or heavy cardboard, to the sizes shown on the plan.

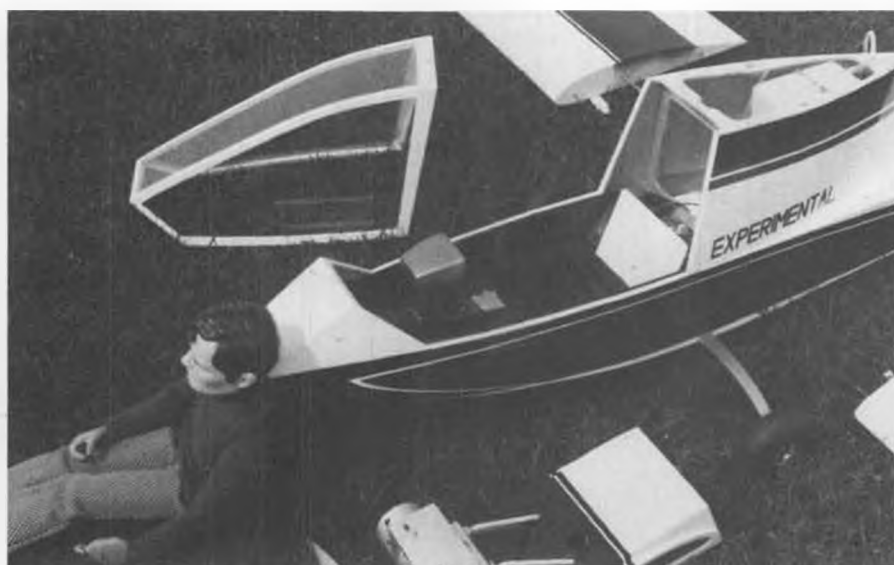
Lay each fuselage side down with the jigs positioned as shown and apply contact cement or polyester resin (I prefer resin) where the doublers will go. Lay the balsa doubler in place, apply the next layer of resin, and lay the plywood doubler over top immediately. Note: This has to be done *fast*; don't use too much hardener or the resin will cure too



Overhead view of cockpit, showing seat and instrument detailing. Radio is hidden under and behind seat, battery pack is ahead of instrument panel. How 'bout them pleats!



Yes it do fly, and with extreme ease! Author has built two, and neither needed flight trim.



How's that for a nice, flat, do-it-yourself canopy? With all of that "greenhouse", a detailed cockpit is just about a necessity. Single strut landing gear bent from thick aluminum.

quickly for you to get everything lined up.

Pin the assembly down at bulkhead "E" and put a weight on top of it in the cockpit area so that the fuselage side touches each point of the jig. Once one side is complete, you can remove it and do the other.

From now on, the building is easy.

Glue the longerons (68) to the fuselage sides from where the doublers end all the way back to the end of the fuselage side. Glue in the balsa cross-webs as shown.

Now we come to that "easy" part I

was telling you about. Because the fuselage is perfectly flat on top, you can build the whole thing upside-down on top of the plan.

Pin the fuselage sides upside-down, standing up on the plan and install half-bulkheads "A-1", "B" and "C".

Install the 1/4 sq. fuselage cross-braces between the fuselage sides as shown, lying on the plan, and glue the narrow half-bulkheads "H", "I" and "K" into position.

When dry, turn the fuselage right side up and install bulkheads "E", "F" and "G". Then glue the 1/8 plywood mount-



A slow and easy pass for the photographer. Slight dihedral eliminates scale 'saggy' look.

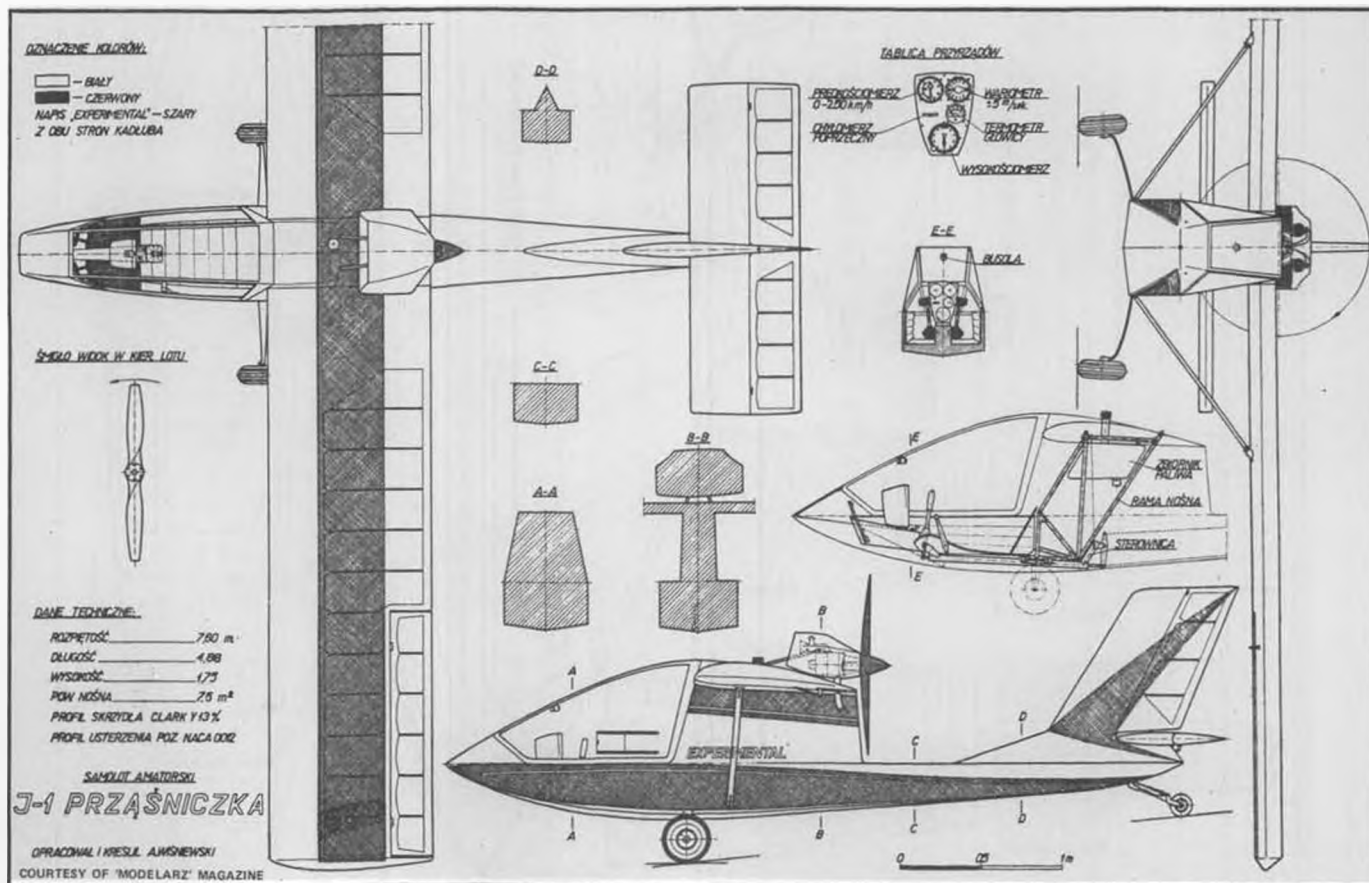
ing base (65) for the engine/wing pylon on top of them. Install spruce triangle stock (64) where the bulkheads butt up against the pylon mounting plate.

Install plywood nose former "A-2" and also nose sides (53) and top (52).

Cut out the fuselage top sheeting from 1/16 balsa and glue it to the top of the fuselage.

Glue the two spruce stiffeners (63) at the rear of the cockpit area and the single trailing-edge stiffener (66) from the pylon mounting plate to the top of the fuselage.

Between bulkheads "F" and "G",



glue the 1/8 balsa fuel tank compartment floor (79).

Cut out and glue on 3/32 balsa side sheeting (67).

Glue in the 1/16 ply cabin floor. Install the balsa fuselage keel stringer (69).

Glue in the rear fuselage bulkhead "J".

The vertical stab should be built at this time so you can glue it to bulkhead "J", with its pine trailing edge stiffener extending down "J" to the center line of the fuselage. Construction of the vertical stab and rudder is similar to the horizontal stab and elevator. The plans should be self-explanatory.

Once you have the vertical stab completed and installed as described, glue on the triangular leading edge (80) of the fin, and install balsa former "Q".

At this stage, you must fashion and install the control rod and horn for the rudder, which is made from 1/16 piano wire with a metal control horn (76) silver-soldered to its bottom.

Slide a piece of Nyrod inner tubing (85) over the wire and bend the top of the wire to the shape shown on the plan. Fasten the tailwheel-steering cables to the bottom horn and install the assembly, glueing the nyrod to the pine stiffener extension (83).

Now install the Nyrods for the rudder and elevator.

For the rudder klevis, I prefer the new Du-Bro threaded ball-links, as the swivel action absorbs any binding side-to-side motions.

The Nyrods should be secured between bulkheads "G" and "J" so that they can't twist or vibrate in flight.

Install the 3/32 sheeting (70) between the vertical stab and the fuselage.

At the rear of the fuselage, glue the 1/4 inch balsa strips (71) on both sides and the plywood end bulkhead "L".

Bend the tail-skid (72) from 3/32 steel, 3/8 inch wide . . . preferably spring-steel.

Silver-solder tube (74) to it and install the 1/32 steel stiffener (73).

The tailwheel fork is 1/32 steel drilled in the center for a 6-32 screw and silver-soldered. The screw goes



The author and his second "Don Quixote". Slight modifications from the first one are included in the plans. Pusher configuration requires reversing engine operation or L.H. props. See text.



Gosh, that was a hard landing! A lesson learned from R/C sailplanes . . . Two half wing panels are easier to pack than one whole one! Center section also removes for access to fuselage.

through the tubing and horn (75) is silver-soldered on top of it. The fork and horn must move together freely for good steering.

The tailwheel assembly is fastened to bulkhead "K" with two 4-40 bolts. The two control cables from horn (76) protrude through bulkhead "K".

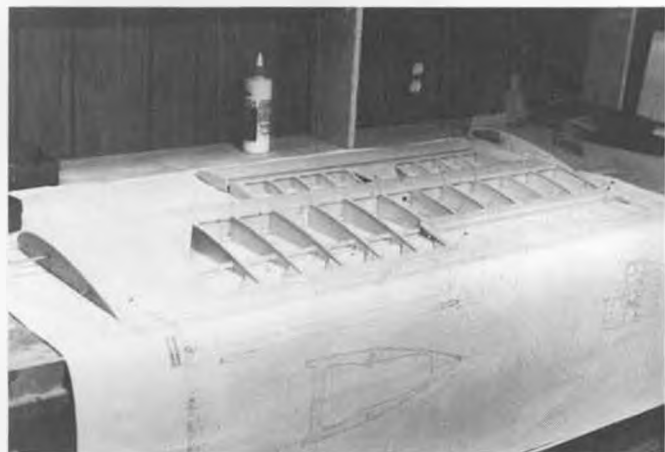
Now, the bottom of the fuselage can be completely sheeted with 3/32

balsa from nose to tail.

Install 1/4 bulkhead "E-1" in the fuselage and glue hardwood block (78) for the landing gear as shown.

Install plywood stiffener (77) as shown.

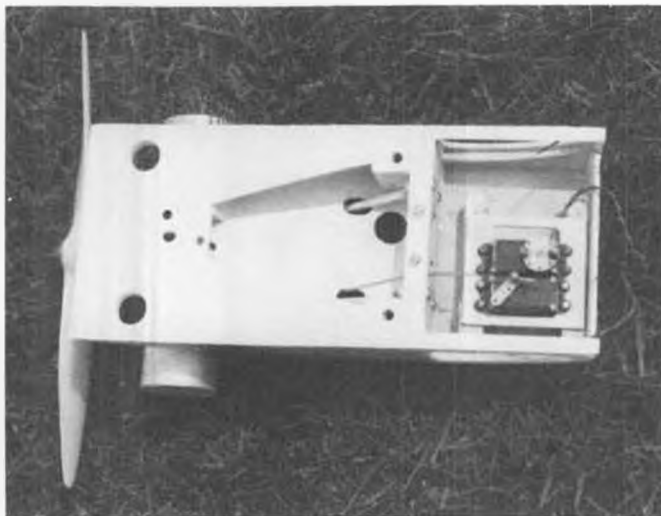
Glue the horizontal stab (*Whoops! Gotta build it first! See further on. wcn*) to the fuselage and drill a 1/16 hole through stiffener (29) in the hori-



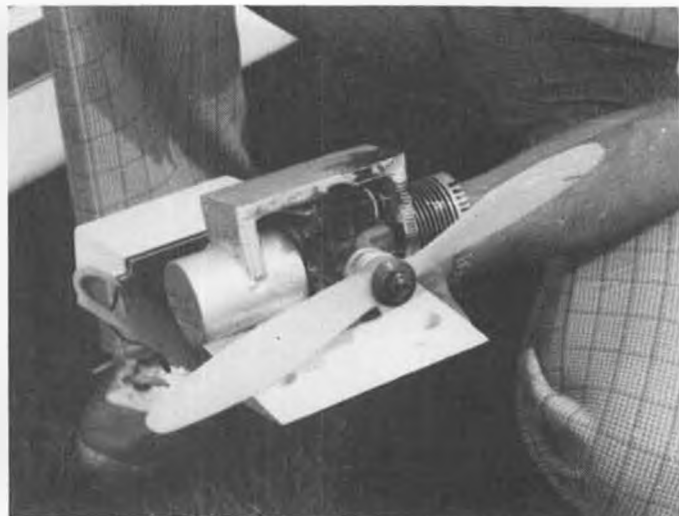
Right wing panel during construction. Flat bottomed airfoil simplifies building. Gee, what a neat workbench!



Fuselage is also easy to build on the board because the top is flat. Sides are prebent when doublers are glued on.



Underside of centersection pod, showing aileron and throttle servos. Fuel must be pressurized, or pumped. Dummy cylinder is muffler.



Top side of centersection pod, showing dummy engine cylinder which acts as muffler. Silver soldered from 1/64 sheet steel.

zontal stab and the 1/4 inch balsa (71) at the fuselage rear. Glue a dowel in this hole to pin the stab in position permanently.

The cockpit frame is made from four layers of 1/16 balsa laminated together. For a pattern, use pins or cut the shape out of cardboard. Use Titebond or similar glue for this job.

When the glue is dry, lay the plywood end plates "A-3" and "D-1" into position in the fuselage and glue the laminated frame members (57) and (58) to them to rough out the canopy shape.

When dry, sand everything to the proper angle and about 1/16 smaller than the finished outline. The inside of the frame can now be filled, primed, and painted white.

Now take clear plastic or acetate sheet for the windows and cut it out about 1/8 inch larger than the frame. Sand around the outside edges of the plastic about 1/4 inch in on both sides with fine sandpaper for a good gluing surface, and glue it to the frame with slow-curing epoxy. Use masking tape to hold the plastic to the frame while drying.

The outside framing is then made from thin white plastic or ABS sheet, lightly sanded on the inner side and glued over the clear plastic with epoxy.

The sliding window is on the left side. It should be made before you glue the left side window material to the frame.

The inside of the cockpit is done after the model is finished and painted.

The instrument panel column and seat are made from 1/16 balsa with the upholstery as follows:

Cut the sides from thin cardboard.

Glue 1/8 inch foam to the cardboard.

Cover it with leatherette, folding the sides around the cardboard and gluing them to the bottom side.

Draw lines with a soft pencil where the leatherette is to be sewn.

Sew the stitch lines right through the cardboard.

Do the same for the seat cushion.

LANDING GEAR

The landing gear is made from 3/16 or 5/32 dural.

First, drill all the holes, and then bend it to the shape shown on the plan. You shouldn't have to heat the aluminum to bend it.

WING CENTER SECTION AND ENGINE MOUNT

Cut out the two plywood pieces for the main spar center brace (39) with all holes and center lines as shown on the

plan.

When done, take one side and epoxy the 3/16 brass tube right on the centerline of the brace.

Glue in the 1/4 x 1/8 and 1/4 sq. spruce filler pieces and glue on the other side of the brace. Make sure everything lines up, and then fill the rest of the spaces between the balsa and sand smooth.

Cut out two airfoils "C-1" and drill holes 3/16 and 1/8 for the wire joiners.

Cut out the center section bottom



Another view of cockpit area. Everything is quite accessible. Two piece landing gear is installed after fuselage has been finished and painted. Engine braces provide precision thrust adjustments.



Optical illusion makes wings look 'saggy', but hold photo up and sight along trailing edge. See? Built-up steerable tail wheel provides excellent ground handling. Nose-overs are impossible!



MB editor's 3 inch scale, 7-1/2 foot span Gipsy Moth, just after completion in 1961. The Forster 99 ignition engine could barely sustain flight, replaced by a Fox .59. The 15 lb., Quadruplex controlled ship placed 3rd in scale at '65 Nats, and 4th in '66. Anyone interested in plans?

'REMOTELY SPEAKING...'

R/C News, by BILL NORTHROP

ANYONE FOR OH-TEN PYLON?

Jerry Nelson and some of his cohorts in the East Bay (San Francisco) R/C club were the first to come up with the idea of head-to-head R/C pylon racing. The first article on the subject, written by Jerry, was published in the March, 1965 issue of M.A.N., back when we were R/C Editor of that magazine. Up until that time, the only official pylon event was a one-at-a-time affair, against the clock, developed when the earlier super-regen radios only permitted one plane in the air at a time.

Later that year, multi-plane pylon racing was introduced to the modeling

public when demonstrations were held during the Willow Grove, PA., AMA Nationals. Out of that beginning, Good-year, or Formula 1 pylon, and the NMPRA were formed . . . and along with it came a succession of offshoot pylon events.

There was Formula II, which never really got off the ground. Originally intended to be scale Thompson and Greve Trophy racing, with the classic radial and other big engined aircraft of that era, it was shot down before it had a chance by a loose set of rules which allowed slightly modified Form I aircraft to compete and dominate, thus

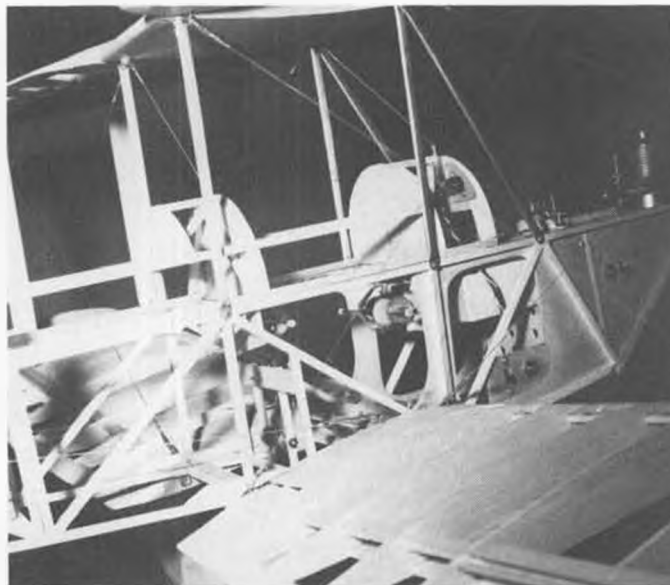
loosing all of its identity.

Another event, which is still in the AMA Rule Book, was Sport Pylon. This was to be a racing event for "everyone", in that the contestants could use their every-day sport and pattern airplanes so they wouldn't have to build a special airplane just for racing. Ho, Ho, Ho . . . you can imagine how long that lasted! If it hadn't been checked in its path, you'd probably be seeing 60 powered 300 square inch "sport" planes chewing up flying fields and people.

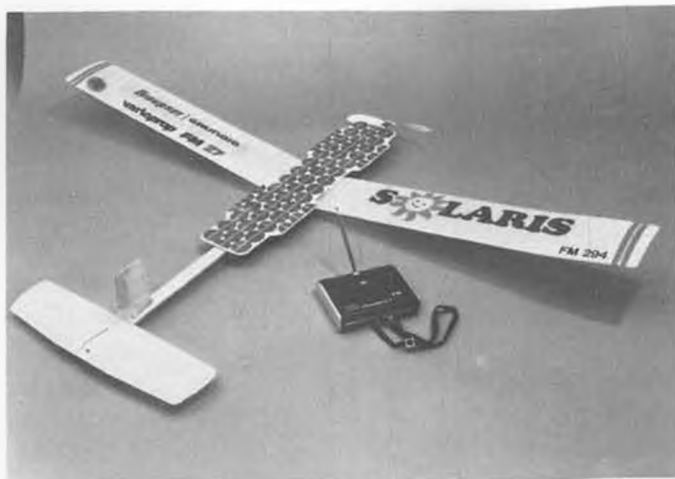
By the way, there's been some talk about 60 powered pylon. Well, go right ahead. Just follow the Sport Pylon



At the '59 or '60 DCRC Symposium, the Gipsy's skeleton was on display. Fuselage was later covered with 3/32 and 1/8 sheet balsa.



Early homebuilt servos were Mighty Midget electric motors with centrifugal clutches, driving shafts which operated control cables!



Members of the Graupner firm, including the late Fred Militky, have made the first sun-powered R/C flights with this 21-3/8 oz, 81" ship.



Cliff Weirick and Eugene Jones, of Cox Hobbies, examine R/C conversions of the C/L Super Stunter, by Eloy Marez and Bob Root.



Burnis Fields, Jacksonville, Fla. hobby dealer, with his Checkers Stearman, Enya 60, EK R/C.



Winners of biplane contest, Oct. 30, Jacksonville (l to r): Barry Conners, 3rd, Lanier Rebel; Burnis Fields, 2nd; and Dick Marty, 1st, Aeromaster, Kraft radio, Sig finish.

specifications as they now exist. But before it gets too far gone, how about requiring mufflers . . . please?

And then there was FAI Pylon. Bugged down for several years when the then chairman of the R/C Subcommittee of the CIAM tried to push through .29 powered cabin monoplanes pulling streamers, it finally emerged as another modified Formula 1 event . . . modified for the worse, that is.

Next came Quarter Midget. At a late 60's Toledo trade show, we coined this

title during a discussion with Phil Kraft and Joe Bridi about a grass-roots pylon event using smaller engines. Shortly after, Don Dewey beat us to the punch and published the first set of Quarter Midget rules. Most "now generation" modelers know that QM has since developed into a top pylon event, with as strong a following as Formula 1.

Somehow, the grass-roots idea of QM got lost in its rapid development, and even while it was in its growing pains, some modelers were starting to

fly 1/2A pylon. To date, 1/2A pylon has probably come the closest to being the "club" event that gets the most non-competitive modelers out of their workshops. It has been growing in popularity over the past few years, and now has been proposed as an AMA event with standardized rules. We're frankly a bit apprehensive about standardization of this event, since this would seem to be contradictory to the concept . . . low cost racing. Once you standardize and

Continued on page 109



Tony Orsini, with Sig Skybolt, Sig dope, and Fox Eagle power, at biplane contest.



Barry Conners' Lanier Rebel is K&B powered, and uses Kraft radio. Nice pit area!



Fred Williams, with his Big Honker Biplane, Monokote covered, K&B 40 power.



Formula I Sig Races, August 15, 1976. The winners (l to r): Bill Preis, 1st; Charlie Brunner, 2nd; and Lynn (Turkey) Stevens, 3rd. Hmmm, wonder why all the merchandise prizes are from Sig?

PYLON

By JIM GAGER

**"GO FAST AND
Turn Left!"**

• Hi, well, as I sit and write this column, it's just one day after the last race of the season around here and, believe it or not, I wish there were still more races to come. However, as with Mother Nature using the killing powers of winter to allow life to retrench and prepare for its new growth and beauty in the spring, so too must we turn to our workshops to rebuild and plan for the new season. Which is one way to say that if we work things right we'll be bringing you some kit reviews, and if it's a new airplane to us, we'll include flight reports, if our Indiana weather

will cooperate.

If you are new to racing, might we suggest that you have at least two airplanes completely finished by spring, another one ready to paint, and one more on the building boards. You might not need all of them, but believe me, it's better to build and prepare in the winter than to be rushing to complete them during the racing season.

Don't know if you've been following all of the newsprint in racing circles, but we went to the trouble of looking up the definition of a word that has been

being used extensively lately, i.e. "turkey" . . . a winged bird noted mainly for its inability to fly; native to the southeastern United States.

* * *

Just a couple of Nats '76 notes . . . While at the Nats, and occasionally since then, the subject of whether anything was proved as to who was best, has come up. The talk being that, because there were no qualifying rounds with flyoffs amongst the top twenty contenders, perhaps the best flyers didn't come out on top, due to some flyers not having to fly against some of the fastest competitors. Well, BUSHWAH! The guys were winners because they won their heats by being faster in those heats and by being prepared to race and win. Luck plays a big part in any racing event . . . remember at the "Indy 500" when a driver had it won and ran out of gas on the last lap? Also, the way that the matrix breaks down, with 81 entries and the limited number of frequencies available, is always a factor with which to contend. The Nats is a contest for everyone, and everyone entered should have an equal opportunity to fly an equal



Dick Steine holds as Hank Pohlmann starts his Sig Mustang 450 at the Sig Formula I pylon races, Aug. 15, 1976.



Lynn Stevens anchors for Dan Kane as he fires up his Miss Dara, at the Sig event.

number of times. Sounds like there might be some "sour grapes" mixed in with the thinking of those who are complaining. Besides, if we're saying that the Nats doesn't prove anything, there's always the NMPRA Quarter-Midget Nationals and the NMPRA Formula I Championships, which are limited to racing exclusively and should prove something.

One other suggestion we have concerns Formula I judging. When the Formula I aircraft are judged for handicapping, there are to be no identification markings as to whom the airplanes belong. This is to not unduly influence the judges with the "big names". Well, fine, though I doubt that it really serves its purpose, and it unnecessarily lengthens the handicapping process. After all the planes have been judged, they then must be identified and matched with the contestant's entry form so his place in handicapping can be recorded, and then the contestants must pick up their planes. It seems that perhaps the flyer's name could be placed on a business-size card and taped inconspicuously on the under side of the airplanes to speed things up. Any comments?

* * *

Although the following is quite lengthy, we're going to print it in its entirety, as it concerns every one of us interested in Q-M racing. If the rules proposals are passed as is, we'll have to live with them for at least two years, so you'd better pay attention to what they say. If you disagree with them, now is the time to do something about it.

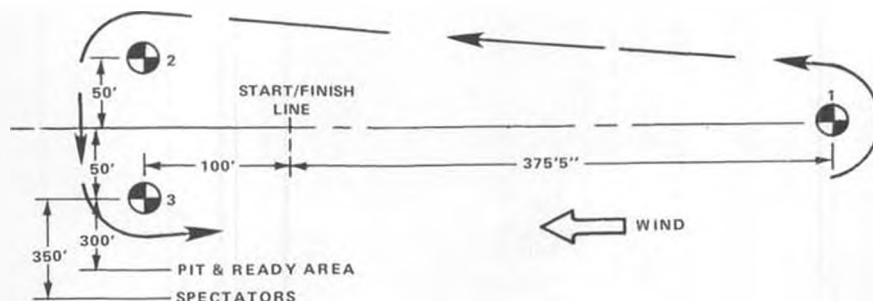
The first part we'll cover is that letter that George Zink, current President of the Q-M section of the NMPRA, sent along to explain some changes that were made at the Q-M meeting held during the 1976 Nats as opposed to the original rules draft proposal that was derived from a Contest Directors' and a separate Q-M fliers' survey conducted.

One other note that George sent along refers to Paragraph 19 Head Gear. The word "personnel", as defined by the rules committee Chairman, Fred Fogelmann, in the context used, denotes contest workers, and can be read to exclude the fliers and callers. NMPRA-QM Rules Proposals, by George Zink

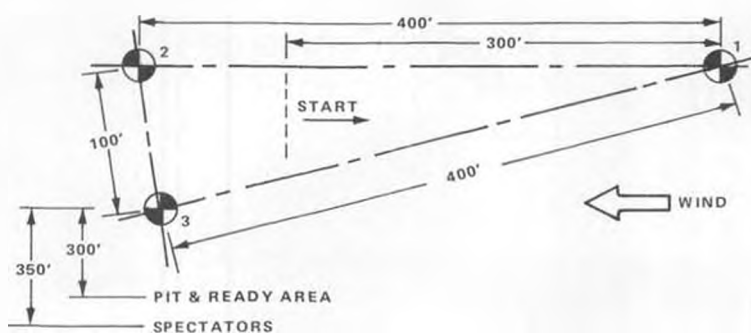
"When NMPRA-QM decided to become involved with presenting rules proposals to the AMA for inclusion in the 1978 Rulebook, we wanted to have something which would be acceptable to the vast majority of QM racers throughout the U.S.A.

"Our first step was to determine just what the current situation really was. That was the purpose behind our CD survey. A second survey, published in RCM, cleared up some of the questions we had from the CD survey, and it received much wider circulation. What

Continued on page 81



Standard Quarter Midget Pylon course layout.



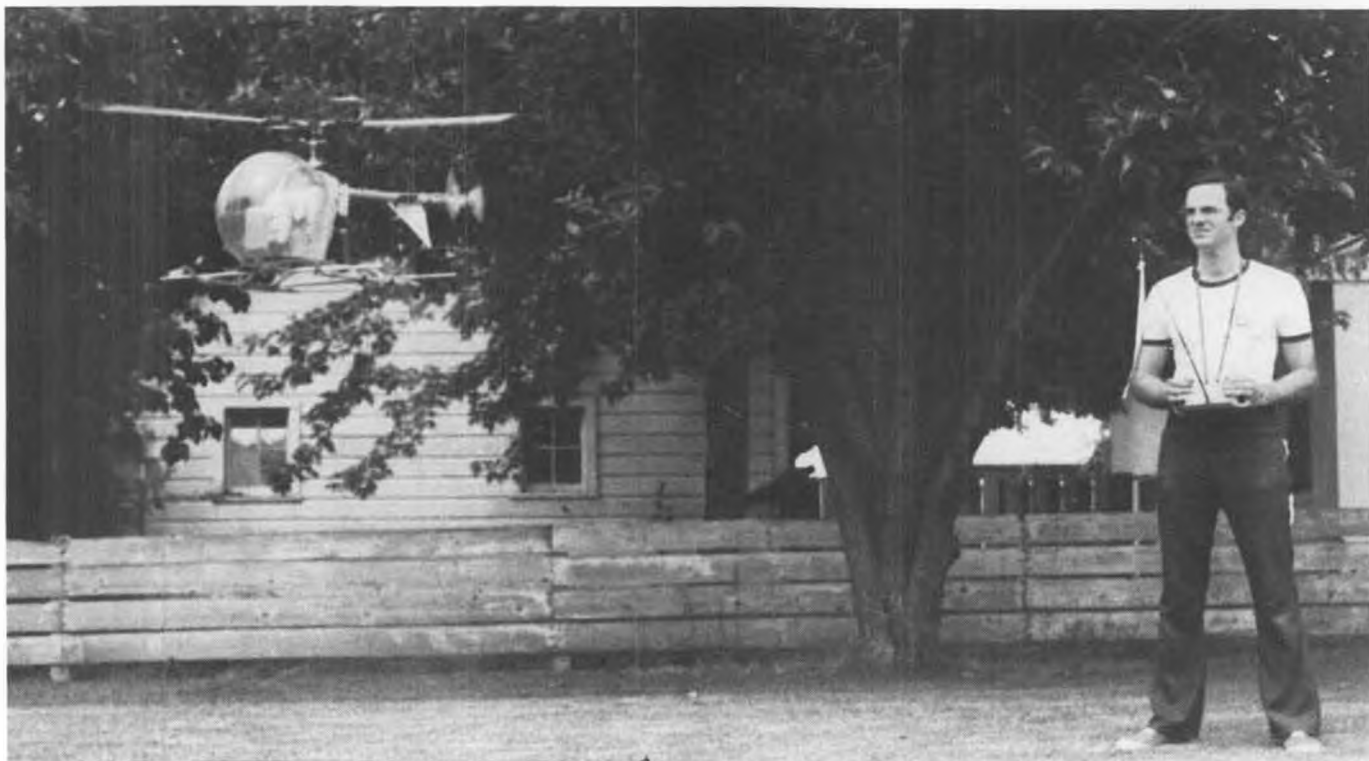
Proposed Quarter Midget "Short Course", already in use at most Southern California races.



At the Start/Finish line during the Sig Races (l to r): Starter John Edmonds, Bill Preis, and Charlie Brunner. Course was set up at Sig's airport, Montezuma, Iowa.



Dick Steine's (Minneapolis, Mn) K&B powered Toni takes off from the grass strip at Sig's field. Must be awful tempting to use that silo for a fourth pylon!



Roger May, College Place, Washington, does all of his flying in his 30 by 60 back yard. Try that with your .60 powered pattern ship! Chopper is the MRC Heli-Baby, with Kavan gyro.

CHOPPER CHATTER

By JOHN TUCKER



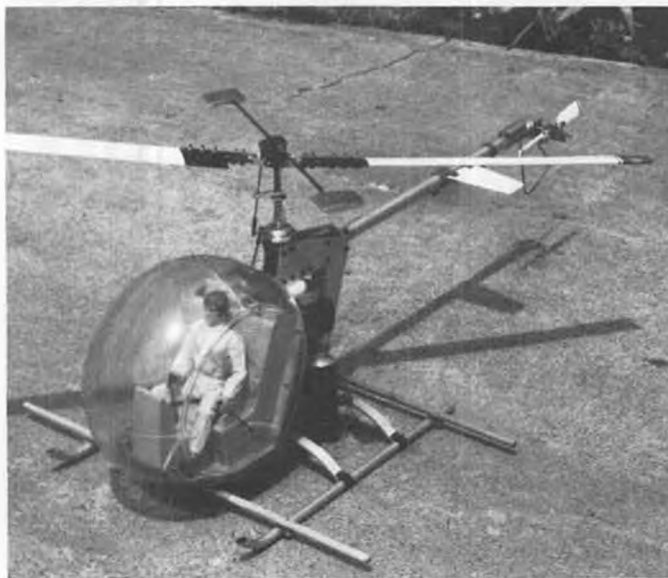
● One of my hardest chores each month is to figure out how to start this article, particularly in view of the many projects which come across my workbench. After looking back over the previous issues, most of which featured construction articles, I decided this would be an appropriate time to catch you up on our reader activities. Besides, my secret project won't be ready for at

least another month, and even then, might not warrant much space in the column. More on that later, so now on to more important news.

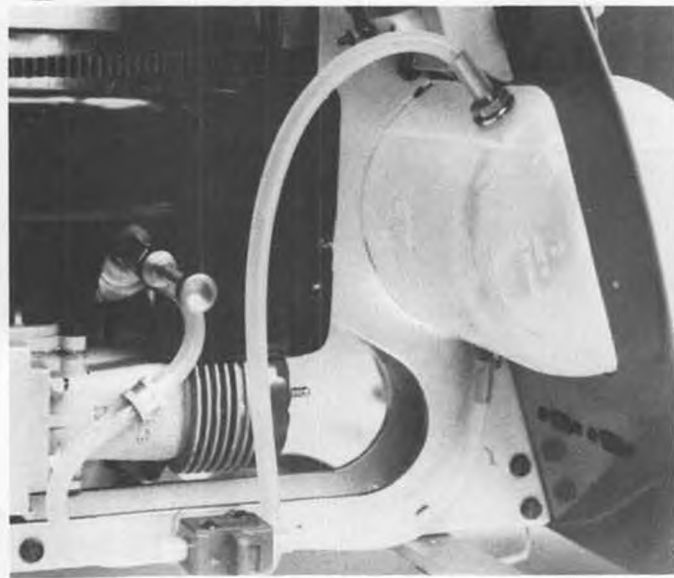
Received a letter from Cliff Turner, who reports he is stationed in Athens, Greece, and has the only operational R/C helicopter in the country. He has no previous helo experience, but after putting together a Kavan Jet Ranger, he

has managed to accumulate about 12 hours of hovering, with many learning problems, but no damage to the chopper. And that's not too bad for a beginner with no help! Perhaps some of you chopper pilots might like to collect overseas letters, so will give his address . . . G. S. Turner, Jsmagg AFS, APO New York 09253.

I still believe the average R/C chop-



Close-up of Roger May's Heli-Baby, showing his training gear rig. Power is a Webra .40.



May has installed a Perry fuel shut-off.



Photo of Roger May's Heli-Baby with pilot and seat removed. Note Kavan gyro.

per pilot will experiment and modify until he comes up with an answer to his specific problem, and our friend Mike Dailey, 14819 Corliss N., Seattle, Wash. 98133, is no exception. Mike writes that he has experienced a loss of left tail rotor control on his Jet Ranger when hovering in gusty winds and the gusts hit the tail rotor at just the right angle. Apparently, the problem doesn't seem to have any connection with tail rotor RPM, and he suspects the thin symmetrical tail rotor blades may be prone to stalling. The blades he has been experimenting with are flat on one side, have a rather thick section and a wider chord. His idea is that with the tail rotor only turning 5000 RPM, the stock blades cannot develop the thrust he requires. Preliminary tests of his new blades are reported as very promising. His new blades are made out of a section of Heli-baby main rotor blade stock, and pre trimmed to a length of 114 mm, and a chord width of 29 mm. This is about 4 mm wider than the stock blades, and with the high-lift airfoil, should provide considerably more control range! I'm sure we'll all be interested, Mike, in your final conclusions, so let us know what you find.

And while we're on the subject of tail rotor blades, you "Alouette 2"

owners might like the results of using Jet Ranger tail rotor blades instead of the Alouette blades for more response. Try it, you might like it!

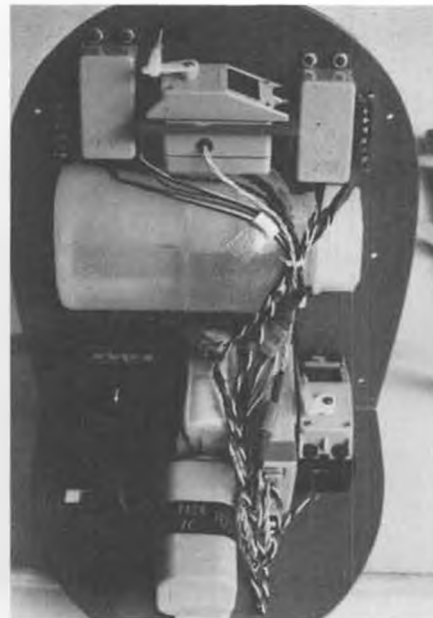
Lot'sa mail from Washington this month . . . Roger May, 615 S.W. Davis Ave., College Place, WA. 99324, sends some pics of his beautiful Heli-baby and his neat installation of the Kavan gyro under the seat. When I talked to him on the phone, I couldn't believe he had stuffed all that equipment under the seat, but the photos show how he did it. Of particular interest was his mention of an electronic fuel control unit mounted after the pictures were taken . . . let's have a little more info on that one, Roger! Futaba FP-S7 servos are used, since the swash-plate servos are located outside the cabin and eventually get oil-soaked. The Futaba FP-S7's are waterproofed during assembly and are perfect for the job. Roger also notes he has installed the Semco 202 ESW muffler on his Webra .40, but doesn't care for the positioning of the exhaust gasses, so he has ordered a model 202 BCT muffler, which he hopes will do the trick!

Recommended highly are Walt Schoonard's hardened seesaw and "swing-back" machined blade holders for the Heli-baby. This accessory is of very high quality and is available from Miniature Aircraft Supply, 2563 Diversified Way, Orlando, Florida, 32804 (305-422-1531).

Last one coming up . . . a letter from Jerry Holcomb, 1010 N.E. 122nd Ave., Vancouver, WA 98664. Jerry is a member of the Portland Sky Knights and was kind enough to send all the hot news from Portland so will reproduce the whole thing.

"Dear John, Thought it was 'bout time to write and let you know what is going on in the 'copter scene in the Portland area. I have given up on the scratch built route for this summer, since I had a belt failure on my latest ship over the Memorial Day weekend . . . fell into some tall grass with minimal damage, but I am a little tired of messing around re-inventing the wheel. My wife bought me a red Revolution for Father's Day, and it has been working just super . . . those high rpm systems sure seem to work well.

"Emery Wayman has had his share of bad luck this summer. He had an engine



Another view of May's control system installation. Water-proof Futaba FP-S7 servos used.

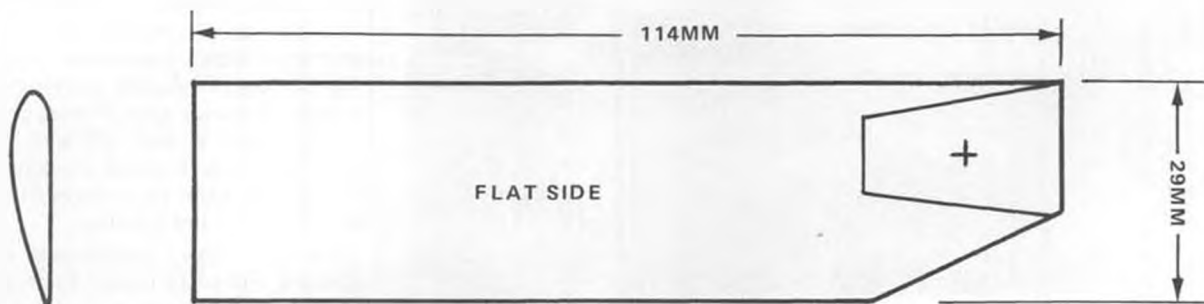
flameout in his Gazelle over the Memorial Day weekend . . . about 50 feet in a hover . . . only he fell onto a paved area! Ugh!! Since he is an even more devoted 'round winger' than me, he got together another one shortly thereafter, but fate is fickle . . . the same thing happened to him this past weekend. Double Ugh! He isn't too happy with his old faithful Webra anymore. It worked well for over a year, but something has gone over the hill now.

"Mike Miller is flying his trusty Cobra again. I say again, since he holds the local record for chewed up tranny gears, some sort of meshing problem I suppose, but he seems to have it licked now. He too has a Revolution, a blue one.

"Dick Smith is just getting started with another blue Revolution. He has a couple of hours under his belt now, and can hover for a few seconds more or less under control. He has succeeded in turning turtle three times in one day, however, despite using Simone's huge training gear. Very sturdy bird.

"Gotta get to work now, will write again soon and will include my modifications to the Revolution then."

There ya go . . . let's have more letters and photos. We like to hear what someone besides the columnist is up to!





Down on the farm, Chet Lanzo test glides his original R/C design of 1937.



PLUG SPARKS

By JOHN POND

● This month we are extremely fortunate to have a follow-on description of how old timer events got started in New Zealand, from none other than the founder, Seddon Finn!

In reading how things got started, this columnist is struck by the similarity of the rules hassle that the Society of Antique Modelers went through in the early days. Starting with the original rules as written by this writer (and Seddon Finn in the New Zealand case) the main governing body has attempted to "improve" the rules. Rather than simplify the rules, a rash of confusing

and contradicting rules have been the result of much "nit-picking".

Actually, things got rolling in New Zealand when the New Zealand Model Aeronautical Assn. (the AMA counterpart) called upon various modelers for the best way to celebrate the coming of age of the organization; 21 years. Finn took it upon himself to introduce the concept of a Vintage Event and quite simple rules, i.e., 1950 model design deadline, R.O.G. strictly, 20 second engine run and precision landing (landing closest to a marker down wind).

As Finn puts it, the meet was some-

what of a fiasco, as only two gas models and one rubber model showed up. Probably the biggest amusement to all the onlookers was the search for the prop nut lost from the backfire of an engine. One thing was patently obvious, despite this unimpressive start, was the tremendous enthusiasm and crowds generated by this new event. Actually, the poor turnout was due to the late announcements of the meet, hence most modelers felt there was insufficient time to build and test a new (old) model.

As pointed out in the last column, nothing further occurred in the way of Old Timer Events at the Nationals until 1972, when again, the Council put a call for suggestions as in 1968. Finn didn't pass this opportunity up, as he promptly responded again, together with others suggesting the same. Finn further proposed a get-together at the Nats that would feature films showing the present state-of-the-art developments of old Timer Flying in New Zealand.

Quite surprisingly, an enthusiastic letter from the Council was received, and before Seddon could reply, found himself appointed as organizer of the events. With time short and the events scheduled for the evening (what a bummer!), Finn declined to run the event. The rules were the same, with the exception of a 15 second motor run, as some modelers were concerned over the possible loss of valuable vintage engines. In New Zealand, such motors are at a premium, and at best, difficult to procure. The New Zealand modeler faces the same problem in all form of modeling equipment and supplies.

On the 25th Anniversary of the NZMAA, Finn had hoped to promote a trophy to arouse more interest in the Vintage event. Failing to promote this,



Bob Jeffrey's "Standby" never looked better. Don Hartman can be real proud of his handiwork. A good sturdy design for R/C assist.

he then proposed that the contestants, to enter, would place their models on static display to give the old timers maximum exposure to spectators and interested modelers.

About this time, someone in the Council came up the dubious bright idea of running all classes of models together, i.e., gas, rubber, and glider. An immediate controversy ensued, with Finn pointing out that no other old timer organization abroad had run such an event. With gas engines providing most of the interest and no precedent set (except for Bassett cleaning house on the rubber boys in 1933) for flying different types of model against each other, Finn was unable to prove this point. Things got so bad after numerous suggestions (many bordering on the ridiculous) that no rules were used at all!

The contest, if it could be called that, was judged strictly on nostalgia and flying. In the end, all models were placed equal and all entrants received a small prize. (How else could you adjudicate a contest with no rules?)

However, this did not detract the old timer enthusiasts, as the event was run in the evening in a light wind. Actually



This is the way to go! A gaggle of SAM 21 boys under the tree, waiting their turn. Westerner in foreground, then Super Buc, K-G, and Bassett's "Miss Philadelphia"

the poor time slot proved to be a blessing, as winds died down to a mere whisper. Probably the most excitement was generated when G. Newton, of Wellington, was able to fire up his Ohlsson 60 in a New Ruler quicker than the diesel engines. Did that ever put the critics in their place for making statements about the difficulties of ignition engines!

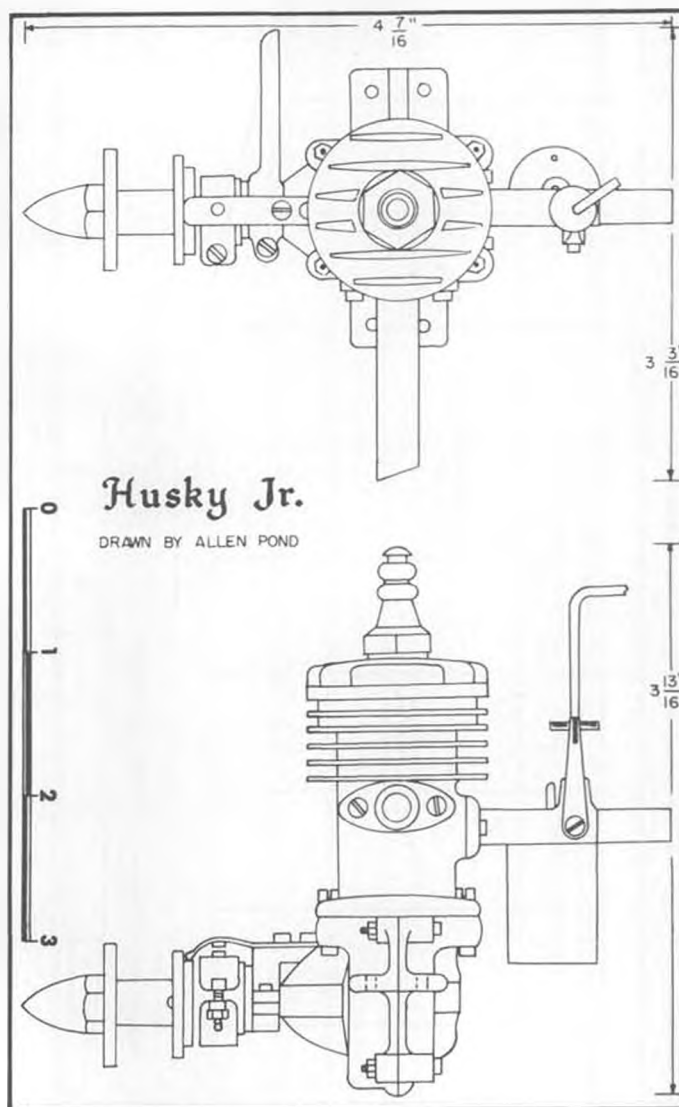
The meet proved conclusively that there was sufficient interest to stage the Vintage events in subsequent Nationals. Promptly drafting a letter to the NZMAA, Finn made two proposals for vintage rules, the first being as previously outlined, and the second concept (which has become the basic one of present N.Z. rules), the original words which read: "Model achieving the best



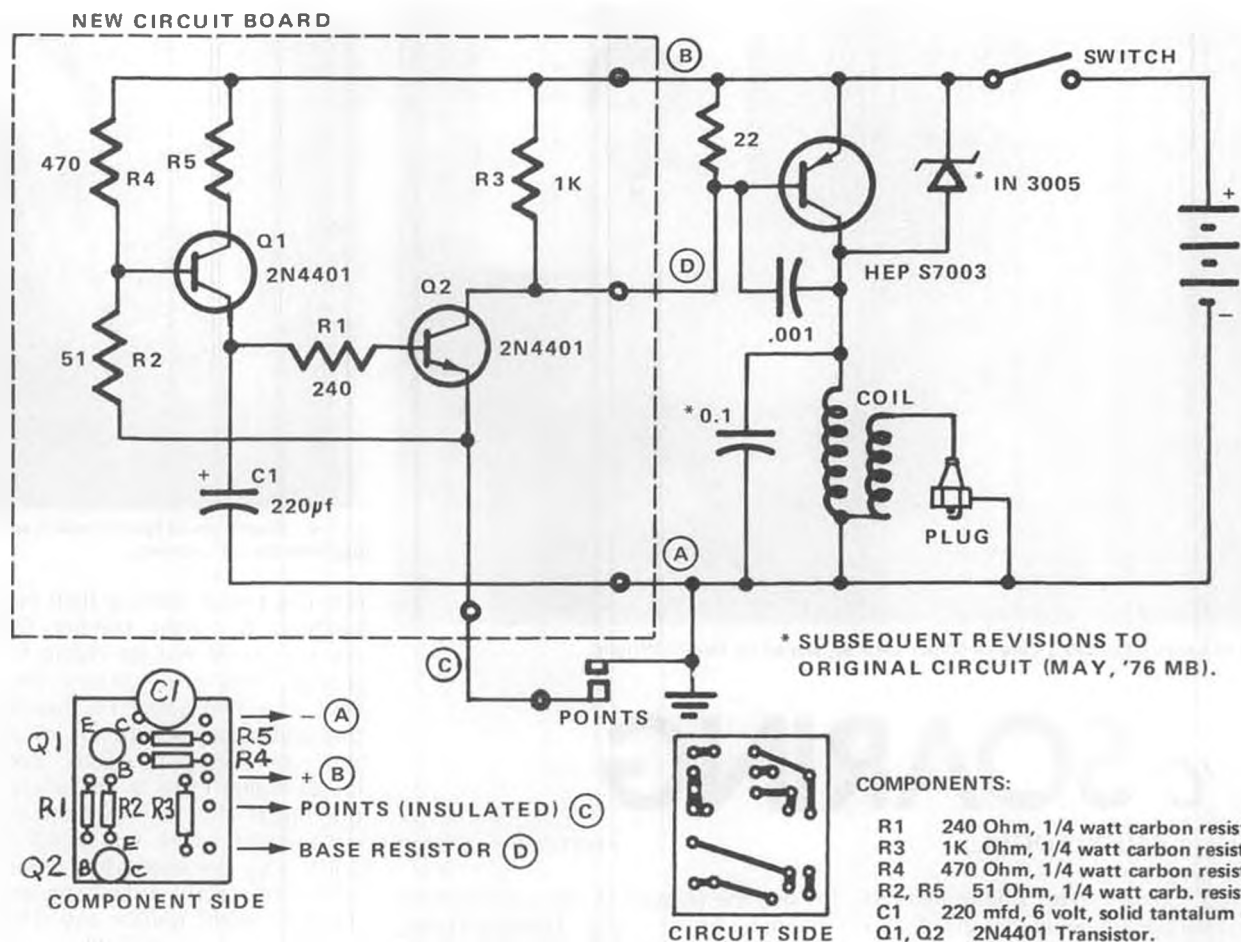
A Ray Heit "Scrappy" by Ron Haddon, Barnet, England. A follow-on design of the "Scram".



Roger Hammer's Flamingo, by "Daddy Warbucks" Pond. It was published in JASCO's 1938 catalog. Ignition Merco 61.







ratio of glide to 20 second engine run wins."

The upshot of this proposal was to prod the NZMAA into action and circularize the proposal for comment and speedy action to insure the event(s) would be incorporated in the Dec/January Nationals. Hence, from this point, through the cooperation of the Wellington Council, official action was started and this has formed the basis of

the current Vintage movement.

Well, we're getting rather long winded on this subject (yeah, I know, I know) so we will serialize this article and conclude the development of the old Timer movement in New Zealand. As they say on TV, don't miss the exciting conclusion!

MOTOR OF THE MONTH

This month's motor derived its name from the university in its area; the

Washington Huskies. The prototype, which came out in 1937, featured radial head fins, lapped piston, bolt-on bypass and exhaust. Bore and stroke of all Husky engines was .625 x .625. The early carburetor resembled the Elf float type, but the production model featured a standard intake tube and needle valve assembly.

Homer Conklin, in conjunction with

Continued on page 63

THE RAMBLER

OLD TIMER Model of the Month

Designed by: Gil Shurman

Drawn by: Al Patterson

Text by: Bill Northrop

• The Rambler was published in the September 1939 issue of Flying Aces. This article states that it was first flown at the Second Annual Quaker City Gas Model Airplane Association contest at Northeast Airport, Philadelphia, in September 1938, which may or may not qualify it as an Antique. Check with John "Daddy Warbucks" Pond.

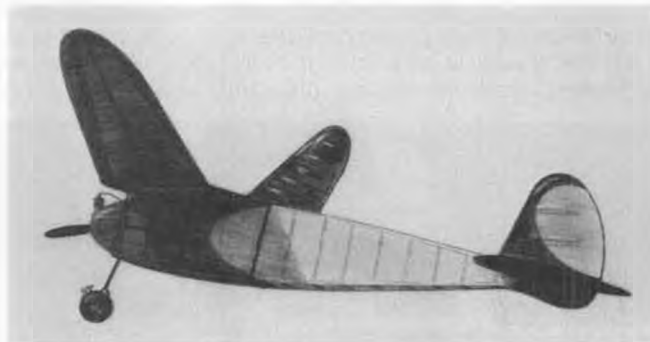
The wing features a flat center panel with sharply dihedralled tips, a con-

figuration that has been proven time and time again to be excellent at thermal finding . . . and keeping. Worth thinking about for modern designs.

Adding a D.T. set-up should be a snap when you consider the way the tail surfaces are mounted. And once again, there is no indication, on the plans or in the text, as to location of the balance point. Considering the short nose and long tail moments, and the

symmetrical stab, we'd suggest starting at 50%, or 6 inches back from the wing leading edge.

For R/C assist, the Rambler should be excellent for the 20 second engine run event, and for the increasingly popular precision time and spot event. The wing area of about 730 qualifies it for .29 glow engines, which, combined with its light weight, should make it a real performer.



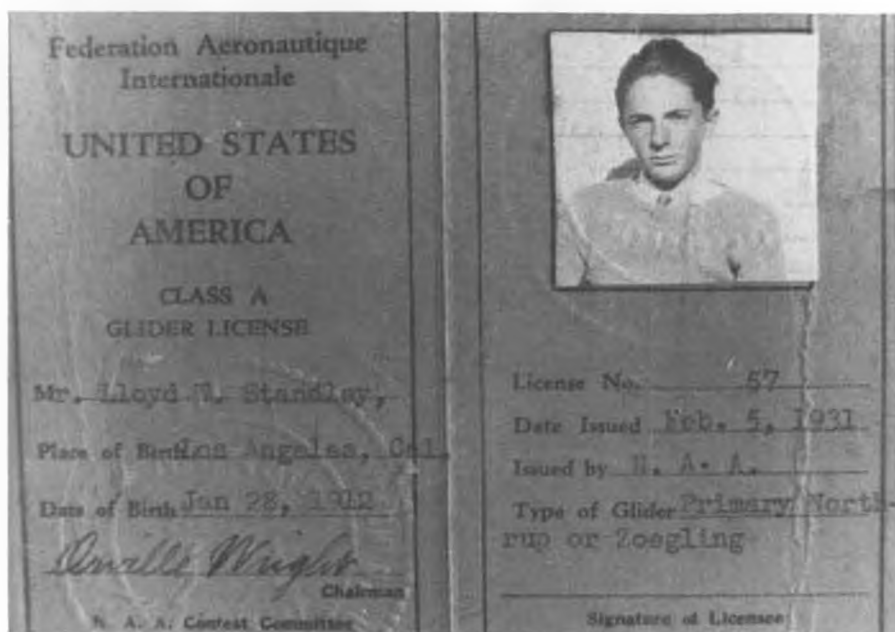


Photo of Lloyd Standley's Class A Glider License, signed by Orville Wright.

R/C SOARING

by Dr. LARRY FOGEL.

PHOTOS BY AUTHOR

• It's all too easy to become so involved in what people are doing that you fail to see their past accomplishments. Take a case in point. In 1931 Lloyd Standley received his full-scale glider pilot's license, personally signed by Orville Wright. Since then, he has remained keenly interested in soaring, but is ordinarily too shy to tell you all he's done. In our last conversation, he did go on to describe the new electric Hi-start rewind he has devised.

Here, two 12 inch reels rotate together, thus allowing separation of the rubber tubing from the monofilament line. The reels are driven by a 12 volt motor which he connects to the battery of the car. You walk away from the car, pulling the line off the reel, then proceed

to use the Hi-start in the conventional manner. When you've finished flying, you return to the car and flip the switch, which then rewinds the Hi-start for you. Lloyd notes that it's wise to reel-in the last few feet of rubber by hand to make certain that it is not stretched on the reel. Such tension would shorten the useful life.

* * *

In trying for long duration flights, the pilot is constantly faced with the dilemma of allowing the sailplane to become so high as to go out of sight, or to come down so low as to make finding sustained lift much more difficult. As a result, I've been looking for a convenient way to make my aircraft more visible while flying at high altitude. You could



Lloyd's double-spool hi-start reel is self-winding from his car's battery.

install a xenon flashing light inside the fuselage. But light coming from the canopy would not be visible from the ground. You could mount the xenon light in a pod under the fuselage, but this adds drag, weight aft of the c.g., and other design problems. You could install flasher lights in the wingtips, but this might also involve some drag and puts weight where you don't want it. Then, too, the long wires required for taking the electrical discharge energy to the bulb might radiate and affect your receiver. Not very desirable.

I've tried using conventional binoculars, but it's too hard to hold them and fly at the same time. I purchased special binoculars which mount on your head like eyeglasses. This 2.8 power Sports Glass by Binolux feels fine . . . but you have to keep your head very steady or the plane appears to jump around in the sky. And if you lose sight of the aircraft, it's very difficult to find it again with so small a field of view. Removing the binoculars at that point leaves you in an even worse state.

What about using a monocular? Here, one eye maintains a broad field of view while the other focuses on the aircraft



Ernie Heyworth's transmitter sling/mount leaves one hand free for launching glider, eating a sandwich, or what have you.



The author's Legionair with mylar sheets attached. Too much drag. Perhaps cutting into narrow strips would help.



Alex Mladeneo and the Roger Taylor modified Windrifter.

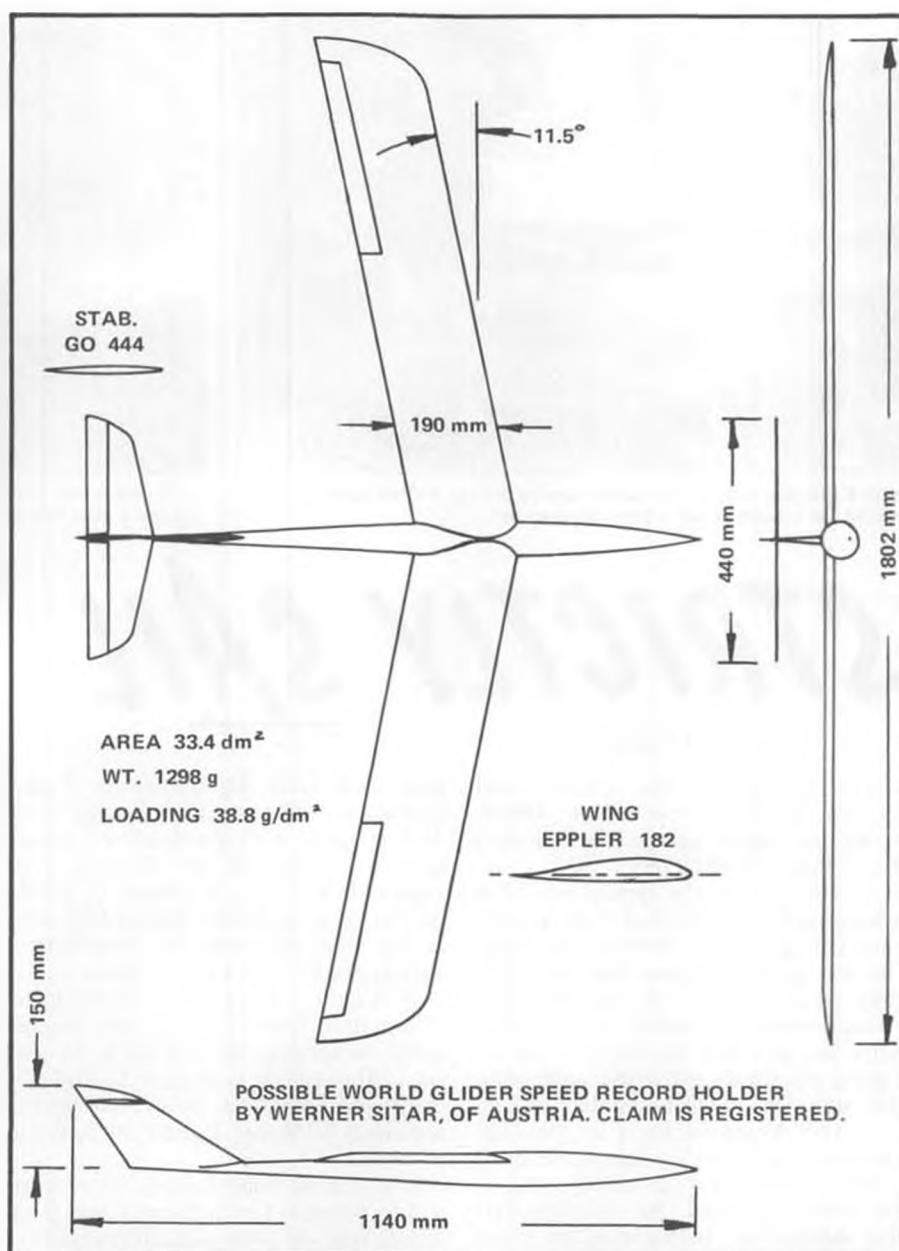


"Murph" Miscewics and his version of the Ridge Runner.

at high magnification. I've tried that, too. It's very disconcerting to watch two aircraft, one of which is jumping around relative to the other as a reflection of minute head movements.

What about the possibility of coating the underside of the plane with conductive foil and using a surplus radar? I don't know what that might do to my radio receiver reception pattern, but I do know that there's no such available radar . . . and if one became available, the cost would probably be prohibitive, to say nothing of the danger of standing in front of the radiating antenna. At my age, it wouldn't matter, but what about the younger pilots? Infrared tracking also came to mind but here, cloud reflections and the near-field sun pose difficulties.

(Maynard Hill and I used X-band radar, furnished by Dahlgren Naval Weapons Lab. in Virginia, when setting



world altitude records for R/C power back in the late 60's. As for danger, the radar antenna was on top of the mobile unit van . . . no problem there. Also, there was absolutely no radio interference from the radar, even though we were operating as far as 5 and 6 miles straight range distance. The radios were everyday digital proportional systems on 6 meters . . . Kraft and PCS.

By the way, I can verify, from actual experience when setting my 16,610 foot altitude record in 1965, and when for 5 minutes lost visual (tracking scope) contact with the aircraft, that normal radar tracking information does not feed back quickly and accurately enough to fly by. You know where the model is, but you can't tell its attitude! wcn)

Hey, what about leaving a smoke trail or putting a burst of smoke in the sky if you should lose track of a plane? Smoke pods are available, but these require external mounting because of the heat, and generate smoke only for a short

time. Releasing a smoke burst seems to involve significant engineering, and probably too much additional weight . . . not the convenient kind of solution we're looking for.

Have you seen the long, shiny silver mylar dragon kites? Could we tape a sheet of such material to trail from the wingtips, thus providing a bright scintillation in the sky? Surely this would make the plane visible at great distance. The problem here is the drag of the additional surface area. Suppose the mylar sheet is 6 inches wide and 20 feet long. With one on each wingtip, that makes 20 square feet of added surface on each side. Is that too much drag? Clearly an experiment is in order.

On a day with more than enough slope lift, I attached two one foot wide, two foot long mylar sheets to the outer panels of my Legionair 140. I reasoned that short stubby trailers would have less chance of getting tangled in the con-

Continued on page 91



John Krick demonstrates an advantage to the big A-Class boats . . . you've got a place to carry your transmitter!



You either lift one end or put a set of steerables on the dolly! This is not a boat that you tuck under your arm.

STRICTLY SAIL

By ROD CARR

• The growth of the International A-Class has been slow within AMYA during the past 6 years. This is in part due to three major factors:

a. The size of the typical pre-1970 A-boat, and the published A-designs for vane sailing tended to be rather large. The average displacement for the 1956-1965 series of British champions is just a shade under 57 pounds. As a result, many skippers fear the onerous task of lugging around an extremely large boat, and opt for smaller, lighter classes.

b. The A-class skippers in the U.S. have been rather widely spread. Without a strong class organization as some of the others have had, the welcome that new skippers get is minimal, and I suspect that many lose interest.

c. Application of the A-class rule to new designs specifically for R/C have

been few and far between. Roger Stollery's "Clockwork Orange", a 36.5 lb. boat with the familiar fin and bulb keel seen in the M-class, first appeared in 1971. A couple of other designs have appeared, even a U.S. one in the 38 pound range, but insufficient data exists to evaluate the design trend.

d. Lastly, there has been little information published in the model press concerning developments in the class. This article is written to compliment and extend an earlier one which appeared in *Model Builder* in January of 1976.

I have great hope that a bit of interest will be generated in the class. It is a class which has an international following, and one in which I foresee a possible beginning for meaningful competition on the international level. Rather than sending everybody who can afford the airfare, a crack team would be selected to campaign a boat much in the same way that the America's Cup is defended. I realize that we have the Mini-America's Cup, which is sailed in East Coast 1'2-Meter boats, but that is a one-design conflict, and does not really reflect the concept of a country designing, building and sailing a product of its own sailing expertise. Who knows, maybe the A-class will form the basis for this new trend. They certainly do offer the extra room for equipment which is being added beyond the simple rudder/sails combination that we have found basic.

In January, I reported with some disappointment that the A-class skippers in competition were leaving much to be desired. I am happy to relate to you now that the situation is changing rapidly. An evening phone call recently

put me in touch with John Krick of Glenolden, Pa.. John had just completed winning the 1976 ACCR for the A-class and was kind enough to take the time and trouble to contact me about it. (I have yet to hear anything out of the Class Secretary.) I asked John for some photos of his boat, and he and our intrepid photographer, Doug Barry, swamped me with a complete tour of John's boat. Many are included here for you. They also took some of the interesting fittings that John has been developing, but we'll save them for a later article on such doodads.

The vital statistics on the boat are as follows. Challenge Design by John Lewis. Displacement, 56.36 lbs. LOA, 74 inches. LWL, 56 inches. Freeboard, 4.2 inches. Beam, 14 inches. Draft, 12.46 inches. Lead, 39 lbs. Sail Area, 1514 sq. in. Sail Control Unit, Harris Engineering Hercules. Sails, Carr Sails.

This is the third year this boat has been sailing. It finished 5th in the 1975 ACCR. John put the new sails on it shortly before the 1976 ACCR, and said that they were a major factor in the improvement shown by the boat.



The 84" mast on this Challenge design dwarfs its owner, John Krick.



John Krick's 1976 U.S. National Champion A-Class boat in action.

As a further incentive to new skippers who may be looking for a growing class to enter, or for skippers from other classes who would like to build a boat from the ground up, we present a new Adrian Brewer design, "Sound Effect." As with the "Sonic Boom II" 50/800 we recently featured, the Sound Effect is a well-tested competition design, yet of recent vintage, with the lines scarcely three years old from drawing board to bringing home the silver. She is well drawn for good sailing in all conditions, and all-round performance is certainly something to be considered if one is going to invest in a boat for this class . . . although I will say that supposed light-air boats are doing better and better as they learn to cope with stormy conditions, and provide the proper sail handling techniques as we have previously discussed (*Model Builder* Oct. 1976).

"About ten years ago, I ventured into 'A' Class design. Prior to this, I had confined myself to the 'M' Class, as its rule is fairly simple and can accommodate a wide range of shapes and ideas. The 'A's however, were different, and many existing designs were studied and dimensions analyzed before I finally put pencil to paper.

"To cut a long story short, I could not have been more pleased with her speed and handling, and her Australian Championship record so far is; 1972 (Adelaide) second, 1973 (Sydney) third, 1974 (Melbourne) first, 1975 (Adelaide) first.

"Since 'Cougar', I have designed many 'A's as my experience increased, but the 'Cougar' type of boat has stood out as the best all-rounder. About two years ago, I re-analyzed her lines, dimensions, and performance in general and felt that a revision could be rewarding. The result was 'Sound Effect', and her lines accompany this article.

"The changes were minor, but they have produced a very efficient boat. As radio control was beginning to move rather rapidly in Australia, it was felt that this point should be a major factor when evaluating any changes. Briefly, the changes made to 'Cougar's' lines were as follows:



Ace Radio Control kits this twin .049 powered Rockwell International Shrike Commander, designed by California's Ken Holden. Uses Ace foam wings, 3-channel radio, and the prototype has been looped and rolled on one engine!

The 1/2-A SCENE

By LARRY RINGER

• Every now and then I get a question, either by phone or mail, about which of Cox's engines to use for some application. Part of the answer comes from the scale chart that was presented last month. From that chart you can evaluate a particular kit or design for the most reasonable power level to use.

Surprise, surprise! The scale chart was mistakenly left out of last month's column. If the full moon doesn't get to us, you'll find it about 9" to your right.

This month we offer another chart with some more data for the various Cox engines. The power and thrust values are approximate. Manufacturing tolerance and your own break-in, fuel, weather, altitude, etc. can cause significant variance up or down from these values.

So what? Well, the power figures are not terrifically useful since there isn't any good data available on model pro-

peller efficiency. What the chart does tell us is that there are five distinct power levels available in the 1/2A engine size range. For example, if you have an old timer scale-down to fly, you have to use a Tee Dee .020 for competition, but for sport flying, you can get the same oomph cheaper and easier with a Babe Bee .049.

Basic differences in ease of starting and sensitivity to needle setting are primarily caused by use of rotary intake valving or reed valve. The reed is self-timing on a pressure demand basis, so it seals early for starting, but won't pass as much air at very high speed. Rotary valving is always timed the same, so it is harder to start, but can be controlled accurately and tuned for top performance.

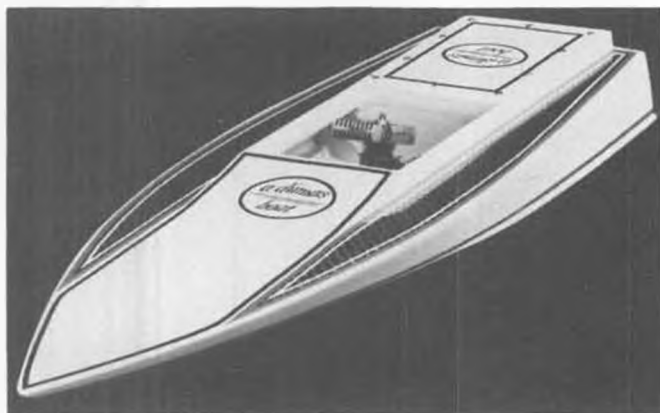
Putting it all together, if you don't need peak power from a specific displacement size, you might as well use a

relatively large reed valve engine and get easy starting and running. If you are displacement limited, as in various competitive classes, you need the power output that a rotary valved engine can give you.

The odd duck in this case is the overlap between Medallion .049 and Black Widow engines. The Medallion will use an external tank for control-line stunt, and is available with throttle for R/C. The Black Widow mounts easily, starts and runs a bit easier, but has only a 2-1/2 minute run time. Also, the Black Widow can run backwards, while the Medallion runs forward every time.

Next subject of interest is a comparison I did on weights of various ready-to-cover materials. As you recall, weight is a very important factor in achieving performance with small models.

I cut 50 sq. in. patches of each of the covering samples I had on hand and



The Dumas "Skee Vee 10" for two-channel radio gear and .049 engine. Finished in white epoxy, "Alpha" side panels, tape stripes.



P-51B from the Top Flite "Junior Aces" series. Can do any stunt maneuver in the AMA competition pattern. Weighs 5-1/2 ounces.

weighed them. To use these results, you need to just estimate the total square inches of covering which you will use on you model after trimming. Take that number and multiply by the weight per square inch of covering to get the total added covering weight. For example, a 1/2A RC pylon racer with a 200 sq. in. wing would have about 650 sq. in. total covered area including fuselage and tail surfaces. With orange Flite Kote you add .8 oz in covering, while yellow Coverite is over twice as heavy at 1.9 oz. In addition, you have to paint the Coverite, so it gets even heavier.

The weights are:

Yellow Standard	
Coverite (unpainted)	.00297 oz/sq. in.
Red Silk Spun	
Coverite (unpainted)	.00194 oz/sq. in.
Black Monokote	.00138 oz/sq. in.
Chrome Monokote	.00141 oz/sq. in.
Silver Monokote	.00141 oz/sq. in.
White Monokote	.00176 oz/sq. in.
Orange Flite Kote	.00123 oz/sq. in.
Transparent Blue Solarfilm	.00152 oz/sq. in.
Red Solarfilm	.00162 oz/sq. in.
Black Solarfilm	.00145 oz/sq. in.

As you can see, there are significant differences. In a game like free flight, where weight is immensely important, it pays to do a bit of measurement.

MODELS FOR THE MONTH

First, something a bit different. Dumas Products has slowly but surely been phasing out their airplane line and developing a great line of boats. The one shown in the photo is the "Skee Vee 10". This is a high speed RC speedboat which uses two channel radio gear. This particular model has been in the Dumas display at several shows. It is a beautiful model finished in white epoxy with "Alpha" tape side panels and red and white pin-striping. The engine is a Medallion .049 R/C.

Next model is the Super Sniffer, a free flight sport model from Midwest Products. Wingspan is 48 inches, area is 300 in. At that size, you could add a single or two-channel radio for school yard flying. For free flight use, you had better add an engine cutoff timer and remember to light the D.T. The engines



The Super Sniffer is a free flight sport model from Midwest Products. Span is 48 inches. Could take up to 2-channel radio for schoolyard flying.

to use for this model would be the Babe Bee or QRC, depending on whether you want a muffler or not.

Third model is one of Top Flite's "Junior Aces" series. This small control-liner is a P-51B. The model has 135 sq. in. wing and weighs 5-1/2 ounces. It is capable of any stunt maneuver in the AMA competition pattern. Mine has camouflage two-tone Olive Drab on top and pale blue on the bottom. Aero Gloss flat military colors were used over Japanese tissue. Unlike most 1/2A designs, this one features a full-depth wing spar, and wing-mounted landing gear. It was one of my all-time favorite

airplanes. It looked good and flew great.

Last model for this month is a new one from Ace R/C. Ken Holden designed a real gem in this Rockwell Commander Shrike. Intended for use with three channels, Ken uses a couple of throttle — modified Tee Dee .049s. Wing structure is the ubiquitous ACE foam wing, and controls are aileron, elevator and throttle. A reliable, knowledgeable, unbiased witness tells me he has seen Ken do a loop and also roll the airplane safely on one engine. If you have a yen for that twin-engine sound, this sure looks like the way to go!

See you next month.

Engine	CONTROL LINE						R/C			
	Stunt		Combat		Sport		Aerobatics		Sport	
	W	A	W	A	W	A	W	A	W	A
Tee Dee .049 .051	13.5	275	3.8	125	12.7	200	22	250	33	330
Medallion & Black Widow	10	225	2.8	102	9.5	165	16	205	24	270
Babe Bee Golden Bee QRC, & Other Tee Dee .020	8.0	195	2.3	88	7.9	145	13	177	19	235
Pee Wee .020	6.1	160	1.7	72	5.5	115	10	145	14	190
Tee Dee .010	3	98	.8	44	2.8	73	4.5	88	7	117

	POWER (BHP)	PROP	FUEL	RPM	INTAKE VALVING	FUEL CONSUMPTION OR TANK RUN	APPROX. STATIC THRUST	ENGINE WEIGHT
Tee Dee .049/.051	.11	6x3	Racing	18,000	Rotary	.151 oz/min	14 oz	1.5 oz
Medallion .049	.080	6x3	Glow	15,000	Rotary	.140 oz/min	12 oz	1.5 oz
Black Widow .049	.078	5x3	Racing	16,000	Reed	2-1/2 min	12 oz	1.8 oz with tank
Golden Bee .049	.065	6x3	Glow	13,000	Reed	3 min	10 oz	1.8 oz with tank
QRC .049	.070	6x3	Glow	13,500	Reed	3 min	10 oz	2.36 oz with tank and muffler
Babe Bee .049	.065	6x3	Glow	13,000	Reed	1-3/4 min	10 oz	1.8 oz with tank
Pee Wee	.035	4-1/2x2	Racing	15,000	Reed	1-1/2 min	6 oz	0.75 oz with tank
Tee Dee .020	.055	4-1/2x2	Racing	19,500	Rotary	Tank — 1-1/2 min .083 oz/min	7 oz	0.85 oz
Tee Dee .010	.027	3x1-1/4	Racing	27,500	Rotary	Tank — 1-1/2 min .052 oz/min	5 oz	0.5 oz



This is the Mustang version of the Star Interceptor, as built and flown by Leonardo Silva, Senior Class winner of 1/2A Stunt at the 1976 Nationals.



Senior 1/2A Stunt winner Leonardo Silva and his "Mustangceptor".

1/2 A C/L STUNT

By FELIPE ALVIREZ . . . Winner of Senior 1/2A Stunt at the 1976 Nationals, in the hands of Leonardo Silva. A popular new event .

● Having talked to many friends about their needs or wishes about control line aerobatic planes, I have found that most of them look for, or would like to have a plane with the following features:

1. Inexpensive
2. Easy to build
3. Easy to get, unsophisticated components
4. Easy to handle and carry to the flying field
5. Low operating costs
6. Strong, to take great punishment
7. Can be flown almost any place
8. Capable of flying the complete competition pattern.

That's too much for a plane, isn't it? Wrong! When I sat down, trying to find if it could be done, I chose the TD .049 (or .051) for being an incredibly powerful engine, very light, easy to get, and with availability of all spares. After several calculations of lift, drag and weight, emerged a plane of 34 in. wingspan, with 255 sq. in. of wing area, weighing 8 oz., and that flew the pattern easily. Not only that, it is the only plane that I have seen that, while performing the pattern, has crashed vertically against the grass, coming from that without damage.

You have to watch this plane flying to believe it, from both positions; outside the circle, as spectator, or at the handle, to see that I am not kidding. And you will enjoy it a lot by the way. Since 1968, when I designed the basic plane, and just making a few modifica-

tions to date, I have seen this craft in the hands of youths (from eleven up) who had a background of only a Baby Flite Streak or similar plane, enjoying it and learning the entire pattern with ease. Of course, I taught them how to build and fly it, but what they got in a very short time was tremendous skill, comparable only to what many men who I know have acquired several years and



No need to say that this ship will do the whole AMA C/L stunt pattern . . . it has already done it well enough to win the big one! Here is competition stunt in its least expensive mode.

many planes later. Even if the plane was designed with the purpose of popularizing advanced stunt in a nutshell, for everybody, I am certain it will catch more with youngsters, as their budgets and preference of not so big planes put it in a favored place.

As in any plane, the most important thing is the wing . . . it was designed with an airfoil thick enough for generating all the lift necessary for tight consecutive loops and corners, and enough drag for slowing down the plane sufficiently for thinking what you are doing, and allowing a very strong but light structure. The sweepback was embodied to eliminate the tendency to yaw and

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A LOOK AT **MODEL ROCKETRY**

By DOUGLAS PRATT . . .

• A lot of official business was brought to conclusion for the National Association of Rocketry at the last NARAM, and now that there has been time to assess results, things are looking very encouraging. The major problem in the past has been the failure of NAR's journal, the "Model Rocketeer", to show up on time, or, (occasionally) at all. Pre-

dictably, the antics of that widely-loved organization, the US Postal Service, has played its part. As we have reported, two new co-editors have been selected, and the location of the editorial operation has been changed; this action has already shown some results. We've heard that printing and mailing will still be done at the old location, in Pittsburgh, which is a trifle disturbing; the Pittsburgh post office is widely reputed to be something of a loser; but signs are encouraging, and we're hoping for the best. One of the encouraging signs has been the arrival in recent weeks of three missed back issues of the *Rocketeer*, positive proof that someone is working on the problem.

The new editors, Don Carlson and Steve Behrends, have announced that they will combine their first issue into a two-monther, so the October-November edition will be about double the usual size. They are asking (begging) for articles from readers, and the *Rocketeer* has an excellent reputation for publishing them. Technical articles are very welcome, as well as coverage of club and meet activities (there is talk of reviving the old Club News column); comments on NAR activities and especially the Sporting Code rules are welcomed for the "Loudly from a Broken Soapbox" column. You can reach editor Carlson at 10622 Sageburrow, Houston, TX 77034. Membership applications and similar requests for information should be sent to good old NAR HQ, Box 725, New Providence, NJ 07974.

Not all of the recent news has been good. We had plans to attend the Mid-America Modroc Convention in Detroit, when we received word that it had been cancelled. It appears that they had a lot of promises to attend, but so few people were paid up in advance that the decision was made to cancel the hotel reser-



EOS rocket with F7-6 powerplant, similar to US record holder. Photo by Dean Henry.

vations. This is more than regrettable, since the Mid-Con was an unqualified success last year, and the schedule of events was bigger and better this year. The main thing that squelched it this year was the internal communication problem . . . the fact that no one got the Contest Calendar on time and subsequently only those "in the know" could make plans far enough in advance. Well, Harry Neuman and his people in the Great Lakes Association of Rocketry are a hard-working bunch; we really hope that they'll try it again next year. With the *Rocketeer* situation clear-

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Airfix Saturn 1B plastic conversion lifts off at NARAM-18. Photo by Bob Kaplow.



FSI's Lonnie Reese prepping an F100 powered Black Brant II. FSI photo.



The FSI Black Brant II at countdown plus 1.



Doug Pratt "hissself" as Range Safety Officer during NARAM-18. Photo by Craig Kuhn.

● Approximately 200 avid spacemodelers took over Allentown College, near Philadelphia, Pennsylvania, for the week of August 1-6. The event was the eighteenth NAR Annual Meet, NARAM-18; and excitement was high, since important NAR business would be carried on as well as the usual competition.

Most of the major model rocket manufacturers turned out for the manufacturer's demo Sunday afternoon, and several stayed on throughout the week. The schedule called for movies from NASA and USAF, lecturers from General Electric's satellite division and Thiokol Chemical's solid rocket motor plants, and a keynote speech by the Deputy Director of the National Space Institute.

The annual Open Meeting of the NAR was scheduled for Monday night,



Winners of the NARAM-18 events. See list at end of this article. Photo by Bob Kaplow.

NARAM-18

By DOUGLAS PRATT . . . A complete report on the 18th National Association of Rocketry Nats, and a run-down of some rule changes.

with the Triennial Meeting on Tuesday. At the Triennial Meeting, the membership of the NAR elects a new Board of Trustees, who run the NAR through their three-year terms. There were also meetings of several committees scheduled, most notably the Pink Book Revision Committee (the Pink Book is the U.S. Model Rocket Sporting Code).

At the Contestant's Briefing Sunday night, several rule changes were announced by CD Carl Warner. Among others, he emphasized that it is illegal to catch Eggloft or Scale entries; catching an Egglofter DQ's the contestant's flight, while catching a Scale entry automa-

tically forfeits all flight damage points. Chief Scale Judge Don Larson announced a new procedure: the scale substantiation data packets were allowed to be turned in to the judges eight hours before the scale turn-in deadline. This would allow the judges to determine whether the entrant's data met the minimal Pink Book requirements. At last year's NARAM, several entrants were DQ'ed for technicalities concerning their data packets, and Don and his team were determined to give the entries every chance to clear up these problems. The Plastic Model judges also announced that there would be a general dis-



Tom Hoelle, newly-elected NAR Trustee, and his Genie air-to-air missile. Kaplow photo.



Tom Hoelle's Genie at liftoff. Kaplow photo.



Don Larson and his Nike-Tomahawk scale entry. Kaplow photo.



Plastic Model Skylab Saturn V lifts off. Gets plenty of attention. Craig Kuhn photo.

cussion concerning the Plastic Model entries after the judging and before the flights.

Dr. Gerald Gregorek, chairman of the NAR Standards and Testing Committee, announced several changes in the list of NAR Contest Certified engines. As of August 1, 1977, the old "Enerjet" motors will no longer be contest certified. The Enerjets have not been manufactured for several years, and this ruling is designed to prevent an unfair advantage to those with hoards of the engines. Engines manufactured by MPC will fall under a similar ruling. Dr. Gregorek also announced a long-awaited change in the contest ratings of some FSI engines. Since FSI's engines were originally certified about ten years ago,



The Vikings, this year's Championship Section. Bob Kaplow photo.

there were comments implying that some of them may now be under-powered. FSI submitted all of their engines for re-certification two months before NARAM-17, and the final results were announced at NARAM-18. The FSI D4 and D6 engines have been re-certified as C engines, and the E5 engine is now allowed in D engine events. Conversely, the A4 engine has been re-certified as a B engine. These ratings are for contest purposes only, and, as Dr. Gregorek pointed out, all of the above-mentioned engines retain their NAR Safety Certification.

Monday dawned bright and clear, for Class 3 Streamer Duration. Class 3 allows C engines for power, and the models are timed from moment of liftoff to moment of touchdown. Several design strategies were apparent. For

one, streamers were mostly made of crepe paper; although a greater length of mylar can be successfully deployed, crepe has far greater drag. Piston launchers were almost universally used, as were towers to support the models for launch. A tower is one of the two best methods of eliminating the drag of a launch lug on the side of the model. The best time of the meet was achieved by Billy O'Donovan, of the Vikings Section in northern Virginia. Billy took first in B division with a flight of 3 min. 13 sec., a full minute ahead of the nearest flight. Billy had remarkable success at this NARAM, with a total of seven places. Oddly enough, he says that he seldom uses a piston launcher; instead, he's a purist in his design and finishing, sticking to trapezoidal fin planforms of a high aspect ratio and



Chris Tavares hooks up a scale D-Region Tomahawk. Craig Kuhn photo.



Another Plastic Conversion entry, a Saturn V. Very realistic. Craig Kuhn photo.



Paul Vandall checks his piston-launched Parachute Duration model. Craig Kuhn photo.



A launch rack full of scale entries. (l to r): Genie, Javelin, Saturn 1B. Craig Kuhn photo.

filling and sanding the entire model to cut down on drag. It's a point worth remembering, since he was beating the modelers who got a 25% power advantage out of the same type engines Billy used, by using pistons to augment thrust. Billy is currently working out a piston launcher of his own, augmented with a tower structure to prevent tip-off and deflection of the flight.

Monday afternoon was Pigeon Eggloft, one of the lower-powered eggloft classes. D engines are allowed, which sets the total impulse limit at 20 nt/sec. The main design debate in Pigeon seems to be single engine vs. two-stage, and it turned out to be pretty much of a toss-up. The AVI D6.1 was a popular engine with the single-stagers, coupled with the ubiquitous pistons. The two-stage crowd all seemed to be going with the FSI D20 engine as a booster and a B14 engine as a second stage. Since the D20 is rated at 15 nt/sec. and the B14 is rated at 5, this stack gets every last newton-second allowable out of the power plant. Note that the competitor should keep abreast of current NAR ratings on engines; if an engine doesn't come all the way up to the top of its rated class, you may be able to optimize the thrust by staging it to an engine with different thrust programming. (Look for a column on this in the near future). The new ratings on the FSI engines had many modelers thinking along these lines.

Tuesday morning saw a brisk breeze, and Swift Rocker/Glider. Swift class is 5 nt/sec. or B engines. Incidentally, the terms Boost/Glider (B/G) and Rocket/Glider (R/G) are NOT interchangeable: a B/G may eject parts, like pods, engines or other things to change its trim; while on an R/G, everything that goes up has to come back gliding.



Hooking up the Plastic Conversion Saturn V shown taking off on previous page. Kuhn pic.

There were three popular design concepts on the R/G field. One was "sliding wing," where the wing section was carried against the tail for powered flight. The ejection charge of the engine releases the wing hold-down and allows it to slide into glide position. Another was "variable geometry" in which the wings are mounted on pivots attached to the boom. The wings are designed with a very high aspect ratio. They are carried parallel to the boom during powered flight, and released into position by the engine ejection charge. The "flop-wing" is a variation of this; in a three-panel polyhedral, the outer panels are folded back flat against the center panel, and hinge outward into position on engine ejection. The third design was "CG shift," in which the engine is mounted in a long pod, which slides in a sleeve attached to the boom. At liftoff the engine is over the wing centerline, and the ejection charge kicks it back, sliding the tube back against a stop, and changing the center of gravity for flight trim.

The sliding wing designs seemed to do the best, but all of the designs were plagued by that magic constant, the speed of balsa. The Vikings Section was the main proponent of sliding wings; they used a square boom, and built a box under the wing centerline for the wing to slide on. A thin thread held the wing against the tail, and a rubber band was used to pull it forward. The thread was let through a hole in the engine pod just ahead of the engine, so that the engine ejection charge would burn through the thread and release the wing.

Tuesday afternoon was Single Payload. In this event, open to 10 nt/sec. (C) engines, a standard lead weight, weighing one ounce, was flown as a payload and the models were tracked for altitude. Piston launchers predominated again, but due to the high weight of the models, some of them experienced severe problems with tip-off. The best entries



Bierdon and Langford prep their winning Argo D-4 Javelin scale model. Kuhn photo.



The Bierdon-Langford Javelin returns to earth.

used a piston-tower combination. Once again, there was a toss-up between competition strategies. Most modelers used a single C engine, but some tried staging the "mini" B engines to take advantage of the smaller diameter. The C engines provides superior lift at ignition, and generally assured a straight flight; however, the B-stack provided a greatly increased thrust duration. There was no debate on one little bit of contest strategy: tracking powder! This is a dark powder (usually dry tempera paint) that is used to dust the parachute and packed in the top of the model so that a cloud is formed at ejection. This gave the trackers something solid to home in on; an important consideration since payload models are kept as small as possible due to weight and drag.

Wednesday morning saw the Plastic

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Les Pardue, author of "Polish Pit Patter" contained in this month's column. Pit man for Shew/Pardue Racing Team. Shown here with two Rossi-powered "Badyears." Photo by Lorna Samuel.

Control line

PHOTOS BY AUTHOR UNLESS NOTED

By "DIRTY DAN" RUTHERFORD

• Like most columnists, I tend to write about whatever is on my mind when I finally get the urge to sit down and type at ya'. More than a few have noticed that Combat is the C/L event that is on my mind the most! That's OK, as I can defend myself by pointing out the coverage given to Racing (in Project Goodyear) the last few months, and I generally always have something about Stunt. Even Speed and Carrier (both of which are way down low as far as number of participants are concerned) get covered.

Is the above my form of an apology? Why, of course. You just plant your

buns in a chair while I tell you about the best Combat meet I've ever attended.

This meet was held here in Seattle on Sept. 26, in super conditions. Fog in the morning, but the clearest skies you've ever seen from 10:00 on. The contest in question was the "Bladder Grabber Combat Contest", where we had a \$1200.00 Phase Linear speaker system for first place and a \$360.00 Phase Linear amp for second. Not bad, huh? All for Fast Combat, of course, Silly (Slow) Combat would hardly warrant such super prizes as this!

Surprisingly, we only had 26 entries, which is about average for a Fast Com-

bat draw here in the N.W. A few of the locals simply could not be out and only Rich Brasher, Norm McFadden and Neal White could make it from California. Rich, Norm and Neal are good enough to be competitive in this area . . . we assume that the others from California and Canada who were invited, but didn't show, are not! (*Write to Dan, not us! wcn*)

We used the Condor Legion method of double elimination, which is very popular in this area. We laugh at the supposedly double elimination system as used in FAI Combat and in certain AMA Combat meets around the country. The Condor Legion method insures that you actually have to lose twice before being eliminated. Also, with this system, a fresh round is drawn as each round of flying is completed (no pyramid is used), which allows drawing the round in such a way that team partners, people from the same area, etc., never have to fly each other until the very last couple of matches.

With this system in use, an awful lot of flying takes place, and the contest has to be run very efficiently. For example, we had flown 26 matches (26 entries equals 13 matches per round 1 and 2) and only eliminated 4 people! Only 4 people had been unfortunate enough to lose both of their first matches. This looked like it would put us into darkness before completion of flying, but the next few rounds started dropping people out with pretty fair regularity, and we finished on time . . . barely!

With Mark Saterlee doing a super job as CD, and the level of readiness shown by N.W. Combat fliers, we flew 58 matches of Combat and we started at about 11:30, finishing about 6:30. That's efficiency in action!

This contest made the Nats seem rather tame, by comparison. More kills were scored at this contest than I saw in a whole week at the Nats! The top two finishers flew in 8 rounds . . . it takes only seven rounds to win the Nats. Mid-airs were few and far between . . . the percentage of mid-airs was 10% or less.



Part of the "Jive Combat Team" (l to r): Gary Stevens, Ron Scoones, and none other than "Dirty" hisself! In the sequence across the bot-



-tom of these pages, we find them (1) all prepared to do battle, prop ready for flippin' and Dirty with glow clip and leather chicken finger.

Very clean, highly skilled Combat. None of the get-a-cut-tangle-and-punch tactics shown by a few rather unskilled Combat fliers at the Nats.

At the Nats, where you're only flying for plastic and pot metal, these tactics were quite noticeable. Out here in the N.W., we were flying for some heavy prizes and not one questionable move was seen made by any contestant. It was fantastic Combat action and I wish every Combat flier in the country could have seen it, just to get a look at what For-Real Combat is all about.

I could go on and on about this contest, but already did in a report written for the MACA n/1. Check it out, if you're interested.

Instead, I'd like to take the space to say that "Bladder Grabber '77" will happen, and you're invited. The ante will be upped considerably, we will be giving away about \$3,000.00 in top-notch stereo equipment and modeling merchandise. It'll all take place after the Nats (sometime in Sept., like it was this year) and we'll be buying ads in the MACA n/1, Patty's Pinkie, etc. Or, if you send me a large SASE we'll send you a flyer direct as soon as they are available. Write to: Dirty Dan, 920 240th St. S.E. #1, Bothell, WA 9811.

Gee, I almost forgot to tell you who won Bladder Brabber '76! Hell, I won, and now you know why I'm bothering to write about it! (*Geez, no wonder his column was in two weeks early! wcn*) Jeff Rein took second, Bob Carver (owner of Phase Linear and prime contributor to the contest) took third, and Tracy Brazzle was fourth. The speakers are super . . . eat your heart out, Chuck Rudner!

Before getting on with Project Good-year, I want to warn everybody about Rich Brasher and Norm McFadden. These guys showed up with their latest versions of the "Rotation Station" and freaked everybody in this area, where top-notch Combat planes and motors are rather ordinary. The new Rotation Stations are quite a lot different from those seen at the '76 Nats . . . and fly much better. Rich and Norm presently



Les Pardue (left) and Phil Shew, author of "Piloting Technique" in this issue. Phil does the flying in this team. Won at this year's Southwest Regionals in January, Buckeye, Arizona. Samuel pic.



Rich Brasher's new "Rotation Station" in the pits at the Bladder Grabber '76. A fantastic new combat design, better than anything seen at the '76 Nats. Photo by Buzz Wilson.

have equipment that is about two years ahead of what anybody else will come up with until they see these planes in action. I'd go into the specs on these planes, but that is an option belonging to Rich and Norm. They'll show ya what it's all about when they feel you can handle it without wetting your pants!

One thing about their planes that I

do feel at liberty to mention is that they are using the new Fox Combat Special exclusively for power. Only the Fox has enough power to satisfy this pair. They are massaging the motors internals, but even in out-of-the-box condition, the Fox motors are the only choice for raw power. I know that I have switched back to Fox, as have most of the fliers in this area.

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(2) With right hand pinching off fuel pressure, Dan turns to psych out the opposition with his "you really think you're good enough to



beat me" look, (3) starts the engine on the first flip (we are lead to believe), and (4) fine tunes before removing leads. Buzz Wilson pics.



Start 'em early! Bob Langenberg at 3.



Ten years later . . . a built-in helper for the old man.

THE MAKING OF A

JUNIOR CHAMP

By BILL LANGENBERG . . . There's no standard procedure for turning a young boy into a modeler, but perhaps this father's experience will be of some help to those who would like to give it a try.

• The place was Dallas, Texas. It was the conclusion of an annual Labor Day weekend contest, and awards were being presented. The contest director announced . . . "And now . . . the winner of the midget modeler event . . . Robert Langenberg!"

An eager 6 year old boy leaped to his

feet and hurried toward the stage to receive his award, a handsome trophy which seemed to dwarf its winner. As I observed the scene with typical parental pride, I did not conceive that this win would spark Robert's interest in modeling to the stage that he would progress to become Northern California Junior

Champion three consecutive years by age 14.

But it did. And along the way it provided opportunities to build his competence and confidence, experience a real sense of accomplishment, and enjoy priceless hours of father-son companionship.

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A trophy winner at 6! Don't that didn't help matters. Bob's at lower right.



At 12, hand launch glider, an event for junior vs. junior, not junior vs. junior's daddy.



F/F gas not recommended for 8-9 year olds. Rules require competitor to start own engine.



Trophy time. The size of the competition is not important.



Nothing like a trophy to bring out a smile . . . unless it's two trophies.



ANNOUNCING!



MODEL BUILDER magazine's **THIRD ANNUAL INTERNATIONAL** **Parcel Post Proxy Peanut** **RUBBER SCALE CONTEST!**

Every peanut model, from near or far, will be proxy flown, indoors, by some of the U.S.A.'s best rubber scale flyers, including Walt Mooney, Bill Hannan, Clarence Mather, Bob Peck, Fernando Ramos, Bill Warner, and many others.

Local modelers will be allowed to enter, but their planes must also be proxy flown, and no verbal or physical help will be allowed from the owner . . . only written instructions to the proxy flier, as allowed for all entries.

"Spirit of St. Louis"

SPECIAL EVENT

To commemorate the 50th Anniversary (May 20, 1977) of Charles Lindbergh's history making flight across the Atlantic Ocean from New York to Paris, we will have a special category for Peanut Scale models of the "Spirit of St. Louis." All judging and flight rules to be the same as for the 5 other categories. There will be prizes for Best of Scale, Highest Flight Points, and a Cox-Sanwa 2-channel radio for Best Overall.

Open to modelers from all parts of the world... any nationality... any age... any sex... come one, come all!

AWARDS to include TROPHIES and MERCHANDISE . . . ALSO, a KRAFT RADIO SYSTEM to the

GRAND PEANUT of 1977!

(HIGHEST OVERALL COMBINED STATIC AND FLIGHT SCORE)

Other prizes include such items as; Peanut Scale kits and materials, Astro Flight and VL Products electric motors, Brown Jr. twin and single cylinder CO₂ engines, Uber Skiver knives and sets . . . over 50 trophy and merchandise awards altogether!

Contest Director: CARL HATRAK

Competition will be divided into five (5) classes: Pioneer, World War I, Golden Age, World War II, and Modern. There will also be individual awards such as; most distant entry, best shipping container, entry most damaged in shipping (Don't try hard for that one!), best entry built from Walt Mooney plans, best model by a female, best entry by any modeler under 15 years of age, oldest qualifying contestant, youngest qualifying contestant, best biplane (Big John Award!), best entry built from a Peck-Polymers kit, longest flight, most static points, plus a few surprises.

Chief Static Judge: RUSS BARRERA

Scoring will be based on the total of each entry's static scale points (100 maximum) and flight points (100 maximum). Static judging will be according to AMA Indoor Rubber Scale rules. Flight points will be the average of the two best flights out of four official flights (10 seconds minimum, 100 seconds maximum). Ties will be broken by highest single score, or a fly-off. Number of attempts to be limited, subject to size of total entry. **DO NOT SEND UNTESTED MODELS!** A three-man jury will preside over all decisions.

SCHEDULE: Register by mail on or before February 1, 1977.

Models to be on hand on or before April 1, 1977.

Contest to be held approximately April 15 to May 1, 1977.

Send in now for your registration form, which includes an entry blank, a complete set of rules, and other particulars. Write to:

MODEL BUILDER PROXY PEANUT CONTEST

621 West Nineteenth St., Costa Mesa, California 92627 USA





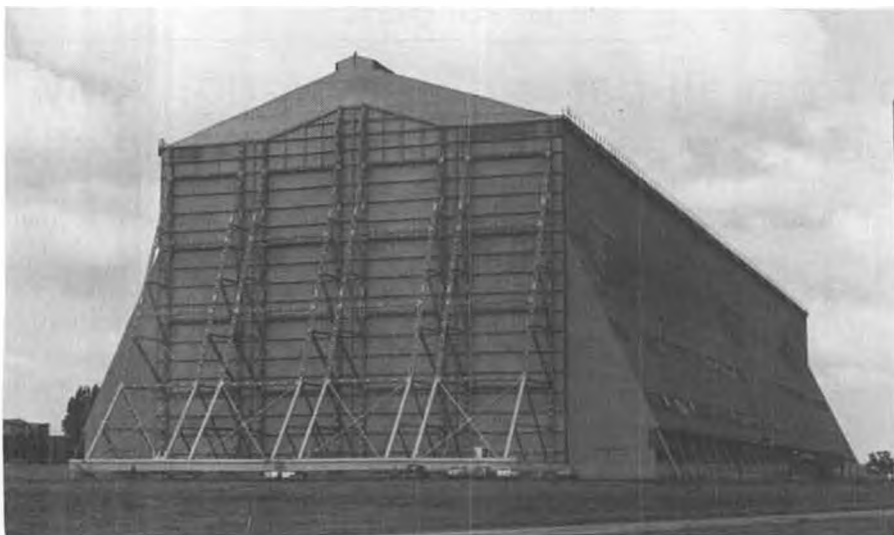
The new Indoor World Champion, Bud Romak, and some of his loot. Son Steve Romak doesn't look too displeased, either.



National flags, plus FAI and R.A.F. flags inside the hangar at Cardington.

INDOOR WORLD CHAMPIONSHIPS

JIM MOSELEY reports on the quietest of all world championship competitions, and a great win for Bud Romak and the U.S. Team.



The No. 1 hangar (shed) at Cardington, in which the indoor champs were held. Building is 180 feet high and 900 feet long.

• Friday August 27th witnessed the gathering at RAF Henlow of 41 Indoor enthusiasts from fifteen countries for the 1976 FID World Championships, to be held in the huge airship shed at Cardington, Bedfordshire. The majority of the teams and their supporters were accommodated throughout the long weekend by the Royal Air Force, who also laid on outstanding catering arrangements, both at Henlow and also at Cardington upon the contest days . . . where a very extensive cold buffet was supported by a well-appreciated and frequented bar facility.

As arrivals renewed old acquaintanceships, and founded new, many made the short journey to Cardington to view the 900 by 180 foot high hangar and to watch the transfer of the parachute-training balloons to the neighboring building. A brisk breeze delayed this operation, but by mid-afternoon, the great doors had inched closed and it was not long before boxes were opened and the opportunity taken by some to indulge in some early practice.

Saturday was set aside as the official practice day, and it rapidly became apparent that standards were uniformly high. The U.S. and U.K. teams were



(l to r): Ron Green looks on as organizer/competitor Laurie Barr instructs Sven-olv Linden of Sweden.



All Swedes (l to r): Sven-olv Linden, Vaillet Linden (Team Manager), and Per Sodersten.



The U.S. Team (l to r): Bucky Servaites, Pete Andrews (TM), Bud Romak, and Jim Richmond.

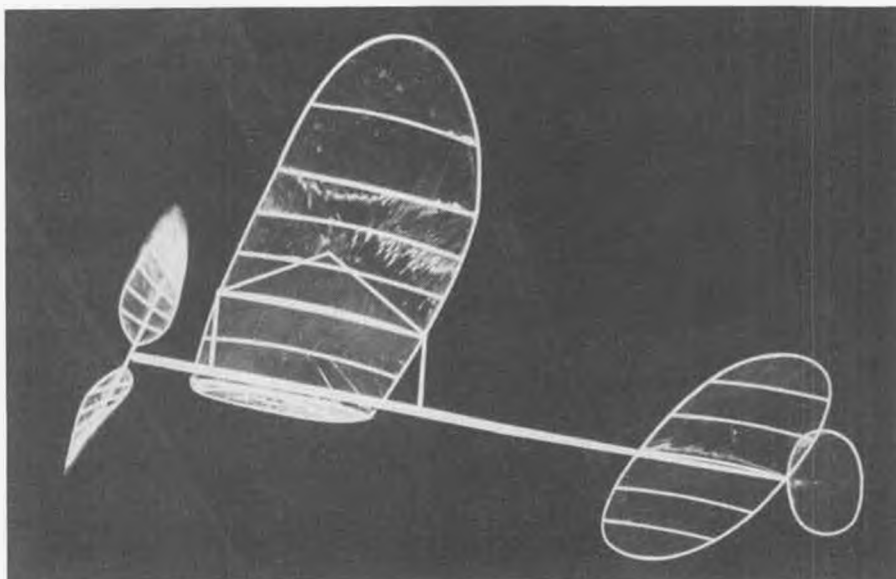


The Canadian Team (l to r): Andy deMello, Paul Roberts (TM), Mike Thomas, and Jack McGillivray. They placed 3rd.

obviously on form and, as expected, the experienced Czech, Polish and Yugoslav contestants were consistently recording high times, and speculation grew as to whether the competition proper would see the posting of 40 minute flights.

The Canadians, fielding a team for the second occasion only, looked to be very strong, with DeMello, McGillivray and Thomas all putting in flights well in excess of the half hour. The Swedes, attending a Championship for the first time, had no previous experience at high ceiling work and, accustomed to 'normal' times of 10 to 12 minutes at home, were elated when Sven Pontan put in an initial test flight of more than 26-1/2 minutes.

Contestants arrived at the hangar on Sunday to the accompaniment of miserable weather conditions, which later turned to a steady persistent downpour, and for more than an hour after the official commencement of the event, there was a marked reluctance for anyone to make an official flight. However, the Swedish team led off with a flight of 16.36 by Per Sodersten, and this was rapidly followed by Mike Thomas of



Model flown by Guy Cognet, of France. Best time was 19:38.

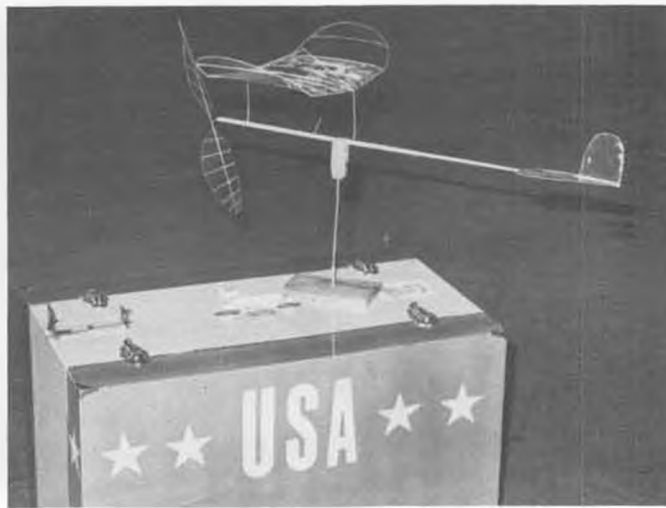
Canada, who promptly indulged in many minutes of nail-biting tension as his model cruised amongst the girders and tie-bars of the roof structure, with frequent collisions and eventually the inevitable hang-up . . . only to drop free

again after some eight seconds and resume its wanderings, to a spontaneous burst of relieved applause from all present who were watching the flight to assess conditions, finally circling safely

Continued on page 96



Happiness is 34:06 from a (previously) 12 minute model! Sven-olov Linden of Sweden.



Bucky Servaites' model and box. His best time was 34:37.



Bill Noonan (Messerschmitt M23b, Oct. '76 MB) has produced still another fantastic large size rubber scale model. This Fokker Universal spans between 50 and 60 inches, and is a slow, graceful bird in the air.

FREE FLIGHT SCALE

By FERNANDO RAMOS

• The Flightmasters have just held their 27th Annual Scale Contest, and several interesting observations, from my standpoint, were made. The number of entries was down from previous years, due in part to the unsettled weather we have been experiencing here in Southern California. As it turned out, the weather was never a problem, and it was a perfect flying day. There were several hundred spectators in attendance, enjoying the "big boys" flying their scale models. I brought a couple of my students to help with tabulation, and I think they were a bit surprised to see their "learned, sophisticated pedagogue" chasing model airplanes.

Even though the number of overall entries was down, the quality and workmanship was considerably higher. This meant that the competition was much keener. But, with the low-key fun attitude that is tradition with the Flightmasters, this was not a problem at all.

For several years now, the trend has been a steady increase in the popularity

of rubber scale, both standard rubber and Peanut. On the other hand, there has been a decided lag in gas scale and CO₂. Electric scale is still too new to make any decision, one way or the other. I think it is fair to say that this trend is occurring not only in Southern California, but also other areas in the U.S. where F/F scale is being flown with any regularity.

The question I ask, is why? R/C scale, or more correctly, R/C Sport Scale, is very popular, so why not F/F gas scale? The noise factor is not much of an argument, because R/C engines, mufflers and all, still make plenty of noise compared to an unmuffled .020 or .049 engine. I realize that in some populated areas, flying sites are far and few between, and that usually leaves school grounds to fly models in. Schools do not generally permit gas powered models, on the grounds muffled or not. Add to this the fact that it takes considerably more time to build a highly detailed gas model, which includes

cockpit, engine detail, etc. To fly this work of art without the aid of "strings" or radio, is another reason modelers won't tackle gas scale. A great deal of work can end up as a pile of splinters on the maiden flight. Unfortunately, not everyone has access to the proverbial tall grass that is so desirable on those first test flights.

Rubber, on the other hand is quiet, takes less time to build, and is not restricted from school grounds. I am not going to say that scale rubber is not challenging, because it is! Not everyone can detail a rubber model and yet keep it light and competitive.

The peanut mania is something else! This event has really taken hold, not only in this country, but in Europe as well. How come? Is it because they are easier to build and fly, or because the rules are so flexible that they encourage more participation? Not hardly! Peanuts are not necessarily easier to build, due to the small size of the bits and pieces.



Bill Warner launches his Airspeed AS-4, powered by no less than 3 Astro Flight .010 electrics!



One could almost guess this was a Bill Stroman project without being told! Not sure, but we believe it is electric powered.



Walt Mooney launching his CO₂ powered Weick W1-A. Telco engine.



Walt built the Weick as a test stand for the new Telco CO₂ motor. We'll have plans in the near future. Ship was the forerunner of the more noted Eracoupe.

Some Peanuts are easy to fly, but others are tough. Rules . . . well, I won't get into that, other than to say that they have been hassled around for quite some time now, and the AMA official rules aren't pleasing everyone competing in Peanut. As an example, at this year's Flightmasters Annual, we had planned to use the Mooney system as usual, and run concurrently, the AMA rules, just to see what would happen. The majority of the fliers said 'forget it! The reason is simple. We run the Mooney system (which we fully realize is not fool-proof) so that there are unlimited flights, with the single best time being the winner for the flying portion. I know that many will comment about the lucky flight into a thermal. With unlimited attempts, the chances of nailing "good air" are greater, but most of our contestants aren't really too worried about that. Most are flying for the fun of it!

We get contestants from all kinds of distant places, and to ask them to fly only four official flights is for the birds. I think that is another reason that Peanuts have become so popular. It is truly one event that you can fly and fly until the end of the contest. Incidentally, there was not one Lacy entered this year.

About the time that I was writing this column, I read that an electric powered model won scale at the Nats. This certainly isn't going to help gas F/F scale. I can recall the Nats in '67 (the last time the West Coast had the Nats) that a well known modeler was given the OK to enter his rubber powered scale model with the gas powered ones. No one at the time gave him any chance of winning. Well, he didn't win, but he did place second or third. This really opened up Pandora's box for quite a few years.

I realize that CO₂, electric, and gas have been grouped together in the F/F

gas category. One distinct inequality of this arrangement is that, in general, CO₂ and electric powered models make better transitions between the power and the glide. With both the CO₂ and electric, the models usually come down with the prop still turning. In other words, there isn't an abrupt stop of the

prop as you get from a gas powered engine. Therefore, there is usually a very smooth transition between full power and the gradual decrease in power.

Realistically, CO₂ isn't competitive, in my opinion, with gas, from a scale standpoint. CO₂ models are generally

Continued on page 89



Masayuki Suzuki, Tokyo, Japan, and his model of the Morane Saulnier MS 230, which acted as a German fighter in "The Blue Max". Fuselage is super-thin vacuum-formed plastic.



Guy Larsen, Roanoke, Texas, launches his 24" span Art Chester "Goon" at Flightmasters' 1976 Annual. A moment later it "wiped out" against a VW bus. Photo by Guy Larsen.



Carl Goldberg gets some help as he prepares his new 1/2A design, the "Skyrocket", at the 1976 Nationals. Photo by Carl Fries.



Launch time for the "Skyrocket". Monokote covered, T.D. .049 powered, it lives up to its name. The old master still has his touch.

FREE FLIGHT

By BOB STALICK
PHOTOS BY AUTHOR

• Well, another summer has come and gone. If you live in the northern parts of this country, you are just looking out the window and wishing. If you are in the southern part, you are probably out tossing a few models into the air.

While you are doing your thing, the CIAM is just about now sitting in judgment over the fate of FAI programs around the world. It might just be appropriate to pause and give a good wish for sanity in Paris. It really doesn't matter whether you are a free flyer or not, the effects are the same for anyone who flies FAI events . . . R/C, U/C, Scale, Indoor or Outdoor.

As with most governing bodies, the CIAM got in over its head. It's happened before . . . and it will happen again. The AMA has done it, the FAI F.F. Committee has done it. Part of it comes about by wishing to be "good guys" and provide equal opportunity for all. Part of it comes from extending the resources beyond the capacity of the

organization to accommodate. If you've never done the same in your own personal life, then you have a good grasp on your own limitations and resources. If you have, welcome to the majority.

Enough of the philosophizing.
MYSTERY MODEL FOR DECEMBER

This model should prove of little difficulty for those of you who have been in the modeling game for awhile. It is one of the earlier FAI Power models, and though originally intended for diesel operation, it has been flown successfully with glow engines. I believe it was even kitted for awhile. Younameit, yougettumpize . . . from Bill Northrop.

The Mystery Model for August was correctly and first identified by Russ Oliver, Phoenix, Arizona. It was the Electro-Mite, by Paul Del Gatto, from Dec. 1960 A.M.

Gerald Knoblauch, Simsbury, Conn., and D. A. Coover, Marion, Ohio, first identified D. A. Krupp's "Pixie", from

March 1958 F.M., as the September Mystery Model.

Maurice Schoenbrun's Torp .29 powered Class B "Planeteer", from October 1948 F.M., was the Mystery Model for October, 1976, and it was first correctly identified by Russ Barrera, San Marcos, California, who was founder of the famed Russ-Craft Model Museum.

DARNED GOOD AIRFOIL—Gott. 428

You'd think that with the recent series in Model Builder Free Flight, we would have exhausted the Göttingen line of airfoils, right? Wrong! This one was tested and developed as a section for FAI Power Models. Granted that was in the days before the 7 second engine run, Seelig timers and Rossi engines, but the airfoil has many of the characteristics we look for in such a model section. Somewhat sharpened leading edge, high point just around 30%, slight under-camber. It has one thing which we don't usually look for, and that is a 9.6% top camber. With some judicious trimming of the section, the top camber can be reduced to be more in the neighborhood of 8 to 8.5%, thus putting it in the category of current fads. This section might be looked at as a thicker version of the Benedek 8353 b2. Billed as a stable airfoil, with recommendations to plank the upper camber to about the 40% mark to avoid laminar separation, you should use a stabilizer section in the 7% to 8% range. Thinned Clark Y would be an excellent choice.

THREE-VIEW OF THE MONTH

This month's model is available to you as a full-sized plan. If you are intrigued by the challenges of Jetex powered flight, this little ship will get you going at a minimum of expense. Powered by a Jetex 50 Hellcat, the Good Times simply



Electric powered free flight is here. Model is the original Batt-Bird, by Bill McDow. Styrofoam construction in the fuselage. Powered by a Mattel unit.

zips into the air at a phenomenal rate of climb. Best of all, it can be built with a minimum of effort and time . . . as well as cash outlay.

Three models have been built since our move into apartment living, and they have all performed admirably. I don't think the D/T system shown on the plans is absolutely necessary, since the model is really easier to build than a hand launch glider, and the D/T system simply congests the model . . . but they do thermal since the weight is nearly nothing.

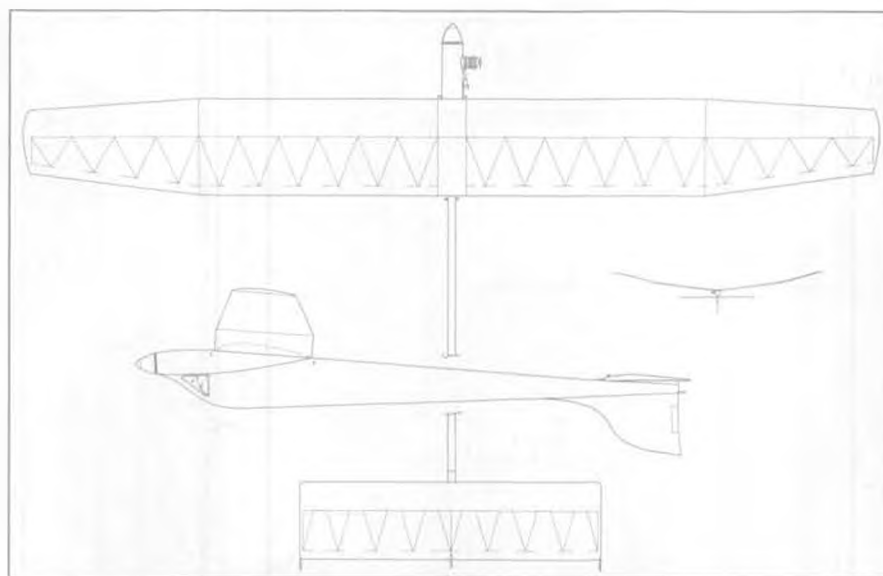
The plans are self-explanatory, but a couple of notes are in order. Be sure to include the spruce backbone on the fuselage, or else you'll be troubled with fuselage breakage. Cover the wing with tissue and apply two coats of thinned nitrate dope. Dope the entire fuselage and stab with 2 coats of nitrate. It would help to glue a piece of aluminum foil under the fuselage just behind the engine to keep this area from getting charred by the blast (?). Be sure to wash in the wing as specified. If in doubt, put in more wash in than you think it will need. Glide is controlled by excessive stab tilt to the right and climb is controlled by offsetting the rudder to the right. Engine thrust should be straight . . . with no offsets. When ready to fly, the entire ship should weigh in at around 20 grams with motor loaded. That's about .8 ounces, and with a good Jetex burn giving out around .6 oz. of thrust, the model really hauls.

For those of you wondering how to get more out of your Jetex, follow these tips:

1. First of all, remember that Jetex is a finicky power source, and so you should approach the entire experience with some good humor and finickiness.

2. Be sure your fuel is really dry before trying to get it to light. What we do is to sandpaper the faces of each pellet and put in a 200 degree oven for a minimum of 1/2 hour. Then we remove the pellets from the oven and place in a sealable jar with a dessicant inside . . . Silica Gel from a camera shop or jewelers is fine. Don't open the jar until you arrive at the field, and don't touch the fuel any more than you have to.

3. We also take some of the pellets and cut them with a razor saw so that they are about 1/3 as thick as original.



MYSTERY MODEL for DECEMBER

We use these to fill up the engine case.

4. When loading the engine, put in all the pellets and the thin pellet on top. Hot Stuff the wick to the top pellet. Leave out the screen and run the wick through the nozzle . . . coiling the wick against the top pellet also helps ignition.

5. The major problem encountered with Jetex, other than poor ignition, is blowby, caused by a poor gasket fit. A gasket can last for several flights if, when the motor is disassembled, you take care to twist the nozzle assembly from the case instead of yanking it off. If the gasket is shot . . . replace it. If you don't, you'll get nearly as much thrust coming out the side of the motor as you get through the nozzle. If you are having difficulty getting Jetex engines, fuel and wicks, drop a line to Polk's Hobbies in New York. Aristo-Craft still imports the little devils, so they're around, although you might have to do a little hunting. The bigger hobby shops should also carry a good supply.

Hope you have some good times with your Good Times.

WHAT EVER HAPPENED TO THOSE NEAT GLIDER KITS?

The Flash, Sweepette, and U.S. Kid were first kitted by Mathis and Co., with M&P, then later by American Balsa Corp. With the demise of this company,

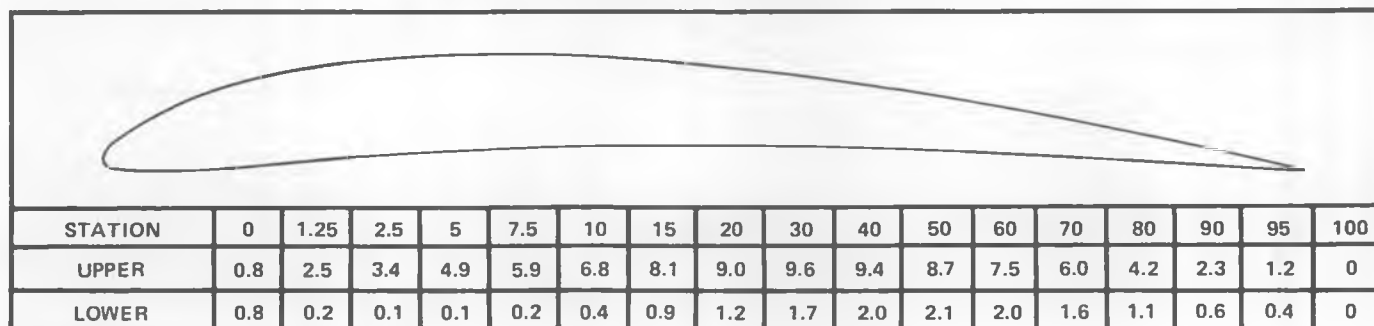
the source for these excellent kits also dried up. Now, the word is out. Matt Gewain, doing business as Aero Modeling Enterprises, is kitting these gliders, as well as the Bo Weevil, Polly and the Mini-Flash (See ad in this issue). Just ask your local hobby dealer. If he doesn't have them, then drop a note to Matt at 2215 So. Air Depot Blvd., Midwest City, OK 73110. Send him some money and he'll send you some gliders.

Also, the new improved series of the Pearl designs (Mini, Midi and Maxi) are now on the market. A new company, entitled Solaran Mfg. Co., is coming out with these very popular and successful kits, updated to meet the demands of contemporary competition. More information on this Dallas, Texas based concern in a later issue.

RUBBER TESTS

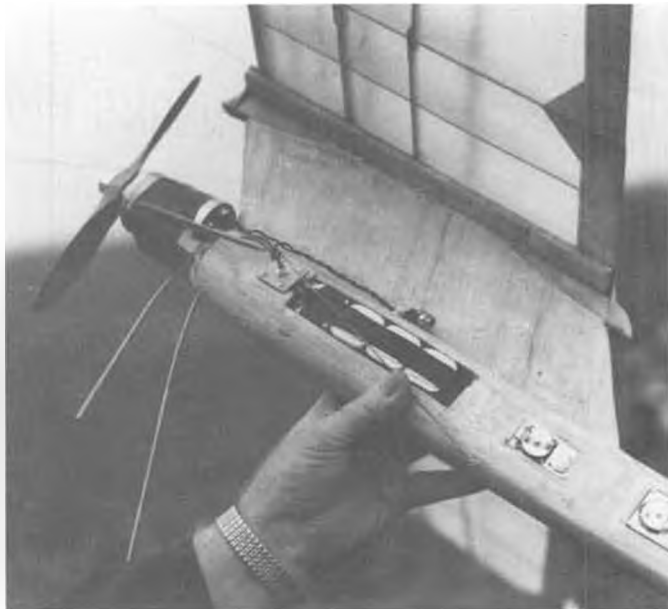
The September issue of Free Flight Digest just hit this apartment last week, and in it were rubber tests by Chris Matsuno. His ratings included some recommendations regarding different rubber power strip now being sold in the U.S.A. When I came to the description of the Sterling "Oriental" Rubber, I was a bit surprised. His description was different from the rubber that I had bought and reported on in some recent issues of **Model Builder**. I sent Chris a letter and a sample of the

DARNED GOOD AIRFOIL — G - 428





Gene Bartel with his Satellite 788 GLH, powered by a large Astro Flight electric motor. Power system added 20 ounces to total weight.



Close-up of Astro installation in Bartel's model. Fifty bucks worth of nickel-cadmiums! Motor cut off by Tatone timer to spring loaded sw.

rubber I had and he responded:

"The sample of rubber which you sent me does appear to be different than the sample which I tested earlier this year. The rubber you sent me is much thinner (about .037) than the rubber I tested (.040). It is also softer, and seems to have a different surface texture."

So, more information will be forthcoming on tests of this kind of Sterling rubber.

CHANGE IN EVENTS

It's always a bit sad to see an event dropped because of lack of interest. It's kind of like cancelling tomorrow for the same reason. Recently, in Bugs Buzz, newsletter of the Thunderbugs MAC, it was noted that there was a decision to drop Payload at the 1977 USFFC, but it was saved from extinction

by Joe Norcross, who offered to underwrite any losses. The reason for consideration of dropping the event was that it has failed to draw in all the years it's been offered. Penny Plane and EZB will also very likely fall by the wayside for the same reasons.

Cargo was dropped at the 1976 version of the BMA Scholarship Meet. The difficulty facing clubs who sponsor contests is that meets become more expensive to fund . . . and there is a loathing to raise entry fees to compensate even though the costs of prizes continues to escalate. Consequently, some of the more intriguing events, like Cargo and Penny Plane, go by the way . . . but yet we keep our plethora of lookalike gas classes, because they are popular.

This also means that we might be loathe to add new events for the same reasons. An exception are the new

electric classes which are beginning to be seen in the newsletters. The Williamette Modelers Club decided to try an electric event at our Annual Silent's Please meet this year, expecting to get one or two contestants. When the contest rolled around, there were not one or two, but five entries . . . and the event was won by a junior flying a Starduster powered by an Astro .020. Maybe electric is the new event of the future in free flight.

So, there you have it for 1976. Here's hoping your new year dawns brightly with a good year for 1977.

While you are wishing each other the season's best, remind yourself that you should be in contact with your contest board member more often . . .

Make it a New Year's Resolution.

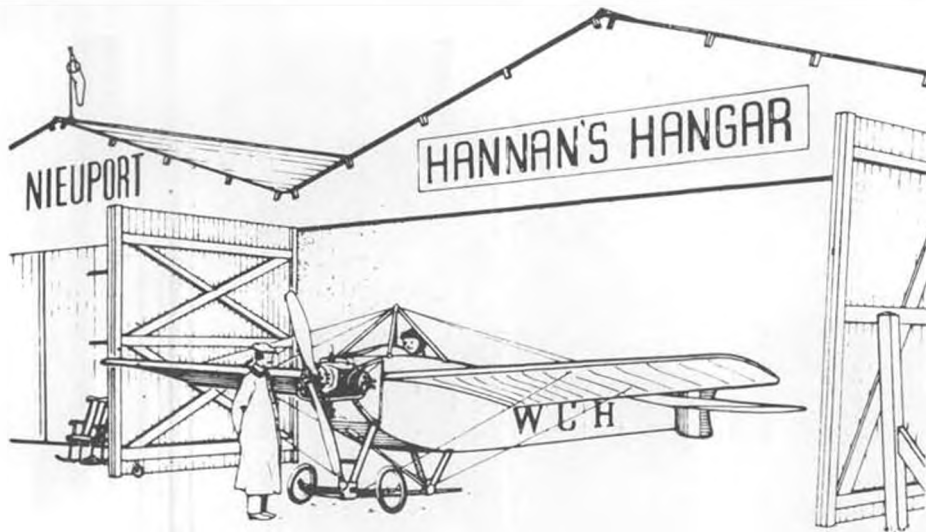
See you in 1977. ●



Steve Dona, Kent, Washington, tied John Lenderman in Unlim. rubber with this British design, Urchin. Lost in flyoff.



Rol Anderson, the guy who beat out Lars Olofsson in A Gas at the 1976 Nationals for 1st place. Both used their FAI ships.



Model builders are powered by self-esteem engines!

COLUMBIA AGAIN

● Our several mentions of the Bellanca trans-Atlantic monoplane prompted well-known model builder Joseph Kovel to send in photographs of a Bellanca CH300 restoration, finished in Chamberlain's markings. While not identical to the original, this machine attracted considerable favorable reaction and was awarded the Grand Champion Antique award during the annual fly-in of the greater New York Antique Airplane Club. Our congratulations to owner Preston Snyder, and our thanks to "Mr. K" of K-G gas model fame (and the "G" stands for Grant),

Joseph Kovel.

NEW RESEARCH SOURCE

Long-time aircraft enthusiast and professional model builder, Cedric Galloway, recently retired from Lockheed Aircraft, has announced the availability of prints from his excellent photo collection. Taken over a period of many years, these prints are ideal for reference and proof-of-scale purposes. A list describing currently available photos, including such classics as Wacos, Stinsons, Stearmans, Fairchilds, and a few miscellaneous types, features a diagram indicating the angle from which each photo was taken. Prices are a very



Bellanca CH300 restored and finished in the markings of Clarence Chamberlain's Atlantic-hopping aircraft, owned by Preston Snyder, Hazelton, Pa. Photo by Joseph (K-G) Kovel.



Another view of Snyder's Bellanca, photographed by Koe Kovel at the Antique Airplane Club of Greater New York annual 'Fly-in', Suffolk County Airport, West Hampton, L.I., N.Y., 7/18/76.



Meredith Lueken built her Miles M. 18 from Peck kit. Pilot is peanut with a top hat.

reasonable 85 cents each for six 5 x 7s, and \$1.10 each for 8 x 10s. A stamped, pre-addressed envelope will bring you a list from: C.G. Enterprises, P.O. Box 651, Hesperia, Ca. 92345

SO NOW YOU KNOW

Dave Stott points out the origin of the term FLAK, so frequently misspelled in certain aviation publications. It is derived from FLugAbwehr-Kanone, German for anti-aircraft cannon.

WALLPAPER, ANYONE?

Georges Chaulet, of France, notes that the walls of a Paris indoor contest model flying site were decorated with Walt Mooney plans!

A BIT OF PHILOSOPHY

Road Tweet (that's correct . . . Road), Chairman of the English Department, Augustana College, had this to say about modeling motives: "Most English teachers have a manuscript for a novel tucked away in a drawer, which they can pull out and work on during quiet moments; my drawer is full of glue, pins, wallboard, and plans for a Peanut, which is slowly going together. It's very good therapy between sets of freshman themes. My Ph.D. is in the field of Colonial American Literature . . . far removed from airplanes. I guess the real reason I build models is that it is fun to see something *work*. That relationship between effort and results is much more difficult to see in the teaching profession."

SHOCKING NEW PEANUT PROPOSITION

Ed Toner, of Buzzer Models, and donor of last year's trophy for the best multi-engine Peanut in the MB postal contest, now proposes to sponsor an award for the first successful ELEC-TRIC Peanut to be entered in this year's postal event. To date, most electric models have been on the large side, so perhaps Ed's award will provide some

Continued on page 100



THE "Peanut" of ST. LOUIS "

By DENNIS NORMAN . . . Just as the original "Spirit of St. Louis" was rushed to completion in a crash program against time, so was the "Peanut of St. Louis", in order that modelers would have plans and documentation necessary to enter MODEL BUILDER's special event in this year's Parcel Post Proxy Peanut contest!

• Even those only dimly aware of aviation history know the names Lindbergh and "Spirit of St. Louis." To air enthusiasts the names are inspirational and create visions of the best in human ingenuity, resourcefulness, and daring. May 20, 1977 will mark the 50th Anniversary of Lindbergh's famed New York to Paris flight, and the Golden Anniversary of the event will be celebrated in many ways. Since "Lucky Lindy" and "the Spirit" did so much to stimulate aviation awareness and since they no doubt contributed to the boom of model airplane building in the late 1920's and early 1930's, it is entirely appropriate that a tribute be paid by the model builders of today. Hence, Model Builder's Third

Annual International Parcel Post Proxy Peanut Scale Contest will feature a special "Spirit of St. Louis" event in which peanut-sized "Spirits" will soar in tribute to their revered prototype and armchair Lindberghs will dream and plan their own conquest of time and space.

The "Spirit" is a high-wing monoplane and, without seeing scale views of it, you might think it is a "natural" free flight subject, but after examining scale views you will realize that the "Spirit" is a subject to be reckoned with . . . particularly if you intend to attempt creation of a reasonable facsimile. The wing has a Clark Y airfoil, but otherwise it is proportionally huge (being substantially greater than the Ryan M-1 and M-2 monoplanes after

which the Spirit was patterned) and there is *no* dihedral (imparting a characteristic "droopy" look and almost guaranteeing side-slip problems).

By comparison with the wing, the fuselage is dainty and short, short, short! A reasonably long nose gives some encouragement to the would-be free flight trimmer, but the microscopic tail surfaces are a flying "scale buff's" nightmare. Then there is the landing gear. Built to scale, it means R.O.G.'s will be impossible for a rubber powered ship and also that every "landing" will be a replay of the "tumbler" tumble weed!" In short friends, the Spirit of St. Louis is a challenging, possibly tormenting, subject.

In the hopes of making your Yuletide



The "Spirit" getting refueled for one of its test flights at Rockwell Field, San Diego, California. Small sign under seat on side of truck says, "Standard Oil Company". Note solid truck tires with holes for "shock absorbing". Photo courtesy of Pete Westburg.



Only modifications to scale outline are enlarged tail surfaces and a slight amount (3 degrees) of dihedral.

a bit brighter, I have concocted a set of peanut plans for the "Spirit" showing both the "true" lines and suggested deviations for improving flight. A set of "proof of scale" three-views also accompanies the plan, so you will have all the documentation required when you mail your version of the Spirit to the Proxy Peanut Contest next Spring.

Construction is conventional, with an emphasis on weight saving. The model is built almost entirely of 1/20 x 1/32 medium straight grained, balsa.

FUSELAGE

Fuselage construction begins with the building of the sides from 1/20 square strip. Once these are completed, they should be joined by cross pieces directly over the plan. Figuring that nose weight would be needed, and also taking into account the rather abrupt change from a rectangular section at the wing to a circular section at the nose, I

elected to construct the nose of my model from block balsa which was hollowed to the approximate lines shown in the plan by the use of Dremel tool after the external surface had been carved and sanded to shape. Experience has taught me to avoid balsa for rear motor mount peg supports, and these, on my model, are made from 1/32 inch plywood cut wide enough to comfortably admit a short length of 1/16 inch diameter aluminum tubing which serves as my rear motor peg.

The prototype "Spirit" fuselage had three stringers on each side and three stringers on the top aft of the wings. Weight being of major concern, these were eliminated from my model, but you might want to add them for greater "scale effect."

When the basic fuselage frame is completed, the entire fuselage may be covered with either white, or if you



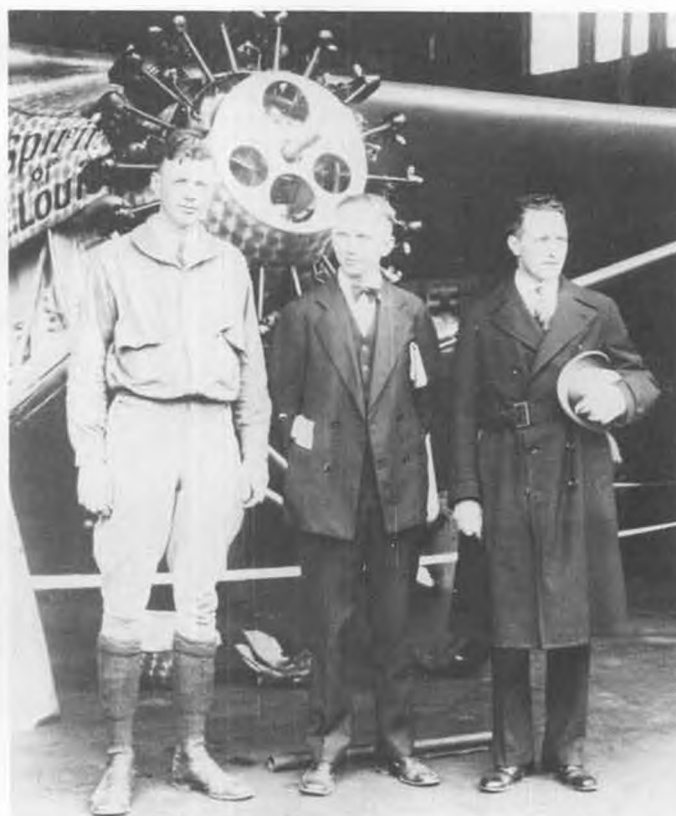
Even full size ship was unstable as a result of small tail surfaces, designed for smaller wing. Poor stability helped Lindbergh stay awake!

care to order it from me, I have new, good quality, silver tissue from Japan available at 60¢ per sheet, plus postage or \$7.00 per dozen postage paid. Write me at 13885 Edgewater Drive, Lakewood, Ohio 44107. With the fuselage covered, the nose is then drilled for the nine cylinder heads of the Spirit's Wright Whirlwind engine. I really agonized about the engine detail and found that the Williams Brothers cylinders, even at 3/8 scale, are too large. I rummaged a bit through some plastic kits I had collected and I think I could have probably used cylinder heads from the 1/4 inch Lindberg plastic model of the Curtiss F11C-2 Goshawk, but I decided to simply grit my teeth and rap thread around short lengths of balsa dowel in the time honored tradition. It takes a lot of work to make the engine, but once done, you will not regret it.

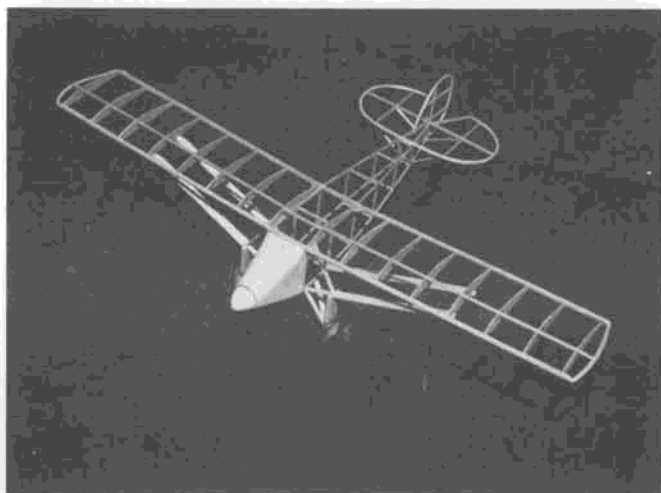
The very characteristic engine tur-



Lindbergh with "KEEP OUT . . of the water" sign. Note plane-finished spinner, as compared to photo on previous page. Westburg pic.



Lindbergh, Clarence Chamberlain (ctr), and Richard E. Byrd. Two weeks after Lindy's flight, Chamberlain flew from N.Y. to Berlin.



Bones of the "Peanut of St. Louis". Ribs are in scale locations, but some have been left out. Built up nose was hollowed with a Dremel.

nings on the cowl of the original "Spirit" is a detail that simply cannot be overlooked. I experimented with several ideas, but finally decided to use the "optical illusion" method. First, the cowl area is wet-covered with tissue (you must be in a very relaxed mood when you begin this step!) and given one coat of dope. Then, using the head of an ordinary straight pin, and a straight edge guide, make row after row of pin-head depressions, staggering every other row. That's it! Hopefully, the photographs will indicate how well it turned out. Appropriately, on close examination, the surface looks somewhat like a peanut shell.

As a scale instrument panel and pilot, "Lindy", would obstruct passage of the rubber power, and since window area was negligible anyhow, we decided to simply use black tissue to indicate windows. **Model Builder** has agreed to bypass the pilot requirement for the special "Spirit" event in the 1977 Parcel Post Proxy Peanut contest.

The Spirit's spinner was turned out of medium hard balsa block using a 1/4 inch drill and sandpaper. Photos of the original show two spinner shapes being used: one pointed, the other blunt. I preferred the blunt, but the pointed is shown on the "proof of scale" drawing. Everyone has an approach to making things like spinners, but my favorite technique is to cut a thin (1/64 inch) plywood disk of the size needed for the spinner's base and to glue this cross-grain to a balsa block. Next bore a 1/16 inch diameter hole using a Dremel drill press to insure a 90 degree angle, and then insert and glue in place a short length of 1/16 inch diameter hard wood dowel. Shape the block around the plywood disk with an Uber Skiver knife, forming a cylindrical shape. Having done so, insert the dowel into the jaws of a 1/4 inch variable speed hand drill and use a combination of files and/or sanding paper to "turn" the spinner to the desired shape.

The propeller blades are laminated

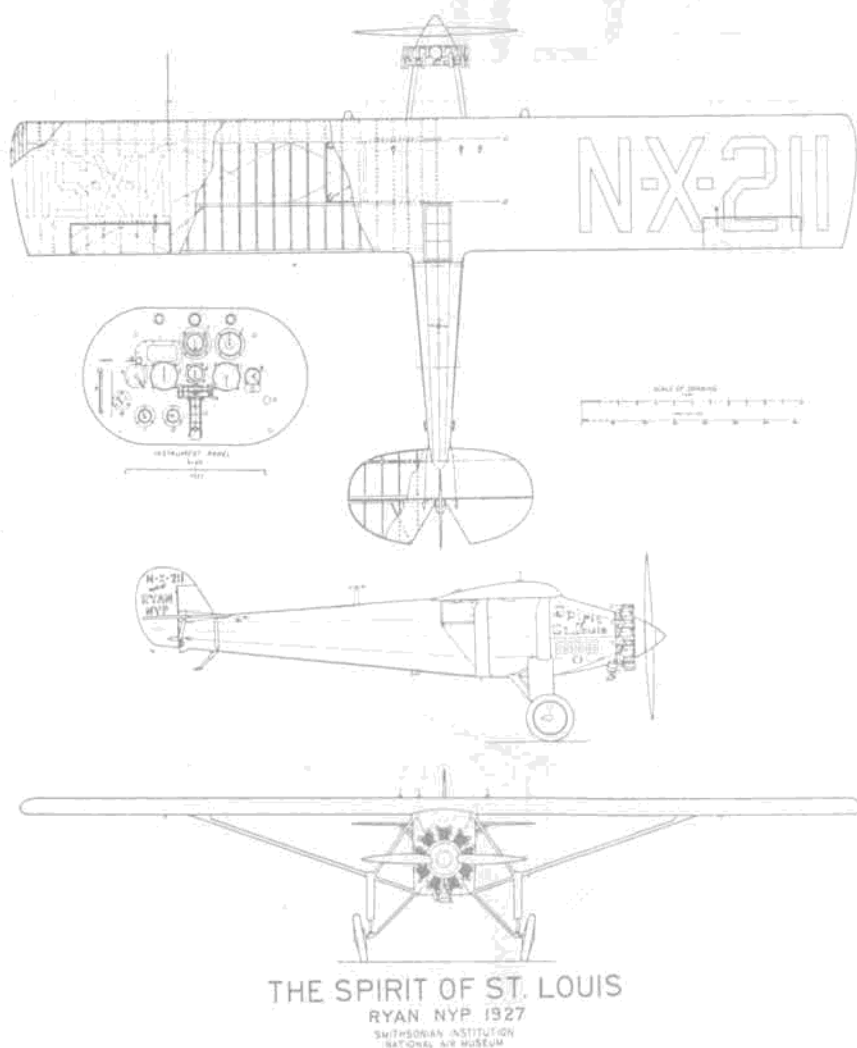


Clever trick provides illusion of engine turnings on cowl. Head of pin was forced into wood. Close up, it looks like a peanut shell!

from two layers of 1/32 inch sheet balsa using thinned Titebond glue. Each blade is wrapped with strips of scrap cloth at an angle of 10 degrees off the longitudinal axis of a 2-1/4 inch tomato paste can. This assembly is then placed into an oven at 200 degrees and "cooked" for an hour or so to speed up the curing and drying process. When the blades are completed, they are sanded to the appropriate airfoil shape and inserted into the spinner.

In view of the extremely short fuselage, a rubber length of two times or more the motor peg-to-propeller hook length will be needed to give any reasonable power run. Long motors usually present the problem of "climbing" up the propeller shaft, but this may be avoided by the use of what is sometimes called an "S" hook on the propeller shaft. I have sketched the details for making such a hook on the

Continued on page 68



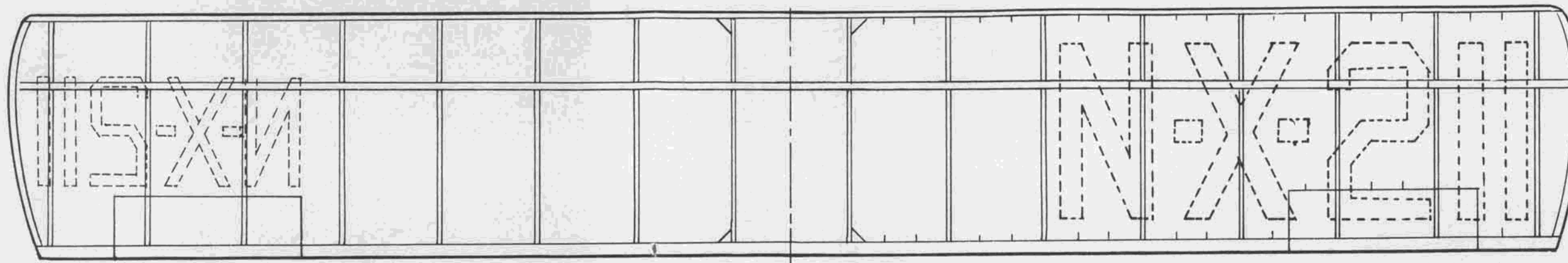
THE SPIRIT OF ST. LOUIS
RYAN NYP 1927
SMITHSONIAN INSTITUTION
NATIONAL AIR MUSEUM



Prop. blade
(1/32 sheet X 2)



Rib pattern (16 req.)



N-X-211

N-X-211

N-X-211

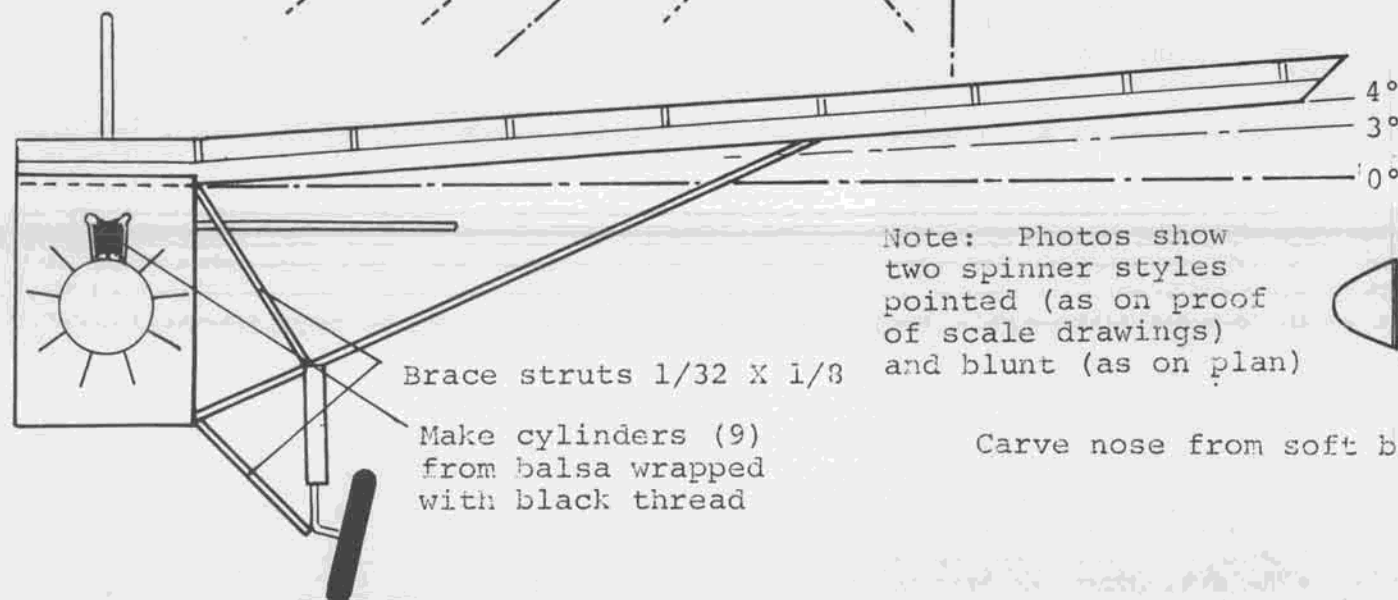
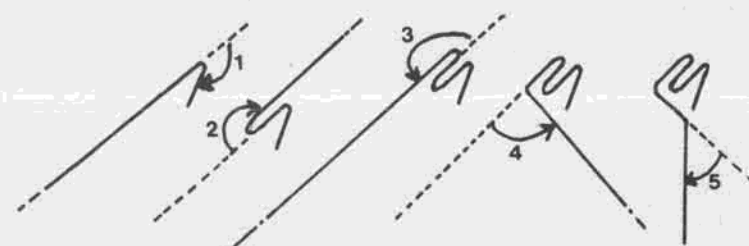
RYAN
NYP

Spirit
of
St. Louis

Spirit
of
St. Louis

Power: one loop 1/16" Pirelli 12" long (indoor)
one loop 1/8" Pirelli 12" long (outdoor)

Make "S" hook to avoid rubber climbing



Brace struts 1/32 X 1/8

Make cylinders (9)
from balsa wrapped
with black thread

Note: Photos show
two spinner styles
pointed (as on proof
of scale drawings)
and blunt (as on plan)

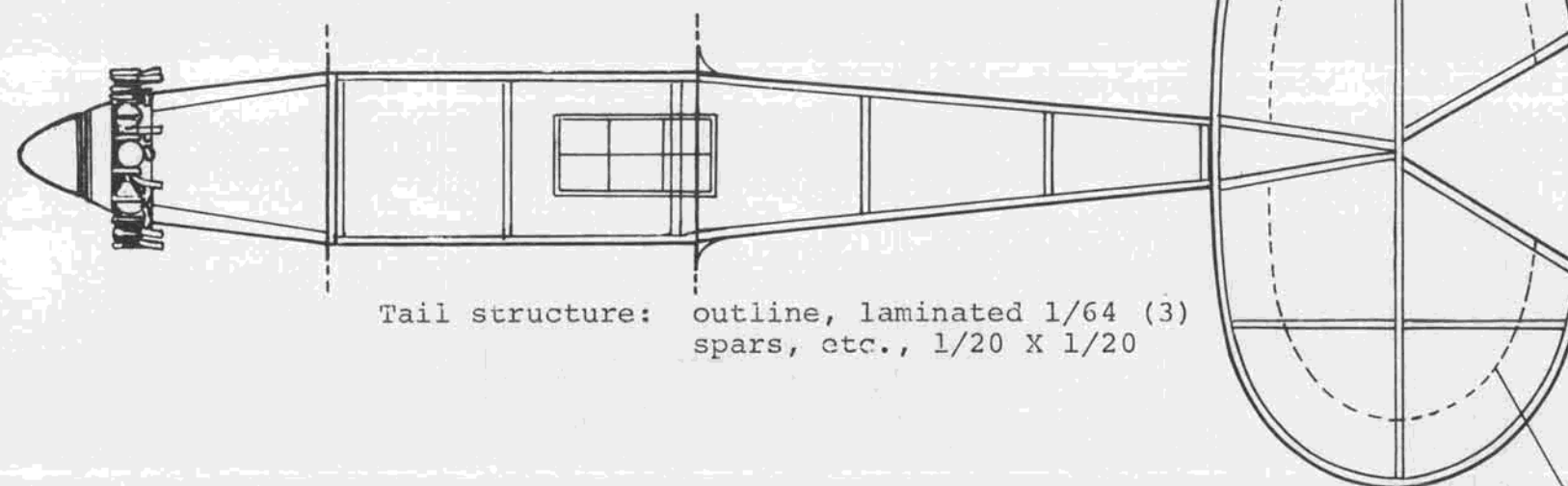
Carve nose from soft balsa block

3/4" wheels (Williams Bros. or similar)

Color scheme: all silver
with black name, numbers
and trim.

Cover with "Genuine"
Silver Japanese tissue
now available. For
sample send SASE to
Dennis O. Norman,
13885 Edgewater Drive,
Lakewood, Ohio 44107.
Limited supply!

Wing structure: leading edge, 1/16 X 1/8
spar, 1/20 X 1/20
trailing edge, 1/16 X 1/8
ribs, 1/32 sheet
tips, laminated 1/64 (3)

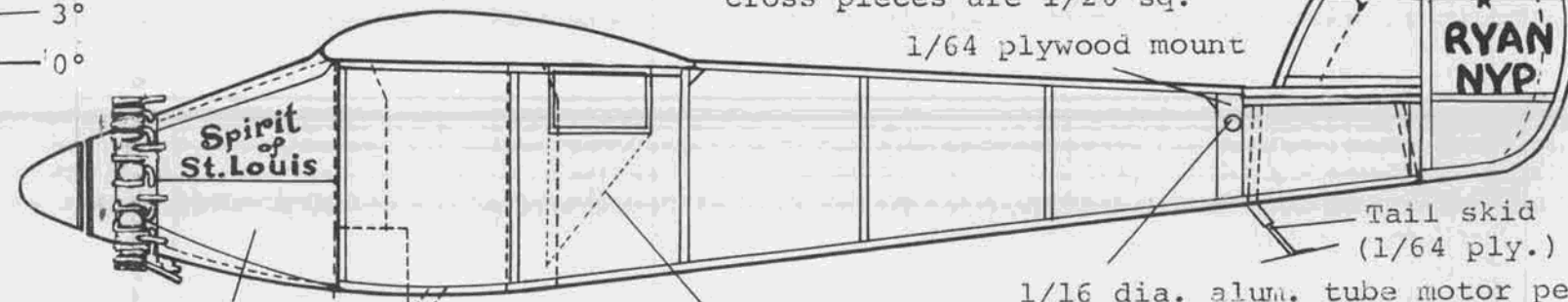


Tail structure: outline, laminated 1/64 (3)
spars, etc., 1/20 X 1/20

Fuselage structure: nose, carved and hollowed
balsa block
longerons, upright and
cross pieces are 1/20 sq.

1/64 plywood mount

Scale outline

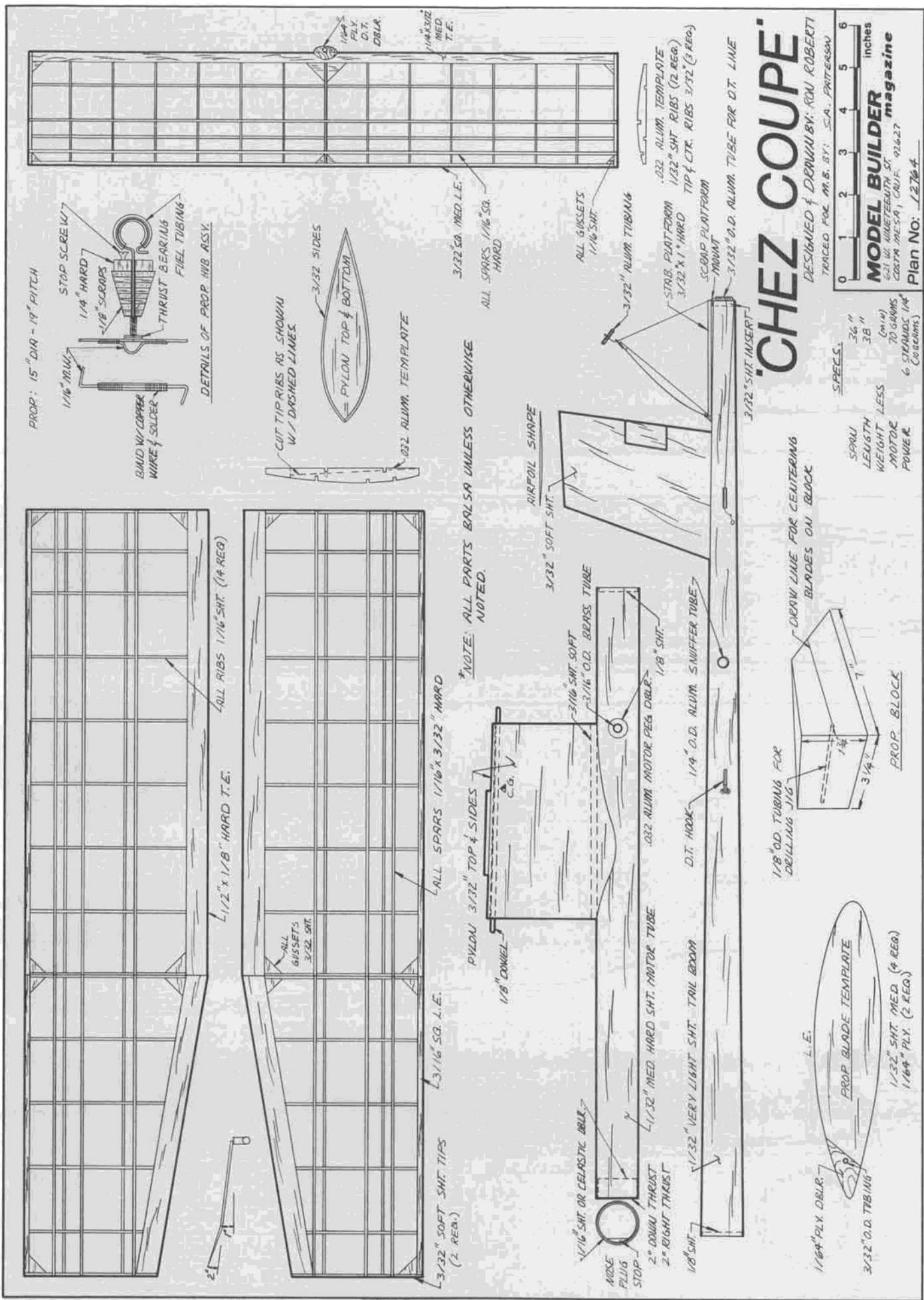


Door outline
(right side only)

1/16 dia. alum. tube motor peg

SPIRIT OF ST. LOUIS

Designed and Drawn for **MODEL BUILDER**
A Peanut Scale Model
by Dennis O. Norman November 1, 1976



CHEZ COUPE

DESIGNED & DRAWN BY: RON ROBERTI
 TRACED FOR M.B. BY: S.A. PRATERSON

MODEL BUILDER magazine

621 W. WILMETTE AVE. ST. LOUIS, MO 63105
 COSTA MESA, CALIF. 92627

Plan No: 12764



the Chez Coupe

By RON ROBERTI . . . Select a nice, straight pool cue and build yourself a couple of compact competitive coupes for the coming contests.

• After building and flying Unlimited Rubber for many years with good success, I was talked into trying Wakefield by a good Wakefield flyer and a good friend, Bob Loeffler. Well, to my own amazement, I loved it and managed to make it to the finals in my first year, 1976. After that, Bob talked me into building an 80 gram Coupe. I did, and the results astounded him, and me. I really didn't believe an airplane could fly so well on 10 grams of rubber. An excellent climbing and gliding Coupe for the contest flyer, you will really have a ball with it.

Let's get to work on Chez Coupe.

THE FUSELAGE

The fuselage is made by rolling a sheet of 1/32 med. hard straight grain balsa around a 1 inch form. To make the tube, wrap a piece of tissue one complete wrap around the form. Lay the sheet wood, that has been soaked in water, as close

to the edge of the form as possible, making sure it lines up perfectly straight. Roll the wood around the form. Tape the tissue to the form so it does not unroll and bake in a low temperature oven for 30 minutes. When completed, remove the motor tube from the form and cement the seam. Make sure the seam is perfectly straight so that the tube doesn't bow. Use care here because any bend in the tube will render it useless. When this is dry, sand the excess glue from the seam and give it three coats of nitrate dope, sanding lightly between coats.

Now you can roll a piece of 1/16 x 1/2 around the same form used for the motor tube, to form a doubler for the nose section. See plans. Use the same procedure as used on the motor tube. Fit this piece inside the motor tube at the front end and cement in place. You'll

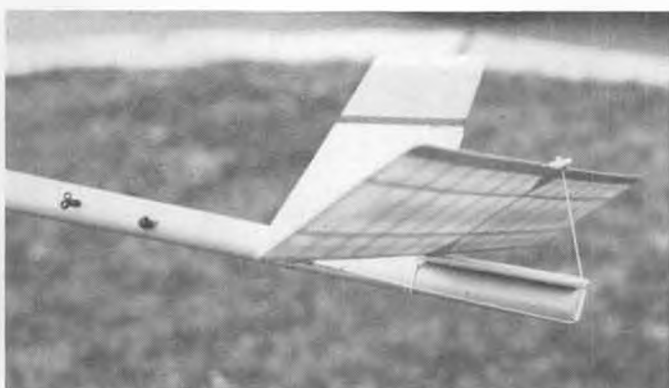
Continued on page 93



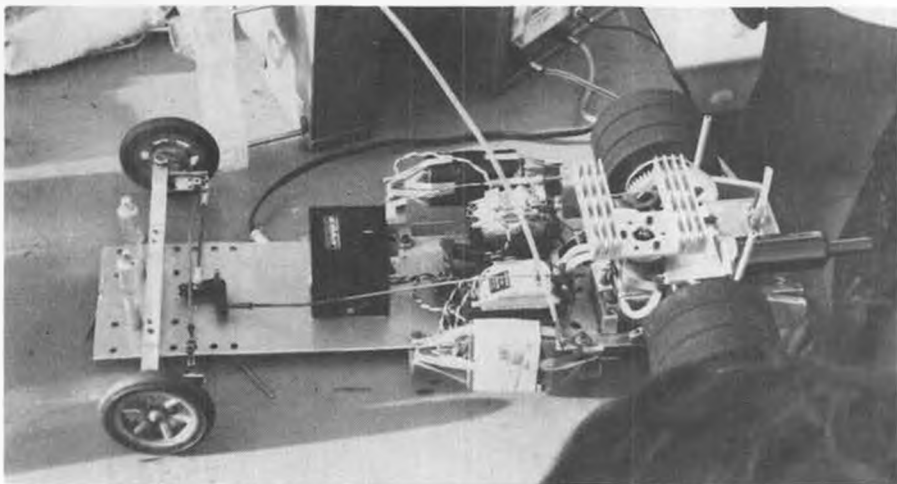
Only carving for the prop is in making the form over which the 1/32 balsa and 1/64 ply laminates are molded.



Small rubber bands help pull prop blades into retracted position. Ron didn't tell us if that's his son holding the coupe.



Stab in DT position. Mechanism is uncomplicated and therefore quite fool-proof . . . if you remember to light the fuse!



Bet Franz Kavan never expected this! Carl Petri's car had Kavan gyro for stabilized steering. Never had a chance to see its capabilities because of radio problems. Watch for later report.

R/C AUTO NEWS

By CHUCK HALLUM

• I'd like to continue for a little on ROAR rules proposals for 1977 (that's what I finished up with last month). If you're not aware of it, you ROAR members are going to have to vote on the new rules proposals that make it through the Rules Committee. So it's best if you know what they might be and discuss them at your meetings, or whatever, and know how you really want to vote. Obviously, I can only mention the rules that I know about that probably have gone to the rules committee.

In Superstock, proposals are in; to allow synthetic oil fuels to be used at local level races, to define crossflow porting, to set a time (3 or 4 months) allowance for approved engine parts, and to tabulate currently approved engine parts for the Veco 19. There has been some discussion of opening the class to any engine (up to 3.5 cc) with .19 carb and 10% nitro fuel. The any-engine rule is OK, but I think it's a little bit premature for 1977, and I would rather wait 'til 1978 rules on that one.

A muffler rule is very likely to show up. As I mentioned last month, the current 85 db at 50 ft. is very difficult to enforce at races. One suggestion was to limit the outlet bore of mufflers to .375 dia. Apparently, the stock McCoy (21) mufflers are larger than this, so a new suggestion was made of 5/16 dia. and a 3/4 in. stinger length for commercial chamber type mufflers, or 85 db for other type mufflers. There may also be some limitation on homebuilt chamber type mufflers. Overall, I think this is an improvement, because practically all racers run the commercial chamber type mufflers and these could be tech inspected very rapidly. Personally, I'd rather see a .375 dia. (we could press a .375 ID tube into the old mufflers), but we may not have that choice.

Proposals on limiting carb size on the Open class may show up, but I think they are out of line. Too many people enjoy wide open racing. Besides, there is the Superstock class.

Another biggie that will probably

show up is a request to reduce the minimum tire diameters. I don't think reducing tire diameters is a good idea for several reasons. But the people suggesting smaller tires say it will allow racers to run the tires longer. That really won't happen. If the legal tire size is reduced, racers will start with smaller tires to begin with, because of gearing and adjustments, and will probably get less time before the tires are worn out because there is less rubber. Besides that, manufacturers would probably reduce the tire donut size. Finally, smaller tires look terrible on cars . . . really look at your car when you run the tires down practicing and you'll probably agree. So let's hold the tire diameters where they are . . . you can always run them down smaller during practice.

In general, I personally like to see as few changes to the rules as possible so racers don't have to completely re-do (re-gear, jack-up, etc.) their cars from year to year. Once in a while, changes are required to stop a runaway problem . . . just like moving drivers from one class to another. Once in a while, I think it's a good idea to get a new class started if there seems to be interest in another type car, and possibly when there gets to be too many entries in one class. Several things which I see coming in the future are the .19 carb, 10% fuel, any-engine in the superstock class, a dune buggy class, and possibly a sprint car class with a midget type race program. I'd also like to see some action in the sedan stock car class.

Now let's get to what this month's article is supposed to be about . . . the technical aspects of the '76 eighth scale Nats. One of the first things that impressed me was the number of K&B 21's that were in cars and going super. There were a great number of racers that had the same horsepower as the top dogs and could no longer complain about the horsepower race. For awhile, the K&B 21 has evened things up. From what I've seen, you really don't have an awful lot of things to do with this engine to have a goer. First and most important, put in a



Art Carbonell's sports car has typical layout. Note second set of wing tubes . . . for forward wing mounting?



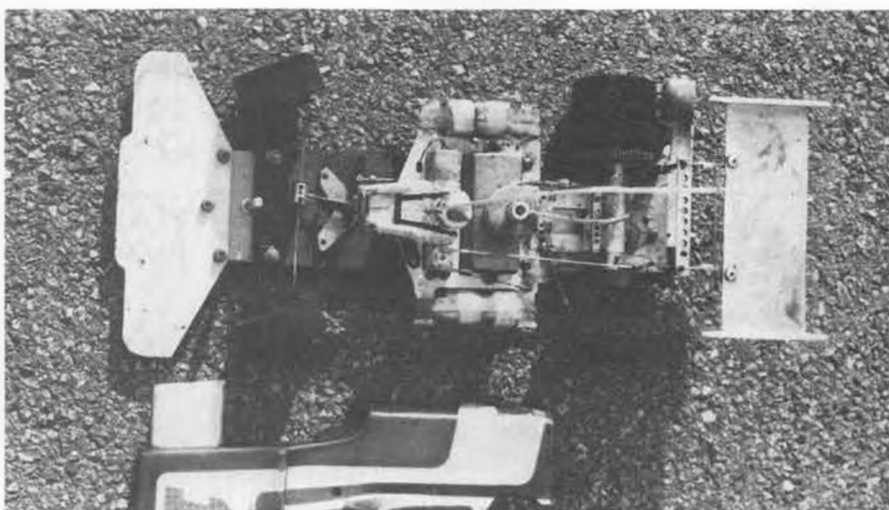
Dual trays above and below equipment vertically stiffens chassis on Roger Curtis' oval car.

larger diameter hardened wrist pin . . . the McCoy/K&B 21 pin is most often used. Next raise the bottom of the piston skirt to uncover the front two transfer ports when the piston is at bottom dead center . . . radius the inside edges. It probably helps to taper the back of the crank bore slightly to reduce the flow velocity some . . . see my past Veco/McCoy hop-up articles on this. Also sharpen up the edge of the crank intake port on the closing side and do not change the timing (again see the old Veco/McCoy hop-up articles if you have questions). Now put on that super carb if you want super horsepower. A 40 size carb will do great . . . but 60 and 61's will really give you that super zap. Finally, when you put the engine together, add cylinder head shims so that you have at least .020 to .025 in. of piston head clearance at TDC. Now you're ready to find out that your car cannot handle this kind of power except on super traction tracks.

As you can see, there really isn't much you have to do to the K&B 21 to have super horsepower. Many other things can be done to the engine, but they don't seem to help. Many of the additional things were mentioned in my articles on engine hop-up. One other thing which several fellows had was fitted McCoy pistons, wrist pins and rods. These fitted parts undoubtedly helped reliability and life of the engine more than the horsepower.

As I mentioned last month, several types of Superstock engines demonstrated approximately equal car performance. The engines went from high rev engines using almost 6:1 gearing to torquers using 4.67:1 gearing. I'll have a full report on three of these engines next month.

There were no real far out chassis designs at the Nats this year. John Thorp had a slightly different front suspension, Joe Sullivan had front suspension, and I had front and rear roll rate. But these really didn't show any



Chassis "tweak" plate, located under steering bellcrank of Gary Kyes' oval car, allows changing of the tire loads with one set screw.

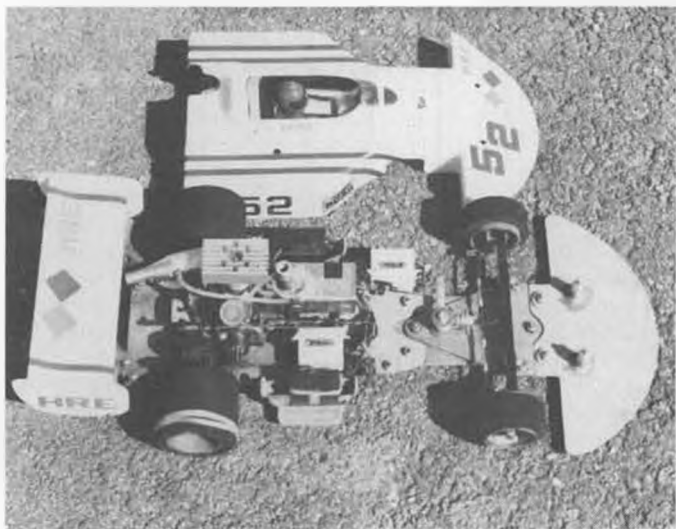
real advantage because of the super traction that developed. I think that the added flexibility did help the cars to take the bumps in the track, particularly on the first two days during the oval racing when traction was lower. But after that, even the simplest chassis were all that was required as the traction came up.

In oval car set ups, one of the most significant things that can be done is to bias the weight of the car to the inside of the turn, the left side. I'm sure that lots of racers do this to get a little edge. Roger Curtis, who won the expert oval, had the weight biased to the left, as did Arturo Carbonell, in probably the fastest oval car on the track. Needless to say, I had the weight biased also. Some pictures illustrate how some of the cars were set up. In general, put the battery and fuel tank to the left and then get the servos as far to the left as possible, even if it means shifting weight a little to the front.

Besides shifting weight on the oval cars, I think it is also beneficial to have torsional flexibility, but retain vertical stiffness (center part of chassis moving

up and down). Roger Curtis had what amounted to two radio trays . . . upper and lower. I suspect that both top and bottom trays had slotted mounting in the front to allow torsional motion, but could not move much fore and aft so that they stiffened the chassis flex vertically. In my car, the radio tray was bolted directly to the chassis to increase vertical stiffness . . . and the front and rear controllable roll rate rocker plates provided the torsional flexibility. John Thorp's cars usually have a wider chassis plate and sometimes radio boxes to enclose equipment, so that gives vertical stiffness and the front suspension gives the torsional flex. John still uses a differential to unload a lifting rear tire and reduce power oversteer, but now he's using quite heavy oil in the differential to control the amount of slip and not lose so much power.

As always, the tires must be used to control bounce caused by the track non-flatness and the traction/power delivery or cornering forces. If the track is not flat, there is only so much you can do with tire hardness 'cause the vertical chassis flex will still give some bounce.

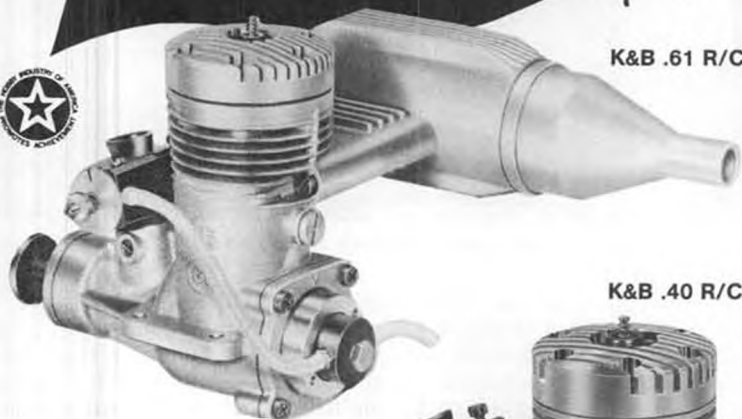


Author's oval car with weight bias to left. Equipment tray stiffens chassis, rocker plates for torsional flex.



No weight bias on Bill Steele's oval car . . . might have cost him a few seconds. Elevated tray vertically stiffens chassis.

DON'T YOU BELIEVE IT!

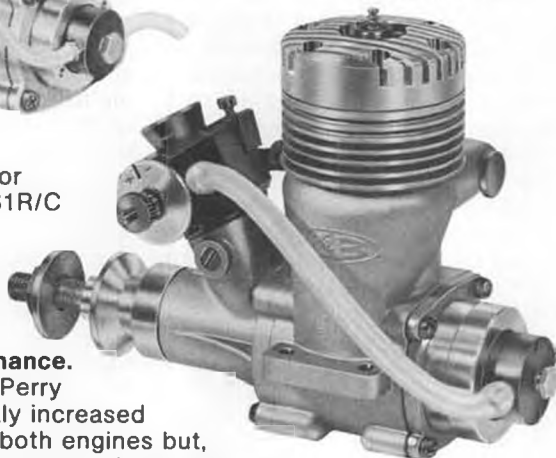


K&B .61 R/C

There's nothing complicated about the pump and regulator system on the K&B .61R/C or K&B .40R/C. Its operation is simple and maintenance is minimal...but what isn't minimal is its **added engine performance.**

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This is the most advanced step in a model engine fuel system to take place in many years...someday all model engines will be so equipped...**but K&B did it first!**



K&B .40 R/C

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Torsional flexibility and suspension will then be needed to reduce the bounce. Usually, with the plate-type chassis, a little harder tire, rears mostly, will reduce the bounce. Super horsepower will usually accentuate the bounce problem if there is reasonable traction. Again a little harder tire will help. Straight line bouncing was the big problem in the oval cars at the '76 Nats. Another solution to the horsepower induced bounce problem is to reduce the delivered torque to the rear wheels. Decreased nitro or a lower rear end ratio would help, but most racers would be unwilling to accept this approach.

There were several formula cars, or open wheel, bodies which were working

well. The Associated Ferrari and Parma March bodies were probably the best, but the Parma Talon and Lola bodies also looked good.

In the Superstock class, there appeared to be two problems that lots of fellows were encountering. Engine needle valve setting seemed to be more critical than usual. Possibly the humidity and temperature variations had some effect, but I for one had forgotten how sensitive the Perry 19 carb needle setting is. After some running, I remembered I used to change the needle setting by a "tweak" or a "tad", which is about 1/8 or 1/16 turn, respectively. After that, I seemed to home in on the right setting. Rear tires were the second problem. By the second

day of Superstock competition, the road course traction was improving and many cars were experiencing rear end hop during cornering, both accelerating and braking. About the only way to combat this problem is to use harder rear tires. I'm sure part of the problem is that the Superstock cars are a little heavier than the other classes. I did not really expect this kind of a hop problem, and only had one set of medium (hardness) rear tires and two sets of medium-soft rears. In Superstock, I had to settle for the medium-soft rears, but they were still too soft and the rear end hop remained with my car all the way through the main. John Thorp had the same problem, and said he just plain left his harder rear tires on the bench at home. Gene Husting, Bill Jianas, Rich Lee, et. al. had their harder rear tires there, and it showed.

The Associated Corvette seemed to be the body choice of most racers, and they do handle well. The new Parma Lancia Stratos looked good (handling) too, but there were only a couple since the bodies were just pulled the week before. The new Associated Ligier-Matra looks pretty, but doesn't seem to be as good a handling body as the Corvette. The MRP Camaro seems to handle as well as the best, but may have a slightly higher drag force.

Sports car racing was at its best at the 1976 Nats. The new K&B 21 engine was the real equalizer. Everybody was going fast, but Bill Jianas and Art Carbonell were going the fastest. Bill's engine was really strong and was well broken in... he had run some toothpaste through the engine after freeing up the carb and forgetting to clean the engine 'til later. Because the traction had improved so much, I think at least a 60 carb on the K&B was required to make the Expert main. So the first thing experts needed was a super strong engine. The next requirement was preparation. All the racers that made the mains had the bugs out of their cars and were ready to race. Gene Husting is always in the top few in Southern California, but had fuel feed problems. In both qualifying heats after a few laps, Gene's car would die going around the first corner... and he was out of it. Tires were again a factor. But an interesting thing seemed to be happening here. Not only was the rear bite up (with power application), but also the front bite. Usually when rear bite really comes up, you have to go to softer fronts to maintain the car balance by improving front traction with tires. Here the front bite came up as well as the rear. If you went to softer fronts the front end seemed to chatter some. So what had to be done was to go to harder rear tires to reduce rear end hop but leave the fronts alone. If you don't fully understand this problem, read up on some old back articles on tires,

covering the effects of rubber compounds and track bite.

In drag racing, I didn't see anything that was really new or different except for Carl Petri's funny car. Carl's funny car had a gyro (stabilizer) for electronic feedback to the front steering. Many of you know these gyros are used on helicopters to improve directional stability. Funny cars are probably the most directionally unstable cars there are. The idea here is to provide almost instantaneous correction when the car begins to rotate, power oversteer, to the right or left. If the car rotates to the left without being commanded to do that, the gyro automatically turns the front wheels to the right (or vice versa). Hence car stability is improved and more power can be applied. But we didn't get to see this car's potential because the radio went out on Carl's first run and he went into the boards at full throttle, demolishing the car. The idea seems reasonable, so I'm waiting to see how Carl does with it in the future.

A neat little goody showed up on several MRP cars . . . a chassis tweak block. It looks like a little butterfly, and is attached to the center of the chassis just behind the front wheel bellcrank/servo saver, as shown in one of the pictures. If all tires do not seem to be contacting the ground evenly, a turn of a locking set screw is all that is required to remedy the situation. All one has to do is determine which front wheel is lightly loaded and then turn the screw on that side down until the front wheel loads are equal. Possibly you may have to back off the other side. But one must be careful not to use this rather than change or rotate tires when required, because if the screw turning is carried too far, the chassis will be permanently bent and the adjustment range will disappear.

During Sports Car practice, Roy Moody was checking on noise emitted by our little hornets. He found very few that were legal, and I believe he was doing it from outside the track perimeter. So the boards were even cutting down the noise some. I know many sounded really loud. Here in Southern California, most guys do not seem to be bound by any rule, and drill out the outlet, cut off the stinger and do everything but take the muffler off. We've just got to do something about this.

Before I sign off, let me tell you about an international race that is going to be sponsored and set up by the Orange County R/C Auto Racers here in Southern California. The race will be on the July 4, 1977 weekend, and will probably be a three day affair. There will be more than 30 drivers from Europe and several from Japan in attendance. Ted Longshaw of England and Gene Husting, here in Southern California, are the primary initiators of the idea. Ted is

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The easy way to a "Standoff Finish"*

- 1.** Brush on a coat of Hobbypoxy color.
- 2.** Brush on another coat of Hobbypoxy color.

Okay, okay, it's not really that simple, but almost! You should sand the balsa before step one, then let the paint dry thoroughly and sand it before step two. Will you settle for the Hobbypoxy four-step?

Seriously, this method will give you a tougher, more flexible, more fuel proof, super-shinier finish than a half-dozen coats of dope will. Cheaper and quicker, too. It's ideal for the weekend flyer who's in a hurry to get in the air, and will have his dope-happy buddies eating their hearts out.

* For best results, view from two feet away. For an even better finish, add another coat or two. For a perfect finish, send for our free booklet, "Hobbypoxy Painting Pointers". Ask for our latest color card, too!

HOBBYPOXY PRODUCTS

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going to set up some kind of charter flight from Europe and indicates there is lots of interest over there for this idea. The race will be staged at a permanent track location, yet to be selected, here in Southern California. That way, competitors can arrive a week or more ahead, practice and get their cars set up, so that there will really be some competition of the best cars from all over the world. Tours to some of the local attractions will be scheduled before (or after) the race so wives and the drivers can get in some good sight-seeing while here. Sounds super doesn't it? I'll keep you posted on future developments of the International R/C Car Race.

Well, that's thirty for this month.

Any comments are welcome, or if you need any re-prints of articles, write to me at 3859 South Main Street, Santa Ana, California 92707. 'Til next month and the Superstock engine article, good luck in racing. ●

Plug Sparks . . . Continued from page 27

a flying companion, Stuart Finely, started making motors in his basement. The success of the engines soon attracted the attention of the Douglas Model Aircraft Co. in Seattle. The production model was modified heavily to allow for sand castings all through the engine. The head was changed to the six finned type to utilize a 3/8 plug. A thin steel cylinder was fitted to a single ring aluminum

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MODEL BUILDER PRODUCTS

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piston, the metal of which was called "Vanasil". It must be noted that Conklin lapped pistons in most all of this early models.

In the September 1937 issue of Model Airplane News, the Douglas Model Aircraft Co. came out with an announcement of a new engine to be shortly forthcoming. Finally, in the November 1937 issue, a photo of the engine was featured in the advertisement. The inverted style picture (heavily retouched) was featured until the June 1938 issue, which showed the upright Husky J.V. version at \$12.50. This photo was also completely retouched.

A good photo of the Husky appears in the Modelcraft, Los Angeles, advertisement, showing the true carburetor setup. A float type carburetor (like a true carburetor) was attached to the intake tube, together with a gravity type tank on the firewall.

Just about the time that 500 units had been produced, the young designer was informed by the subcontractor that they were going to take over the entire project. Conklin, however, was able to salvage and retain the name.

The Douglas M.A. Co. decided to stay with Conklin, hence the piston manufacturing concern (to utilize their tooling setup) went into making copies of the Husky Junior, called the "BAT" . . . not to be confused with Jack

Keener's "BRAT". The confidence of Douglas was soon vindicated, as Conklin, after many diligent hours in the basement, turned out another engine called the Husky Junior, so named after the Washington Husky Junior Varsity rowing team that was making such a world-wide name for itself. But that's another story!

The operating instructions for the Husky Jr. specify white gas and SAE 70 wt. oil in 4 to 1 ratio. Incidentally, for those who did not have timers to shut off their motors, the Husky could be made to run on just what gasoline was in the carburetor float valve. Motor runs of 15 to 45 seconds could be obtained by adjusting the sliding float on the needle. This, of course, after the gas line had been clamped off. With the float removed, motor runs of two minutes were possible.

The Husky Junior engine was designed for small models of 2-1/2 lb. weight. The motor swung an 11 x 1/2 inch thick propeller at approximately 7000 rpm. Interestingly enough, the flat spring type timer actually acted like a governor and rpm ratings with a propeller above 7000 rpm were hard to obtain. The later JV model corrected this fault. Husky engines were produced until late 1946, when the superior post-war designs outsold them.

BATTERY SAVER CIRCUIT

How many times has your motor stopped with the propeller in such a position that the points are closed? Many times, I'll bet with the usual results. Unless you have new batteries or a way to quickly re-charge them, you are out of luck!

Well, enough of that old stuff! Tom Bristol, that energetic prexy of SAM 21, in conjunction with Larry Jones, another outstanding electronic man of SAM 21, has come out with an addition to the transistorized ignition system (featured in the May '76 Model Builder) that eliminates this problem. You will note from examining the Battery servo circuit schematic that two transistors have been added to the original ignition circuit. The operation is rather simple; when the points are open, capacitor C1 is charged. When the points close, capacitor C1 turns on transistor Q2, which in turn, activates the transistor in series with the coil. When the points open, the coil field collapses, giving a spark to the plug.

Now, when the points are closed (and left closed) the charge drains off through transistor Q2. From then on, the points no longer have any effect, and the charge has been completely dumped with no way of rebuilding again. How about that!

Of course, such a circuit is a real life saver for those modelers flying Texaco ignition type models, where the soaring portion of the flight is three to four times the length of the motor run. With the points closed, that's more than enough time to come down with dead batteries. It should be of interest to all, that in spite of the system having been designed for shielded radio use, this electronic ignition would be much superior to the old coil and condenser system used in free flight. The reliability and starting factors are improved immensely, not to mention the added power and economy resulting from the improved spark. Try it, you'll like it!

SAM 21 SPARKS

It has been quite some time since this columnist has reported anything on the doings of SAM 21, but if the facts be known, a report or two could be carried every month on this most active club, that stages at least one contest a month.

With better than 50 plus members all over Northern California, it was only a matter of time until SAM 21 started to break into separate clubs based on various regions represented.

Trust that energetic Ed Wood, who moved from the San Jose area to Santa Rosa, to immediately organize the local boys and existing members of SAM 21, 17 in all, into a new SAM chapter, No. 27, to be exact.

The recent SAM 21 Texaco and Limited Engine Contest at Santa Rosa was literally deluged with SAM 27 boys, taking three of the four places. Ed Wood



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set an excellent example, taking two second places. Ed Solenberger, a local Santa Rosan, won first in the Limited Engine Run Event, with a scaled-up Advanced Challenger, powered with a Torpedo 40. The piece-de-resistance was Larry Jones' win in Texaco. Having worked in parallel directions with Tom Bristol, Larry Jones produced a photo-electric ignition system that allowed his converted ignition Fox Eagle 60 to run eight minutes on 5/8 ounce of fuel! Coached by the columnist (after all, it was his very first contest!), Larry was able to keep his Powerhouse in a light thermal over the tin ranchhouse on the south end of the field. Despite the low overcast, the Powerhouse registered a smashing 16 minute flight. Couldn't have happened to a nicer fellow!

The new SAM 27 club went all out for this contest, attracting no less than three reporters from local papers and magazines, to help publicize the opening of their flying field. At the close of the contest, Ed Wood had arranged a special banquet at Occidental. Attended by 27 contestants, this was a most memorable meet.

With SAM 21 starting to fragment into large SAM chapters like the Santa Rosa SAM 27, the writer was greatly pleased when Whitey Pritchard, of the Santa Cruz group, advised the columnist they were going to pull away and form

a new chapter. Now, if the Sacramento group (no less than a starting ten members) decides to form a chapter, the darndest round robin of contests can be scheduled for 1977. Imagine the inter-SAM Chapter rivalry for various trophies!

OHIO ECHOES

Jim Robinson writes to say the Old Timer Championships held in Ohio were about the best thing that ever could have happened to O/T F/F in that area. With the awakening of interest and the pursuit of new fields, the Northern Ohio Free Flight Assn. (NOFFA) was able to put on their 12th Annual O/T Contest.

Four events were staged, with Bob Piktel's Westerner A taking Class A, a Zipper by Rudy Kluiber (isn't this the Demon he has been using for years?) took Class B, while Warren Weisenbach took Class C with the old dependable Playboy Sr. The .020 Replica contest, which is always hotly contested; saw Tom Kalsul win with a Booklyn Dodger.

NORTHWEST RAMBLINGS

Dave Knight again reports to say his second O/T contest suffered because of site change. However, the third one at Harts Prairie Lake was a goodie. Attendance is picking up more all the time. The two minute target time event (similar to that described in the last issue about New Zealand Nats Events) seems to be the one that draws the crowd.

According to the latest dope from Dave Knight and Bob Schafer/Clarence Haught of the Spokane area, there are going to be a flock of old timer contests up north. Knight is planning no less than four at the Harts Lake Prairie area, now that he has official permission.

The greater Spokane - Couer d'Alene area boys will have their 2nd Annual O/T bash in July, 1977. Put that together with the WMC O/T Annual Champs and there are certainly no less than six O/T contests scheduled. Before you know it, the Northwest is going to look like the California schedule!

NORTHWEST O/T ANNUAL CHAMPS

Talking about Northwest activity, the Willamette Model Club just got through staging their 6th Annual, which features a complete slate of old timer events and a beauty event, something that seems to have gotten lost these days.

As we mentioned in the last issue, Don Dodd and Tom Cope were going to run an Advice Clinic. Prices did suffer a drastic drop, as expert advice on engines and models was only one cent, as compared to advice on everything else at five cents. Kisses were free (no takers at last report!)

Of the ten events presented, interestingly enough, Bob Findlay entered three with his Super Cyclone powered Miss America. Now get this, if you don't think Miss America designs aren't competitive; First in Time Target Event, First in Antique, and second in Ignition Cabin Event. Whew! It took Don Nordlund two models to get two seconds and a third to match the number of places taken.

Beauty Event is starting to tighten up as only ten models were entered. Clarence Haught produced a very patriotic looking Playboy Senior in red, white, and blue, trimmed with lots of stars. The Beauty Trophy in itself was unique in that it featured a large stained redwood base with a Genie engine mounted on a block on the right side of the base together with a picture of the winner mounted under plexiglass on the trophy. Great idea!

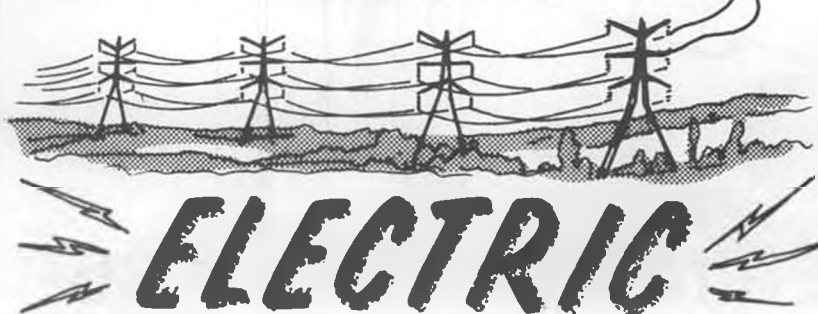
Although a number of ships disappeared, all were returned. That makes for an enjoyable contest. The wind actually died down by 11:30 a.m. and the boys had a real great time.

Probably the best comment of the meet (as related by Al Grell), was made by quiet Ernie Linn just after Earle (Foggy) Moorhead had presented Clarence Haught with the Beauty Award that Earle alleges took two months to build. The remark went like, "You'd better treasure it, because it's the first thing that Foggy has built in three years." Amen to that!

NATS O/T CHAMPS REVIEW

Well Lee Webster did it again! It has been quite noticeable at the Old Timer Events staged at the Nationals on Friday

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SEVEN "ELECTRIFYING" EVENTS!!

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and even at the SAM Champs leading off the Nationals at Wright-Patterson AFB.

We are specifically referring to that curvacious doll of a daughter who Lee brings as his "helper". Normally dressed in bib overalls which barely disguise her natural talents, Lee had his daughter dressed like quite the lady. Something has got to be done! It is the writer's opinion that too many modelers are watching the wrong model! This is particularly true of the old timers.

With such unfair competition as this, the writer feels that Lee Webster should share his daughter with all the boys. In that line of thought, how about bringing your daughter to Las Vegas in 1977 to enjoy western hospitality as Miss SAM Champs? That's such a great idea, I must modestly admit it is all my own. Are you listening, Joe Besbar?

"SAM SPEAKS" MOVES

For the past year, Jack Bolton, retired USN Commander, has been editing the official SAM newsletter, "SAM Speaks". Just about the time we all figured he was doing a great job, Jack gets himself a job in the Washington, D.C. area. This, of course, necessitated the appointment of a new editor. Peter Vano, of 8 King George Road, Warren, N.J. 07068, has taken on the thankless job, so we all wish him well.

In the meantime, Bolton can still be reached at 8007 Ferncliff Ct.,

Springfield, VA 22153, as he is still writing a column for Model Aviation. So make sure you send your SAM business to the right guy!

CONTEST STUFF

Received two letters from the Chicago area with the results of the 15th Annual Chicago Aeronauts Fall Old Timer Contest. It has been quite some time since any news has been forthcoming. We miss Pete Sotich, as he faithfully sent out reports on all the O/T meets.

Bob Hayes was C.O. for this meet, and describes the meet as having respectable air quality; in other words, no too heavy on the winds, and good thermals. Of course, flights were limited to 2 minute maxes, as a fair wind to them is a real hurricane to us Westerners!

Eight events were staged, with Mitch Post winning Class A and Class B ignition events. Not to be outdone, Art Suhr won Class B-C glow and .020 Replica. Our compressed air boy, Tim Banaszak won the cabin rubber event with a Korda Wakefield, on three straight maxes. On the rubber stick side of things, Charlie Sotich is practically unbeatable, with his Korda Stickler, making four maxes.

The big ones (Class C) is always the most hotly contested, with Buck Zehr using a KGS (don't see many of these!) pulling out a seven second victory over Bill Shaffer. Joe Konefes actually com-

peted with his original Bombshell! This model is in remarkably good shape considering its 1940 vintage. To wrap things up, Bob Yurkowski copped Class A Glow with a hot flying Ranger.

LAS VEGAS BASH

As Jim Adams put it in the newsletter, "Hot Leads"; the 5th Annual Las Vegas meet has come and gone and those of you who missed the biggest little meet, missed a lot of fun. The Vegas meet attracted contestants from Arizona, Arkansas, and Texas, not to mention California. Tropical storm Katherine passed over on Friday and made the dry lake, where the flying is conducted, into a very wet lake. The backup field in Northwest Las Vegas was also in the same shape, but by Sunday, everything was beautiful, sunny, and clear. Best of all, there was practically no wind.

In spite of the controversy over converted glow engines, it is interesting to note that of the 28 winners, one was powered by a glow engine, six by converted glow-ignition, and the remaining twenty one were original ignition engines! Adams feels it might do well to look at WHO is winning with converted engines: Bruce and Leslie Norman, Sal Taibi, Larry Boyer. In any contest regardless of what they are using, you could expect them to win!

Jim feels that rather than try to handicap or outlaw converted glow

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CONTROL LINE KITS

and now there are



If you really want to have some fun, then 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 Biplanes which have a few more). 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. You can use most any .049 engine made (even from an abandoned

plastic model, tho' it may need some modification). They are just perfect to learn to fly on (First time flight instructions on plans). Everyone of them flies just great—and you can't hardly hurt them—because they're light and rugged. We've got 15 in the line now—priced so low, you'll want to build a fleet. Wing Span's are all about 21" and the tools you'll need are usually found around the house—So get over to your dealer and take a look—they're the most . . . for your fun . . . for your dough!

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engines, why don't we do something about the flyers who win all the time. It is competing against PEOPLE, not engines, that makes it tough for the losers.

In that same line of thought, the Western Associated Modelers (WAM) used a system that might be applicable here. In the flying scale event particularly, the WAM judges docked the winner of the previous meets 10 or so points at the next contest. If he won again, he then faced a double handicap at the third meet. No question about it, something could be worked out if there was enough demand for it.

Before wrapping up the Las Vegas meet (which incidentally, is the site under consideration for the SAM Champs), a worst crackup trophy, the "Phineas Pickham Award", a very humorous statue of a typical hot pilot, was given to Bob Chambers for busting up his Forster 99 powered Scram when it lost its rudder tab.

STOCKTON 16TH ANNUAL

No report would be complete unless we reported that the oldest (and original) Old Timer Contest is still going. Received an enthusiastic writeup from Rod Persons, of the AMPS, stating that this was the best Stockton meet in many years. There were 68 entries by 36 contestants.

Sweepstakes was won by Larry Boyer by a wide margin over Phil McCary, who flew only two events. Probably the best

thing to happen was to see the columnist's long time buddy come out of retirement to win the rubber event with a free wheeling prop Roy Wriston Diamond. Gotta watch out for those kind of guys!

Only casualty of the day was Otto Bernhardt, who couldn't get out of the way of an .020 Replica Model. After being sewed up at the local hospital, Otto returned to finish his flights. Game guy!

Persons delightedly reports there were trophies and merchandise for all in every class. Dick Douglas did a terrific job as C.D., making the meet more enjoyable for all. You'll come back next year!

THE WRAP UP

Thanks to SLAM News from the Salt Lake City boys, one of the better jokes making the rounds these days allows you to use anyone's name. The gag was something like this.

A real competition oriented modeler died and went to heaven. Upon his request, he was given the grand tour of the Heaven Free Flight area which consisted of miles and miles of grassy land with no trees, hills, or obstructions a free flight could encounter. Upon arriving at the upwind end of the field, they came upon a Heavenly personage making a record attempt with a Powerhouse.

A check of the officials' table showed he had completed six straight maxes and was about to try for his seventh. The newly arrived modeler turned in wonderment to this guide with the comment, "Who does this guy think he is, St. Peter?" To which the guide replied, "oh, he is St. Peter alright. His problem is that he thinks he is Sal Taibi."

We'll say amen to that!

Peanut Continued from page 55

plan. It may seem formidable at first, but take your time and use a good pair of pin-nose pliers, and you should not have any problems.

Letter the words "Spirit of St. Louis" on either side of the model's nose and the fuselage is nearly complete.

WING

As with most aircraft of its era, the Spirit had a profusion of closely spaced ribs. In the interest of weight saving, scale rib spacing was not used, but the ribs shown on the plan fall at "scale" positions of the other ribs needed to build a "scale" wing as shown. Again, to save weight, the ribs might be individually built up (or "sliced"), but ribs from 1/32 inch soft sheet balsa were used with satisfactory result. The leading and trailing edges were made from 1/16 inch by 1/8 inch balsa strip and the wing tips were laminated from 1/16 x 1/20 strip bent around cardboard or

fifteen to choose from!

READY TO ASSEMBLE



BEGINNERS MESSERSCHMITT 4.95



sheet balsa forms in the usual manner.

The single spar of 1/20 square balsa strip was added after the ribs had dried and you will note that the wing tips have been constructed so that they bevel up to the spar. This is done to add as much as possible to the chances for recovery in a side-slip. When the wing is dry and removed from the plan, some dihedral should be added. I recommend at least three degrees per panel, as this much will not bring a penalty under the present AMA rules, and it will also help a bit with the otherwise "saggy" look which is a characteristic of aircraft lacking dihedral.

With the leading and trailing edges shaped, the wing should then be covered with white or silver tissue. The registration numbers may then be cut from black Japanese tissue which is stretched tight with tape on your work board, using a sharp pointed blade, and adhered using clear dope. Ailerons may then be drawn with India ink (if you have given the wing at least one coat of clear dope) or may be added using very thin strips of black tissue held in place with clear dope.

With the wing completed, it is joined to the fuselage and the details of the struts and landing gear are added through the use of 1/32 inch and 1/8 inch balsa sheet as shown. Generally, I prefer to make the airfoil shapes of the struts *before* they are cut to the

appropriate lengths from the balsa strips. If the struts are to be covered with tissue, or painted, I find it easier to do this directly with the strip stock before cutting the individual struts from it.

With the struts and landing gear in place, the model is taking shape. At a 13 inch span, Spirit's wheels come to 3/4 of an inch. Either Williams Brothers wheels may be used, or you might want to cut an ultra light set from either balsa sheet or styrofoam. Even Hungerford wheels might be considered, but you would have to cover those beautiful spokes to get the right look for this particular subject.

TAIL SURFACES

Both the horizontal and vertical tail surfaces are extremely small and should be enlarged as shown on the plan. The surfaces are built entirely of 1/20 inch square balsa. The outline being made, like the wing tips, of three 1/64 x 1/20 laminated balsa strips around a waxed balsa or cardboard pattern. Build directly over the plan, adding 1/20 x 1/20 spars and ribs once the outlines are dry.

Because the tail surfaces are fragile, it is probably a good idea not to water shrink or dope the tissue applied to them. If you feel compelled to shrink and dope, build a stabilizing jig by sandwiching a piece of 1/20 strip of approximately 3/32 inch width between two strips approximately 1/8 inch wide so

that you will have a channel approximately 1/20 inch wide to slip over the leading and trailing edges. Pins can then be driven through the jigs into your work board to hold the individual tail surfaces firmly while water or dope applied to them dries.

The characteristic markings on the rudder were painted free hand using a triple-o brush and Polly S "Night Black" (PF 10) paint. Struts of 1/64 x 1/20 plywood are added beneath the stabilizer, and a tail skid of similar dimension completes the empennage. If you feel really fussy, you might also want to make control horns for the rudder and the stabilizer, using bits of thin plastic card. The control "cables" can be readily fashioned from "stretch sprue" made by taking scrap plastic from the "trees" of the plastic models and holding it over a candle until it becomes soft. The "tree" is then pulled rapidly, creating a thin plastic "thread" which can then be cut to the desired lengths and held in place by a tiny drop of white glue at either end. As with the ailerons, the control separations for the rudder and stabilizer can be simulated by the use of India ink or thin, black, tissue strips.

FLYING

Because this model was built hurriedly to meet a publishing deadline, I did not have time to test fly it before submitting this article for publication.

they sure look real
because they're Scale.

for the first

12.95

KIT E13 SPAN 33"

SCALE 1 1/8" = 1 Ft.



DE HAVILLAND TIGER MOTH

Unique because such amazing scale detail is achieved with these kits that are relatively easy to build. They can be built many ways, such as: Rubber Powered (as supplied), Electric Motor, .020, .049 or CO2 Engine Power. For Free Flight, Control Line, R/C (pulse or Single Channel) or Static Scale.* Any version makes a museum-like model. Frame members are accurately Die Cut from the finest quality Balsa Wood, and every part is numbered to insure fast and accurate assembly as clearly shown on the easy step-by-step plan. Highly detailed Plastic Parts simplify assembly adding a touch of realism-in-miniature. Covering material, formed wire parts, Wheels, Decals, Hardware that includes Control Line parts is a partial list of the contents of these fine kits.

* Dry Kit. Rubber power material supplied. Other equipment not included

I suspect that 1/16 inch rubber strip will be adequate to power it, and I certainly do not anticipate anything more than a strip of 1/8 inch rubber. I will begin my testing by the use of a short loop just covering the distance between the rear motor peg and the propeller hook. Assuming successful flights can be obtained with a short motor, I will then lengthen the motor to at least twice that length and possibly even more.

I suspect that it may also be necessary to steam in some wash-out in both wing tips. In any event, this model should be stimulating to trim and fly and if you plan to build a version for the Proxy Peanut Contest, I urge you to start early as a delightful challenge awaits you! ●

Sailing Continued from page 31

1. The mid-section retained its original shape, but the buttocks about this point and towards the stern were very slightly flattened, to improve weight distribution and to try and correct a tendency to squat by the stern while sailing downwind and hard pressed.

2. The overall length was reduced from 84 to 74 inches, which resulted in slightly finer bow waterlines. It also got rid of long overhangs which never fully contributed to increased sailing length, but did increase windage.

3. A 'fence' was added under the hull, aft of the keel, which was hoped would help control the directional stability of the boat downwind. It was also felt that if the enormous power generated in the quarter wave on a broad reach could be used as a 'surfing' wave by moving it further aft, then the stern would lift rather than squat.

"The displacement was reduced from 55 lbs. to 50 lbs. as a result of these changes, which also reduced the sail area, as a small penalty was incurred. The waterline and waterline beam remained the same.

"The alterations were a great success and the problems in 'Cougar' are no longer apparent in 'Sound Effect'. There are four 'Sound Effects' currently sailing in my own Club, one of them being the 1976 State and Club Champion."

For those interested in a full discussion of the A-class formula and its application to actual designs, there is no better reference than "Model Racing Yachts" by Priest and Lewis. Beware . . . they also cover the 10-Rater classes and 50/800's in the same book, and if you are not firm in your resolve to read about the A's, or you just idly flip open to any page, you'll be hopelessly sidetracked from your goal.

Suffice it to say in these pages that the main key for the formula is load waterline length coupled with displace-

ment, which together determine sail area. Actually, if you have chosen any two of the three factors, the third is then fixed and Sail area is defined as measured triangle area of the mainsail plus 0.85 times the area of the foretriangle (formed by the forestay, deck and mast) with a maximum forestay height of 64 inches. The following table gives an idea of the interrelation.

L.W.L. (inches)	DISPLACEMENT (lbs.)		SAIL AREA (sq. in.)	
	MAX.	MIN.	MAX.	MIN.
50	49.0	41.0	1830	1700
51	52.0	44.0	1790	1670
52	55.0	47.0	1750	1640
53	58.0	49.0	1710	1610
54	61.0	52.0	1670	1580
55	64.0	55.0	1640	1550
56	67.0	58.0	1610	1520

The maximum draft is only allowed to be 0.16 x LWL + 3.5 inches. For a 52 inch LWL boat, this works out to be 11.82 inches. Any excess over this is multiplied by three and added directly to the rating. This works such a stiff control on draft that rarely is a penalty ever taken, since it acts to reduce sail area at a rapid rate. So the switch to fin and bulb keels in this class is one of putting as much of the mass of the boat into the bulb which hangs from a very stubby keel fin compared to modern 50/800's. In part, we have seen the fin and bulb beginning to be used now that

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lightweight but strong fiberglass hulls are being employed.

I'm sure that there is more A-boat activity in this country than a lot of folks would believe. If you will let me know what you are doing, we can share it with all the skippers who read *Model Builder*.

Many thanks this month to Adrian Brewer for his new Sound Effect design which is now available from *Model Builder*. Also, many thanks to John Krick and Doug Barry for the photo coverage of the 1976 A-Class Champion.

AMYA's new Secretary, Bud Chrysler, 2709 So. Federal Highway, Delray Beach, Fla. 33444, is just waiting for you to send in your American Model Yachting Association dues for 1977. Only \$5.00 and you will be amazed to see how much racing and sailing is going on in this country.

I'll continue to field questions at 7608 Gresham, Springfield, Va. 22151.

Interceptor . . . Continued from page 35
shake into a corner, that is often found with constant chord wings. The inner panel is 1 inch longer than the outer, for added line tension in overhead maneuvers, and the flaps help a lot in tightening the figures. The positioning of the stabilizer allows extra-short takeoffs in very rough fields without nosing over, when you give it full "up" signal mo-

mentarily (it flies in practically any grass field). One extra bonus . . . most of the boys fly it with standard dacron lines of 43 ft. (cheap!)

CONSTRUCTION:

Building the plane does not represent a difficult task. It was designed to build quickly and does not demand any particular skill. Although it is very simple to build and employs standard techniques, it is advisable to have some previous experience building and flying model airplanes (if you have built planes like the Top Flite Junior Aces or Sterling Baby Ringmaster you are OK), for this little bomb will outmaneuver you if you have not tried basic stunt before. Remember that it flies like the big ones, but its response is much faster!

The main ideas to keep in mind are:
1. Double cement all the joints, but use the cement sparingly.

2. When sanding, round all edges for streamliness and lightness.

3. Cover the wing with Japanese tissue and just clear dope it. Paint only wooden surfaces. Paint weighs much more than clear dope.

4. If you prefer, use some of the plastic coverings, like Super Monokote. They really build light.

5. Become accustomed to use mufflers. Tatone and Cox have some very efficient ones. They will help you more than any other thing, to obtain or to

keep flying sites available. And it is more pleasing to fly a silent machine. Easy with the nerves.

WING:

Cut the ribs by the lazy boy method, making 1/32 plywood or tin can templates of the root and tip ribs, and then sandwich as many rectangles as ribs needed and slice the surplus wood, cutting the grooves for the spars, leading, and trailing edges. For the left wing, it is time to punch the holes for the leadouts. After this, carefully mark each rib and remove 1/16 off from the upper and lower edges of ribs Nos. 1 and 2 (it's for the planking). Sand smoothly but don't round the corners.

The wing is built by pinning down the lower portion of the trailing edge to its place on the plan, then tracing the position of the ribs in the spars and leading edge and then assembling all the ribs to the spars, with the help of pins and rubber bands. At this step, place the bellcrank platform (already drilled for the bellcrank screw), in the grooves of Nos. 1 and 2. Then pin down some scraps of balsa in four or five places along the position of the spars, for shimming the lower spar, and pin down the aft portion of the ribs to the lower trailing edge, checking for alignment (ribs vertical and square to the trailing edge). Then pin the leading edge, and after checking for alignment, glue all joints. Let it dry thoroughly and remove



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the pins that fix the ribs to the trailing edge and to the board, cementing the upper portion of the trailing edge to the ribs. *Let it dry overnight.*

After removing the wing from the board, cement the remaining joints and check for warps. If any, steam the wing and place it on the board. Put some Model Builder magazines (they are thicker and will transmit more wisdom to your plane) over the lifted portions and let the wing dry overnight. Once straight, glue the wing tips and reinforce the bellcrank platform with 1/8 sq. strips. Note that the platform protrudes 1/8 through the ribs, for reinforcing it in both sides of the ribs.

Bend the flexible leadouts (Perfect No. 232) over the bellcrank (check for freedom of movements) and wrap about a 1/2 inch with thin copper wire and solder. Bend the 1/16 wire pushrod and hook it to the bellcrank, placing a keeper (Perfect No. 248) so you won't worry about some day your plane going amuck. Never run risks. Do not use solder to fix the push rods, because it may become brittle unexpectedly and you lose a plane. If the keepers are not available, bend some from paper clips. Bolt the bellcrank, making sure everything runs free and then put a blob of cement or epoxy on the bellcrank's nut for avoiding that someday it will become loose.

Plank the center section and sand the

wing thoroughly (round off the leading edge). Sandwich the counterweight with some scraps of 1/16 balsa. Now your wing is ready for installing it on the fuselage.

FUSELAGE:

Use maple for the engine bearers (1/2 by 3/8 sliced in half, so you will have two bearers of 3/8 x 1/4) that will fit the wing's curvature, resting on the wing plank. Glue them in place, sandwiching the nose with 1/16 plywood. Do not forget to glue the cockpit in place, for it gives added strength to the joint of the nose to the wing. Glue stab platform, dorsal fin and rudder (check left turn indicated), let it dry, and sand to shape.

ASSEMBLY:

Glue the wing to the fuselage (square it in front on top view), let it dry overnight (or epoxy), and glue the reinforcing cloth. Never underestimate its strength, as it distributes the strain on a larger area and avoids vibration as well. Now place the flap horn (Clary 6781, small), drilling a 1/16 hole in the fuselage behind the trailing edge and inserting it from the right side, connecting the pushrods and the keepers, drilling a 1/16 hole in each flap at the horn position, and aligning both from the rear so one will not be higher than the other. Bend the horn (with flaps removed) until they are aligned. Glue the flaps in place with the cloth hinges.

Cut, sand, and assemble the elevator and stabilizer. Install the elevator horn in place (Perfect No. 231) and connect the elevator pushrod and, with flap leveled, position the stabilizer in place, moving it back and forth until the elevator is leveled too. Mark its position and glue it in place, square it and pin it down, letting it dry completely. Glue the reinforcing triangles and cloth. This procedure gives to you a perfect alignment between wing flaps and elevator, and insures you that the plane will fly the same on both inside and outside maneuvers.

Center the fuel tank (Perfect No. 20) with the engine's thrust line, trace its position and drill the mounting holes accurately, for it will pay you. A slightly lower or higher tank position

gives different engine run when flying inverted or performing inside and outside maneuvers. Trace and drill engine's mounting holes, checking with propeller vertical to avoid up or down thrust. Place two washers on front bolts between engine and plane. Bend the landing gear (use C.G. 1-3/8 wheels, they are light!) Finish details, sand, cover, dope, paint and install everything. Now, the great moment.

FLYING:

One word about balancing the model. It is recommended to build the plane light. This way it will fly better and will level a little nose heavy. It is convenient for the first flights for familiarizing with its characteristics, before you try to learn or improve on all the maneuvers in the book. Then you can add some weight (some small coins or solder glued on the bottom surface of the stabilizer will work) until it makes all the corners as you dreamed. It is easier and lighter to add some weight to the tail than to the nose.

If you are learning maneuvers, try to receive some advise from an expert (better if he flies with you), organize your friends in groups (or clubs, categories), try to help the newcomers, keep learning and don't hesitate to write us about any question or comments about the plane and how to organize a club and, over all, enjoy flying it!

Control Line . . Continued from page 41 PROJECT GOODYEAR . . WILL WE EVER COMPLETE IT

Probably not, as Project Goodyear is supposed to be kind of an ongoing thing, as a test-bed for new 15's if nothing else, but this month we'll pretty much wrap up the heavy stuff. You'll be hearing more about the Project plane in the future, but only as we come up with significant items of interest.

To start things off, we're going to take a look at a couple of good articles written for the "Duke City Dope Sheet", newsletter of the Albuquerque Thunderbirds. First up is Phil Shew, with "Piloting Technique for Racing".

"Another contest season is upon us

Satellite City

“HOT STUFF” NEWS NEWS

QUITE RECENTLY IT WAS REPORTED THAT A MR. WILEY BODYFLANGER, IN AN ATTEMPT TO PROVE HE COULD BUILD A MODEL FASTER THAN ANYONE IN THE COUNTY, JUMPED FROM AN ALTITUDE OF 10,000 FEET CLUTCHING A BOTTLE OF “HOT STUFF” IN ONE HAND AND AN ASSORTMENT OF Balsa IN THE OTHER. WILEY WAS ABLE TO COMPLETE HIS MODEL JUST BEFORE IMPACT. UNFORTUNATELY THE MODEL WAS DESTROYED. HOWEVER ALL THE “HOT STUFF” JOINTS REMAINED INTACT. WE WOULD LIKE TO THANK MR. BODYFLANGER’S WIFE, “PEACHES” FOR PASSING THIS INFORMATION ON AND FOR PROVING ONCE AGAIN THAT

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Craft-Air

and, as usual, we have a serious shortage of Racing pilots. This article was written in hopes that others might be encouraged to take up the handle and join in the fun. Besides, I'm going broke replacing tennies.

"Let's start off by clearing up a common misconception . . . the *pilot* is the real heart of any good Racing team. We all know that any flat foot can pit, but it takes real athletic ability, lightning-quick reflexes, superior mental capacity and a *strong right arm* to be a good pilot. Pilots have been known to leap tall opponents in a single bound, whip faster than a speeding bullet, and smell stronger than a bull. If you want all those luscious girl modelers hanging all over you at the next contest, read on and become the *better* half of your Racing team.

"Seriously, no amount of reading or writing will create a good pilot. The intent of this article is to discuss objectives and techniques. It's up to you to get out and practice until most of this is second nature.

"Basically, the race can be broken down into three parts as far as the pilot is concerned; the takeoff, level flight, and the landing. Let's talk about these one at a time.

THE TAKEOFF

"The takeoff is the single greatest source of grief in a race . . . lines go slack, planes crash, and props are broken. Any of which is enough to ruin your whole day. The cause of these problems is the frequent violation of two basic principles:

1. You've got to be *ahead* of the plane *all the time*. That means you've got to *pull* the plane off the ground and into the air. Don't wait for the plane to take off by itself!

2. You've got to be *ready*. The pitman probably won't check to see if you've fallen asleep while he's been

doing his thing (I realize they're slow, but 9 times out of 10 your pitman will get it back in the air again before the race is over). So be alert and stay that way.

"How does that translate into action? First let's take a look at a circle layout.

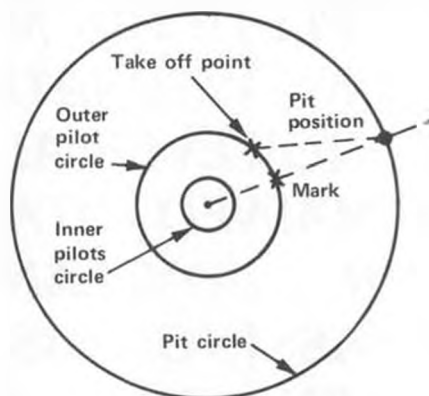


FIG. 1

"Before the race starts, always mark a spot where you can plant your clodhoppers in the same place every time. This will allow the plane to land at the same spot at each pit (more on this later). This spot will be directly opposite your pitting position (Fig. 1). This is *not* the place you stand to take off!! Move around the circle a few steps. You've got to be ahead of the plane *all* the time . . . even before it is released. As you move, extend your arm to make up for the increased distance between you and the plane (pitmen tend to get short-tempered when you start dragging the plane into the circle). The extended arm is really an asset . . . as the plane takes off you can take in a lot of slack by just bringing the handle into your chest.

"Now, how to get your body from the take off spot into the traffic in the inner circle? There are two no-no's here. *Do not* run around the outer circle. Your plane will be dangerously close to

other pitman. If you hit one, you're liable to break a prop or get blood on your plane. Plus, once you're up to speed, your plane will be in a position to wrap lines around the other pilots who *are* in the center where they should be.

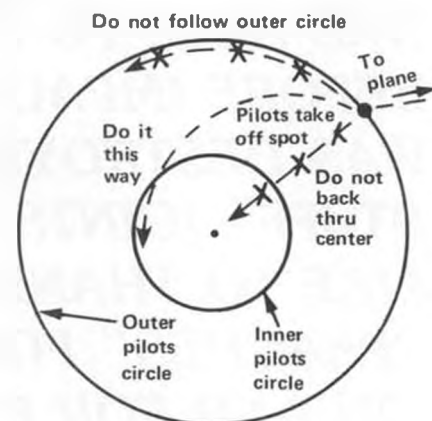


FIG. 2

"*Do not* back through the center. This tends to make the other pilots very unhappy and causes line tangles, crashes and hard feelings. This is usually caused when the pilot is caught flat footed as the plane is released . . . *Be Ready*. The correct route to the center is shown in Fig. 2. Always move from the outer circle towards the center circle in an arc. By the time your plane is up to speed, you'll be ready to merge with the center traffic. This is no time for a Sunday stroll . . . move it on out! And *don't* stand straight up the instant the plane is released. Remain at a semi-crouch until you're in the center. If you insist on standing up, the resulting line cuts about the head and shoulders will eventually ruin your natural good looks.

"One last thought about the extended arm. Don't pull it in before you have to. It's a whole lot easier to whip with a fully extended arm. Once you merge

with the center traffic, you can pull the handle into your chest and reduce your actual flying radius.

LEVEL FLIGHT

"For some unknown reason, everyone thinks you've got to fly high during a race. It just ain't so . . . check it out some time. You'll go faster at 10 feet than at 25 feet . . . especially with a Goodyear or Fast Rat. Slow Rats *may* have enough wing area to fly high and still go fast, but I doubt it. Anyway, if the other guy is flying high, the judge is probably watching him, so whip the hell out of yours!!

"During the race, try to fly as level as possible. All the ups and downs add distance to the race, and more distance means more time. Also, keep the handle as near to the chest as possible. An extended arm adds about 1/3 mile to a 10 mile race. At 100 mph that's 12 seconds added to your race time! Along this same line, it should be obvious that you *want* to walk the smallest circle possible. This is where the competition really begins for the pilot . . . the battle for the center. You see, those other pilots also realize that the center is the place to be. Not only does it shorten the race, but it's a whole lot easier to stand there and pivot around than it is to continually walk a circle. This is where you have to look out for yourself . . . I've rarely seen a judge who realizes what's going on out there (they're usually too busy trying to get everybody to quit whipping). Just lean in there and let the other guys know you expect them to play fair. If they don't get the hint . . . spikes, brass knuckles or bad breath may help.

"Don't get lulled to sleep just because everything is going along smoothly. You've got to be alert all the time. Be aware of what's going on around you . . . especially when one of the other teams is shutting off or getting back in the air. If someone else gets into trouble, it's a whole lot better to make a quick shut-off and an extra pit than to get involved in a mid-air or line tangle. Also, keep an eye on your pitman. He may be trying to get you to quit whipping or signaling for a pit.

LANDING

"The landing sequence begins at shutoff and ends when the plane is safely cradled in the pitman's arms. The objective here is to get the plane to the pitman. If he has to move at all, you'll be losing valuable time (I told ya — *they're slow!*) So shut off far enough out so the plane arrives at the pitman at some reasonable speed. One lap out is usually a good place to begin. Hit the shutoff right over your pit position. There's really no need for all that radical climbing and diving action commonly seen during a shutoff. This only endangers other fliers, who may not be ready for your wierd aerobatics and frequently causes mid-air collisions. A quick down

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and return to neutral shouldn't cause you to lose significant altitude. By all means, learn to shutoff from level flight!! If you miss the shutoff on the first try . . . *relax!* Wait until the next lap and try again. Otherwise, you'll end up shutting off a half-lap out, which means the plane will either land a half-lap from the pitman (very bad! They hate to run) or you'll have to whip the plane a lap and a half (also bad). Either way you've wasted lots of time.

"Once you hit the shutoff, get your body out of the pilot's circle and your plane out of the traffic pattern. A few rapid shakes of up and down control should kill off any excess airspeed. By this time you should be ahead of the

plane again, *pulling* it around the circle. When the plane is 1/8 to 1/4 lap out, you should be firmly planted at your marked landing spot. The plane should roll straight to the pitman. As soon as he catches it, move to your takeoff spot and *get ready*.

"It all sounds simple, right? Well, it is, but you have to practice the basics until they're automatic, because things just happen too fast during a race to be learning. Which brings me to the final issue . . . how to practice.

HOW TO PRACTICE

"The *only* way to really practice is to mark off the circles so you can get a feeling for the relative distances in-

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volved, directions to move, and timing required. Practice walking a small circle until you can walk around one spot for hundreds of laps without looking down all the time. Take long strides . . . short running steps just throw you off balance and tend to wear a person out. It should take about 4 steps to go around the proper sized circle.

"Practice flying with the handle pulled into your chest. It's a little awkward at first, but feels natural once you get used to it. Also try flying with the handle held above your head, just in case you have to pass a tall pilot. When practicing alone, follow the correct routes between the inner and outer circles until it's second nature. Once you feel comfortable alone, find a second team to fly with. Do lots of passing and pitting until you can do everything smoothly without running into the other guy, falling down, or crashing.

"Finally, practice with three pilots, whenever possible. You'll notice that passing with three in the center is a little more difficult . . . usually because the guy doing the passing has to walk and pass everything at the same time. You've got to keep movin'!

"I hope this article has been worth reading. If we end up with even one more pilot, it will certainly have been worth writing. Now let's get out there and work together. I think the team work involved in the Racing events is one of the most enjoyable aspects of modeling."

Hey, that was an OK piece, wasn't it? Now we hear from Les Pardue with his article "Polish Pit Patter".

"Now that Fast Freddy has written an article on Goodyear and Shewski revealed that secrets of 'Piloting' in the last issue of Dope Sheet, it's my turn to dazzle you with my pen. Everybody has a winning Racing plane, right? Wrong! You can be the world's best pilot and have the best equipment money can buy, but the most important part of any Racing team is the person doing the pitting. The pilot and the pitman must work together and the only way to get things is to practice. Remember when it was called Team Race?

"It is impossible in writing to tell someone the best way to pit a Racing plane. I could say grab the plane, fill the tank, hook up the battery, flip the prop and release; but that doesn't help too much. Everybody has his own techniques, so try different ideas to see what works best for your combination of plane and motor. If you get out and practice, you will get a feeling for what is going on. Some engines come in dry and others wet (some take a prime and others don't). Personally, I keep a log on every engine and how it handles. It includes:

1. Total number of laps, including practice.
2. Prop
3. Plug

4. Fuel
5. Weather
6. Speed
7. Type of head and clearance
8. RPM on ground
9. Time turned for race

10. Sun spots, full moon, horoscope, rabbit's foot or anything else you did that might help.

"Read through it from time to time to see what is working and what is not. If you practice enough, you will see the mistakes you make. Learn your lessons and, hopefully, you won't repeat mistakes at a contest.

"At a contest, don't just relax, stand around and watch the girls or tell everybody about how great you are doing. Your pilot is fighting it out in the middle and wearing out his tennies; but your job is coming in the pit. Listen to see if there is anything you can do to improve your next flight. Is the setting too rich or lean? Is the engine over-propped or under-propped?

"You should work out a set of signals between you and the pilot. Sometimes the pilot can tell by the sound what is happening. He may have a strong right arm, be a little weak between the ears, and little dizzy from going around in circles, but sometimes they can help. Your signals should include:

1. Time to pit
2. Lean it out
3. Richen it up
4. Fly lower
5. Stop whipping (the judge is watching you).
6. Whip a little harder (the judge is watching the girls).

Make sure each of you can tell what the other is trying to say. You might be trying to tell him two more laps 'till the race is over, and he might think you said time to pit.

"You should have a fight plan, but don't be inflexible. Pick the lap number you want to pit and use your signal if things are clear. If someone else is pitting and your engine is running good, wait a few laps. If you are running slower than usual, go ahead and pit early. The tank should be large enough to make up the laps before the next pit.

"The speed of your pits will improve the more you practice and the more contests you enter. You can tell how you're doing by clocking the plane for a half mile, and then clock for a half mile with a pit in the middle. If the difference is over twenty seconds, it is a little slow. Ten to twenty seconds is about right, and under ten seconds is super. But don't forget some of the time involved depends on how fast your pilot can slow the plane down and get it to you.

"One of the best modelers I have known, Luther Cheek, once told me, 'There are three types of modelers; builders, fliers and engine specialists.' Just look around your group or club and you can probably pick them out.

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Most modelers fit into one category. A real outstanding modeler may make two but I have never seen one in all three.

"When you are looking for a partner for your Racing team, try to find one in a different category than you're in. If you're an engine specialist, try to find a flier or builder. If you're a flier, try to find a builder to replace the planes you wreck.

"Just stay cool and don't get nervous and become all thumbs. As you get the flipping finger working better, maybe even you can be known the 'Great Super Flipper'."

C/L Editor's note: A famous modeler once said, "If the pitman screws up, the race is lost. . . If the pilot screws up, the plane, engine, and race may be lost." Think about it!

The preceding two articles are just a sample of the kind of material found in the Duke City Dope Sheet, one of the best newsletters around. You guys in the T-Birds better take good care of Editor Phil Shew and Assistant Editor Rog Edwards! They're doing an outstanding job for ya.

And how is Project Goodyear doing now? Not too bad . . . Gary and I are now running in the 6:25 to 6:35 range without much problem, and without resorting to some of the currently fashionable tricks. For instance, we are still using Kelly glass props that have yet

to be put on a pitch gauge. We just clean 'em up, thin them some, and use them. The last batch of props Gary thinned with a table sander! This winter we will no doubt be doing some heavy testing and prop development, which will require the use of a pitch gauge (the Prather prop pitch gauge is recommended, it's very nice) and we will no doubt see some improvement in our times.

Also, we are not using a megaphone, just the standard, open-face exhaust. The Project plane is built to accept a meg, and we may try one yet. But we have not found it necessary to use a meg to get into the mid 6's, which is competitive in most every area of the country.

There are a few minor items to talk about in future columns and we'll do that later. And you can take part, if you want. George Aldrich has offered to answer a list of questions concerning Goodyear. I've got a few questions all ready for him and if you would like to have a particular question answered by GMA himself, send it to me and I'll forward it to George. When I hear back from him, I'll publish his answers in this column and we'll all learn from the best engine man in the business. Don't limit your questions to just engines, however. George knows his stuff, from the prop back to the skid, so if your question relates to Goodyear in general, it'll be used.

CL-RPM

Just enough room to tell you that an organization for Racing enthusiasts is being formed. The above is short for Control Line Racing Pilots and Mechanics, the name of the new organization. At the urging of John Kilsdonk, Russ Sandusky and Dave Tisdale have decided to give it a try and will be sending out the first n/1 in Feb. '77. To join, send \$5.00 to: CL-RPM, 725 Bauernschmidt Drive, Route #1, Baltimore, Maryland 21221. You'll receive a membership card as your receipt and be one of the first to get a n/1. More on this organization next month, in the meantime get signed up!

Gotta run, the Jive Combat Team is preparing for yet another contest to be held tomorrow. We're going to . . . a F/F contest! And Bob Stalick had better be prepared for dirty tricks and general harassment. •

NARAM . . . Continued from page 39

Model flights. This is a pretty rough event, and the flights showed it. The idea of Plastic Model is to convert for flight a non-flying plastic kit of an aircraft or spacecraft. Models are judged on a scale of one to one thousand points, with 900 points awarded for various things during static judging and 100 flight points. Of course, all models must turn in a safe and stable flight to qualify. The Range Safety Officer usually

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acts as an unofficial member of the judging team, and has to clear an entry before it is allowed a flight attempt. There were quite a few Saturn 1B and Saturn 5 plastic kits, several Eagle Transport kits, and even a couple of original designs, such as Chris Flanagan's "Eagle Freighter," a modification of the MPC Eagle kit, which placed first in C division. 'A' division saw a number of Lunar Modules, some of which, unfortunately, were not allowed to fly. Safety procedures and range operations were tightened for the flying, since, even with the tight check-in and many modelers' insistence that "it flew fine before" there were quite a few unstable flights. The quality of workmanship was generally good in the static judging, but it seems that not enough attention is paid to dynamic stability testing. It's not surprising, as many of these designs are difficult to test, unless you happen to have access to a wind tunnel.

Wednesday afternoon was Hornet B/G, and, as explained before, the models were allowed to eject parts. Parasite gliders strapped on to carrier rockets were popular, as were gliders of the pop-pod type that eject their engine pod on its own parachute. Hornet class is limited to 1/2A engines, so most of the models were pretty tiny. Built-up wings and foam wings were seen. The best flight of the day was a notable one: Howard Kuhn finally got one of his

Manta gliders to work. In fact, it beat the nearest flight by almost two minutes. Howard is considered something of an institution among contest modelers, and it's a byword that most of his designs, marketed through his Competition Model Rockets company, work beautifully for other people and flop for him.

Thursday saw the Class 1 Parachute Duration flights. Class 1 is limited to A engines, so the models were small, and pistons were again the standard. The most popular chute material was 1/4 mil aluminized mylar, which, although tricky to work with and deploy, shows up beautifully once it's out. A lot more of it can be fitted in a smaller tube, too. There was some discussion of competition strategy on the field; one modeler asked why everyone seems to build flat-out for performance, ignoring wind conditions and similar features. Howard Kuhn answered by re-stating what is generally known as Kuhn's Law: "If you design for strategy, you will always be beaten by Dumb Luck." The reason is, according to Howard, if you hold your performance down in order to return the model and get a qualified flight, you are counting on everyone with a better model losing it due to poor conditions. This never happens, and Howard has racked up an impressive number of second places to prove it.

Thursday afternoon saw the flights of entrants in Research and Develop-

ment, whose project involved flight demonstration. There were few of these, indicating a trend into theoretical research at current NARAM's. Al Celetti, of the Celetti-Lawton Team, tested his electronic delayed staging timer, which electronically ignites the upper stage engine. The Thoelen-Bauer-Porzio-DelVecchio Team, commonly known as the Modroc Mafia, displayed a series of performance graphs. They acquired their data through literally hundreds of test flights, in which models were set up with constant diameter and the weight was changed each time, in an effort to determine the optimum weight for each type of engine flown. All of the R&D reports were skillfully done, and the popularity of this event shows that spacemodeling really is a highly technical and educational activity.

Friday was entirely devoted to the Scale flights. Scale entries are judged on a scale of 1-1000, similar to Plastic Model, except that dimensions and color patterns account for a large number of points. Extensive substantiation is required for the particular vehicle modeled. In fact, it is so extensive that there is discussion on creating a Sport Scale event, to allow more different kinds of models to be entered, since data on many vehicles is very hard to get. Scale quality was excellent this year; notable among the entries were Fred Schecter's Apollo-Soyuz pattern Saturn 1B, Don



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Larson's Nike-Tomahawk sounding missile, and NAR Trustee Tom Hoelle's Genie air-to-air missile. Sounding missiles are very popular; in fact, the speaker of the evening before, who is manager of Thiokol's sounding rocket motor plant, was heard to say that he had stayed an extra day to see how his company's rockets fared in the competition! First place in C division went to the Biedron-Langford Team's beautifully-detailed Argo D-4 Javelin. Bob Biedron and John Langford are members of the USA International Spacemodeling Team for scale.

At the NAR's Triennial Meeting, the final election for the thirteen new Trustees was held. Mail ballots from members unable to attend the NARAM were counted earlier, and after the election, several new names had been added to the Board. Among these are Tom Hoelle, the Mid-America Regional Manager and newly-appointed committee chairman, and Chris Flanagan, a recent graduate from MIT and member of the International Team. Manning Butterworth was elected President of the Board.

One of the new Board's first actions was to begin procedures for finding a new editor for NAR's monthly journal, the *Model Rocketeer*. Elaine Sadowski, who ran the journal for many years, retired due to her graduation from college and subsequent lack of volunteer time. We have heard as of press time

that the Board has appointed Don Carlson and Steve Behrends co-editors of the *Model Rocketeer*. The Rocketeer has been plagued with many production and distribution problems in the past, and we wish Don and Steve the best of luck. The Rocketeer is only one benefit of NAR membership; you also get discounts on mail orders from major manufacturers, flight insurance, competition sanctioning, and last but not least, a discount on subscriptions to *Model Builder*!

Model Builder! (Fifteen (15) percent off subscription price. Included your NAR membership number along with your name, address, zip and check. wcn)

The Awards Ceremony was held Friday evening after the banquet. Mr. Lou Villegas, Deputy Director of the National Space Institute, addressed the contestants at the beginning of the ceremony. He stressed the educational aspects of space modeling, and stated that he was impressed with the seriousness with which the modelers took their hobby. The National and Reserve Champions, as well as the winners in the NARAM events, were presented with large trophies and merchandise certificates from the manufacturers. As is traditional, there were several Special Awards. The Newsletter Award was presented to the Spotter, newsletter of the THOR section of Pennsylvania.

The Distinguished Service Award was presented to Mrs. Dottie Galloway, for a record of service that would take five pages to list. A new award was also presented; The Howard Galloway Memorial Service Award, presented by a group of modelers in memory of Dottie's husband Howard, who passed away in January of this year. Howard was undoubtedly the friendliest man in the NAR, and only Dottie comes close to his record of service to the hobby. The first Award was presented to Richard Nelson, chairman of the NAR Membership Committee and originator of the Pearl River Modroc Seminars held every year in Pearl River, NY. In a lighter vein, an award which has been traditional since NARAM-12, the Giant Bumblebee Award, was given to Terry Lee for his work with sliding-wing R/G. The award consisted of a gigantic cardboard sliding-wing glider. Terry, who is also the newly-appointed National Contest Board Chairman, was awarded a baseball bat to fight off all of the people who will be after him during the next contest year. An award was presented to the Squirrels Team for having the worst luck of the meet; out of all the events they managed one qualified flight.

All in all, this years' NARAM was a big success and a joy to all involved. Big thanks are due to the CD, Carl Warner, and his helpers from the SPEAR and THOR sections. Thanks are also due to

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CLASS 3 STREAMER DURATION

A Division:

1 David Alexander	2:07
2 Mike Alexander	2:06
3 Mark Friedlander	1:38
4 Teresa Leahy	1:19

B Division:

1 Billy O'Donovan	3:13
2 Perry Denoyer	2:13
3 Carl Runge	1:56
4 Jim Gearhart	1:37

C Division:

1 Bernard Diales	2:57
2 David Kusterer	
3 Terry Lee	1:40
Bundick-Justis	1:40
4 Geoff Landis	1:39

PIGEON EGGLOFT

A Division:

1 Chip Purcell	357M
2 Scott Baird	352M
3 Mark Friedlander	290M
4 Sally Loman	287M

B Division:

1 Guy Bradley	387M
2 John Hopkins	326M
3 Mike Janko	313M
4 Perry Denoyer	304M

C Division:

1 Terry Lee	621M
2 Bundick-Justis	442M
3 John Sisco	369M
4 Bob Koenn	368M

SWIFT ROCKET/GLIDER

A Division:

1 Hank Simpson	180 sec.
2 Doug Lieberman	143
3 Joel Kenney	110
4 Scott Baird	73

B Division:

1 Billy O'Donovan	204 sec.
2 Sam Jaskilka	76
3 Jim Gearhart	75
4 Mark Batterson	60

C Division:

1 Guppy Youngren	197 sec.
2 Biedron-Langford	80
3 Chris Tavares	74
4 Terry Lee	68

SINGLE PAYLOAD

A Division:

1 David Alexander	685M
2 Bob Vogel	383M
3 Bruce Cashen	374M
4 Mark Friedlander	360M

B Division:

1 Billy O'Donovan	461M
2 Jim Gearhart	456M
3 Mike Zienkiewitz	415M
4 Sam Jaskilka	413M

C Division:

1 John Rains	454M
2 George Gassaway	443M
3 Chris Tavares	435M
4 Paul Vandall	429M

HORNET BOOST/GLIDER

A Division:

1 Jared Hall	2:17
2 Trey Ewing	1:43
3 Mark Friedlander	1:25
4 Scott Baird	1:12

B Division:

1 Phil Barnes	1:57
2 Sam Jaskilka	1:31
3 Mike Janko	1:19
4 Billy O'Donovan	1:13

C Division:

1 Howard Kuhn	4:15
2 John Rains	2:34
3 Chris Flanagan	2:24
4 Terry Lee	2:03

CLASS 1 PARACHUTE DURATION

A Division:

1 David Alexander	4:15
2 Scott Baird	2:55

3 Mark Friedlander	2:41
4 Greg Taylor	2:37

B Division:

1 Draw Murphy	5:00
2 Jeff Vaccaro	4:46
3 Billy O'Donovan	4:04
4 Glenn Stanton	3:39

C Division:

1 Randy Ringner	4:06
2 Phil Slaymaker	3:28
3 Squirrels Team	2:39
4 Kevin Hendrick	2:22

PLASTIC MODEL CONVERSION

A Division:

1 Chip Purcell	579
2 Robert Noble	381
3 Phil Ruppert	280

B Division:

1 Billy O'Donovan	591
2 Sam Jaskilka	574

C Division:

1 Chris Flanagan	765
2 Bernard Biales	586
3 Don Larson	584
4 Tom Hoelle	514

RESEARCH AND DEVELOPMENT

Combined A and B Divisions:

1 Billy O'Donovan	
2 Mike Alexander	

C Division:

1 Chris Flanagan	
2 Thoenen-Bauer-Porzio-Delvecchio Team	
3 Mike Micci	
4 Celetti-Lawton Team	

SCALE

A Division:

1 Mark Friedlander	627
2 Joel Kenney	597
3 Mike Alexander	576

B Division:

1 Steve Behrends	757
2 Sam Jaskilka	723
3 Turkey-Guano Team	594
4 Fred Schecter	578

C Division:

1 Biedron-Langford Team	813
2 Don Larson	764
3 Tom Hoelle	760
4 Bundick-Justis Team	756

NATIONAL CHAMPIONSHIPS

A Division:

National Champion: Hank Simpson
Reserve Champion: Chip Purcell

B Division:

National Champion: Steve Behrends

Reserve Champion Section: NOVAAR

Reserve Champion: Andy Katz

C Division:

National Champion: George Gassaway
Reserve Champion: Tom Hoelle

Team National Champions:

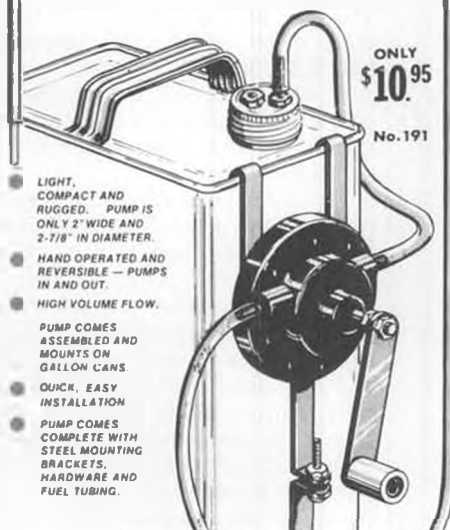
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Reserve Champions: Biedron-Langford Team

Section National Champions:

National Champion Section: Vikings

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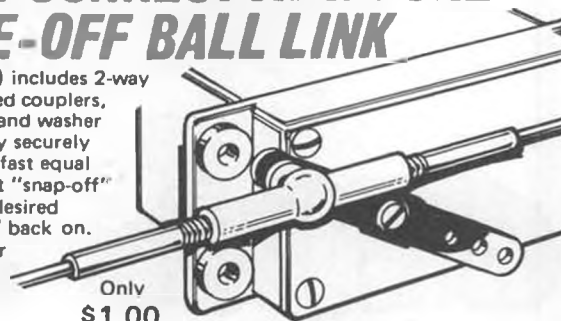
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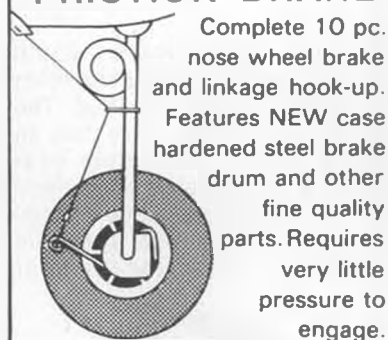
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R/C Pylon . . . Continued from page 21

was now needed was to construct rules proposals from the surveys results and to present them for approval to a body of QM people from all parts of the country. The opportunity to do just this came at the Nationals in Dayton.

"We gave a set of our rules proposals to each contestant in the QM registration line, gave them a day to digest the rules, and held an informal meeting the second night.

"For the most part, our proposals were accepted by those present. A few minor changes and addition, but generally there was good support. There was one glaring exception, however, one which caused a good deal of heat as well as light. This was our interpretation of the 2-class system. Since we made a radical departure from our first proposal, we feel we owe an explanation to those people who received the first set of proposals, as well as those who supported the 2-class system.

"You may have noted that the survey went in favor of the 2-class system by about a 2/3rds majority. We dug a little deeper after the meeting at the Nats and broke the results down by area:

West Coast	55% for
South Central West	69% for
North East	92% for
North Central West	44% for
South Central East	46% for

North Central East 35% for
"Although the districts are split, the overwhelming response from the North East threw us a curve and swayed the overall response.

"By itself, that still would not have swayed our support of 2 classes. The people at the meeting offered much more compelling reasons for the change.

"First of all, the 2-class system was really not defined well for the questionnaire. The second class we had in mind was closer to an open class above QM for the advanced fliers. Some of the people who wanted 2 classes would have liked to see the second class expressly for beginners.

"There were other valid points for continuing with a single class system, but the one which broke my resistance was the lack of confidence (to put it mildly) that the 2-class system would really draw new people into Quarter Midget. Indeed, it may even cost us a few of the people we now have. Some of the areas which just barely support one class would be forced to split the racers into 2 classes and would find it impossible for QM to continue. On the other hand, the areas which are presently using a 2-class system, established and can still operate under single class rules.

"Some of the other modifications to the rules proposals made by Dayton were as follows:

1. Exhaust extractors -- Instead of a

short length tube of constant cross-section, the present rules proposal uses the 1/4 inch slot to detune exhaust systems.

2. Weight of the aircraft is to be checked at the end of each heat.

3. Idle requirements revert to 1/2 point penalty for engine off landings with no option to regain the points lost by a separate idle demonstration.

4. Race Horse starts shall be the primary starting method with staggered starts at the option of the CD.

"I doubt if you could find even one QM flier who would wholeheartedly agree with each and every rules proposed for 1978. But taken collectively and considering all parts of the country, we think this is a pretty fair set of rules and they deserve at least a fair trial.

"We would like to express our thanks to all the people who got involved with helping us write these rule proposals; the people who took the time to answer our survey questionnaires, the people at Dayton, and especially the people who helped with the computer work and actual proposal writing. We had great cooperation from everyone concerned and hope the proposals reflect the work and dedication it took to make them."

Yours truly,
George Zink
Pres., NMPRA-QM



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What follows is a complete set of QM rules as they would appear in the 1978 AMA Rulebook, assuming that all individual proposals submitted by George Zink, representing NMPRA-QM, are accepted by the R/C Contest Board. In all, 29 proposals were submitted that relate to QM, not all by NMPRA-QM. The changes from 1976-77 rules represent those which have approval of NMPRA-QM.

1. OBJECTIVE. To provide closed course racing that will encourage participation by the sport flier and novice racing enthusiast.

2. GENERAL. All AMA regulations (see sections titled Sanctioned Competition, Records, Selection of National Champions and General) and FCC regulations covering the RC flier, his plane, and equipment shall be applicable to this event, except as noted herein. The contestant shall be allowed two aircraft entries, both operating on the same radio frequency. The alternate or back-up aircraft may be used only if the primary aircraft is considered unsafe by the CD or his appointed official. All aircraft must be checked by the CD or his appointed official prior to insertion into its race flight. Consideration for the safety of the spectators and contest personnel is of the utmost importance.

3. MODEL AIRCRAFT REQUIREMENTS. Models entered in this event shall be semi-scale or recognizable replicas of full scale piloted propeller-driven aircraft that have been designed for or competed in closed course, speed record attempt, or cross country racing. No deltas and/or tailless type aircraft shall be allowed. In case of unusual or little known designs, the flier shall produce documentation to verify that such a plane or special design did exist.

4. ENGINE(S) SPECIFICATIONS.

4.1 Definition — The engine shall be a complete unit, ready to run, needing only prop, fuel and starting voltage, *excluding* glow plug, exhaust extension, gaskets, head bolts, crankcase bolts, drive washer, prop washer and prop nut. The excluded parts are not subject to rules regarding production and availability.

4.2 Production — At least 1,000 engines (with RC carburetors) shall be available through normal retail channels throughout the United States.

4.3 Availability — There shall be a period of at least 60 days between the introduction of engines to said retail channels and the use of the engines in a contest.

4.4 Price — A maximum list price limit shall be required for the engine (with RC carburetor, ready to run) as purchased through said retail channels. The list price shall be computed at the present value of \$60 as of June 1, 1976.

4.5 Modifications — No rework or modification shall be permitted to the engine as defined above.

4.6 Carburetor — Shall be supplied with the engine or specifically cataloged for the engine. It shall be subject to the same availability and production criteria as the engine. No modification shall be permitted to the throat or spraybar area.

4.7 Inspection — Any competitor at the contest may have another competitor's engine inspected for compliance with the rules by posting \$15.00 with the CD. The engine and carburetor shall be inspected by the CD or his appointed official. If declared legal, the owner collects the \$15.00 for his trouble. If declared illegal, the owner is disqualified and the protestor is returned the \$15.00. The CD may request engine inspection prior to the awarding of prizes without posting a fee.

4.8 Fuel Tank Pressurization — Only atmospheric pressure shall be permitted.

5. EXHAUST EXTRACTION. (Local conditions shall determine muffler usage).

5.1 Mufflers — When required, mufflers shall be stock, commercially available units. Only modification to the muffler inlet for the sole purpose of mounting to the engine shall be permitted.

5.2 Exhaust Extractors — When used, shall have a 1/4 inch slot from the end of the engine exhaust stack to the end of the exhaust extension. The full length of the slot must be visible from outside the aircraft, and shall not be covered by any material when the aircraft is ready for flight.

6. PROPELLORS. Two blade, fixed pitch, wood propellers shall be used.

7. SPINNERS OR PROP NUTS. An AMA prop nut or a spinner, rounded in front to at least 1/8 in. radius, shall be used.

8. FUSELAGE. At a point, measured within the chord of the wing, the fuselage must be at least 2-3/4 in. wide. At the deepest point, the fuselage must be at least 5 in. deep (including windshield, canopy, pilot's head or headrest.) Width and depth points need not coincide. Fillets and non-scale protuberances are not to be part of the measurement. Cross-sectional contours at the height and width measurements, and at stations determining the likeness to the original aircraft, shall maintain the integrity of contours in the original aircraft. The only exception permitted shall be in the engine compartment for maintenance purposes.

9. LANDING GEAR(S). Landing gear shall not be retractable, and wheels must be free rolling. A tail-skid, if used, shall point to the rear end of the aircraft. No brakes shall be allowed. Minimum wheel diameter shall be 1-1/2 inches.

10. WING(S). No minimum span required; thickness shall be 7/8 inch measured outside fuselage wing fillets and progressing in a straight line taper to the tip. Wing area shall be a minimum of 300 sq. inches.

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A biplane shall have not less than 5/8 inch upper wing thickness, measured on a line projected vertically from fuselage side, as in a top view, at the point of fuselage and wing intersection. Lower wing shall be not less than 1/2 inch thick at projected root, provided its area is not less than 2/3's of upper wing area.

11. WEIGHT. Ready to fly, less fuel, the aircraft shall be 2-1/2 pounds minimum and 4 pounds maximum. Weight is to be measured at the completion of each heat.

12. MATERIALS AND WORKMANSHIP. Workmanship must be of satisfactory standards. The CD or his appointed representatives shall be empowered to refuse permission to fly or disqualify any aircraft, which in their opinion, is not up to reasonably safe standards in either materials, workmanship, design details, radio installation, or condition as the result of damage.

13. RACING NUMBERS (Optional). Racing numbers shall be at least 1-1/2 inches high and placed in scale racing positions.

14. REGISTRATION NUMBERS. Registration numbers shall be at least 1-1/2 inches high and shall consist of the last 2 or 3 numbers of the entrant's AMA number and placed on the upper right and lower left wing panels. The letter N will precede the registration number and the initial of the entrant's last name shall follow the registration number.

Alternate: Registration numbers at least 1 inch high may be placed on both sides of the fuselage.

15. STARTING TIME. Contestants will have a maximum of 1-1/2 minutes to start their engines and prepare for takeoff. If after 1-1/2 minutes has elapsed, the contestant is not prepared

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for takeoff, the contestant may not fly or run his engine on the course area, and is given a score of 0 points for that heat. If determined at a pilots meeting before the race, the heat may be started when all the pilots and callers are ready, before the 1-1/2 minutes have elapsed.

16. IDLE REQUIREMENTS. The contestant shall be required to demonstrate a controlled, engine idling landing at the completion of each race heat. If, in the opinion of a designated official, this requirement is not fulfilled, 1/2 point is deducted from the contestants heat score.

17. FUEL. Fuel shall be commercially available, contain not over 15% nitro, and shall be supplied and dispensed by the hosting organization.


18. RACING PROCEDURE AND SCORING.

18.1. Standard 2 Mi. Course Length (Figure 1) — Procedure and scoring shall be in accordance with all paragraphs under Operation of the Race and Scoring of the Formula I & II RC Pylon Racing Rules.


18.2. Short Course Length (Figure 2) — Same as 18.1 except; the contestant shall fly for 10 laps only. After the completion of each heat, the pylon judges and starter will note any cuts and score the heat in the following

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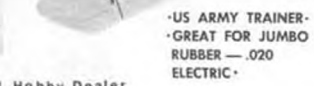
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manner: 4 points for first, 3 points for second, 2 points for third and one point for fourth. If a pilot cuts one pylon and still finishes the race, only 1 point is awarded. If a pilot cuts twice a 0 is awarded for that heat. Planes finishing without cuts will be given full points awards, i.e. first across the finish line with one cut will be awarded only 1 point, second to finish, no cuts, will receive 4 points, etc.

This course is intended to be run without flagmen at the Number 1 pylon, and is recommended if there is insufficient manpower to run the race.

18.3. Race horse starts shall be used unless conditions exist which are considered hazardous by the CD. Regardless of the starting method used, all timing starts with the drop of the first flag.

19. HEAD GEAR. All personnel (contest workers, not pilots and callers) required in the flight line area (between pylons) shall be required to wear hard hats.

20. AIRCRAFT CONTACT. In the event of mid-air or takeoff contact between aircraft, all participants to the contact shall be directed to land as soon as possible. One point shall be awarded to each of the contact participants, and the heat shall not be rescheduled.

21. ADVERTISING. Advertising of the event to the media should include at

least the following information: Long or short course, muffler requirements, if any, and brand of fuel to be used.

Jr. Champ . . . Continued from page 42

Rather than trace Robert's progress from midget modeler winner to Junior Champ, perhaps some suggestions based on our experience might be interesting. Since many junior modelers are introduced to the sport by their parents, the following observations seem germane:

1. Start early. Exposure to models at ages 3 or 4 is a good way to generate interest. Remember, however, that the attention span of a child that young is short, so don't overdo it.

2. Don't push. Take junior along when you go test flying, but don't force him to build unless he evidences a spontaneous interest to do so. Give him an old model to fly as a starter. But insist from the beginning that he build and fly his own models in any competitive event.

3. Initially enter events where you are assured that junior competes with another junior, not with junior's father. The hand launch glider events, both indoor and outdoor, are probably best for this, although towline glider can also be an individual effort.

4. Be careful not to lose your temper when junior makes an elementary mistake. Remember you were not born 40 years old, with 25 years of contest experience under your belt. I suggest sipping another cold beer and being philosophical under such circumstances. Admittedly this is not always easy.

5. Advance is natural order from simple events to more difficult ones. I suggest hand launch gliders or elementary prefabricated rubber models as a starter, progressing up to towline glider and then control line or free flight gas. Be aware that model engines are frequently too awe inspiring for juniors before ages 8 or 9.

6. Stick with elementary kit models, and stay away from the complex, difficult-to-build designs. There are now excellent simple kits available for hand launch glider, free flight gas, rubber, and control line events.

7. Be patient. One or two wins does not mean junior will wipe out the competition every time he enters. Did you? Remember that luck still plays an important role in contest results. Personally, I think that may be a good thing.

8. Remember that the opposite sex and cars will probably replace models as primary interests when junior reaches high school. If your memory goes back that far, however, you may recall that you had similar changes in tastes.

The above suggestions are perhaps among the more helpful ones I can make based on our experiences. If you, like me, built models as a youth and still have an interest in the sport, I

believe the participation and development of a junior modeler in the family can lead to real enjoyment for both parent and child.

Imagine the pride your son or daughter would have, and the vicarious pleasure you would receive, when the contest director or awards chairman announces . . . "And how . . . the Junior Champ . . . !!"

Counter Continued from page 9
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* * *

"No job is too big with Multi-Stripe, simply because it works", is the word from Dick Jensen, the "DJ" of DJ's Multi-Stripe tape, marketed by Carl Goldberg Models.

DJ's striping tape is available in four widths, from 1/16 to 1/4, in six colors (yellow, white, black, gold, blue, and red), and in 6 x 36 inch sheets from which numbers and unlimited designs can be cut.

A patented adhesive that cures in the sun in three hours is used, after which the tape has become a permanent part of your paint scheme, impervious to hot fuel or cleaners.

Limited only by your imagination and daring, this material is a simple way of getting some life into an otherwise drab paint scheme. The wide sheet comes complete with patterns for two sizes of numbers and AMA lettering plus various suggested designs.

The narrow tapes are attractively packaged in 36 foot rolls, and cost from \$1.98 to \$3.69, as determined by the width. The 6 inch tape is \$3.95.

While you are getting your favorite color, be sure and look at the other quality accessories available from Carl Goldberg Models, Inc., 4732 West Chicago Avenue, Chicago IL 60651.

* * *

Sullivan Products Inc. has decided to clamp down on things . . . engines, and vibration, that is. They have recently introduced a revolutionary new engine mount that not only allows rapid engine changes, even to one of a different brand, but holds the engine in such a way that you never need worry about its coming loose. This mount also allows thrust adjustments to be made, and you can set the fore and aft position at the best point for proper balance or prop/spinner clearance.

The mount is of rugged aluminum casting construction, with steel clamps and 10-32 Allen screws to lock the engine securely in place, in the manner used by machinists to secure material for milling.

The mounts are available in four sizes, to cover all classes of engines. The MM-1 is designed for most .29 to .44 size powerplants, the MM-2 for .45 to

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Be your choice Formula One, or Quarter Midget, and whatever your choice of engine, you will find a Top Flite Racing Prop to match. These hard maple props are available in diameters from 7 to 9-1/2 inches, by half inch increments, and pitches from 5 to 9 inch. All maple, hard enough to reduce vibration and tip flutter to a minimum, they are also hard enough that you can tighten down on them as much as you feel necessary.

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All kits feature lightweight fiberglass fuselages; foam wing cores; plywood firewalls; wing and gear mounts; canopies; plans and three-views. Wheel pants and landing gear also available if needed.

All prices FOB Tustin, CA. Calif. residents add 6% sales tax. Dealer inquiries invited

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world records than any other brand, Top Flites are also available in a wide variety of sizes and pitches expertly developed and designed for sport, control line and free flight.

Check your favorite shop, or inquire from Top Flite Models, Inc., 2635 S. Wabash Avenue, Chicago, IL 60616.

* * *

"Designed by Earl Stahl" needs no introduction to those of us who have been modeling since the 40's, or even after. His rubber powered designs have always been successful flyers, as well as attractive models. Flyline Models is re-introducing his scale models in kit form, beginning with two of everyone's favorites, the Rearwin "Speedster" in a 28 inch wingspan kit, and the Howard DGA-8, as a 24 incher. Both appeared in Model Airplane News, in the 40's, and are produced with permission of the publisher and designer.

In addition to rubber, they may also be flown with electric or CO₂ power.

Another new introduction from Flyline is a 39 inch wingspan, .049 powered, three channel R/C Kinner "Sportster". This is a highly accurate scale model of excellent proportions, well suited for standoff scale competition.

The Kinner is available now, for only \$12.95; check Flyline Models at 10643 Ashby Place, Fairfax, VA 22030, for price and availability of the Rearwin and Howard.

* * *

The well known D&R Products plastic open-gimbal stick assemblies are now available for the do-it-yourselfer and for retrofit in older R/C systems. D&R gimbals are known for their soft, accurate centering, and the "feel" necessary for precision flying. Electronic trims are built in, which can be connected in a cross trim configuration if

desired. A throttle ratchet is featured on the 2-axis assembly. Optional third trim type pot and lever assembly is available for an additional channel control, if desired.

These stick assemblies fit most existing transmitters, requiring only a 2 inch square opening and 1-1/2 inch depth clearance.

The 3-axis unit, with thumb trim lever for the rudder knob, is priced at \$24.95; the 2-axis is \$14.95, complete with 5k main control pots and 1.5k trim pots. Also, 25k or 100k pots are available on request. The third channel control pot and lever assembly is priced at \$3.00.

Tell Dick & Rose you read about them in MB. D&R Products, 3407 W. MacArthur Blvd, Santa Ana, CA 92705.

* * *

Following in the propwash of Sophia, Gina, and Anna, the latest Italian beauty has almost equally interesting dimensions.

And the surname is equally well known . . . Rossi. The full name is R 60 FI RC, the latest .60 front intake R/C engine for pattern and sport from the Rossi company in Italy, and Bill's Miniature Engines, 1325 Carol Drive Memphis, TN 38116.

All of the visible external high quality evident in previous engines from this manufacturer are apparent in this design. It features Schneurle porting, a single ring, side exhaust, and the already mentioned front intake. The advertised power for the R/C version, with the muffler/reasonator, is 2 horses at 16,000 rpm.

To be produced also as non-R/C versions, the unpiped engine is rated at 2.25 hp at 24,000 rpm, and with the Rossi-produced tuned resonator, the power goes up to a fantastic 3.25 hp at

24,000. This must class it as one of the most powerful 60 size engines presently available.

The engine measures 2-13/32 at the lugs, with 1 x 2-1/16 inch spacing of the mounting bolts. Bare weight is 19.5 ounces, the muffler/resonator adds 5.5 ounces, including the elbow. The length of the latter, from the center point of the exhaust to the end at its longest recommended position is 19-3/8 inches. This can be shortened if the engine is to be operated at higher rpm's, as described length with the muffler at full extension, from the end of the prop shaft to the tip of the muffler, is just over 23 inches.

Muffler pressure is recommended, using a "Vee" fitting between the pressure tap and the tank, and two pressure inlet tubes one on each side of the tank. This assures that one tube is always out of the fuel. The engine is then claimed to operate at the same rpm regardless of aircraft attitude, be it normal, inverted, diving, climbing, or anything in between.

The propeller shown is described as a Rossi carbon-fibre prop, about which we have no further information, other than that it is recommended for use with this engine. The same 'no further info' applies to the Rossi-produced plug, about which we know only that they are produced in 7 types in various temperatures and for various sizes of engines.

We will report on the latter two items as we receive the information.

The .60? Would you believe only \$115; the tuned muffler is \$25. Tell Bill McGraw that MB sent you.

* * *

From the home of the Rolls Royce and one half of the Concorde SST, comes the new Telco CO₂ engine.

This little dandy is just the thing for a power conversion of those scale and semi-scale models that you've been flying

NOW... THE SUPER POWER TEAM

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with rubber power. Enough torque is available to successfully fly all 18 to 24 inch span planes, with a total weight of up to 2-1/4 ounces.

The claimed displacement is .06 cc, or approximately .003 cubic inches. Normal rpm with a 5.5 inch diameter, 6.5 inch pitch prop is 3500. Rated power at 2500 rpm is 2.4 watts, which equates to .0032 horses. The weight of the motor, with tank and fuel lines, is 14 grams, or .5 ounce.

"Fuel" is the common and readily available CO₂ cartridge, which is inserted into the Telco Charging Gun, and thence into the airborne tank. Approximately 7 power runs of 45 seconds are possible from a cartridge.

The complete set consisting of engine with prop, mounting screws, CO₂ cartridge, charging gun, and a set of decals, is priced at \$19.95. Props, engines, and chargers are available separately, as is a maintenance kit and all major repair parts for the engine.

Look for the Telco at your dealers; available from the following distributors: A&L Distributors, PO Box 7144, Van Nuys, CA 91406.

Midwest Model Supply, 6929 W. 59th St., Chicago, IL 60683.

SIG Mfg Co., Box 1, Montezuma, IA 50171.

* * *

From a name long synonymous with success in R/C boating, comes the

Instant Motor Mount.

Steve Muck's mount comes drilled and tapped to fit almost all currently popular engines. The basic mount is available in either 4 or 5 inch sizes, and is made of high-strength extrusion aluminum. Removable engine pads attach to the main mount, to provide the proper spacing for your favorite powerhouse. All parts are deburred, and nuts and bolts are provided to install in your hull. The design allows easy access to all bolts.

The Instant Motor Mount will fit all Deep Vees, Hydros, Mono, and Tunnel hulls. The basic mount in the 4 inch size is priced at \$10.50; \$10.95 for the 5 inch size. Engine mounting pads are \$6.50 a pair, drilled and tapped; \$1.75 undrilled.

Contact Steve at 3422 Greenwood Avenue, Los Angeles, CA 90066, and tell him MB sent you.

* * *

The engine experts tell us that one of the main reasons for deterioration of engine performance is the accumulation of carbon and varnish on the cylinder and piston walls. Davis Development Corporation has developed a handy, fool-proof tool for removal of this nasty growth from Cox .049 engines.

The Davis D-Varnishing Brush is a stainless steel round brush with bristles 1/3000 inch in diameter, which is used by removing the head and twirling the

brush inside the cylinder. It is claimed that the fine bristles will micro groove the surfaces, thereby optimizing lubrication. The brush will not leave small metallic particles, as does steel wool, therefore cleaning can be done at the field, without flushing being required. The handle can be bent to the most convenient shape for the individual user.

The D-Varnishing brush sells for \$2.69, plus 50¢ postage, direct from Davis Diesel Development, Box 141, Milford, CT 06460. Connecticut residents add 19¢ sales tax.

* * *

ACHTUNG! Beholden das Messerschmitt '163' Komet, eine fliegen-flopper mit-aus tail. Well, almost without tail; the Big Art's Models 1/2A R/C kit of this interesting German aircraft does have the vertical part of the normal tail assembly.

This very complete kit includes a 3-1/2 ounce fiberglass fuselage, foam wing cores, wing sheeting, installed firewall, special sliding servo hardware for "elevon" operation, 3-views, plans and instructions, and most everything required except radio and engine.

Wing span is 33-1/2 inches, for a total of 211 square inches. The flying weight is 20 ounces, and the radio compartment will accommodate most KPS-14 size servos.

From Big Art's Models, 20620 Emmett, Taylor, MI 48180, or from

● == CONVERT YOUR TRANSMITTER TO A PRECISION FLYING INSTRUMENT. == ●
● == INSTALL ONE OR TWO D&R CONTROL STICKS. == ●



- Already standard equipment on many U.S. transmitters.
- Soft, accurate centering, for precision pattern flying.
- No metal bearings to wear out, or freeze in cold climates.
- Electronic trim. Allows cross-trim, if desired.
- Trim levers in face plate . . . no extra trim slots required.
- Optional third trim lever and pot for auxiliary control.
- Fits most transmitters with little or no modification.

(2" x 2" mounting hole, 1-1/2" depth clearance req'd.)

- Two-axis unit - \$14.95 ● Three-axis unit - \$24.95
- Auxiliary lever for either - \$3.00 extra. ● Three-axis knob only, with thumb trim lever - \$10.00

All prices include assembled units, complete with 5K main control pots and 1.5K trim pots. Note: 25K and 100k pots are available on request.



3407 W. MacArthur Blvd.
Santa Ana, Ca. 92704



California and Western dealer/distributor, Tustin Model Hobbies, 1051 Main St., Tustin, CA 92680.

JoMac Products, Inc. has announced its Comando Mach III modular R/C system, engineered especially for R/C cars and boats. The servos are claimed to be the fastest (.3 seconds at 90%) and strongest (40 inch ounces) available. IC's are used in the receiver front end, decoder, and servo amplifier. The receiver and servo PC boards are double-sided, with plated through holes for vibration resisting solder connections. The system is priced at \$159.95, and is expandable up to five channels.

JoMac is also the exclusive agent for the popular and successful Model Racing Products line of 1/8 and 1/12 scale R/C cars. Pictured is the MRP 1/8th Scale no. 5502P kit, which is complete including painted Lexan Alfa Can Am body and wing. It is also available with the Abarth Can Am body, as kit no. 5508P, either at \$155.00. For those who prefer to do their own painting, the kit is available at \$145.00 with the unpainted body of your choice, or totally body-less for \$122.00, for which many different body styles are available. See them at your hobby store, or send 50¢ for a complete catalog of JoMac Products, 12702 NE 124th St, Kirkland,

WA 98033.

At first glance, you might think that they came out of Pratt & Whitney in Connecticut, but they really came out of Brice Machine Specialties, in California.

They are the new Brice Multi-cylinder, opposed, gear-driven glow engines. Both feature 1:1 crankshaft to prop shaft ratio, for best power transfer. Both feature twin venturi mixture controls, front and rear ball bearings, and are completely equipped with mounting flange and muffler. A unique exhaust throttle is installed that linearly controls speed from 3000 to 11,500 rpm (7-1/2 x 3 prop) on the twin, and 12,000 (8 x 6 prop) on the quad.

The simultaneous firing twin measure 1-7/8 inches long, 4-1/4 inches wide, and 1-3/8 inches high. The weight is 5-1/2 ounces.

The alternate simultaneous firing Brice Four is 3-3/8 inches long, 4-1/4 inches wide, and 1-3/4 inches high.

The twin costs \$69, the quad is \$99, from Brice Machine Specialties, 14722 Leahy Avenue, Bellflower, CA 90706. Send 25¢ for more information, or call Bill Brice at (213) 633-4393.

"The Air Racer", 1909 to 1975.

Now offered as a 3-volume set, by Charles A. Mendenhall, these 8-1/2 x 11

books cover 67 years of air racing history. There are 232 different aircraft covered, from the Curtiss "Golden Flyer", winner of the world's first air race in 1909, to the current lineup of Unlimited and Formula One's.

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Available in various sizes are the old time favorites, such as the SE-5 and Howard 'Pete', as well as some of the lesser known, but nonetheless interesting Moeller Stomo 3, and Russian D-1 Fighter. A few fine rubber sport plans are offered, as are some original designs for the Embryo category.

When you order your Peanut plans for MB Third Annual Parcel Post Proxy Peanut contest, tell them MB sent you.

Sky Books Press Ltd., claimed to be the world's largest distributor of Aviation and Military books, with over 4500 different titles, has announced their distributorship of the new Aviation News "Warpaint" series.

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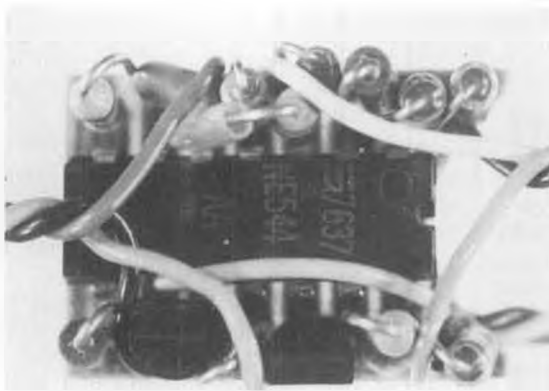


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publications. A history of the subject aircraft is given, as well as extensive information on paint and markings, including color keys.

The first of the series is a 24 page book entitled: *Republic F-84F Thunderstreak and RF-84F Thunderflash in European Air Forces*. New subjects, and books, will appear periodically, and are a must for the historian and scale buff.

For more information about the "Warpaint" series, or about any aircraft that you are researching, inquire from Sky Books Press Ltd., 48 East 50th St., New York, NY 10022. •

F/F Scale . . . Continued from page 47

fairly small, and cannot have the wealth of details due to possible over-weight. Flying, well, that's a different story. Most CO₂ models fly extremely well.

The Flightmasters have always had separate categories for gas, CO₂, and electric scale, the primary reason being to encourage development in each class. For the Nats to do this would be asking too much, but I feel that something has to be done in order to secure and preserve F/F gas scale!

As stated earlier, the majority of models entered at this year's Annual were outstanding. Typically, there are a few that can still be set apart from the others. In rubber scale, Bill Noonan (whose Messerschmitt M23b was in the

October issue of MB) had a Fokker Universal that was something else! The photo(s) will attest to this. I do not know what scale the model was, but it had a wing span somewhere between 50 and 60 inches. When this machine took to the air . . . well, you can just imagine the slow, graceful manner a rubber model of this size can display.

In electric, Bill Warner had a trimotored Airspeed AS-4. This most unusual biplane had plenty of detail both inside and out. It flew beautifully from a hand-launch, but was unable to R.O.G. Bill used three .010 electric motors that will eventually, most likely, be placed on the market by Astro Flite.

Just one quick comment regarding the status of the National F/F Scale Organization. The concept is still on, and it is only a matter of getting all of the details worked out. As soon as this is done, I will let you know.

In the October issue of MB, in "Over the Counter", there was a photo and information about a Cox engine converted to diesel. After seeing this, I immediately wrote to Bob Davis, of Davis Diesel Development, with an order for the .020 conversion and several questions. At this writing, the .020 is still not quite ready, however, the .049 version is. I ordered one of those so I could try it. I have received a couple of letters with what I consider very interesting information that I would like to

pass on to you. I asked Bob if regular diesel fuel could be used with his conversion, and how is his fuel different? "Regarding the question of type of fuel, you may, of course, use any type of diesel fuel on any diesel. I would suspect, though, that the question really is: What would be the best fuel for the average modeler? This has always been a tough question to answer. It is most likely that the typical modeler, at least in the beginning would take his diesel Tee Dee, whether it be an .020, .049 or .09, and run it flat out on a Cox prop as he has done before, in glow operation.

If he does, he's going to develop a lot of heat, which will burn off everything in the castor oil, except the heavy ends, which we call carbon and varnish, and leave behind all kinds of residues on the cylinder and the disc. (The disc is explained later . . . F.R.) We have found in tests that these residues create friction and develop even more heat. Unfortunately, the coatings on the disc tend to protect it from burning out as rapidly as required. These frictions, drags, and tensions overly stress the engine and partially circumvent the thermal safety aspect of the design. Synthetic oil, having no heavy ends, and having a significantly lower combustion temperature than castor, burns away, raises the temperature while doing so, and allows the disc to stay clean until it must be thermally safe.

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Tuff Line - Silicone - Is by far the strongest on the market - semi transparent: shows if bubbles are in the line: heat resistant. Like all silicone tubing, tends to slip off fittings unless care is taken.

Neoprene - Actually a complex compound. Ours is much more elastic than most - clings to fittings - main disadvantage, not transparent.

Surgical Tubing (Pure Rubber) Very flexible. Use when sharp bends are necessary. Semi-transparent. Shows if bubbles are in line. Holds on fittings well. Main disadvantage - tends to deteriorate more rapidly than silicone or neoprene.

Plastic - Ours is as good as anybody's but we don't think much of any plastic fuel line. Advantage - low price and transparency. Disadvantage - tends to collapse on bends and hardens with age and heat. Tends to leak air at fittings after a while.



ITEM	FUEL LINE	PRICE	ITEM	FUEL LINE	PRICE
86880	Small Neoprene	2' Pkg 50	86885	Small Clear Plastic	2 1/2' Pkg .25
86881	Medium Neoprene	2' Pkg 60	86886	Medium Clear Plastic	2 1/2' Pkg 30
86882	Large Neoprene	2' Pkg 70	86887	Large Clear Plastic	2 1/2' Pkg 40
86883	Small Tuff Line	1' Pkg .55	86888	Small Surgical Tubing	2' Pkg 50
86884	Medium Tuff Line	1' Pkg 70	86889	Med Surgical Tubing	2' Pkg 50
86851	Large Tuff Line	1' Pkg 1 00	86890	Large Surgical Tubing	2' Pkg 60

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"If I seem down on castor, I am not altogether. If you don't burn castor oil, if you run your engine slow and rich, it'll probably last forever on castor, but then it would do the same on synthetic under the same conditions. Running a small Cox engine on a large prop is done at a very low compression setting and very rich. For example, a Golden Bee running on a 6x3 wood Top Flite, would deliver approximately 14,000 r.p.m. at a needle setting of about three turns open and a compression ratio of approximately 15-1 or so. On an 8x3-1/2 Top Flite, it would run at 7000 r.p.m., at a needle setting of 5 or 6, and a compression ratio of between 8 and 10 to 1. R.p.m.'s on a 7x3 Cox gray prop for that engine would be 11-12,000.

"Our fuel formula is manufactured by Space Age Fuels (Nitrotane) under our label "Diesel Power", and is a departure from standard diesel fuels in that it contains synthetic oils, together with additives specifically designed for the best possible combustion. It burns absolutely clean and only leaves a small carbon residue from the kerosene.

"You will also notice in the enclosed order form that the .020 has already been manufactured in limited quantities for testing purposes and is now in a first production run. Its performance has been most gratifying, and is certainly comparable with 30% nitro. Example: r.p.m.'s on a Cox gray 4.5x2 prop was 17,500 on both Glo and diesel. On 60%

nitro, it was 19,000, and by putting a fluoro-carbon seal under the cylinder to raise the exhaust and intake timing, the same 19,000 could be achieved on diesel. These numbers represent a Tee Dee. A Pee Wee produces about 10% less.

"This past weekend, I flew an Ace Littlest Stick with both a Tee Dee .010 diesel and a Tee Dee .020 diesel. The .010 produces about 10% less r.p.m. on diesel than it does on Glo. They are approximately comparable to a 30% Nitro mix. However, as you would expect, without the nitro explosive crack, they are considerably quieter.

"Part of the reason I mention this comparison information is to state for the record that dieseling an engine need not mean a sacrifice in power as had been stated by many noted diesel experts."

I asked the question regarding the problem of over-stressing the con-rods with the conversion . . . "From your letter I can only assume that you did not see all the parts that make up the conversion kit, for you would have noted some curious little white wafers. We call them diesel discs. They are at the heart of the device we call the diesel conversion kit. They allow or cause the following to occur: they create a perfect combustion chamber by being moulded into place by heat and pressure. This also allows for easy starting. They create a thermal barrier to keep heat in, to promote high thermal efficiency. They are also reflective. They reduce carbon formation. They readily flex and reform instantly as compression is changed. They disintegrate to gas when critical temperatures are allowed to occur, and thus act as a poor man's ABC system. The reason that the fluorocarbon can exist in an environment where the temperatures are in excess of its limits is that as the fresh charge of fuel vaporizes prior to combustion, it momentarily absorbs heat, thus quenching the fluorocarbon.

"We have run tests without other experimentally, and we know that the combustion temperatures for kerosene-based fuels are in excess of fluorocarbon. Our contra-piston is an extremely loose fitting aluminum puck which is pushed by the adjusting knob. We employ a tension spring to hold a compression setting. This allows the changing of compression with a minimum of friction. It's more a flexing. There is a hole in the head to allow gases to escape.

"All the engines are readily throttleable directly from the compression knob, and even a small servo will readily adjust the speed of the engine with 30 degrees of rotation (This feature could be used to set-up a scale model with high speed throttle for takeoff, then have it throttled back for cruise. This can be accomplished easily using a timer . . . F.R.).

"As far as the ruggedness of typical

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diesels is concerned, I must concur with you. Of course, when one studies the logic of this you must conclude the following; they were designed that way to stop parts from breaking in the event of hydraulic lock, coupled with an ape-like hand forcing at the end of a wooden lever we call a propeller! We know this didn't really work too well since people broke those engines, too. A lot of this was brought about by poor compression seals which lead to people trying to develop hydraulic compression to start their engines.

"We should have learned a lot since the old days, and one inescapable fact is that we have to reduce the weight of all those parts banging around in there to produce power. The fluorocarbon discs allow a diesel-converted Cox to run at a lower compression ratio due to thermal efficiencies. This substantially reduces the stresses involved."

Another question I had asked was the use of a larger prop which is common to most diesels . . . "I think this big prop thing had more to do with the large stroke of the old diesels. Tee Dees are racing engines, and seem to be quite happy running at elevated r.p.m. As a matter of fact, I'd suspect that the r.p.m.'s these dieselized engines have produced are probably higher than any other diesels have achieved; e.g., .010 standard prop-23,000 r.p.m., .020 standard prop-17,000 to 19,000 r.p.m., .049 Cox 5x4 prop-20,000 r.p.m., Tee Dee

.09 7x3 prop-16,500.

"It isn't perfect, and some people are going to break rods, bend rods and break cranks, but by and large, most conversions will allow the average modeler to break into that unique field we call diesel."

I hope that the preceding information is as interesting to you as it has been for me. As soon as I receive my conversions, I will pass along any additional information that can be used for scale work.

Soaring Continued from page 29

trol surfaces during recovery from any unusual attitude. You should have heard the noise from that mylar thrashing about in the air wake. The drag was so great that it was difficult to maintain flight control. Although the landing was perfect, there's no doubt that thermalling with such an attached "sky anchor" is impossible. Then, too, how would I explain the radar reflections to the nearby naval facility? We might even start a rash of U.F.O. reports. Interceptors might be deployed to perform IFF on this "very low altitude unidentified intruding aircraft . . ." I can see it all now.

So we still have the problem of what to do to make high altitude flight easier. Would you please join me in some head-scratching? Hope we find more than dandruff.

The longer you wait to attempt to break a record, the harder it becomes to do so. For example, Werner Sitar of Austria has registered a claim for the R/C glider speed record . . . at 188 miles per hour. His 1802 mm wingspan bird thermaled to 1300 feet before diving into the trap. The pass in the opposite direction was also started from about this same height, gained from using thermals. Quite an achievement!

Ernie Heyworth of Horseheads, New York, devised a way to ease the burden of handling his transmitter. He repackaged the gear into a box which fits snugly into a leather pouch which hangs from his belt. This allows single-handed operation, leaving the other hand free to launch the plane, or whatever. I've seen it operate and it looks neat, although it might take some getting used to for a person like me, who insists on using body English to encourage his plane through each maneuver, right down to the spot.

Dave Jones is a most creative designer who encourages others to share his "thoughts" through the drawings made available by Western Plan Service, 5621 Michelle Drive, Torrance, California 90503. The catalog he publishes is well worth the .50¢ it costs. It provides really interesting designs, including aircraft such as the Raven, a thermal flying wing which performed

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well in the most recent LSF tournament.

Dave points out that this design has been four years in the making. You may possibly recall the Little Plank, which appeared in RCM in May of 1972. This design was followed by other good performing slope models, such as the Beta 36 (small and easy to build) and the Alar 2 (which weighs only 12 ounces with a Cannon 2-channel airborne pack on board). Dave then changed his direction toward larger thermal machines, starting with the Standard Plank, which appeared in RCM in July of 1975. The prototype of the Raven has been flying since January of this year. It demonstrates a high rate of climb in a thermal, and very tight turning ability. It has much higher speed than the 4.3 ounce per square foot wing loading would suggest. It also slope soars well, even in winds up to about 20 miles per hour. Here's a design worth watching... and maybe even building.

Other designers get their kicks out of improving on already demonstrated performance. For example, "Murf" Misciewicz, of Encinitas, California, determined to improve the Ridge Runner which was described in a recent RCM. This aerobatic slope soarer allows a full bag of tricks on the basis of aileron and elevator controls. It even looks scale-like, to boot. To improve the design, Murf decided to use a Gottingen 622 airfoil and ailerons which are ridged so that there's a slight step up for the air as it crosses the hinge line. This inhibits separation and provides more positive control by the ailerons when they are near their zero position. I can personally testify to the fact that this bird flies like a dream.

Roger Taylor of the Torrey Pines Gulls performed cosmetic surgery on his Winddrifter. His version of this fine plane includes a flying stab and totally inter-

nalized controls. The "up front" portion of the fuse is stylized. That doesn't help flight performance a bit but it sure improves the moral of the pilot and maybe that's sufficient justification. This plane is now being flown by Alex Mladeneo.

Here's a tip worth noting, even though you may have heard it before. When you cut or drill holes in finished plastic, as for example in mounting the radio in a Hobie Hawk, it's smart to first cover the surface with masking tape. This prevents chipping at the edge and provides ease of drawing the lines to be cut. On a similar basis, you can help prevent chipping and breakage of balsa by first treating the edge to be cut with a penetrating glue such as Zap, or equivalent.

Another tip, this one from the latest issue of the New Zealand Soaring Society journal. "Don't use lacquer based paints on ABS plastic fuselages, as this accelerates the aging of that material."

I like to keep my planes looking good, and so I had to find a way to prevent tearing the Monokote when removing the masking tape that holds the wings in place. The solution: wrap 3/4-inch wide transparent Scotch tape around the edges of the wings. This is not noticeable, and protects the Monokote effectively. That same tape makes a good spoiler hinge. I've been using it on my Legionair for over a year, through all kinds of weather, without difficulty.

While visiting Pat Potega, of Canoga Park, California, I complained about rust appearing on the wing wires of my Grand Esprit. He could have come back with, "Why don't you fly it more often?" But instead suggested that I use car wax. I'm sure that's better than a bath of protective oil, which might urge the wings to slip off during a spin.

Have you noticed that a long Hi-start seems smoother than a short one even when stretched to pull with the very same amount? Could it be that the longer line allows the rubber to drag on the ground during the first part of the launch, thus reducing the rate of contraction and providing smoother lift? What do you think?

If you have trouble finding sufficient room in your station wagon, why not try half-folding a beach or patio chair so as to make a double deck temporary carrying case. That doubles the area and doubles the pleasure at practically no extra cost.

Birds of a feather flock together. So it is that most would rather fly with buddies than alone. Sharing experience is a joy, and it's cheaper to learn from other people's errors than your own.

On this basis we form clubs, engage in regional activities, and build a national structure within the R/C soaring community. In fact, the National Soaring Society, chartered by the Academy of Model Aeronautics, is the voice of that community. This society is comprised of modelers who speak to and for their own kind.

Specifically, the purpose of the N.S.S. is to serve its members in a wide variety of ways. This is accomplished in part by providing useful information through its monthly journal, "Sailplane", which includes comments and technical articles on the design and flight performance of R/C sailplanes in general. This material is more detailed than can be found in the magazines which appeal to a wider readership. The Board of Directors of the N.S.S. serves as the A.M.A.'s R/C soaring advisory board. It is my pleasure to serve as President of the National

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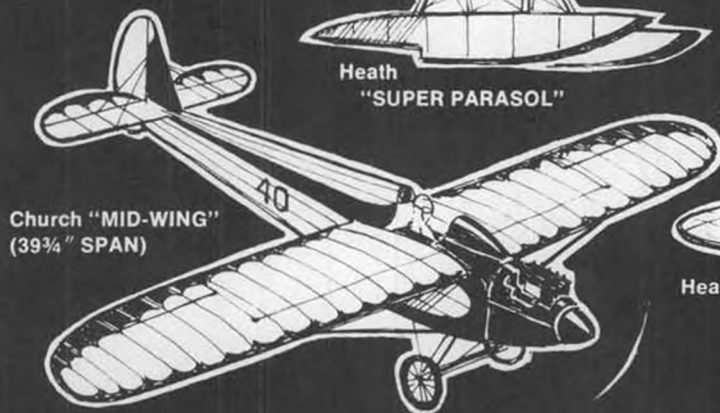
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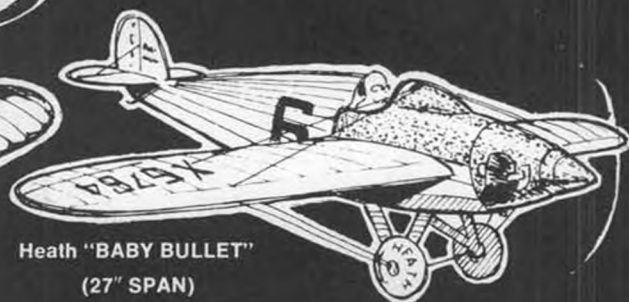


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Our society endorses the program of soaring achievement of the League of Silent Flight and jointly sponsors educational lectures with the American Institute of Aeronautics and Astronautics. We are your voice in such crucial matters as the protection of authorized frequencies for radio control use. We also recognize the need for serving the sports flyer as well as those only beginning to learn the joy of R/C soaring. Our directory of members allows you to contact those who are willing to share their interest and skill. Our Directory of Soaring sites will help you enjoy soaring as you visit communities other than your own.

May I invite you to join and take an active part in this young organization? Only in this way can we represent your best interests and those of the soaring community at large.

Chez Coupe . . Continued from page 58

have to trim it a little so it will fit snug inside. You can use Sig celastic for this also. I use it and find it easier and stronger than balsa. Your choice.

Now cut a disk of 1/4 inch hard balsa to fit inside the front end doubler so that it fits snug inside. This will be used on the prop assembly and as a nose block stop. Cut a small piece from the circle and cement to the nose section doubler. This is the nose block stop. The remaining piece will be used on the nose

block and prop assembly later. Use epoxy here. When this is completed, sand the nose section face for 2° down thrust and 2° right thrust. Cut a 1/8 balsa disk for rear and cement as shown on plans.

Tissue cover the motor tube by cutting 1/2 inch strips of tissue, spiral wrap around the motor tube, and dope. Repeat this procedure twice to get a double tissue covering that's very strong but not heavy. When this is completed, three coats of nitrate dope thinned to 50-50

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should be enough. Set the motor tube aside for now and we'll build the tail boom.

The tail boom is bent the same way as the motor tube, except that the tail boom is tapered. Use very light 1/32 sheet and wrap it around a pool cue stick to form the taper. A good straight pool cue stick can be bought for about \$5 in better sporting goods stores. It's a good investment, as you will use it over and over when building other airplanes. Follow the exact procedures as for the motor tube, and you won't have any trouble. Cut one balsa circle of 3/32 scrap and insert in the rear. See plans.

Now insert the tail boom around the 1/8 balsa plug in the rear of the motor tube. Line up the two pieces so that the center of the motor tube lines up with the center of the rear of the tail boom, and cement in place. Hot Stuff this so that it can be handled without coming out of alignment. Use two coats of dope, sanding lightly between coats, and tissue cover the same as the motor tube, except a single wrapping is enough.

Make the stab platform mount from 1/4 inch soft balsa scrap, making sure you have zero incidence seating. Cement in place and add the stab platform as shown.

The rudder is made from 3/32 soft light sheet sanded to an airfoil shape for a right turn. Cover with tissue, then cut the trim tab out and reinstall as

shown. Cement rudder on tail boom and add all hardware for D.T. lines as shown. The rubber holding peg is 3/16 ID brass tubing mounted as shown inside two circles cut from .032 aluminum and cemented with Hot Stuff at the location shown on the plans. This will give you the proper distance between hooks for six strands of 1/4 inch rubber.

The pylon seems kind of high, but it makes the model much more stable and conforms to the fuselage cross section rule.

Make the top and bottom pieces from the template shown and cover with 3/32 medium balsa. Drill a hole in the front and rear and insert a 1/8 birch dowel for the wing mount rubber bands. To make the mount conform to the motor tube, wrap a piece of sandpaper, rough side out, around the motor tube form and sand the bottom of the mount until it is round and fits uniformly on the motor tube. When this is complete, cover with tissue and dope. Cement the pylon on the motor tube at the position shown on the plans. The location of the wing and C.G. position are important, so make sure you glue it at the right location. I have made many flights with the C.G. and wing in different positions, and this was the ultimate location for maximum altitude and glide. The Chez Coupe climbs and glides extremely well for such a heavy, small size airplane, so proper measuring here will pay off later.

The wing and stab are straight forward stick and tissue building. Cut the ribs from an .032 template so that they are all the same. For the wing tip ribs, cut them to the size of the taper, then mark the thickness of the trailing edge on the back of the ribs and cut a straight line from the lower portion of the rib. See template on plans. All spars are 1/16 by 1/8 hard. When wings are completed, set the butt ribs at the proper angles for dihedral and cement in place.

Do the tips first and then the center section ribs at the dihedral break are butt glued together. Add gussets as shown. Now give the wing two coats of dope and sand lightly. Cover with tissue and pre-shrink with water. When the tissue is almost dry, wash in the right center panel by pinning it on a flat surface and putting a 1/8 thick block under the leading edge at the top dihedral break. When the pre-shrinking is done, use 50-50 nitrate dope, about four coats. When doping is complete, pin the right wing panel down with the 1/8 thick shim under the leading edge and let it stay until a permanent warp has been set. All other panels are flat.

The stabilizer is built the same as the wing, on the plans as shown. Nothing really to explain here. When construction is completed, cover and dope same as the wing. Make sure there are no warps. Add the piece of 1/64 plywood for D.T. hook as shown and drill a hole

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for the D.T. string. See plans. I used a pretty pink Japanese tissue and trimmed in blue and black and it turned out real pretty. The model is almost complete now.

Last but not least, the most important part to go . . . the prop and prop assembly.

First make the nose block by laminating pieces of 1/8 sheet balsa in opposite grain directions as shown. Now glue the remaining piece of the 1/4 inch balsa disk we cut for the nose block stop, and cement in the rear. Epoxy a 1/4 inch aluminum washer in front to act as a bushing. Drill a 3/32 hole through the center and insert a piece of 3/32 O.D. brass tubing and cut it off flush with the front and rear. Carve the block to shape as shown. Use 1/16 music wire and bend the shaft as shown in the diagram. Insert the shaft through the tubing in the nose block. Add the tension spring and thrust bearing and bend the proper angles for one blade. Now bend a separate piece of wire for the opposite blade as shown. Now cut two pieces of 1/16 wire and Hot Stuff them on each side of the blade shafts that we have just bent. Make sure all wire is at the proper angles as shown in the diagram. Now make the winding loop of the same size wire and Hot Stuff this in the center as shown. When all of this is aligned properly, bind with copper wire and solder. Be careful that everything is

in alignment while soldering. This is very important so that the propeller pitch and diameter stay true. Remember, the more care you take with any part of the propeller assembly, the better the end result will be. The propeller is about 80% of the performance of the model, so take the time and do it right.

When the assembly is complete, set it down and balance the shaft by removing excess solder. Make sure that both blade shafts are in track. If one is the slightest bit longer than the other, melt the solder and align them properly. A 1/16 wire shaft assembly can be purchased from F.A.I. Model Supply. It comes with rubber hook already bent, bushing, spring and bearing. I use them and they work real well.

Now let's make the most important part . . . the blades. The blades are laminated with one layer of 1/64 plywood and two layers of 1/32 medium sheet balsa. Cut out two pieces of 1/64 plywood and four pieces from 1/32 sheet balsa, using the blade template shown on the plans. Use the balsa sheet from the same piece of wood so that balancing will be easier later. Lay these aside and we'll proceed to carve the prop block that we will use for forming the blades.

Carve the form from a block of the same size shown on the plans. The prop will be 15 inch diameter by 19 inch pitch. Carving the block has been


covered by many previous articles, so I won't go into that.

When the block is completed, let's start the blades. You will see that by using a block of this pitch and diameter that from the hub to about halfway out to the tip, the curve that the sheet wood has to make is extreme. To prevent bubbles in the wood from forming and to make sure you have a complete laminated bond, stay with the following procedure.


Take the two pieces of 1/64 plywood we had cut in the shape of the blades previously and draw a line down the center from butt to tip. Now start at the blade butt and drill a 1/32 hole every half inch for three inches, starting after the first half inch. Do this only on the plywood. This will relieve any air and excess glue and prevent the blades from bubbling. This procedure works very well if followed correctly. Now take one piece of the plywood and two pieces of the 1/32 sheet we had cut out before and, using 50-50 Titebond cement and water, brush the cement on the blades and laminate them together.

Now spray water on the bottom face of the plywood and top face of the top balsa sheet and lay this on the prop block. I use three feet of 3/4 inch elastic that you can buy in any fabric or sewing shop. Secure one end to the block, and start wrapping the blades on the block very tightly, keeping the sheets

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aligned together as you wrap. Make sure every portion is flat on the prop block. This is a very important part of the procedure, so take care here. When this is completed, bake the blade in a low heat oven for 30 minutes. Remove the blade and follow the same procedure for the second blade. When both blades are complete, sand the underside of the plywood to remove any excess glue. Now take both blades, lay one on top of the other and lay them both on the prop block. Bind again with the elastic and let them sit at least overnight, and longer, if you are not in a hurry. Sometimes there is still a little dampness between the layers, even after baking, so the longer you let them sit, the better they maintain their pitch angle.

Now take the prop block and drill a 1/8 diameter hole through the block as shown in the diagram, making sure that the hole is in the right position. You can double check this by making sure that the distance from the prop shaft to the tip of the blade is 7-1/2 inches. Insert a piece of 1/8 O.D. brass tubing. This will be the drilling guide for the blade folding points. Now cement a piece of 1/64 plywood on the top side of the blades at the hub. This is just a doubler for strength. See blade diagram. Now sand both blades to airfoil shape. Cut two pieces of 3/32 x 3/8 brass tubing and glue in place through the prop folding

point holes we have already drilled. When this is complete, brush on two coats of fiberglass resin, sanding between each coat and making sure that both blades are the same weight. When completed, use rubbing compound to polish the blades. You will end up now with a beautiful set of blades.

Now install the blades on the prop shaft and nose block assembly, making sure that they swing on their hinges nice and free. Use .032 steel wire for blade stops. Install one, first making sure that the center line of the blades lines up with the wire hub. Secure this assembly to a table and, using a wire gauge at one tip, install the other blade stop so that both blades are in track when they are both fully extended. When this is done, check the balance again. If one blade is heavier, use small pieces of masking tape to fine-balance the prop. When this is done, insert the prop assembly in the motor tube and rotate until the blades fold to both sides of the motor tube. At this point, install the prop stop screw as shown on the plans.

Now assemble the model completely with rubber and check the C.G. Add weight wherever needed to bring the C.G. up to the point shown on the plans. Make sure you have installed only a 10 gram rubber motor. The airplane should come pretty close to minimum weight.

If it's too light, add some weight to the C.G. to bring the model up to 70 grams less motor. Do not add weight with the motor in it. If the model comes too heavy, you did not select the wood properly. Remember, it's better to add weight to a light airplane than try to remove it from a heavy one. The Chez Coupe is now complete. Let's fly it.

FLYING

Use a short fuse for testing. Set the stab tilt at the same angle as the center wing panel dihedral for right glide. Test glide the model. It should glide flat with a slight right turn. If it stalls or dives, add shims 1/64 at a time to the leading or trailing edge of the stab as needed. When the glide is set, wind it up to about 50 turns of a 4 to 1 winder, light the fuse, and let it go. Under the initial power burst, it will climb real fast in a right circle with the nose high. You will be amazed at how high it will go. If the climb is not satisfactory for you, use shims in the nose block and very little rudder trim, if needed at all. Check the folding of the prop and the blades. If the blades, for some reason, won't stay folded, use a rubber band on the blades to keep them folded. I always do this for safety, and it works real well.

My airplane flew right off the plans, except that I had to move the C.G. to the position shown on the plans. This is all the trim it needed. Now that you have it trimmed, wind it up to 80 turns and you will see a very competitive Coupe perform. Build it, fly it, and I know you'll enjoy it. Good luck with the Chez Coupe and don't forget to light the fuse!

Indoor Continued from page 45
 below the catwalk for an initial time of 32.19.

Activity then became more intense, and at the end of the first day, 38 flights in excess of half an hour had been recorded, with high time going to Laurie Barr, U.K., with 36.59. Top aggregate of two flights was held by Eduard Ciapala of Poland with 72.03, followed by Barr and Blount of the United Kingdom with 71.29 and 69.47 respectively. Team placings were U.K. 208.59, Canada 202.51 and Czechoslovakia with 199.34. The American team had totalled 184.52 at this stage, an unrealistic score as Bucky Servaites ran into troubles on his latter flights, scoring 14.27 and 10.15 which was disappointing after an initial 34.37. Jim Richmond's best time at this stage was 36.29, and Bud Romak had a 34.59. The early delay in the commencement of flying led to a rush at the end of the day, when Team Managers realized that there was insufficient time for their members to complete their flights under the rule by which only one contestant from each team could be airborne at any given moment. Relaxation of this condition was agreed by C.D. George Lynn, and



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ultimately all flights were completed, though not without some eyestrain on the part of various recumbent timekeepers who were tracking the ghostly shapes that flitted in the rapidly gathering gloom of the roof!

Henlow, that evening, was the scene of much late-night activity, with many competitors undertaking repair work, preparing new motors, coupled with extensive exchanges of information and specialized assistance. Those more fortunately placed retired to the bar and/or took in the modelling movies being shown in the adjacent room.

Monday dawned once again with discouraging weather conditions externally, but on this occasion, the calls for timekeepers came briskly after the commencement bell, and the air rapidly filled with models. Sven Pontan, Sweden, raised some interest when his entry, after a poor climb to low altitude, settled down to a circuit passing close to the side of the hangar immediately in front of the scoreboard and timekeepers' enclosure, and promptly thermalled on body heat for over twenty minutes. The flight terminated when the model contacted the girderwork after Pontan missed connecting with the line of the steering balloon. Had he successfully repositioned the model, it looked as though it could almost have continued its flight indefinitely!

Towards mid-day, the word spread around the hangar that Bud Romak had put in a solid 39.22, nicely centered under the central catwalk, to a round of applause from team mates and manager Pete Andrews, and the possibility of a forthcoming 40 minute flight suddenly became a firm reality. In the meantime, Sven-Olov Linden, Sweden, became the recipient of much congratulations from other fliers present . . . After a best time of 12.26 the previous day, he received much advice and assistance from Canadian and Polish entrants, together with trimming advice from Pete Andrews, the net result of which was a beautiful 34.06 during the early afternoon . . . naturally enough, a new Swedish record!

By mid-afternoon, attention centered on Bud Romak as he went out for his second flight of the day, and after the first ten minutes or so it was evident that, barring accidents, it would be a good one. As time progressed, the model held its cruising altitude well but drifted close to a side wall as it made its way along the length of the shed . . . perhaps due to the occasional opening of a small side door opposite as caterers removed their equipment . . . and in due course, Romak was forced to utilize his steering balloon to re-center the model. By this time, other activity had slowed with the attention of most people upon the flight; Pete Andrews secured the offending door and brought all floor movements to a halt in an attempt to secure near-perfect conditions for the final phase of the flight, and the model should have been assured of 40 minutes by sheer willpower from those onlooking. But it was not to be, and the machine touched gently down for the high time of the meet, at 39.36, to thunderous applause. There was much speculation as to whether the 40-minute mark might have been passed had it not been necessary to use the steering balloon, though Romak did not think that he lost any appreciable altitude by so doing. The point is academic, for the flight time, coupled with the preceding score, brought Bud to the fore as a most worthy

and popular World Champion.

Final flights were completed by the remaining contestants, with Jim Richmond being particularly unlucky in folding the wing of his model whilst steering at altitude after looking well placed for a high time, as did Ron Green of the U.K. This contestant has been building Indoor for no more than two years, and many predict a future World Champion title for him in time to come, his lowest score, other than the aborted flight being 30.12 and all others in the 33-34 minute bracket.

No startling variations in layout were noted amongst the models present, the only small exception to the norm being the Swiss models, most of which carried a longer than usual tail boom . . . "frightened by a Civy Boy" as one onlooker remarked . . . though scores did not rise above the mid to high 'twenties' with but one exception.

At an excellent banquet, the U.S. contingent made a clear sweep of the board, with Bud Romak accepting the C.S. Rushbrooke Trophy as World Champion, together with the beautiful Ernest Kopeckny Trophy for the longest flight in the Championships, whilst Pete Andrews took good care of the cup awarded to the winning team. The British came through into 2nd place in the Team lists, closely followed by the Canadians, who were well pleased with this achievement after so short a time



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in indoor competition.

It appeared to be commonly agreed that this Championship established a new level of its kind, both in flying and comradeship, together with standards of organization and accommodation. Thanks for the latter items must be given to the Royal Air Force, the Royal Aircraft Establishment, who lease the Cardington hangar at a ludicrously low rent (rumored to be no more than about \$3.50 a day!), to those officials of the Society of Model Aeronautical Engineers who ran the contest so efficiently, and particularly to Laurie Barr who, as well as competing, was the main organizer of the Championships, with its myriad problems and details, and who also guaranteed to underwrite the function in the event that it proved a financial loss. Happily, it is believed that this latter course did not prove necessary.

Top Scores were as follows:

1. Bud Romak	U.S.A.	78.58
2. Eduard Ciapala	Poland	72.03
3. Laurie Barr	U.K.	71.24
4. John Blount	U.K.	70.26
5. Mike Thomas	Canada	68.50
6. Karel Rybecky	Czech.	68.43

Team Placings:

1. U.S.A.	215.26
2. United Kingdom	210.16
3. Canada	202.51

• • •

MRCContinued from page 11

Internally, the transmitter exhibits the same mechanical quality as it does externally. All the electronics are on one 1/16 thick PC board, reducing the number of interconnecting wires needed.

The encoder is of the IC type, utilizing three IC's. The neutral time is 1.8 milliseconds, the frame time is variable.

The RF amplifier uses one transistor, a NEC C1589, in a TO-220 type case, with an extended heat dissipating metal tab on top. The exact ratings are not available, but generally, this type of physical characteristic in a transistor results in its ability to handle values considerably higher than those found in an R/C transmitter, thereby assuring plenty of reserve capability. The amplifier follows a buffer and .005% crystal controlled oscillator.

The wide-face, two-color, high visibility meter is connected to read battery voltage, not RF output as is commonly done. The reading will not change when the antenna is extended, or when the antenna is touched or brought close to metallic objects, as will the RF indicator. Any deviation from normal is a sign of a possible battery problem, and no flight should be attempted until it is corrected. Eight 500 mil nickel-cadmium cells are installed in two packs of four, for an approximate operating time of 3 hours. The charger is completely external, being

connected when needed through a polarized receptacle on the bottom.

The antenna is attached to the bottom of the transmitter with a threaded stud, and supported at the top with an attractive molded insulator. It is not intended to be removed; turning it will break the connection at the bottom, and naturally should not be done.

We were impressed by an extra touch inside the transmitter case; it is finished with a light cream lacquer or epoxy enamel. True, this will not make it fly better, but is to us an indication that the builders have pride in the product. It does have a practical purpose, as those flyers who live along the coastal areas and who have seen what happens to unprotected raw aluminum will attest.

The stick-to-servo link results in 29° movement of the servo wheel each side of center, as the stick is moved from one extreme to the other. The trim range is 6.5°. Translated into pushrod movement, using the last hole out on the perimeter of the wheel, the full stick movement results in 3/8 inch total travel. The trim gives 3/32 inch total travel.

The temperature operating range claimed for the transmitter is 10 to 150 degrees Fahrenheit, which also applies to the receiver. The servos apparently operate in even colder climes, down to 0 degrees. To an adopted citizen of Panama like myself, who dons thermal underwear any time the temperature drops below 60, this is of no interest. But it is important and worthy of mention for the more hardy R/Cers. **RECEIVER**

The receiver supplied as part of the 775 System is also built on a single 1/16 inch thick PC board. It is relatively small, a mere 2-1/2 x 1-3/4 x 3/4 inches, and weighs in at 2 ounces, including harnessing and antenna. It is enclosed in an attractive as well as functional anodized aluminum case.

Some of the MRC ads show this receiver as a slightly larger plastic cased unit, which we questioned. Frank Ritota, the knowledgeable Customer Service Manager at MRC, told us that both had been extensively flight tested, and the metal cased model had proved superior and has been adopted as the standard.

Circuitwise, it is an .005% tolerance, crystal-controlled, double-tuned front end superhet. Three stages of IF at 455 khz are used, ending up at the C-MOS IC decoder. A sensitivity of 3 microvolts and a selectivity of 3db down at plus or minus 6 khz is claimed. All transistors are of the silicon type, and all resistors are high quality 5% tolerance units. In general, the receiver exhibits the same mechanical integrity evidenced in the transmitter, and should require only the usual installation precautions.

SERVOS

The buyer of the MRC 775 has available a number of servos that can be used,

varying in size and power as determined by the application. The range is from the MR-60 Mini with a torque of 32 inch ounces, at a weight of 1.4 ounces, to the MR-30 180 degree retract servo, which is rated at 60.8 inch ounces at a weight of 1.7 ounces.

We chose the MR-40, a medium servo in size. It is rated at 36 inch ounces, measures 1-3/4 x 7/8 x 1-3/8 inches, and weighs 1.7 ounces. This is not a servo for 1/2A's, but is better proportioned for the larger airplanes; those in widest use and most popular sizes. In our Spickler Quickie 500, the fit is too snug for your elbows and ears, but ample for plenty of padding around the receiver and battery, and between the servo tray and receiver. The average sport or pattern airplane will have more than enough room inside.

The MR-40 is a rotary output servo, supplied with both arms and discs for connection to the pushrods. We liked the staggered holes 22-1/2° off center in the disc which are an easy way to get control surface differential when desired. Bar-type arms are supplied, including some extra long ones, for use where greater movement is required, such as throttles and flaps.

The case is molded of 88 mil plastic; which is thicker than some of the other servo cases in existence. The fact that this might add a gram or two to the total system weight is more than offset by the resulting added ruggedness.

The gears are made of brass for the pinion, white nylon for the idlers, and black filled nylon for the last, or output gear. The fit is tight, with barely discernible play. In practice, we have found that completely tight plastic gear trains have enough built-in friction to use up some of the power available. Some clearance is necessary, and usually disappears when power is applied to the system.

The amplifier is built on a single deck, designed around the latest servo IC from Texas Instruments, the SN28604. In more or less normal fashion, the board is located back of the motor and under the feedback pot, padded over and under with thin pieces of foam. A 16 millimeter motor is used, with tantalum capacitor bypasses for brush noise elimination. Idle current is 9 ma.

The feedback pot in this servo warrants a second look and lots of consideration. Most servos use a wiper and resistive element, both held in the servo cases with properly designed pins or sockets. It is a critical arrangement, as the proper wiper tension has to be maintained, and has to remain constant at least for the part of the arc being used. Too little tension results in intermittent operation, too much tension results in premature wear of the element, both of which often result in the same sickening "I ain't got it".

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does not result in a completely dead servo, it can affect servo operation to the point that competition pattern flyers consider servo pots as one of the weak links in current R/C systems. Many of the 'name' flyers religiously clean these pots, some as often as every fifteen flights.

The MRC MR-40 servo uses a pot completely assembled by its manufacturer under controlled conditions that result in the proper spacing and wiper tension all the time. The shaft rotates in a metal bushing, not plastic, and the wiper itself is more securely held with all metal fittings. The element is securely held in a metal case which is, in turn, firmly attached to the rest of the assembly. The drawback is the size, which is slightly larger than that possible with servos having the pot in an integral holder.

We are not discounting the thousands of servos of the other type in daily use, and the fact that they operate well enough for most of us. However, feedback pots are a problem to lots of flyers, and to the manufacturers who are looking for a better method and will someday find it. In the meantime, we feel that this type of pot starts somewhat ahead of the others, and in time may prove itself as the better mousetrap.

ACCESSORIES

All the harnessing terminates in small neat three-pin connectors, using gold plated mil-spec fittings. The switch harness has an additional charging cable, eliminating the need to unplug the battery in order to charge.

Servo mounting trays are available in the three popular configurations; two-by-two; two-and-one, and a single tray for wing mounting. The former two are supplied with the system, and are complete with all necessary grommets. The larger trays have two very nice features, one being that they hold the servos in place with clips, one on each end of the servo. It is completely secure, and eases the installation, specially for those of us who use the same radio in more than one airplane.

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saving. We don't care for the suggested method of attaching a push-pull wire to the switch, which involves drilling a hole in the switch knob. The material is too brittle for that, and quite often will lead to breaking the knob. We prefer and used one of the cap-and-lever arrangements available from a number of the other manufacturers.

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of 500 mah capacity. The charger is a small wall plug unit, transformer isolated, with independent polarized output cables and separate indicator lights. The charging current is 45 mls for each battery pack. The recommended charging time is 12 to 14 hours; approximate operating system time is 2-1/2 hours minimum.

The instruction manual covers all the features of this fine R/C system, as well as instructions for the proper care and installation. It even covers some non-radio subjects, such as prop balancing, which is important to the longevity of your system, engine and airplane.

There is a new accessory item, and though not included with any of the MRC radio systems, it is worthwhile considering. A loss of signal warning device, it is plugged into an available servo output, or tapped into a servo lead, and sounds an audible tone when a loss of signal or interference occurs. This month's Over The Counter has more details on the "REMOCALL".

FLYING

As can be seen from the photos, we installed and flew the system in a new Spickler Quickie 500. After making the range checks as described in the manual, and having a second cup of coffee to help cure the test-hop jitters, we fired up the K&B and let 'er go. Glen

Spickler's airplane needs no introduction, if you build it like he tells you, it'll fly. This one is no exception, we took a couple of turns around to field to check the trim and proceeded to check out the radio.

We flew far and high, as far as the eyeball permits, with the antenna aimed right at it. We flew far and low, again as limited by eyesight. We flew overhead at a good, safe altitude, and collapsed the antenna, leaving only one section extended, and aimed the shortie at the plane. We flew at the same time that systems on all of the other 72 mhz frequencies were in the air. Through all of this, the MRC 775 followed every command.

It has continued to do this, for all of the ensuing flights, which have been considerable. We've let every Mode One'r who has come around fly it, to give them a feel of the system, and to put as much flying on it as possible.

To date, this MRC system has met and surpassed all of our expectations, and we now fly it with the utmost confidence and enjoyment.

SERVICE AND WARRANTY

An important fact to be considered in the purchase of any R/C system is the availability of service, when and if it is required. MRC has available all the necessary facilities at their manufac-

turing headquarters, at 2500 Woodbridge Avenue, Edison, NJ 08817.

In addition, the following Factory Authorized Service Centers are located throughout the country:

Colby Evett, Evett's Model Shop, 1636 Ocean Park Blvd. Santa Monica, CA 90405.

John Heeren, RCSMR, 2803 Hastings Avenue, Redwood City, CA 94061.

David Hyde, R/C Specialties, 8823 Boundbrook Drive, Dallas, TX 75231.

Richard Frost, RAF R/C Avionics, 503 Berkley Drive, Arlington Heights, IL 60004.

Within one year from date of sale, as established by receipt of the dealer-validated warranty card, MRC will repair your system at no cost, if defective in materials or workmanship. This warranty is void if the system has been improperly handled, tampered with, serviced by other than MRC or their authorized service centers, or crashed. Complete instructions are included in the manual that should be followed when returning the radio for service, either under warranty, or for non-warranty work.

If you have a maintenance or flying problem you need to discuss with an MRC expert, one is available Monday through Friday, at (201) 985-7800. Your mail query will also get the same rapid and expert attention.

The MRC 775 System, available complete with a molded plastic carrying case with individual component sections, is priced at \$349.95. Additional airborne systems, i.e., everything needed to equip a second airplane, is \$250. Additional servos, should they be required, are \$39.95, and an extra battery pack is \$16.00.

As stated, we have flown and enjoyed the MRC 775, and can recommend it without reservation.

Hey!, Don't forget to get your FCC license.

Hannan Continued from page 52

incentive for you "think small" types to get into the act. Hint: How about some of those powerful, yet light motors employed in certain R/C servos?

AND SPEAKING OF R/C

... which we seldom do in this column . . . all the fretting about the "CB nuts" may be for naught. According to a recent UPI news release, increased sunspot activity may render Citizens Band radios "nearly useless", possibly as early as 1978. Quoted is Donald L. Lucas of the Department of Commerce, who says that the peak interference may last from 3 to 5 years, owing to ionization of the "F-2 layer" many miles above earth. Worst hit, according to Lucas, would be the frequencies between 15 and 40 megahertz. Well, there's always two tin cans and a string! (Then CB would stand for "Canned Baloney." wcn)

NEW CATALOG OUT

Phil Koopman, proprietor of Vintage Aero, has favored us with a copy of his offerings compendium. While the accent is on classic models, such as Ideal reproduction kits and plans, Vintage features many more goodies, including electric motors, CO₂ engines, accessories, balsa and bass wood, rubber, covering materials, and even bamboo. (Odd bamboo available only on special order). A bonus is the inclusion in the catalog of detailed instructions for building your own compressed air engine. One dollar to Vintage Aero, 1 The Glen, Tenafly, New Jersey, 07670, will bring your personal copy. 1/72 SCALE

Small plastic display models far out-rank all other forms of scale model building activities in terms of popularity. Traditionally, 1/72 scale has proven the most popular size range, and many American enthusiasts seem to have the notion that World War Two identification models were the first to appear in that scale. Not so, by a long shot. These models were well established in both kit and published plans form in the United Kingdom before the war, but the best substantiated claim to the "invention" of 1/72 scale for aircraft model use has been put forth by P.T. Capon, of England.

Regular Hangar readers may recall the photo of P.T.'s tiny matchstick models which appeared some time ago.

In a letter to CONTROL COLUMN, Mr. Capon told how he started making 1/72 scale models: "... I got a job at Greaves & Thomas, who before the war, made furniture (I believe they still exist) and around 1917, were making Avro 504 wings. I was the shop boy who had to get in around 7 am, light the fires for the glue pots, and then sweep the floors. ... I used to wear a carpenter's apron with two pockets in the front, just large enough to hold the wings and models I used to whittle. At weekends, I used to cycle to sketch details of the Royal Navy Air Service machines at Chingford.

My first model was of an Avro 504, and it was quickly snapped up by one of the chaps so he could show it as an example of his war work. This quickly led to more orders and, so I could 'keep cracking' when not sweeping floors, etc., I used to carry bits of wood for wings and fuselage in my apron pockets. The span of the old 504 was 36 feet so a model of 6 inch span fitted nicely into these pockets ... so, as far as I am concerned, 1/72 scale was born! I seem to remember writing to 'Aeromodeller' re this some years ago, when someone claimed to have 'invented' the 1/72 scale, which I pointed out, was on par to claiming he had invented the foot-rule. But, so far as I know, as you carefully note, I was the first to use this scale, and shall be interested to see if anyone can produce evidence that they 'got there before me!'"

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SCALE ON A STRING

Lou Crane noted our comments regarding the control line scale model shortage, and wrote in to say: "As you mention, and as contest summaries do reflect, other events draw more entries, please highly competitive fliers more, and actually pay for the meets." Lou points out that this situation is self-perpetuating, unless a way can be found to change things. The Omaha CL fliers considered a separate, Concours-type judging, in which models either *required* scale outlines (Goodyear, Class I and II Carrier); *encouraged* it (Balloon Bust/Dive Bombing); or since impressively realistic Stunt/Precision Aerobatics models frequently appear at contests, they might be grouped within the event for appearance judging. This was not even so far along as stand-off judging. The only requirement was that the model would have to be entered *and flown*, in one of the contest events.

The judging expected was to be either super-harsh (IPMS ... International Plastic Modellers Society ... static model builders, could be most demanding), or merely honorary (impression upon local officials, for instance), or some blend. Initial planning was for *category* Concours winners, and an additional trophy (or 1, 2, 3, set) for the *overall* best model. Thus only mini-

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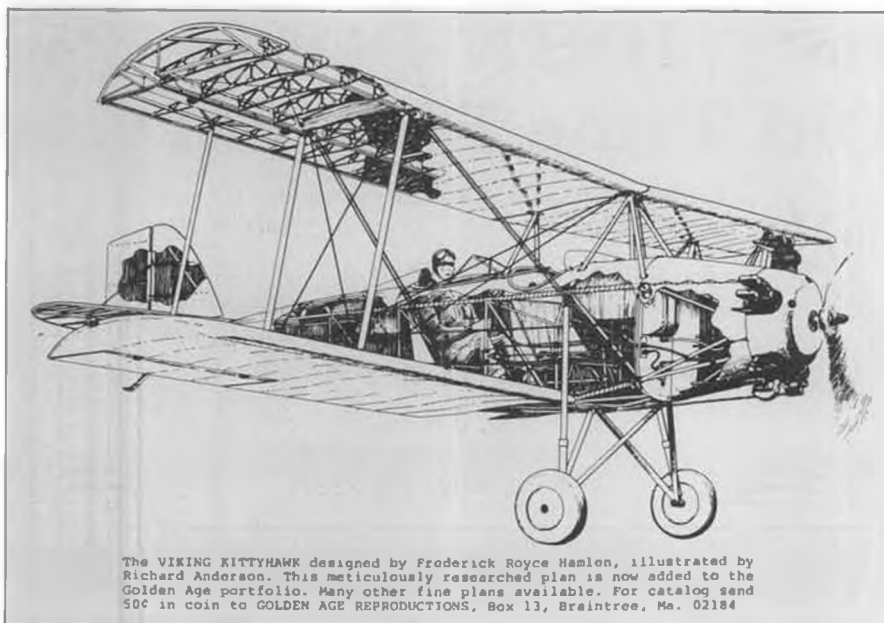
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mal additional judging and awards would be invested.

"Every contest is ultimately a comedy of errors", says Lou, "Some made prior, some during, and even some after. We didn't quite get to put this one through, but the idea of separating flying events and appearance events still seems sound to me, due to the showcasing advantages, both for our own boasting, and for the introduction of the non-modeling public to the challenges of competition flying. Unless someone else has hung a name on this type of parallel event, I'll continue to



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consider it Omaha CL Scale Supplement Formula. Possibly the recognizability of scale-looking planes would help the audience of non-fliers half-way cross the gap between their unfamiliarity with our noisy toys, and our fanaticism in enjoying them at their finest!"

That this may indeed be a workable way to encourage at least semi-scale model participation, may be garnered from the results of a profile scale CL event staged recently by the Valley

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Circle Burners. With only limited publicity, more than a dozen entries appeared, according to the "Patty's Pinkie" newsletter. And the variety attracted was outstanding; with such interesting subject choices as a Westland Whirlwind, a five-engined Heinkel He-111z, a Fokker T.V. twin, an F7F-3 Tigercat, a Martin PBM-3D, TB-25N camera plane, Aero-star 600, B-25H, Dornier 335 (push-

pull), Junkers Ju 52 trimotor, Lockheed P-38 Lightning, P-38 "Yippce", and an OV-10. What a pleasant contrast to the usual "dull" entries!! If the momentum can be maintained, perhaps the enthusiasm could be gradually transferred to more "serious" types of CL scale models?

HOW'S THAT AGAIN?

Sign in a local hobby shop window: "SPECIAL SALE THIS WEEK, 1/4 MIDGET PYLON RACERS, MARKED DOWN FROM 3/8."

THE TREND?

During the recent Flightmaster annual all-scale model contest, for many years one of the largest of its kind, we conducted an informal survey of the entries to determine the relative mix among competition categories. Years ago, free flight gas models dominated in terms of sheer numbers present, with much less interest in other classes. The ratio, however, has undergone considerable change over the years, perhaps reflecting an alteration in life styles. This year, NO control line models were on hand, as a pre-contest survey has indicated too little interest (Through an unfortunate break-down in the postal service, Noel Hess journeyed all the way from Salt Lake City, Utah, to enter control-line, unaware that a contest brochure had been mailed by way of notification of the categories being flown).

In the R/C section, only two models appeared, truly a pity, as Southern California abounds in R/C scale enthusiasts. Six CO₂ models and four electrics were on hand, yet only about three "gas" jobs (including diesels) arrived.

Fifteen "regular" rubber-powered scale models and some 34 Peanuts were entered, clearly dominating all other categories. We took a brief sampling of opinions, trying to determine the causes for the transition, and arrived at the following explanations:

The pre-contest publicity was not as wide-spread as it might have been, especially among non-club members (which possibly includes many R/C fliers). Second, although interest is growing, electric power and CO₂ enthusiasts are still relatively few in numbers. Third, Rubber, the *original* form of model power (not counting gravity, of course) seems to be experiencing a resurgence in interest. The usual advantages cited are: silence, simplicity, flexibility, high power-to-weight ratio, and low cost.

Fourth, concerning the predominance of Peanuts, reasons advanced included: minimal construction time, low cost, and ease of repair. Incidentally, one Peanut was entered in the "regular" rubber scale class, and was definitely competitive with the larger models.

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Entrants and spectators came from as far away as Scotland, Utah, Arizona, Nevada, and Texas, adding greatly to the meet's excitement and enjoyment.

However, we would certainly like to see a larger turnout in the various categories next year. All branches of scale modeling deserve perpetuation, and a few observations and suggestions may be appropriate: Many potential entrants tend to be shy and reluctant to compete. Actually, the odds are not as great as they may appear. Many outstanding appearing models fail to fly for one reason or another, and Lady Luck exacts her toll almost every year, eliminating a few contenders. And after all, participating is half the fun, not just the winning . . . without losers, how can there be winners? One thing is certain, you can't win if you don't enter, and in Flightmaster contests, everybody takes home at least a merchandise prize! Get in there and try!

As for you "experts" who DO participate regularly, how about trying a class outside your own specialty? It may prove an interesting change-of-pace, and the different disciplines required will almost undoubtedly benefit your overall modeling proficiency.

SILLY SIGN-OFF:

According to the Summer WEST COASTER, the folks in Buffalo, New York, are celebrating the BISON-TENNIAL.

Rocketry . . . Continued from page 36

ing up, there should be no problems.

Speaking of the Contest Calendar, the NAR's Membership Committee has recently begun sending out a Newsletter incorporating the Calendar as well as other information that relies on timeliness, such as a current list of engines contest-certified by NAR Standards and Testing and their current ratings. The Newsletter (title's a bit unimaginative, fellows) is a temporary measure, and its future depends on a decision by the Board of Trustees. Personally, we can

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see a definite role for a "quickie" publication of this kind, designed not to usurp the fancier-and-more-complete Rocketeer but to take over the function of fast, wide-range distribution of information among the membership.

Space modelers have always tended to form clubs, and these clubs tend to publish remarkably good newsletters. We've seen literally hundreds; there were more than twenty entered for last year's NAR Newsletter Award. Some of these grow to the point of becoming

small magazines, such as the Buffalo Section's "Satellite", which has a very large distribution; but often the best articles and most interesting information are to be found in the dittoed-and-stapled specimens that circulate only among the club's membership and friends. Keeping tabs on the newsletters is the best way to tell what spacemodeling is doing; and now that your loyal author has left his position with one of the major model rocket manufacturers, we've been regrettably out of touch. So

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we are asking that clubs and newsletter editors that read this column send copies of their publications, which we will review monthly in our Howzat-Grabya Department. Send copies to the Model Builder editorial office, so that they can have a chance to read 'em, too.

The model for this month's review currently holds the US Class 5 (F engine) altitude record. This fact alone makes it an interesting topic; but when we add the note that the model which set the record was a display model, covered with draggy striping tape and decorations, and never intended for contest flying at all, it becomes more than inter-

esting. The kit is the EOS, from Flight Systems, Inc., 9300 East 68th St., Raytown, MO 64133.

EOS is long and thin, which helps to account for its unusually good performance. It's size proved to be an advantage in the record attempt; even though a smaller model would have performed better, the trackers had no trouble focusing on the EOS! Several points are worth mentioning in the construction of the kit. For one thing, FSI uses specially-designed body tubes, which have a superior strength, resist warping because of the glue used in rolling, and

to top it all off, are covered with a final layer of paper selected because of its ease in painting. The transition section between the body sections is lathed rather than ground, and consequently the fit is much more precise than is usual. Finally, FSI makes all of their centering rings and engine mount rings out of plywood, which is much more expensive, but far more durable than the standard cardboard rings. These features combine to make most FSI kits darn near indestructable.

The engine used for the record-setting flight was an F7-6. We've had occasion to mention the F7 before in these columns, and we cherish a great deal of affection for the old "Steam Machine." The F7 comes by its nickname by virtue of its 9-second thrust duration, the longest available. Compare this with the widely-used C engine, which usually sports a thrust duration of 1.5 seconds, and it becomes obvious that F7-powered flights are long, graceful, and *high*! There's a catch, however.

The F7 pays for its long thrust duration with a very low average impulse. This fact alone has made the Steam Machine controversial; modelers expecting to lift a heavy display or scale model with it ("Well, it's an F, isn't it?") find that it either sits on the pad spitting out smoke or gets just high enough to crash. The F engine picture is a perfect example of the importance of the thrust programming, or the way in which the engine delivers its power; the other FSI F, the F100, only burns for .6 seconds but develops a liftoff thrust of forty pounds.

A model with the Steam Machine as a powerplant should be highly stable, since you won't be able to rely on force to correct a deviation in flight path. It should be light; although the F7 can, in a properly-designed bird, lift payloads (we've had successful transmitter and eggloft flights), any unnecessary weight hurts your stability by holding down airspeed. And most importantly, there should be *little or no wind* when you fly an F7. Rockets have a tendency to



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weathercock, or fly into the wind; if there's a 5-mph breeze on the flying field, but you just can't resist flying a Steam Machine, you're likely to be treated to the charming sight of your model heading for the horizon under full thrust. This causes the model to be recovered somewhere in the vicinity of Ware County, Nevada!

The mechanics of launching model rockets is a problem that has seen many different solutions. By far the most elegant one we've seen is the Powr-Pad, a launch system sold by Centuri Engineering, Box 1988, Phoenix, AZ 85001. The Powr-Pad encloses the launch support structure, electrical power supply, and control system into a single unit. The basic structure is clamped onto the terminals of a common 6-volt lantern battery. This structure supports the two-piece launch rod, the blast deflector, and a tilting device. A handle to one side neatly cups the launch control panel, which has twenty feet of wire wrapped around it. The lantern battery serves two functions: power for ignition, and weight to support the model at the moment of launch. This system is the last word in portability; just grab it and head for your favorite field. At the launch site, set it firmly on the ground, pull out the launch control panel, and unreel the wire. Presto . . . complete launch system.

The battery is good for up to 200 launches. The system is great for all but the largest models, and those which use clusters of engines; since the electrical supply is limited to six volts, it shouldn't be relied on to fire more than one igniter at a time. The type of igniter used is also very important; the less power it takes to fire it, the longer the battery lasts and the sooner the party starts once you hit the button. The Centuri Sure-Shot, now included with all of their engines, is excellent. The FSI Electric Match is the most sensitive igniter available; if the battery is fresh, the current used to check continuity will probably fire the igniter. Estes Solar igniters are very good, but a bit fragile.

The standard Estes igniter will work if the battery is good. Finally, the FSI WireWick Ignitor will work OK, but bear in mind that the distance between the micro-clips determines how much juice it's going to take to fire the ignitor; as the battery gets older, it's going to get trickier to hook up the ignitor properly. The Powr-Pad will fire all engines, up to and including F's and staged models; just remember the advice on clustering.

In the near future, we'll be devoting a lot of space to Centuri's newest kit, the much-publicised Eagle Transporter from "Space: 1999." Our project to scale the vehicle based on this very excellent kit is nearing completion. It's

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been one of the most exciting scale projects we've worked on, especially since we had access to still pictures from the show to work from. Estes has just sent along their new Space Shuttle model, and at first glance we are very impressed indeed; we'll use some of our NASA data on the real Shuttle and give the ship a real workout.

Of interest to you glider enthusiasts, we've gotten word on two very interesting designs. First, from those innovative people at Kopter Rockets, we received a Moray kit. The kit's delta-wing design and its really unique elevator actuation system make it a fascinating project;

we'll have in-depth info soon. You can get a Kopter catalog from Kopter Rockets, Box 98226, Pittsburgh, PA 15227; it's 25¢. Next, we have an entry into the world of rocket gliders by the Union Stadt Zeppelin Works, a company which we understand makes Peanut scale models. Their two kits, the Pterodactyl and the Fledermaus, are very unique models designed for mini-engines.

An in-depth review is in the works; meanwhile, you can get full information from the Union Stadt Zeppelin Works (lovely name!), Box 467, Union City, CA 94587.

And in this month's Howzat-Grabya



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Department, we have a picture kindly submitted by Bob Kaplow of a plastic Airfix Saturn 1B at the moment of takeoff. This plastic kit lends itself to flight conversion very well, and this excellent model placed well at NARAM-18 last August. Also from the NARAM, we have a shot of a large, bewildered-looking Range Safety Officer hard at work. Yes, it's your friendly author, and we're wondering if we'll have any friends left after doing our job at that particular moment. Finally, we have two shots of the launch of a Black Brant 2 scale model passed along by FSI. That's FSI's President, Lonnie Reese, hooking up the model; he'll do anything to get his picture in a prestigious national magazine.

Finally, it's time to start planning to attend the 12th annual Pittsburgh Spring Model Rocket Convention, which has heralded the beginning of each contest year since time immemorial. Held every March by the Steel City Section, it is truly a major event, with discussion groups on a very wide range of topics, manufacturer's displays (often accompanied by important announcements), NAR business and committee meetings, and the world-famous Film Session and Songfest. We strongly recommend the PittCon for winter-weary modelers; it's a good chance to let all of your friends tell you all of their best ideas, since you'll still have time to build 'em before the major meets start! Contact Kevin Barkes, 205 Emerson Ave., Munhall, PA 15120 for the Convention info. See you there!

Don Quixote . Continued from page 17

from fiberglass, as I did on my first Don Quixote. However, on the second one, I made a dummy cylinder head as the muffler, silver-soldered together from 1/64 steel or tinplate. It works quite well, and looks more realistic.

WING

First, cut templates "W-2" from 1/8 plywood with the cut-lines for dividing the ailerons marked on them.

Put the templates together and drill the three holes for the guide wires.

Sandwich 13 pieces of 3/32 balsa between the templates, with guiding holes through them and sand them to the shape of the templates while clamped solidly in a vise.

Drill the hole for the aileron pushrod wire.

Now do the same for the other wing.

When both sets of ribs are done, cut the templates at the line marked for the aileron division and sandwich 12 of the finished ribs between these new templates. Cut off the ends of the ribs and save them for use for building the ailerons.

Cut new "W-2"s and "W-5"s from 1/8 ply and drill the holes in "W-2" for

the 3/16 and 1/8 wires.

Cut "W-1" from 1/16 ply with the same holes as "W-2".

Now, cut out a 1/2 inch wide strip of 1/16 balsa and pin it down over the plan on your bench with the edge of the strip flush with the back edge of the bottom main spar (5).

Pin the bottom spar on top of it and pin the trailing edge (23) made from 1/16 spruce in position.

Pin down strip (15) at the aileron hinge line.

Glue all ribs except "W-1" and "W-2" over top of these strips and install the top main spar (4) over them.

Thread the back spar through the ribs.

Where the ailerons have been cut out, pin the spar to the back of the ribs to keep it running true and straight all the way to the tip.

Now glue on the leading edge spar (3) and top trailing edge strip (23).

Between the ribs, fill in the space between the spars with 3/32 balsa sheet webbing (18) with the grain vertical. Where the wing struts will join the wing, glue in 1/4 inch plywood (12) with holes pre-drilled for the wing strut attaching plates (13).

Glue 1/8 balsa strips (21) and (22) on the top and bottom of the rear spar at the aileron cutout, and glue in spruce or balsa top strip (14).

Cut out the 1/8 inch plywood sides for enclosing the piano-wire wing joiners within the wing spars. Cut 4 of each (9) and (10).

Now take the finished wing center section and lay it down in line with the wing root. Put the piano wire joiners in place, spread glue on "W-1" and "W-2" and slide them down the wires into position.

Slide the wing onto the wires and line everything up, prop the wing tip up 1/4 inch for dihedral.

Glue in one side each of (9) and (10) to the spars and enclose the wire with 1/4 inch spruce on the angle it passes through the spar to keep it at the proper dihedral angle. Then glue on the other side of the enclosure using lots of epoxy.

The rear 1/8 inch piano wire (2) is stitched directly to the rear spar and saturated with epoxy.

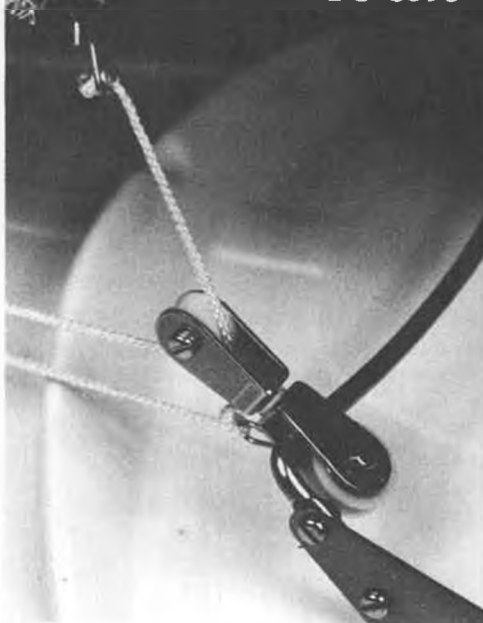
Glue in the 1-1/2 inch wide 1/8 ply bellcrank mounting plate and pass the pushrod wire from the servo to the bellcrank, and the linkage wire from the bellcrank to the aileron horn.

Install the mounting lugs (13) for the wing struts, made from 1/16 brass or steel.

Glue in triangular corner braces (11) and (12) as shown on plan.

The top and bottom of the leading edge is sheathed with 1/16 balsa to the back of the main spar, and the root of the wing is sheathed in completely as shown on the plan.

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Glue cap strips on all the ribs.
Cut the wing tips (25) from 1/4 inch balsa.

The ailerons are built up using the backs cut from the wing ribs. Don't forget the 1/4 inch plywood mounting plate for the control horn.

The wing struts are made from K&S 1/2 inch Streamlined Tubing. Cut the tubing to the proper length, then cut 1/4 inch wide strips from brass or steel and bend and solder it around the tubing to form eyes for bolting them to the wing and fuselage lugs.

Fill the space between the strips with hardwood as shown on the plan and glue them into the strut tubing with epoxy.

When set, drill two holes sideways through the plugs and tubing and pin them with wire or thin aluminum tubing

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epoxied in place to prevent the plugs from pulling out of the ends of the strut tubes.

HORIZONTAL STAB

Cut out templates "S-1" and "E-1". Stack and sand the ribs.

Pin down the trailing edge of the stab (30) and the leading edge spar (27). Make sure that the center lines of both are on the same level.

Glue all ribs (S-1) between them. In the center, glue in the 1/4 inch balsa stiffening member (29).

Sand everything down to the correct shape and glue on the 1/16 balsa sheet-

ing extending past the trailing edge by 1/8 inch.

Glue on the 1/8 balsa leading edge cap and wing tips (37).

Start the elevator by pinning 1/16 balsa strips (32) over the plan at the leading edge and (36) at the trailing edge.

Glue the ribs (E-1) on top of the strips, and add the leading edge (31). Glue on the other (32) and (36) strips at the L.E. and T.E.

In the center, glue in the 1/4 inch plywood control horn mounting plate.

Sheet the center section as shown on

the plan and capstrip each rib.

Glue on the balsa tips (38).

Sand down the leading edge to a round contour.

FINISHING

Everyone has his favorite method for finishing an airplane. Here's how I did mine.

Cover the flying surfaces with Coverite.

Give them two or three coats of clear dope, sanding lightly between coats, until the surfaces are smooth.

Paint the fuselage with two coats of clear epoxy or dope.

Fill any holes and dents with your favorite filler.

Sand between coats and VACUUM after each sanding. It works much better than any tack cloth I've ever tried.

When smooth, give it one coat of primer (I used K&B) and sand with wet sandpaper until there is very little primer left. Vacuum again when dry.

Apply two light coats of the white base color to the whole airplane . . . I used K&B epoxy. Wet-sand and vacuum between coats.

For the red trim and black lettering, start by spraying the whole airplane with a great new product . . . Flite Glass Models' LIQUID MASKING FILM. When the film is dry, cut out the templates for the design on the side of the fuselage from thin cardboard.

Go over the lines with a sharp knife, cutting through the Liquid Masking. Note: LIGHT PRESSURE!

When all the lines are cut, peel off the sections which will be painted black and do them first; then do the same to spray the red parts. Give two coats of red (lightly) and peel off the rest of the masking film while the red is still tacky.

Do the same for the white canopy frame.

Hinge the control surfaces . . . Goldberg's Hinge Slot Knife does a beautiful job here. Because the airplane flies so slowly, pinning the hinges isn't really necessary; just epoxy them directly into the slots.

Install the radio.


The receiver is held by rubber bands around block (78) between bulkheads "E" and "F".


The battery must go all the way to the front, in front of half-bulkhead "A-1". Some ballast will probably be required.

The C.G. should be as shown on the plan.


If the engine can be run backwards, you are all set to go. I am using a Veco .61, reversed by simply rotating the front rotor housing 90 degrees to the left (exhaust side).

If your engine is non-reversible, Punctilio (English) has just come to your rescue with an 11/7-1/2 pusher prop. Hopefully, it is available in your





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area. If not, check the mail-order houses.

The fuel tank should be pressurized. An engine with the new Perry pump would be ideal, due to the low tank position.

However, I can get my non-pump engine to run beautifully every time. Because the model is not designed to fly upside-down, the needle-valve can be set to draw properly in the upright position only.

FLYING

Both of my Don Quixotes flew hands-off the first time out. If you have set yours up exactly as shown on the plan, you shouldn't be in for any drastic surprises, either. In level flight, the elevator should only be a couple of degrees up. If it takes any more than that, you need to remove some lead from the nose. If the trim changes with different throttle settings, the thrust line is fully adjustable to compensate for it.

On grass surfaces, you may have to hold the elevator full-up for a few yards to keep from nosing over. Don't forget to let off again when she lifts off. You'll be comforted to know that this airplane will not snap over if you do happen to "mush off", but let's not press our luck just the same.

Landings are just as easy. Just cut the throttle and let her settle back to earth, easing the stick back a trifle just as the wheels touch.

All in all, she's an easy, relaxing airplane to fly, and I hope you have as much enjoyment from your "Don Quixote" as I'm having from mine. Happy flying. ●

Remotely Continued from page 19

encourage traveling to other competition sites, you're putting high expenses back into it. Of course, modelers already travel great distances to compete with hand launch gliders, Pennyplanes, Peanuts, and the like, so this may be a pointless argument.

Somewhere along the line, the Quixy 500 racers came into the act. So far, these 500 sq. in., front rotor 40 powered, club type racers have maintained their purity and provide the backbone of large size aircraft racing in the less prominent district and local contests. Long may it remain at this level!

Now we see that England is introducing still another pylon category, for .19 engines, called Club 20. Upon reading about this, our first reaction, and the whole point of this essay, is that if we don't stop coming up with new racing categories, we'll soon be spread so thin that there won't be enough fliers in any category to hold a race! With .049, .15, .19, .40, and .60 events, each with its Standard and Expert pilot classes, we've almost got separate racing events

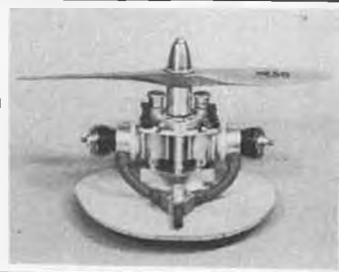
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Lessee . . . how about .010 and .020 events with pulse rudder-only? And at the other end, how about twin .40's? The sound of eight racing .40 engines in a four plane heat ought to be enough to wake the dead!

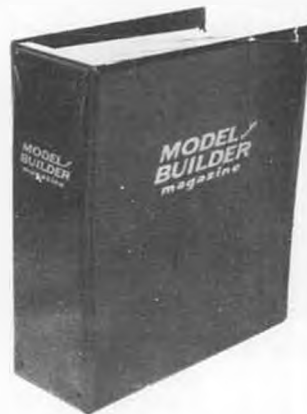
CHICKEN SCALE

We'd like to suggest a new R/C scale category. This new category will not impose any hardship on many modelers, because they already have aircraft that fit the category. We are referring to AMA Scale type models that are now being entered in Sport Scale . . . models that are paneled, riveted, aged, smoked, battle-scarred, paint scratched, instrumented, and what have you. Many airplanes of this type, that could compete very well in AMA Scale, are being miscast as Sport Scale models. They don't belong in Sport Scale, and if their owners don't care to enter AMA Scale, the Chicken Scale is their category.

An alternative to the above would be a new category for true Sport Scale models, which would get us back to the original intent . . . an event for easily built, non-detailed scale models with the emphasis on flying! Perhaps the name should be "Stand Way Off Scale", and true to its meaning, the judging should be done from such a distance, like 50 feet, that all the AMA Scale type detail junk would not be dis-

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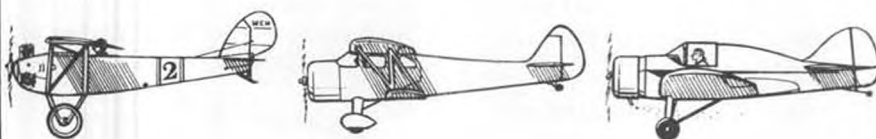
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cernible without binoculars!

The paradoxical Sport Scale rules call for judging from 10 feet, but this is measured from the center of a circle in which an 8 foot span model could be sitting! Not only that, workmanship and finish are two of the static judging factors, both of which require close scrutiny in order to determine score.

At 50 feet, a two inch scale model is being seen as a real airplane that is 300 feet away. At this distance, you can judge scale outline, you can check for proper markings, and you can check the colors. Workmanship and finish cannot be determined at this distance, and *that's the way it ought to be*. Then, if the AMA Scale detailer wants to enter his model in non-AMA Scale (whatever the name), just make sure the static judge doesn't see the model close up until *after* he has judged the model at 50 feet. After all, human frailty being what it is, you couldn't blame the judge for being influenced by neat workmanship and clever detailing if he saw it in advance.

FOAM FINISH FLASH!

Midwest Products Company, which produces several molded styrofoam R/C kits, will be awarding trophies to 3rd place for the Best Finish on All-Styrofoam R/C Airplanes, at the 1977 Toledo Weak Signals R/C Conference.

Any type model . . . power, sailplane, electric, scale or original design, is eligible.

Airframe must be all-styrofoam, but wood reinforcing spars or longerons will be allowed.

Stiff covering materials, such as wood, cardboard, or rigid plastics will not be allowed.

Paper or shrink film is OK.

Any paint compatible with styrofoam may be used.

Model may be scratch-built or from any manufacturers kit. ●

Workbench . . . Continued from page 6

"The trust fund should be generous (\$10,000?) to have a trophy worthy of the one we honor, and at the same time, provide annual sum for traveling expenses of the recipient(s) to Washington, D.C., and to pay for the replica which will be kept. In many ways, this Award is a challenge to the maturity of our hobby.

"Time is short if we want to have the Award ready for presentation by May 27, 1977. Your help and cooperation will be needed. It is an effort that encompasses the entire spectrum of model activities. AMA President, John Clemens, I am sure, will appoint a committee to coordinate our mutual

effort."

Send your ideas to Frank, care of Model Builder, or direct to his address:

Box 135, Northridge, CA 91324.

THINGS TO DO

The annual WRAMS trade show in White Plains, New York, is scheduled for February 26 and 27. As in the past, it will be held at the Westchester County Center. An official announcement will appear in the January issue of Model Builder.

* * *

On Saturday, February 12, 1977, the Central New York Model Aircraft Association is sponsoring an R/C model aircraft symposium in conjunction with the formal presentation of Harold DeBolt's induction into the AMA Hall of Fame. The symposium will be held from 10 am to 5 pm, with the dinner beginning at 7 pm. Both the symposium and dinner will be held at the Syracuse Hilton Inn, in Syracuse, N.Y. Noted R/C modelers will be in attendance, and some of these, plus other top name modelers, will "roast" Harold DeBolt at the dinner.

The symposium will be \$3.00 (\$1.00 for anyone under 15), and the dinner will be \$8.00 per person, including tax and gratuities. Tickets may be purchased in advance no later than February 5. Send check or Money Order, and S.A.S.E. to: C.N.Y.M.A.A., 2104 W. Genesee St., Syracuse, N.Y. 13219.

TO BUY OR NOT TO BUY . . . LOCALLY

This is the title of an article published in the "Ram's Horn" newsletter of the Radio Aero Modelers of Seattle. It was written by one of the co-editors; either Brian Welander, who is also President, or Ed Berman, who is also Sec./Treas. of the club.

Everyone likes a "deal". But is it such a deal buying from mailorder "discount houses"? Have you figured in the cost of postage, COD fees and return postage if you need to replace the part? Have you considered the "out of stock" delays, additional postage on split shipments and the confusion of collecting credits for unshipped items? By the time you get it all together you sometimes find that it has cost you close, the same or possibly even more than if you had picked it all up off the shelf at one of the local hobby shops. When the particular item you had in mind is not on the shelf, you can usually find an alternate item that will function just as well. Some shops even offer discounts, especially on "big ticket" items such as radios. Next time, check it out and compare discount vs. local. That big deal might be just around the corner.

A second point to ponder touches

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DON'T WASTE TIME - To find any plan, article, or three-view in Model Builder (prior to January 1976), you must have the new MODEL BUILDER Index and Digest, compiled by Paul Plecan, P.O. Box 1810A, Garden Grove, CA 92642. \$1.50 per copy, postpaid.

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upon our "using" local hobby shops, in the sense of taking advantage of them. We, the RAMS, hit the proprietors up for freebies and cash all year long; please contribute merchandise for the R/C Show raffle, how about something for contest prizes, wanna buy an ad in the RAMS HORN, etc. This gets multiplied by other clubs' requests. It isn't hard to imagine over \$1000.00 a year going out to local clubs for these purposes. Estimating net profits in a lean year for the industry (like this year) we potential customers would have to pump back over \$10,000.00 in local purchases before the owners really started to see some true profit returning from their good will or "advertising".

And let's face it, they are here to make profit in exchange for providing a useful

and desirable service to us.

So, let your conscience be your guide. If you want to continue to put the arm on the local shops, you are going to have to be ready to make a 100% commitment to support them with your purchases. If you want to buy your big ticket items from the discount houses, be ready to quit asking for handouts from the local shops. Those handouts can come only from your purchases. In effect, you are going to have to face up to your responsibility of paying your own way. You can't, in good conscience, continue to ask for the benefits of having it both ways.

WARNING!

K&B's John Brodbeck sent us a copy of the following excerpt from the October 1976 issue of "Plastics".

FULL-SIZE PLANS SERVICE

(with instructions)

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R/C scale model of Polish homebuilt, 86" span, pusher engine. Laddie Mikulasko.

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Winner of Senior 1/2A Stunt at the 1976 Nats. Two fuselage plans. Felipe Alvarez.

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Hull lines drawing and dimensional sail plan for A-class sail yacht. Adrian Brewer.

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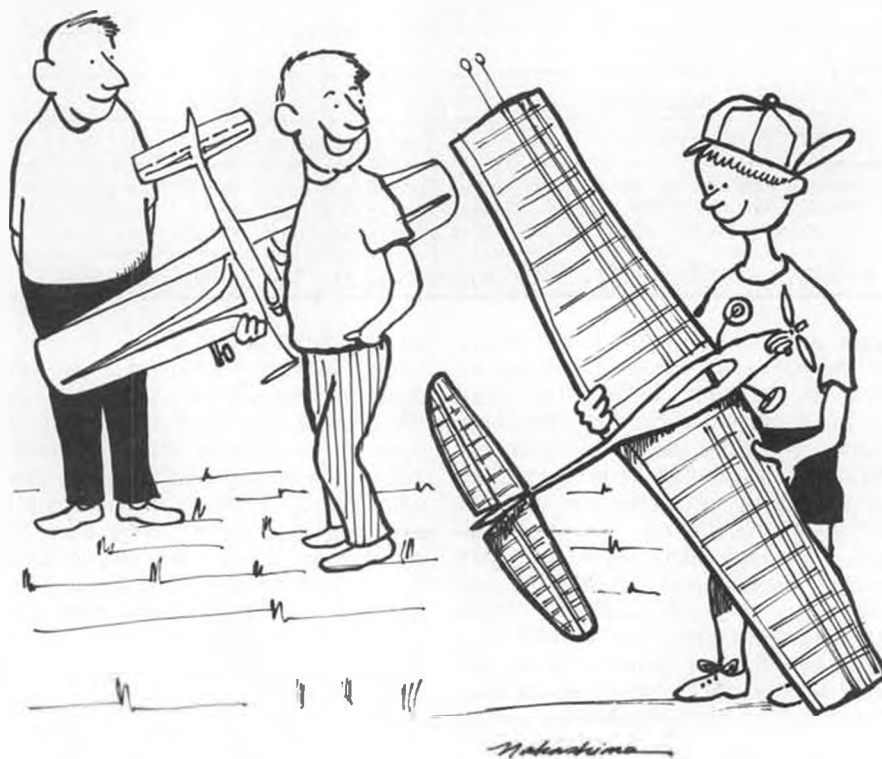
John adds the precaution that nitro benzene is not only similar, but does the same to your body, if not worse. AMEN!

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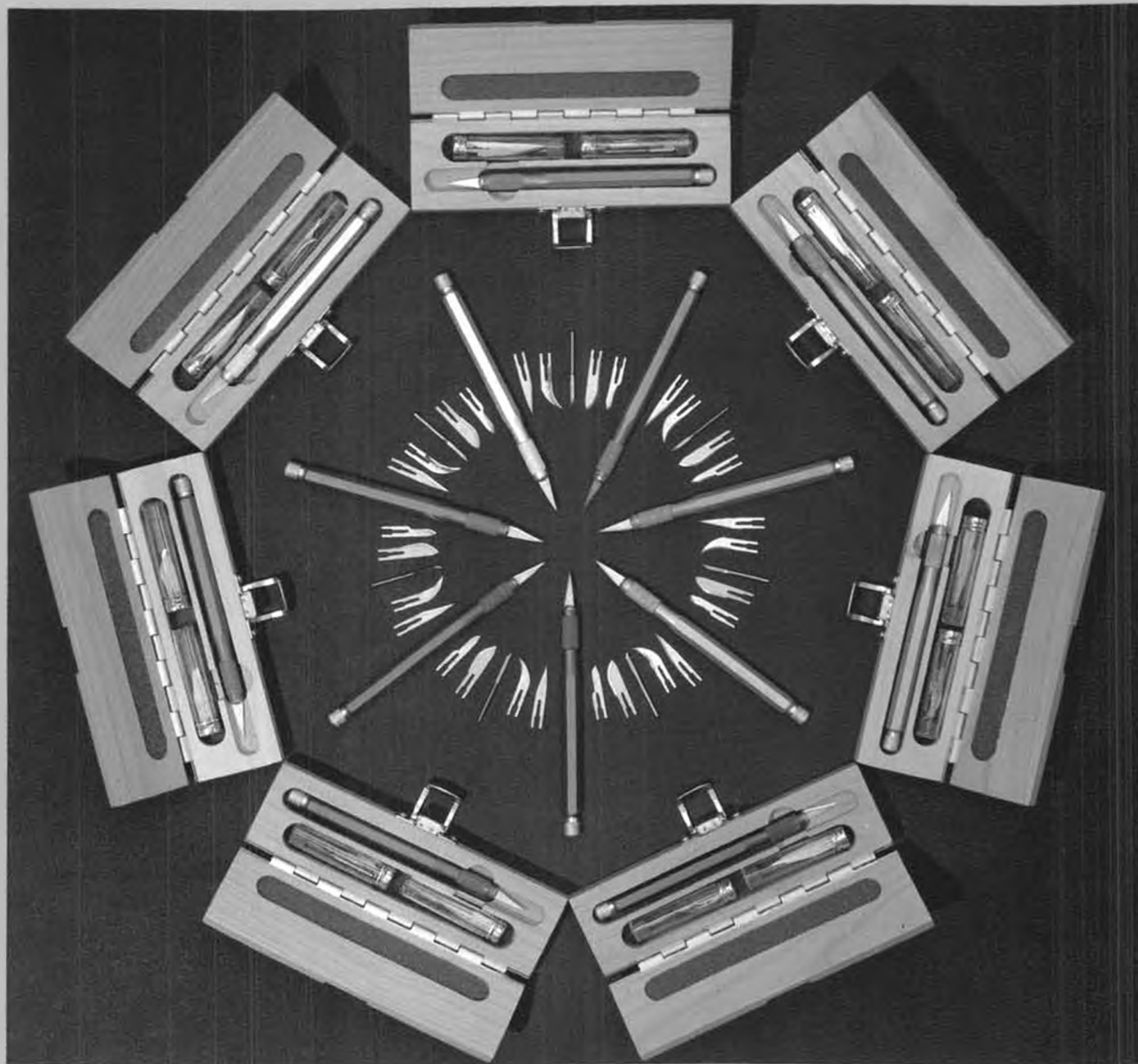
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