

# MODEL BUILDER

volume 8, number 79

\$2.00

AUGUST 1978



**EXPANDED R/C COVERAGE!**

## Power

MRC-Enya engines are for everyone. We've got power outputs that range from .2HP to 1.7, (even without a tuned pipe), and engine sizes from .09 to .60. All to cover the needs of the beginner, Sunday flier and the expert.

## Reliability

It's a legend with MRC-Enya. Our engines are out there season-after-season, Sunday-after-Sunday, doing their job and doing it well. And that's because they're made better to last longer. For instance, the hand lapped, matched piston and cylinder assembly used in many MRC-Enya engines is just one example of why our engines run on and on and on. Hand lapping is an expensive and slow process. But it yields the best, cleanest, lowest leakage fit between piston and cylinder. And that spells reliability.

## Versatility

MRC-Enya engines are available in a broad variety, including marine and U-Control versions. Some are basic cross flow ported loop scavenged engines, others are our complex Schneurle ported, high performance "X" type.

Whatever you need, from U-Control to helicopters, from pattern planes, to Deep Vee boats, whether your interested in competition or Sunday sport . . . let MRC-Enya be your guide for engines that are built to last. See them at your hobby dealer.

### MRC-Enya sport flyers hand lapped engines with bronze bushings

	Max. HP less muffler	RPM		Max. HP less muffler	RPM
.09 III	.2	8,000-16,000	.19 VI TV*	.36	2,500-14,000
.09 III TV*	.16	2,500-13,000	.29 B IV	.8	9,000-17,000
.15 IV	.33	8,000-16,000	.29 B IV TV*	.5	2,500-13,000
.15 IV TV*	.28	2,500-14,000	.35 B III	.8	8,000-16,000
.19 VI	.42	8,000-16,000	.35 B III TV*	.6	2,500-13,000

### MRC-Enya Schneurle ported engines—ballbearing supported shafts and G type carburetors

	Max. HP less muffler	RPM
.19 X TV	.55	2,500-19,000
.40 X TV	1.2	2,500-17,000
.45 X TV	1.3	2,500-17,000
.49 X TV	1.3	2,500-16,000
.49 X TV Helicopter	1.3	2,500-14,000
.60 XF TV	1.7	2,500-16,000

### MRC-Enya engines with ballbearing supported shafts

	Max. HP less muffler	RPM
.19 VI BB	.46	8,000-18,000
.19 VI BB TV	.40	2,500-16,000
.29 IV BB	.85	10,000-18,000
.29 IV BB TV*	.55	2,500-13,000
.35 III BB	.85	10,000-17,000
.35 III BB TV*	.65	2,500-13,000
.40	1.1	9,000-16,000
.40 TV*	1.0	2,500-15,000
.45 II	1.15	9,000-15,000
.45 II TV*	1.05	2,500-14,000
.60 B III BB	1.45	9,000-14,000
.60 B III BB TV*	1.3	2,500-13,500
.60 B III BB TV-G8*	1.45	2,500-14,000

\*Also available in marine version. Tuned pipes and mufflers available separately.

BB—Ball Bearing  
TV—Throttle Valve  
G8—Special Carburetor



# MRC-Enya's Sunday flier's guide



Model Rectifier Corp. / 2500 Woodbridge Ave., Edison, N. J. 08817

In Canada: 3440 Pharmacy Ave./Scarborough, Ontario, Canada M1W2P8

# TOP FLITE

is  
**REALLY BIG**  
in props

As the world's really big name in props, Top Flite has the right size for every kind of flying. From free flight to today's really big R/C birds, each Top Flite prop is precision machined from only the finest straight grain, rock hard maple wood with a high luster fuel-proof finish. Expertly designed and accurately balanced to deliver maximum thrust, a Top Flite prop is the perfect companion for the plane you're now flying, as well as that newest design still on the workbench. Regardless of the diameter and pitch you choose, our rock hard maple not only reduces vibration, splintering, and nicking, but also allows you to tighten your prop securely.

Top Flite has a complete line of props for free flight, control line, slow and fast combat, speed, R/C Racing, R/C Sport Scale, R/C Scale, and R/C Pattern . . . ask for Super M Top Flite and Power Prop designs, Pylon, Speed and Nylon props.

Quality, selection, and lowest price without sacrificing performance . . . more good reasons why Top Flite continues to be the choice of champions.

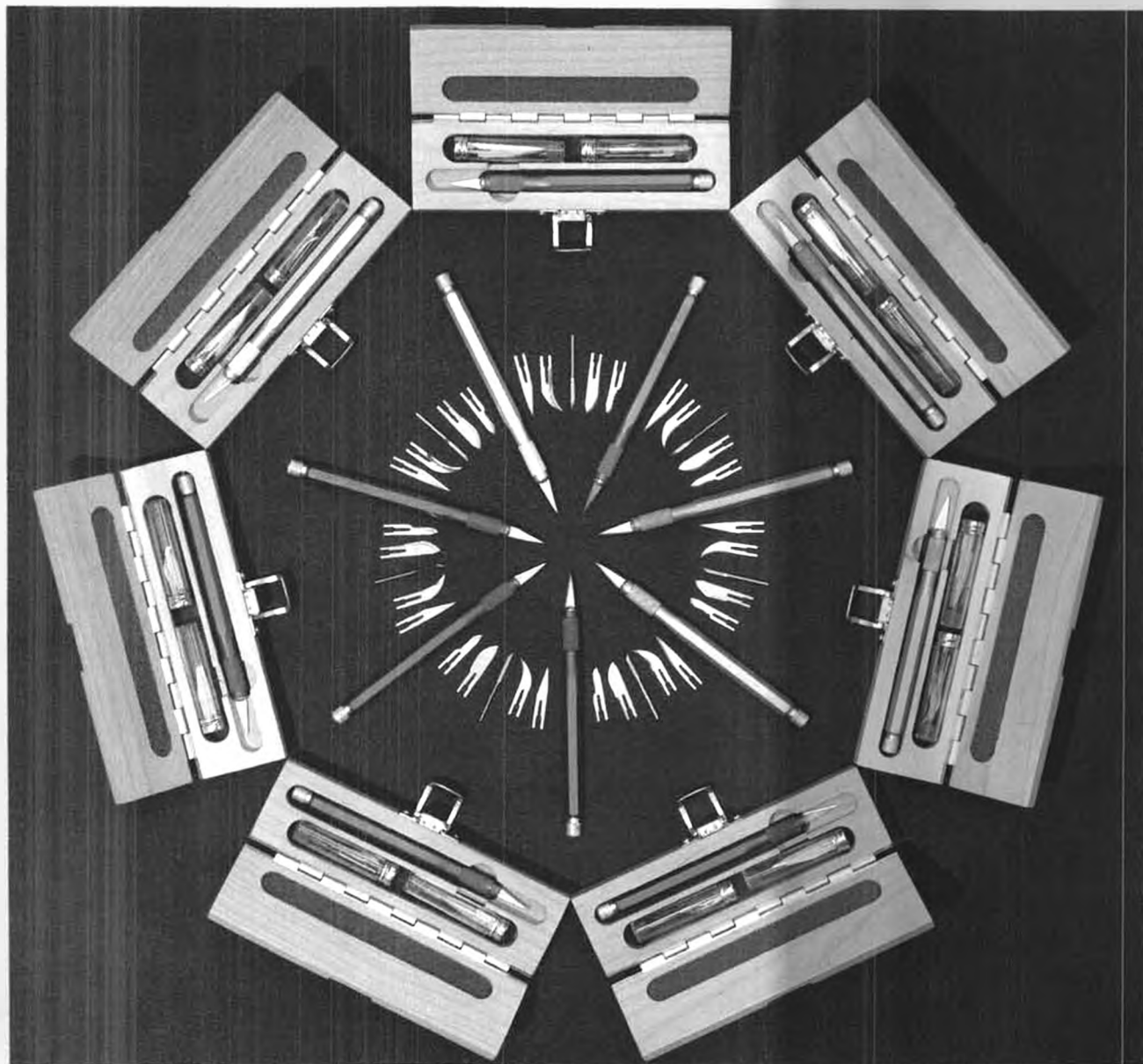
## Introducing Large Diameter Props

18"	4
	5
18"	6
	8
20"	10
	6
	8
	10



Top Flite Models, Inc.  
1901 N. Narragansett Avenue  
Chicago, Illinois 60639

# IN THE BEST CIRCLES, IT'S **über skiver**



## A PRECISION INSTRUMENT FOR THE DISCRIMINATING MODELER

- *Safe, Rear Draw-Bar Clutch*
- *Precision, Instrument-Quality Materials*
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- *Non-Rolling Hex Cross-Section*
- *Deeply Knurled, Non-Slip Grip*
- *Long-Life, Stainless, Surgical Steel Blades*

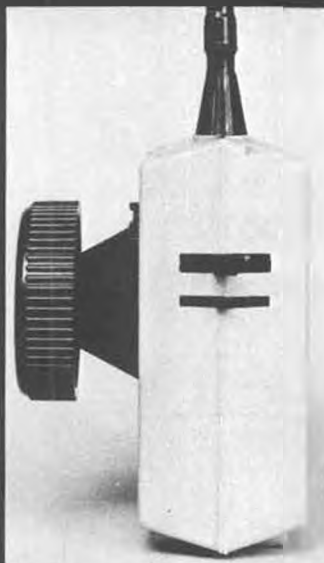


Available in seven satin anodized handle colors: silver, blue, red, green, gold, copper, violet. Complete set in fitted hardwood case; includes über Skiver, together with two vials containing four No. 11, and one each of Nos. 10, 12, 15, and 20 . . . . . \$14.95  
 Individual handles (specify color) \$5.95  
 Vial of 6 blades (No. 10, 11, or 15) \$2.10  
 (No. 12 or 20) \$3.30

See your dealer, or order direct.  
 Dealer inquiries are invited.  
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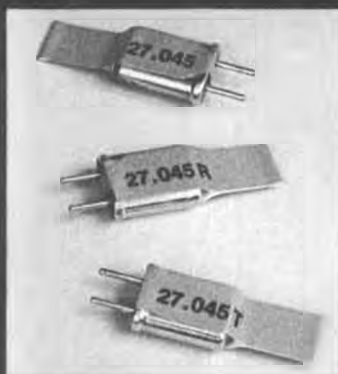
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# 3 Ways to Operate 2 Channels



**1** Intended for cars and boats, the KP-2AW transmitter incorporates a steering wheel and a throttle control spring loaded to an adjustable low speed setting.

**2** Ideally suited for gliders and miniature aircraft, the KP-2AS has a precision open gimbal single stick control more nearly duplicating the controls of real aircraft.



A special feature with the Sport Series 2-channel line is plug-in transmitter and receiver frequency crystals currently available on the 27 MHz band.



**3** The KP-2A transmitter features the popular two stick configuration.



Servos included with 2-channel systems are either two of the miniature KPS-14IIA or two of the powerful high-speed KPS-15IIA.



The subminiature double tuned 2-channel receiver features a convenient plug-in antenna allowing use of special short length antennas designed for boats, cars and small airplanes.



Transmitter and receiver battery cases are also included.

The world's finest radio control from Kraft is backed by a full one-year limited warranty on all systems and system components. Now it costs no more to drive, sail and fly with the best.

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**KRAFT**  
SYSTEMS, INC.  
®

## MEN TRAINER "40"

For the second plane in your R/C flying program, Model Engineering of Norwalk has designed and developed the MEN Intermediate Trainer "40".

The MEN four channel aileron trainer can be slowed to a fast walk for landing, yet at flying speed it is capable of flying most of the AMA pattern.

Model Engineering of Norwalk's THRU-CUT die cutting combined with TRI-SQUARE-LOC construction in its ply balsa and spruce make construction fast and simple.

TRI-SQUARE-LOC enables us to bring to you the best in lite plywood construction. This method of squaring, straightening, and holding parts in relation to one another revolutionizes construction in lite plywood.

The inherent strength of lite plywood construction provides durability and lasting performance.

The MEN INTERMEDIATE TRAINER "40" is designed for four channel radio control operation with 35 to 45 model engines. The 52 inch wing span

combined with 4 1/2 pound flying weight gives a wing loading of 20 ounces per square foot.

The kit features THRU-CUT die cutting, quality materials, rolled plans, building instructions, complete hardware package, pre-shaped wing leading edge in spruce, die cut spars in lite plywood, and pre-bent landing gear wire. Building time for the MEN INTERMEDIATE TRAINER "40" is 12-25 hours.

Now Available: The Men Trainer "40" Wing and Stabilizer Kit. List Price \$28.95

**M.E.N.**  
Model Engineering of Norwalk  
54 Chestnut Hill - Norwalk, Connecticut 06851

DEALER AND DISTRIBUTOR INQUIRIES INVITED

## PIPER CUB J3

Looking for a trainer that looks and flies like an authentic plane? Try Model Engineering of Norwalk's Piper Cub J3, a realistic rendition of a popular airplane that has a speed range of 8 to 40 MPH.

The MEN 5 wing design gives realistic slow flight and excellent stability. Model Engineering of Norwalk's THRU-CUT die cutting combined with TRI-SQUARE-LOC assembly in its plywood, balsa and spruce make construction simple enough for the beginner. The inherent strength of our lite ply construction provides durability and lasting performance. You will be spending more time on the flying field and less at the repair bench.

TRI-SQUARE-LOC enables us to bring to you the best in lite plywood construction. The method of squaring, straightening, and holding parts in relation to one another revolutionizes construction in lite plywood.

The J3 is designed for three channel radio control operation with a 29 to 35 model engine. The 72 inch

wing span combined with approximately 4 pound flying weight gives a wing loading of 14 oz per square foot.

The J3 kit features quality materials, rolled plans, building instructions, complete hardware package, die cut windshield, and pre-shaped landing gear. All decals included. The building time for the J3 kit is 14 to 30 hours.

The following items are needed to finish the model: 1 pair 3" wheels, motor 29 to 35, motor mount, mounting bolts, a 8 oz tank fuel line, 1" tail wheel, throttle cable, 1 8 collars, 1/16 collars, foam saddle, tape, glue and covering material.

Now Available: A Wing and Stabilizer Kit for Men's Piper Cub J3. List Price \$24.95

**M.E.N.**  
Model Engineering of Norwalk  
54 Chestnut Hill - Norwalk, Connecticut 06851

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## THE M.E.N. TRAINER NOW WITH "THRU-CUT" AND "TRI-SQUARE-LOC" CONSTRUCTION

The M.E.N. TRAINER was specifically designed for the absolute beginner in Radio-Control flying. It is by far the best trainer available on the market today. Over five years of extensive design engineering and development have led to its proven success. Its unique design, construction and flight characteristics make your introduction to R/C flying an enjoyable experience. Even seasoned flyers have found the M.E.N. TRAINER a truly exciting and relaxing plane to fly. The M.E.N. TRAINER enables you to learn radio-control flying with minimum supervision and flight training time. Its slow flight and ease of command virtually allows hands-off control, while its distinctive size and shape assure you maximum visibility and ease in recognition of plane attitude when flying beyond normal ranges. Beginner or seasoned pilot. Choose the M.E.N. TRAINER and see what flying R/C is all about.

**FEATURES:** Under-cambered wing with ample dihedral for slow, stable flight. The M.E.N. Trainer flies 8-10 MPH. Trainer will recover hands-off from any attitude in 100 feet or less of altitude loss when properly trimmed—allows beginner to re-orientate himself. 3 1/2 lb. Flying weight with average radio-control sets. 13 oz./sq. ft. Wing Loading. Uses 1/5-25 engine for fuel economy. Large, roomy fuselage for ease of radio installation—old or new. New construction—instruction flying booklet to help the beginner in R/C. Sturdy Plywood-Spruce-Balsa construction withstands beginner abuse. For those first landings, the M.E.N. Trainer will virtually land itself with little input required from the beginner pilot.

**M.E.N. KIT:** THRU-CUT die cutting combined with TRI-SQUARE-LOC construction in lite ply, balsa, and spruce make construction fast and simple. Pre-formed landing gear and brace. Wrapping wire included. Easy to follow plans and instructions including a Monokote cutting guide for the most economical use of covering material. Generous hardware package included with each kit. Quick building—Approximately 12-25 Hours.

**M.E.N.**  
Model Engineering of Norwalk  
54 Chestnut Hill - Norwalk, Connecticut 06851

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## INTRODUCING THE NEW M.E.N. RC BUZZARD BOMBSHELL

M.E.N.'s re-creation of a classic old timer free flight, strengthened and modified for RC, meets the Society of Antique Modelers requirements for RC Old Time Competition.

May be flown Free Flight, Rudder Only, Rudder/Elevator, Rudder/Elevator/Throttle.

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Wing Span 52"

\$49.95

Engine Size .35-.45



Length 41"



Engine Size .29-.35

Length 44"



3 channel R/C

Wing Span 72"

\$44.95



\$31.95

Engine Size .40

3 Channel R/C

Wing Span 58"

Length 50"

If not available at your dealer, order direct. Conn. residents add your tax.



\$49.95

Area 850 Sq. In.

Wing Span 72"

Length 52 1/2 In.

Weight with 3 Channel Radio 3 Lbs. to 3 Lbs. 15 Oz.

Engine .25-.40 Glow .45-.60 Ignition (1975 S.A.M. Competition Rules) .361 Glow Motor

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### HB ENGINES at Savings!

*In Stock w/muffler*

*with special O-ring needle valve on .40 \$ .61*

.15 R/C	\$27.99
.20 R/C	\$31.99
.25 R/C	\$35.99
.40 PDP	\$59.99
.61 PDP	\$79.99

Precision made for power, performance and reliability.

### PROP DRIVE UNIT \$62<sup>99</sup> by DuBro

Smooth running, belt driven unit for slow, powerful flight. New realism for scale & sport.

- Extra Belts ..... \$4.20
- Be kind to your engine - Use ZINGER PROPS*
- |                |              |
|----------------|--------------|
| 9x6, 7         | doz. \$ 9.99 |
| 10x6 and 10x6w | doz. \$10.88 |
| 11x6, 7, 7w    |              |
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- All maple, true pitch. Airfoiled tips. You get smooth power, less vibration. Stock up!

### MONOKOTE

3 rolls \$14<sup>97</sup>

Opaque: red, white, orange, yellow, dove grey, clear, aluminum, blue, dark blue, chrome or olive drab.

Transparent: yellow, red, orange or blue.

### Craft-Air Field Support Box \$18<sup>99</sup>

### L & L Electronics

2.0 volt jack ..... \$13<sup>99</sup>

1.5 volt jack

charge jack

### Portable IGNITION SYSTEM

For 1.5 & 2.0-volt glow plugs. Solid state, rechargeable with automatic glow driver.



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| *Super Pro       | \$255.00 |
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| 2 channel D/S | \$ 72.99 |
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| 6 channel     | \$229.00 |
- \*1 year written warranty

### ECONOKOTE

3/\$11<sup>77</sup>

### EXCALIBUR \$19<sup>99</sup>

54-inch

Semi profile fuse builds fast

Super thick airfoil, self-turbulated for square corners. Warp-free wing construction.

### U-CONTROL STILETTO \$29<sup>99</sup>

### MONGOOSE II \$7<sup>99</sup>

### DREMEL

*Model 271	\$29.99
*Model 281	\$36.99
*Model 371	\$36.99
*Model 381	\$39.99
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*Model 572	\$58.99
*Model 210	\$14.95
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\*with 34 accessories

### A. J. 1/2A RETRACTS

Lightweight, durable, easy to install. \$7<sup>17</sup>

Can be used on U/C

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Size	Pieces per box	Box price
1/16x3x36	25 @ .35	\$ 8.75
3/32x3x36	20 @ .42	\$ 8.40
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3/16x3x36	15 @ .62	\$ 9.30
1/4x3x36	15 @ .67	\$10.05
3/8x3x36	10 @ .88	\$ 8.80
1/2x3x36	10 @ 1.02	\$10.20
3/16x4x36	20 @ .66	\$13.20
3/32x4x36	20 @ .68	\$13.60
1/8x4x36	15 @ .81	\$12.15
3/16x4x36	15 @ .89	\$13.35
1/4x4x36	10 @ 1.07	\$10.70
3/8x4x36	7 @ 1.40	\$ 9.80
1/2x4x36	6 @ 1.85	\$11.10

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### 3-inch Assortment \$14<sup>58</sup>

(7) 1/16x3x36	(4) 1/4x3x36
(6) 3/32x3x36	(1) 3/8x3x36
(5) 1/8x3x36	(1) 1/2x3x36
(4) 3/16x3x36	

### 4-inch Assortment \$15<sup>57</sup>

(5) 1/16x4x36	(2) 1/4x4x36
(4) 3/32x4x36	(1) 3/8x4x36
(4) 1/8x4x36	(1) 1/2x4x36
(2) 3/16x4x36	

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**November 1971**  
Nancy, R/C soarer.  
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LSF Tournament story.  
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Vol. 1, No. 2 \$3.00



**December 1971**  
Curtiss-Wright Junior R/C 2" scale.  
R/C Twin Trainer 75" span, for .40's.  
Peanut Laird LC-DC.  
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How to build light "wire" wheels.

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SHOCer F/F by Mel Schmidt.  
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**February 1972**  
Minnow U/C profile scale racer.  
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.  
Spoiler, FAI Combat.

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**Mar/April 1972**  
Yankee Gull R/C glider 8' to 12' span.  
Miss Cosmic Wind, QM R/C Pylon racer.  
Peanut Scale Bucker Jungmann.  
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**May 1972**  
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Peanut Fokker V-23.  
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Ryan ST 3-views.  
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**June 1972**  
Bob White Wakefield.  
Mongster QM biplane R/C pylon racer.  
Calif. Coaster R/C glider. Sheet wing.  
Three profile Peanuts.  
Deperdussin 3-views.  
Pesco Special 3-views.

Vol. 2, No. 8 \$3.00



**July 1972**  
Fairchild 51, 1" scale, R/C or F/F.  
SAM-5 A/2 Nordic.  
1912 Avro G rubber.  
Comanche C stand-off R/C scale.  
Travellair 2000 2" scale R/C, by Editor.  
Chester Jeep 3-views.

Vol. 2, No. 9 \$4.00



**August 1972**  
Bonzo stand-off R/C sport plane scale.  
Counterforce A/1 Ailless Jic.  
Shoes' R/C QM.  
Pearl R/C aircraft on ts, also big one.  
Fairey 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 Travellair 2000 PT-3 Scale Views.  
Thermal hunting with R/C gliders.

Vol. 3, No. 16 \$2.00



**April 1973**  
Fabulous PEA POD, R/C sailboat.  
Briegleb BG-12, scale R/C soarer.  
R/C Spirit of St. Louis, semi-scale, .049 .09.  
Peanut Volkspplane Finish painting of rubber scale models.

Vol. 3, No. 17 \$3.00



**May 1973**  
Bantee mini-pattern R/C 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, 621 West Nineteenth St., Costa Mesa, Ca. 92627



# MODEL BUILDER



AUGUST

1978

volume 8, number 79

621 West Nineteenth St., Costa Mesa, California 92627 Phone: (714) 645-8830

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COVER: Rex Powell, Huntsville, Alabama, captured the grace and beauty of radio-controlled soaring in this excellent photograph of his Pierce Aero "Paragon", as it circled under heavy, cumulus-laden November skies. The Kodachrome 64 transparency was shot on 35mm film with a 135mm lens at 1/250 sec.



Well, it's OK to dream, isn't it? MB's General Manager enjoys a moment in the company of a 1978 Excalibur, on display at the Los Angeles Automobile show, across the hall from the International Modeler Show, April 28-30, 1978.

## from Bill Northrop's workbench . . .

### YIPE . . . TWO BUCKS!

It doesn't seem right that we should have to be the ones to apologize for the new price of **Model Builder**, however, it'll be a cold day in hell when you get an expression of regret from the Post Office over an increase in rates.

Most of our readers are fully aware of the increase in First Class letter mail, from 13 to 15 cents, which became effective May 29, 1978. But you may not realize that Second Class, which is used for the bulk of magazine mailing in the U.S.A., has been hit with a whopping 30% increase! This will undoubtedly spell doom for many small publications, literally knocking them out of business.

**Model Builder**, like most other publications, depends on magazine sales and advertising for its income. As you have probably noticed, **MB** is not as heavy on advertising as some of the other model publications. Although this is not exactly by design, it does afford the serious modeler a source of relatively uninterrupted reading . . . like having a TV show without an overdose of commercials. In fact, we have even received letters from unaware readers who seem to think we are keeping down the advertising just to please them!

Be that as it may, the balance of income requires that we must be more sensitive to publication costs than magazines that are literally sales catalogs. For this reason, we must pass on the latest postal increase to our readers . . . a regrettable but necessary step if we are to remain in the publishing business. We can only say that we will con-

tinue to strive to give our very best effort in bringing you informative modeling news, interesting construction projects, and useful special features.

### MEET MAJOR BOO BOO

We now know how a famous radio announcer felt when he introduced the President of the United States to millions of radio listeners as "Mr. Hoobert Heever"! In last month's issue, we stupidly mixed up two famous modelers whose initials are J.K. In the article about the historic Comet Curtiss Robin, we stated that Joe Konefes, the designer of the Robin, was also the co-designer of the famous K-G gas model. Definitely not so. K-G stands for Kovel-Grant . . . Joe Kovel was co-originator of the K-G, along with Charles Hampson Grant (Grant designed it, and Kovel built the original model).

Joe Konefes is probably best known as designer of the "Buzzard Bombshell", a cabin-type Class C free flight which is as popular now in both free flight and R/C old-timer as it quickly became after Joe and some of his Chicago "Buzzards" club buddies cleaned up at the 1940 Nationals, placing 1st, 3rd and 5th. WHAT'S A NI-CD?

Didja ever happen to notice how certain manufacturers "luck out" by coming up with a trade name for a product which the general public adopts as THE name for that item . . . no matter who makes it? Take for instance Frigidaire. For many years, no matter what make of electric icebox a person was talking about, it was referred to as a "Frigidaire" instead of a refrigerator. We remember reading a book about a

group of early Pennsylvania Dutch folks who called every automobile a "Ford-car". It could be a Buick "Ford-car" or a Chevy "Ford-car", but it was still, just a Ford-car.

More to the point, and in modern times, "Hot Stuff" is a lot easier to remember . . . and pronounce . . . than cyanoacrylate (sy-anno-ackrill-late) . . . "Have you tried Goldberg's Hot-Stuff?" And it was the first one packaged primarily for modelers.

What we're leading up to is probably the most used proprietary (trademarked) name in radio control modeling . . . "Nicaid". This is the trademark name for nickel-cadmium batteries, the rechargeable types we all use (and abuse) in our radio transmitters and airborne packs. The name "Nicaid", however, is a registered trade name, belonging to Gould Inc., St. Paul, Minn.

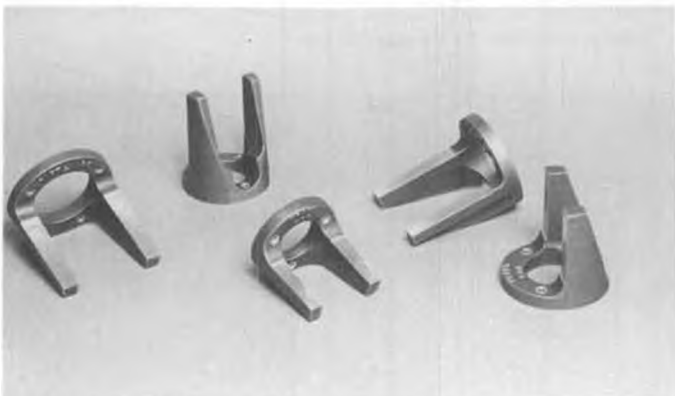
Just about every author of an R/C type article refers to "Nicads" at least once or twice, though the chances are that said author is almost never making specific reference to a Gould "Nicaid", but just to nickel-cadmiums in general.

No big deal? Well, maybe not. But in the publishing business, we must always be on guard for libelous statements about manufactured products, which may get by our proofreading, and this is one of the easiest ways to get tripped up. We've had no run-ins with Gould, or anyone else for that matter . . . so far. Problem is, it's a nuisance to have to watch for, and spell out every reference to "Nicads".

The upshot of this dissertation is that we put this question to "Red" Scholefield, who was again in charge

*Continued on page 142*

# OVER THE COUNTER



Kraft's new metal motor mounts.



Transistorized ignition system by 77 Products.

• All engines need to be rigidly mounted to operate at their highest potential, and the larger the engine, the more important this becomes. You've just run out of excuses for not using a good one, because Kraft Systems and its model accessories are available everywhere. And a line of precision, lightweight engine mounts for .40's, .60's, and .80's has just been introduced.

Part numbers, model numbers, inside dimensions, and prices are:

200-163	40F	1.330	\$5.49
200-164	40R	1.28	5.49
200-165	60F	1.5	5.98
200-166	60R	1.6	5.98
200-167	80	1.655	5.98

The "F" and "R" indicate "Front" or "Rear" intake models.

Meanwhile, back on the other side of the Kraft shop, the electronics types have come up with a nifty plug-in antenna for the receiver, designed for ease and con-



Belt reduction drive for Quadra, by Andy Sheber, Inc.



YS .60SR engine, available through Reading Hobby Supply.

venience of installation and removal of the receiver from your model. Two types are available; the standard 32-inch length, and a base

loaded 18-inch unit for small aircraft and gliders. Either can be permanently installed in your vehicle, and not disturbed when the receiver



New HobbyPoxy products; thixotropic (yes, it's thick) epoxy, and P.F.C. filler.



Douglas World Cruiser in 1/72 scale, by Williams Brothers.



Schluter Heli-Baby, now available from three U.S. sources.



Quarter-scale fleet by Concept Models.



Pactra has entered the epoxy paint field.

is pulled for use in something else. A 12-inch whip antenna for model cars and boats is under development and will be announced as soon as available.

The plug-in antennas are standard with all 1978 receivers, and can be installed on older models at any of the Kraft service centers throughout the world.

If you need to write in for more info about these, or the 1978 R/C



Servo-saving shock linkages by Robinaire.

systems or other accessories, tell Phil that **MB** sent you. Kraft Systems, Inc., 450 W. California Ave., Vista, CA 92083.

\* \* \*

The Schluter Heli-Baby has changed homes. This small, rugged, bolt-together, and very popular little helicopter is now available from the model helicopter conglomerate of Miniature Aircraft Supply on the East Coast, S.C. Modeler in the central U.S., and Gorham Associates out California

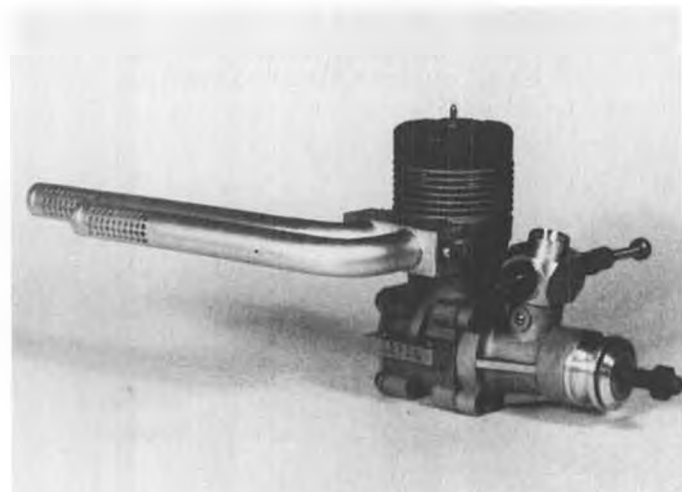


Slim Line muffler on K&B .35.

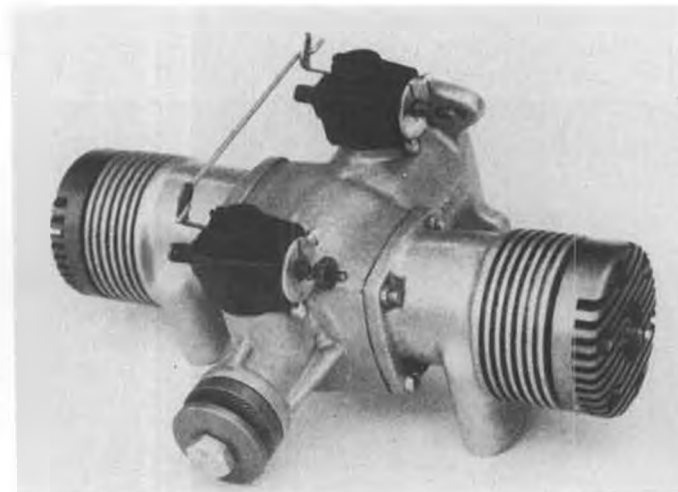
way.

Originally introduced into this country in 1976, the Heli-Baby rapidly made a name for itself as being simple and trouble-free, both in assembly and in operation. It features a wide-stance pair of skids, and low CG, practically eliminating the danger of tipping over. The light weight, only 6-1/2 pounds, also adds to its ease on handling and longevity.

Assembly is claimed to be fast and virtually foolproof, with all the parts



Slim Line muffler on Webra .61.



The Kendel 1.2 cu. in. twin, \$325.



Kraft antenna connector. Allows you to build in antenna.



"Lil Quickie" 1/2A control liner, by Midwest Products.



RM Enterprises' 1/2A "Maverick".



RM Enterprises' "Zingo", for Class A or B.



Kawasaki Hien ("Tony") by Ikon Northwest.

being packaged in the sequence that they will be used, and numbered to correspond to the illustrated assembly manual. The assembly instructions include full-size drawings, 32 photos, and clearly written text.

A collective pitch conversion, a trainer stand, and all spares, are available.

Miniature Aircraft Supply is located at 2563 Diversified Way, Orlando, FL 32804; S.C. Modeler is at 1999 W. Larkin, Elgin, IL 60120, and Gorham Associates is at P.O. Box 1347, Thousand Oaks, CA 91360.

\* \* \*

In this age of space flight and

continent-spanning Senior Falcons, an around-the-world flight hardly gets press mention. But back in 1927, it was different. And it took 175 days to do it. It took Mr. Douglas' biplane to do it, all 27,553 miles of it.

This famous airplane is now available as a 1/72 scale plastic model kit, from Williams Bros., 181 Pawnee St., San Marcos, CA 92069.

It is a highly detailed model, that can be built with either wheels or pontoons, both of which are furnished. The kit also includes decals to allow finishing the model as any of five aircraft: Seattle, Chicago, Boston, New Orleans, or Boston II.

Look for it at your local store first, or write directly for availability information.

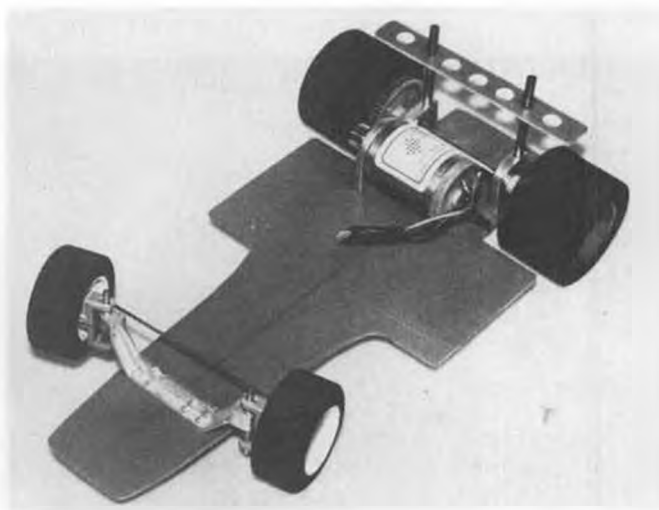
\* \* \*

Mammoth Scaler's in particular will be happy to learn that Top Flite Models has expanded its line of fine propellers to include a selection of the large sizes that they require. Especially designed for the larger engines and reduction units now in such widespread use, Top Flite's "biggies" are carefully crafted from rock-hard, straight-grained maple, and are available in diameters of up to 20 inches and in various pitches.

These props are suitable for all types of large aircraft and feature accurate balancing, high luster fuel-



Webra .91 in Bridi "Cosmic Wind" quarter-scaler.



"Thunder Volt", 1/2 scale electric racer by Thunder Road Automotive.



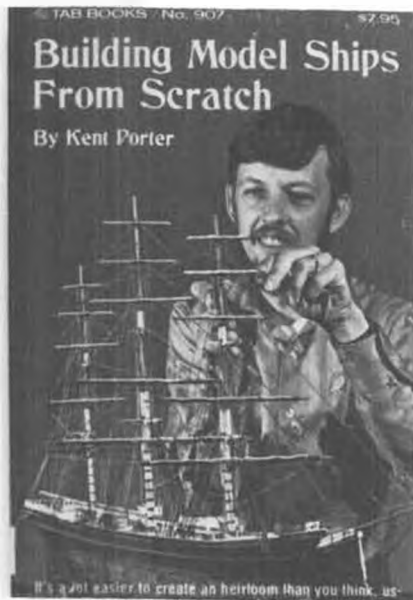
Big props from Top Flite.



Latest Heath catalog.



Dumas line of small boat kits.



Book on model ship building, from TAB.

- 20 x 6 ..... 7.95
- 20 x 8 ..... 7.95
- 20 x 10 ..... 7.95

As with the smaller Top Flite props, they are all designed and manufactured with the same dedication to craftsmanship and workmanship that we have all become accustomed to from this Chicago company.

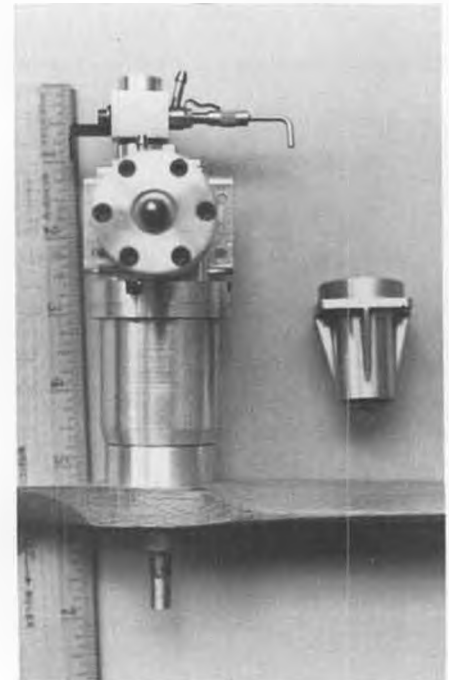
Look for them and for the latest up-to-date prop chart at your local shop. Top Flite Models, Inc., 1901 N. Narragansett Ave., Chicago, IL 60639.

\* \* \*

Following in the prop wash of the popular and successful "Plumb Crazy" and "Miss San Bernardino", Midwest Products Co. has introduced its "Lil Quickie" 1/2A control liner.

It spans 19 inches, and the kit features a formed aluminum racing gear, wheels, bellcrank and lead-out wires, fasteners, and a large, full color decal sheet. All wood parts are machine cut from Midwest's Micro-cut balsa and hardwood.

See this, and the other fine control liners from Midwest at your local hobby shop. Midwest Products



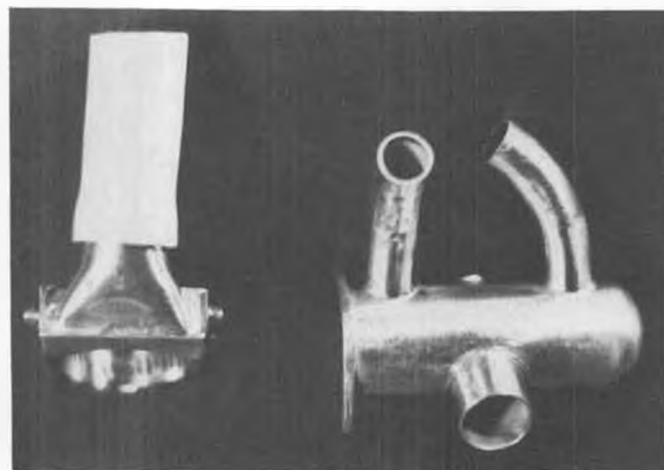
Robinaire's "in-line" reduction gearing.

Co., 400 S. Indiana St., Hobart, IN 46342.

\* \* \*

Thay there, have you tried the new thixotropic epoxy glue from Hobbyoxy? Just like your panty hose, it is guaranteed to have no sags, no runs, no drips.

*Continued on page 136*



Macs Muffler for special problem installations.



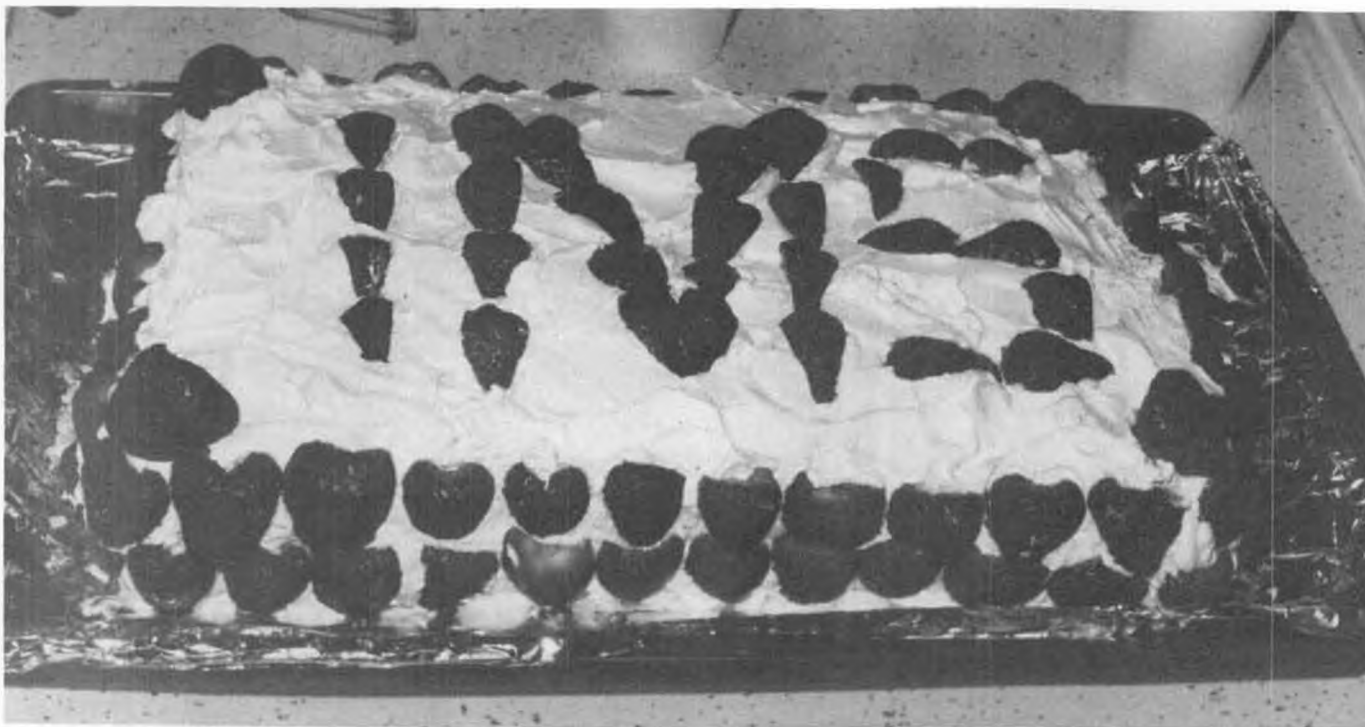
Paper airplane from Olde Time Hobbies.

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Versatile R/C designer, builder, competition flier, and raconteur, Col. Bob Thacker, San Clemente, California, and his Sport Scale Howard Hughes H-1 racer.





This cake was baked and decorated by Joe and Jean Bridi's daughter, Ann Marie. Yes, those are fresh strawberries on whipped cream topping.



# WORLD at the 1978



by BILL NORTHROP

• The first annual consumer's trade exhibition put on by the IMS (International Modeler Show) in Southern California was quite successful, in spite of two serious setbacks; one an apparently unavoidable circumstance, and the other a deliberate attempt to sabotage the show.

In the first instance, the MAC show . . . which combines model exhibits along with crafts and model railroads . . . took place just one week earlier in Long Beach, less than an hour's drive from the IMS show site in Los Angeles. The IMS date of April 28, 29, and 30 had been firmed up and announced in March of 1977.



A section of the static display at the International Modeler Show. Electrics in the foreground.



Bill and Charlie Cannon entertain a customer.



Jerry Jarvis in the M.E.N. booth. He's an expert on die-cutting plywood.





Tom Runge (left) and Fred Marks in the Ace R/C booth.



Rod and Mark Smith were kept busy with flying demonstrations.



Art Reiners (R/N Models) with the 1910 Avro Mk IV, designed by Chuck West.



PR Lady, Nan Miller, with Henry Blankfort, Chmn. of Educational Committee, HIA, and IMS President, Pat Patton.



Anita and Bill Northrop, and subscription manager Georgi Gilleran in the MB booth.

Meanwhile, MACs officials, having decided to leave the Anaheim Convention Center site of previous years, were seeking another location. When their announcements finally came out, several months later, it was learned that they had acquired the Long Beach site for April 22 and 23, apparently the only date they could obtain. Obviously, it was too late for IMS to change its schedule.

The second setback was the result of a deliberate telephone campaign on the part of a West Coast model distributor, who convinced many California hobby dealers to take down their IMS display posters and throw away the thousands of discount tickets which IMS had dis-

tributed for the benefit of the hobby shop customers. This sabotage campaign was apparently conducted for two reasons: one, that the IMS did not restrict any of the manufacturers who exhibited from selling their own products, and two, that a certain nationally known discount organization was going to exhibit, and peddle its wares to the public.

IMS, knowing that a selling restriction is unenforceable on a 100 percent basis, and is therefore unfair, felt that it should be allowed by those who cared to do so. Why should AMA, for instance, not be allowed to sell new and renewed memberships?

As for the discount organization, it had never even applied for exhibit



Ann Marie Bridi is justly proud of her culinary achievement (Hmmm).



Marilyn Nielsen, owner and operator of Applied Design Corp.



Jeff Bertken, holding forth for Violett Models.



Outside demonstrations went on all weekend. American R/C Helicopters provided much of the action.



Name of the game is "Find the Plane". Rod Smith flying "Sonny" biplane.



Curtis Croker, at 12, is an experienced helicopter pilot.



What? Joe Bridi in the radio business!?



National Champ, John Simone, Jr., demonstrates Revolution.

space, and its total participation at the IMS show was the attendance of one of its members, who came as a paying spectator!

Aside from these behind-the-scenes rattlings, the show went very well. Highlight for the exhibitors, most of whom stayed at the Holiday Inn which was just across the street from the Los Angeles Convention Center (visible in some of the flight demonstration photos), was the party on Friday night, completely hosted by IMS. In addition to unlimited drinks on the house, an excellent five-piece steel drum calypso group provided very different, but very danceable music until well past the usual coach-to-pumpkin hour.

Static model exhibitors had 30 categories from which to select an

opportunity to win a handsome trophy. The most outstanding model was a thoroughly detailed Nieuport II framework, constructed from a Lou Proctor kit by M.C. Skee, of Baldwin Park, California. Such was the quality, that M.C. has earned himself very substantial employment by one of the movie studios, as a model maker.

For the first time that we can recall, spectators and exhibitors were treated to the plush feel under foot, and the sound deadening luxury, of carpeting throughout the exhibit area. There were 58 exhibitors, occupying 114 booths, and for the sake of variety, the Los Angeles Automobile Show was just across the hall, in another exhibit area. Guest passes were being exchanged



IMS President Pat Patton, and Didi (Northrop) Kutney.



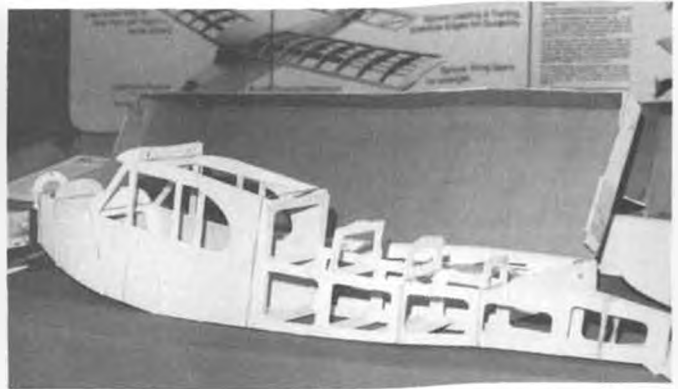
AMA's Exec. Director shows excellent form launching rubber powered P-51.



Tricia Copfer flies Revolution choppers with Marine husband Marvin.



The Fitzpatrick 60 is about to go into production. Well engineered.



Die-cut ply structure of M.E.N. Cub has many interlocking, self-aligning parts.



Casey Solewski's Waco F-3 was first in AMA Precision Scale.



Col. Bob Thacker's Howard Hughes H-1 racer, first in Non-Military Sport Scale.

at a rapid rate! Zsa Zsa Gabor's gold plated . . . yes, gold plated Rolls Royce was on exhibit in the main lobby. Movie actress Shirley Jones took in both shows and was particularly fascinated with static model display.

With so many shows previously reported this year, we'll skip any detailed coverage of the exhibitor's products and go on to tell you about next year.

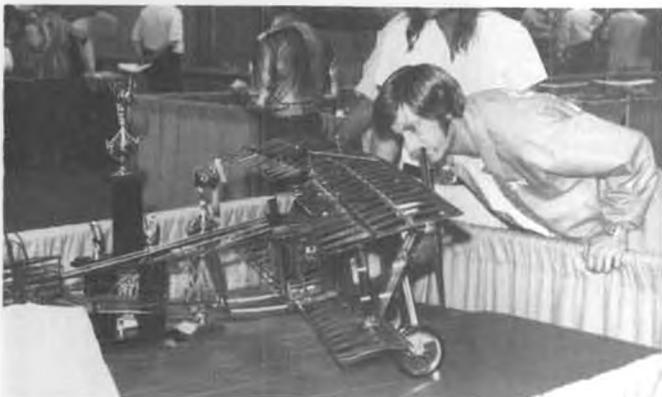
Before the exhibitors packed up and left on Sunday, the date and location of next year's (1979) show was announced. Next year, instead of being the last show of the year, the IMS Show will be the first! Returning to the favorite time of year for Eastern exhibitors, the show is set for January 6 and 7, at the Pasadena Center, in Pasadena, Cali-



IMS President, Pat Patton takes a turn around the floor with electric R/C "hot rod".



Mr. and Mrs. Joe Klaus, of Kustom Kraftmanship.



"Where's the D.T. timer?" Jim Scarborough examines M.C. Skee's overall winning Proctor Nieuport II.



No Nieuport could ever look this polished, but who cares? Skee has bids over \$2000 for it.



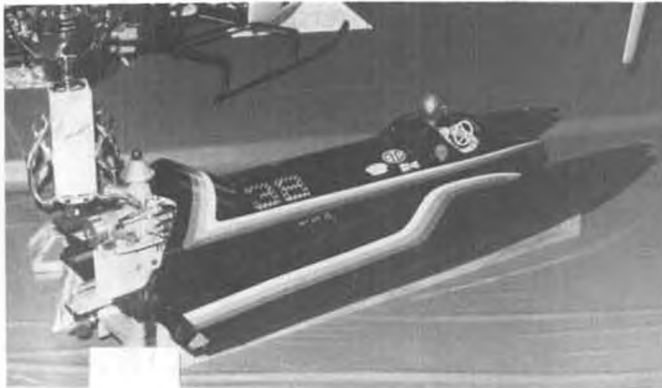
Larry Jenno displays complete line of Zinger props.



Super fixer-upper, Chuck Moses, of Authorized R/C Service.



Christine Hartberg, with Bob Violet's A4 "Skyhawk". Lovely combination!



R/C Outboard Trophy was won by Frank Hu. Tunnel hull design by George Campbell.



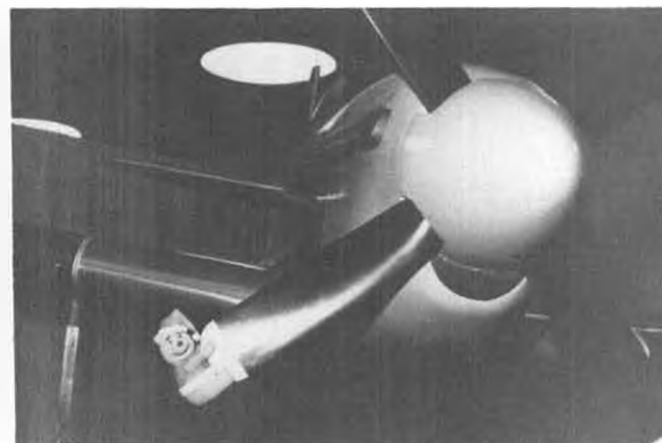
Lynn Barnett's "Spectra", ST .46 powered, best in C/L Aerobatic class.



Tom Anderson's H.M.S. Bergamot, modified Flower class Corvette, won Static Scale Boat trophy.



Charlie Gilbert's electric powered Bell 47G (Astro 15 motor, Futaba radio) won Scratch-Built Helicopter award.



Westcraft's P-51 takes on an extra passenger.



Sonar controlled (!) German U-Boat, by David Adams, Saugus, CA., Best of Show Trophy.



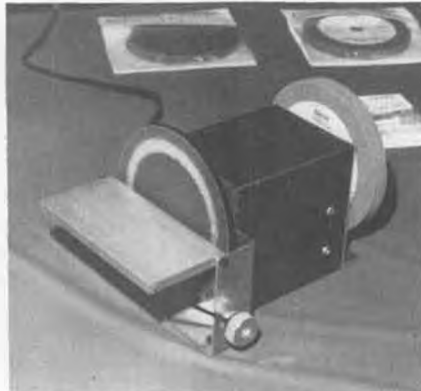
Tony Naccarato flew condenser paper covered indoor stick at frequent intervals.



Christine Hartberg cannot quite out-dimension husband Wesley's Westcraft P-51.



Herb Clukey, Flyline Models, shows new kit boxes.



Grinder wheel can be mounted on Strick's Enterprises sander.



Gene Husting and Bob Rule discuss R/C cars.

fornia, home of the famous New Year's Day Rose Parade and Rose Bowl football classic. IMS officials are already working on the possibility of combination deals for those exhibitors who may want to shoot the works!

Plans for this show began on the first day of the Southwestern Modeler's Show, in Dallas, this January, when, for the second year of the two-year-old show, bad weather all but brought it to a standstill. Show organizers, Mike Clark and Chuck Holden, decided to move the show to later in the year to avoid the snow situation, and upon learning this, International

Modeler Show officers, jumped on the opportunity to switch the IMS date. Incidentally, all of the show scheduling is now being worked out with close cooperation between members of the IMS, WRAMS, Toledo, and Dallas shows, in order to select dates that make it as easy as possible for exhibitors to ship their display materials from one site to the next.

Additional features of the Pasadena Center include underground parking, carpeted exhibit hall, and several across-the-street walking distance hotels . . . even a Holiday Inn on the site, with covered walkways to the exhibit hall! Outdoor

exhibition area includes a boat pond, and flying site for helicopters and low-powered fixed-wing aircraft.

Remember the date. By the time you read this, the IMS Show will be less than seven months away! **BIG, BUT HOW BIG?**

Modeling in this country, to date, has never had a size or weight limit imposed upon it. The FAA looks to AMA for proper guidance in modeling matters . . . it doesn't want to become involved in rules making, and heaven help us if it ever does! Also, our AMA insurance is based

*Continued on page 142*



Craig and Sally Paul run outdoor R/C race track in Bethel, Maine. Will take in IMS and Rose Bowl in '79.



ProLine's Jerry Bonzo, Jim Sunday, from RCS, and M.E.N.'s Jerry Jarvis ("The Three J's"!).



# VELIE MONOCOUCPE

## ...ELECTRIC POWERED...

MAMMOTH



SCALE

By BOB BOUCHER . . . Mammoth Scalers need not be heavyweights. This one, even with heavier-than-gas electric power, weighs just a little over seven pounds. Be on the lookout for the original . . . it was stolen!

• The Velie Monocoupe is a natural subject for a quarter-scale project. It is easy to build, yet has interesting lines for a basic box structure. The Monocoupe is a fabric covered airplane, which means a light but strong structure, and has an exposed radial engine for good engine detail without too much work, thanks to

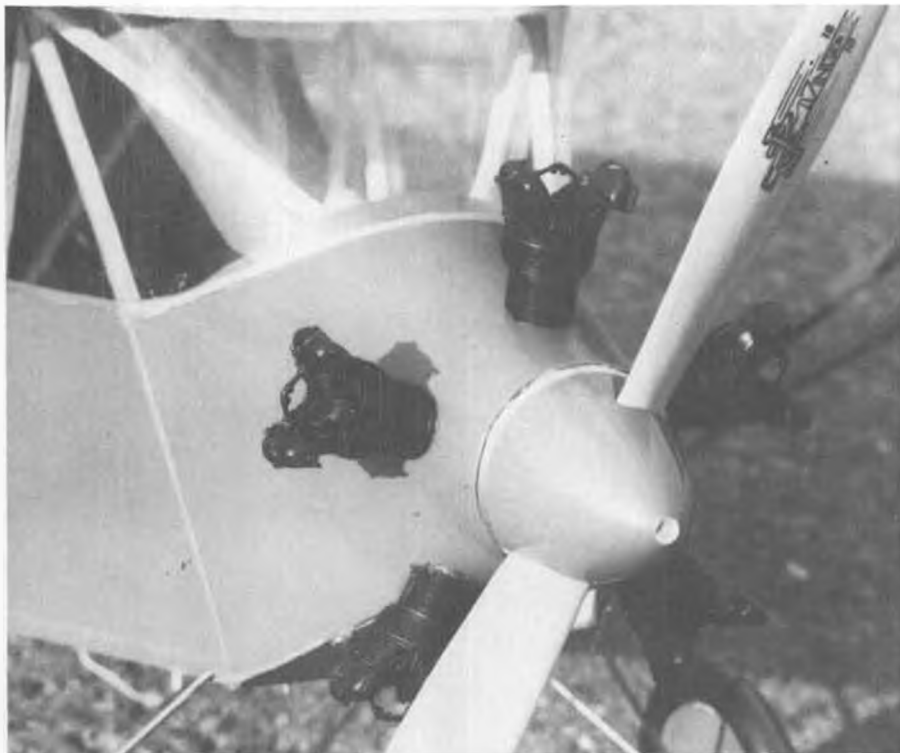
Williams Bros. It met my personal transportation requirements by fitting into my Mercury Monarch and my wife's Mustang. The Monocoupe specs are: span 90 inches, length 56 inches, wing area 1300 sq. in., and weight 7 lbs.

Naturally, for power, I chose the new Astro 25 mechanical speed

reducer, which swings a big 18 x 10 scale prop. I had no worries about enough power, since these dimensions and weights were almost exactly the same as my Super Buccaneer Old-Timer, with which I won the electric event at the SAM Champs at Las Vegas in July, 1977. In fact, the Monocoupe turned out to be a little lighter, so I used a one amp battery pack to allow ten minutes of power. The wing loading came out at 11 ounces, so I bet the ship will thermal, but unfortunately I didn't get the chance to try it.

The plane was stolen the night before our Electric Champs, when some thieves broke into the station wagon carrying this and other planes to the meet.

The first flights were made with a 17 x 6 prop, which loaded the Astro 25 to only 10 amps, about 60% of available power. The climb was good and the plane was very stable and well damped in all axis, and responded immediately to the controls. The Monocoupe's movements were slow and very majestic with the 17 x 6 prop, the speed seemed to be about 25 mph, much too slow for any aerobatic maneuvers. The next day, Larry Jenno and Joe Zingali, the famous JZ team, supplied me with some of their new 18 x 10 props, and I headed for Mile Square to get some flight shots for **Model Builder**. The Monocoupe flew as expected, very realistic, at about 40 mph, and smooth and positive. We wanted



Clean nose with electric power! Williams Bros. 2-inch scale Pratt & Whitney cylinders are about right size, and can be modified to look like Velie.



some low fly-by photos. My timid 10-foot high passes were not low enough, but after about ten circles of the field, I finally got down to about two feet. The Monocoupe is a high winger and can be turned with aileron-only, but a little rudder as well is needed to make a nice coordinated turn.

After the photo session, I returned to the shop to put the final finishing touches and trim on the ship for the

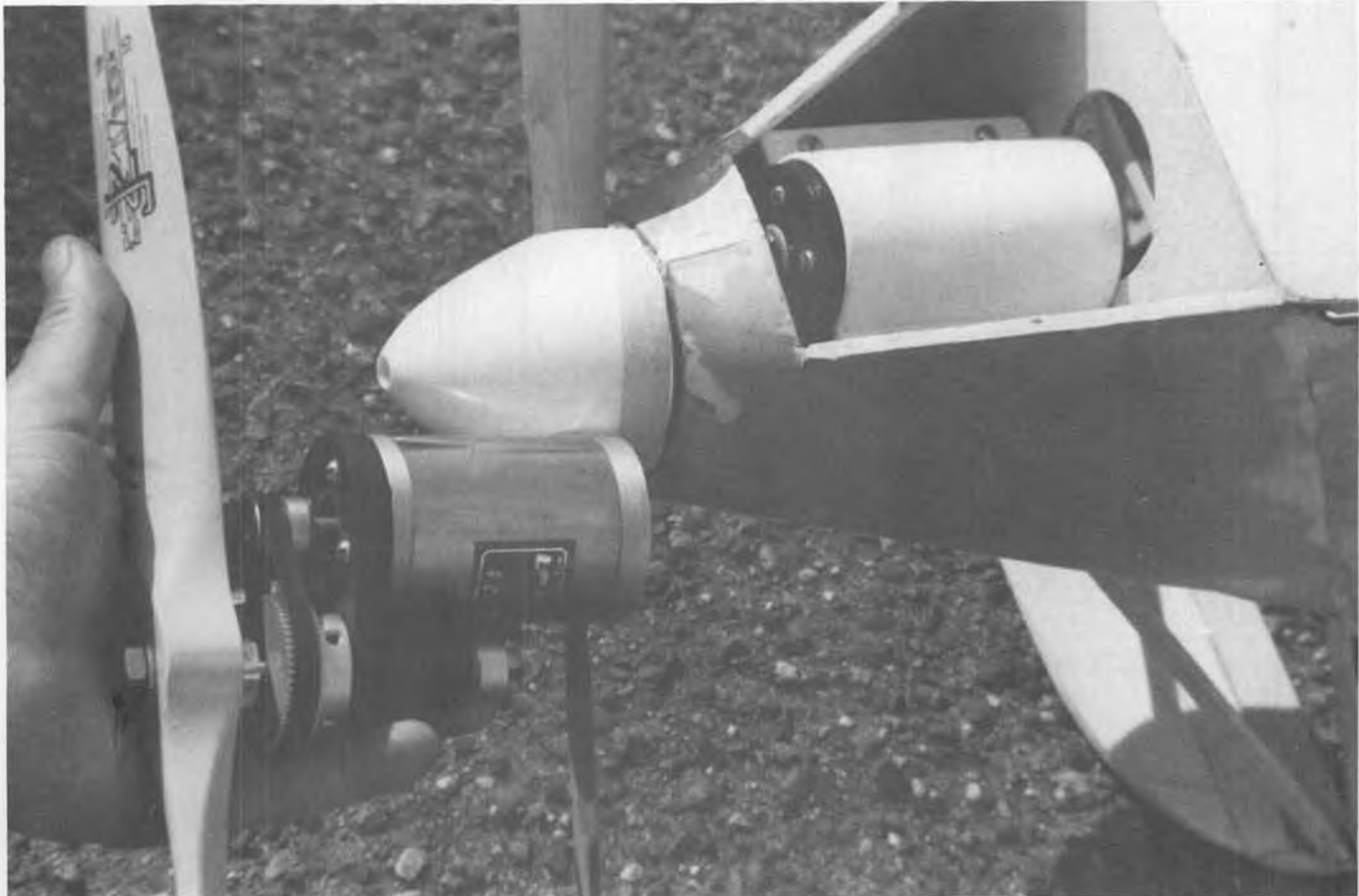
#### Model Builder Electric Champs.

Boy, was I going to show those guys! As I had five planes for the contest, and was CD as well, it was impossible to take everything in one car. So the assistant CD, Keith Shaw, volunteered to take the Monocoupe in his station wagon. That night, some thieves smashed in the window to his wagon and made off with the Monocoupe and two other models, plus transmitters and field boxes.

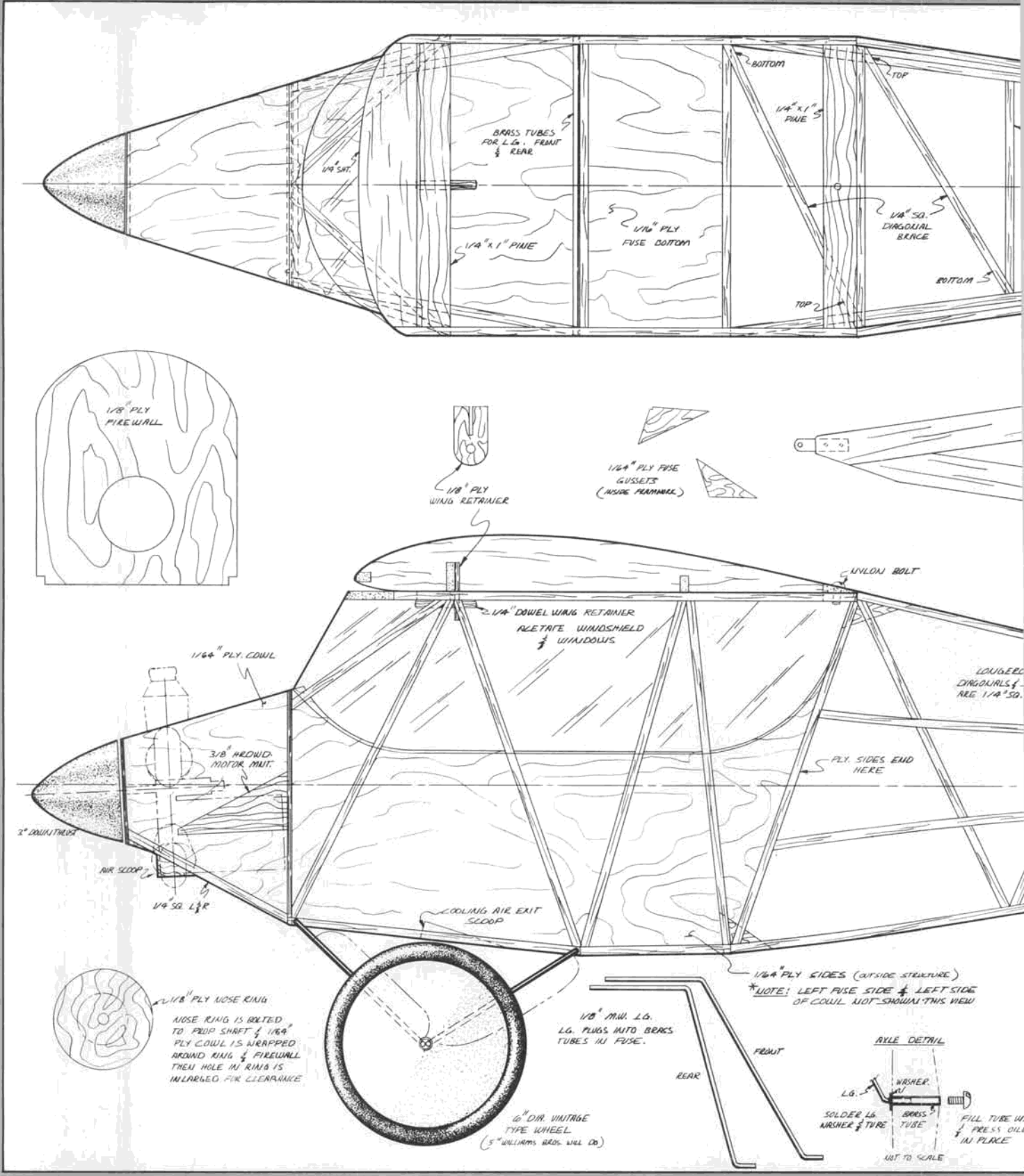
Luckily, Keith had the trophies in the apartment, so the contest went on undisturbed. It was a beautiful California day, and the contest ran very well. I even got in some good flights with my backup ship, a Twin P-68. The next one will be even better.

#### CONSTRUCTION

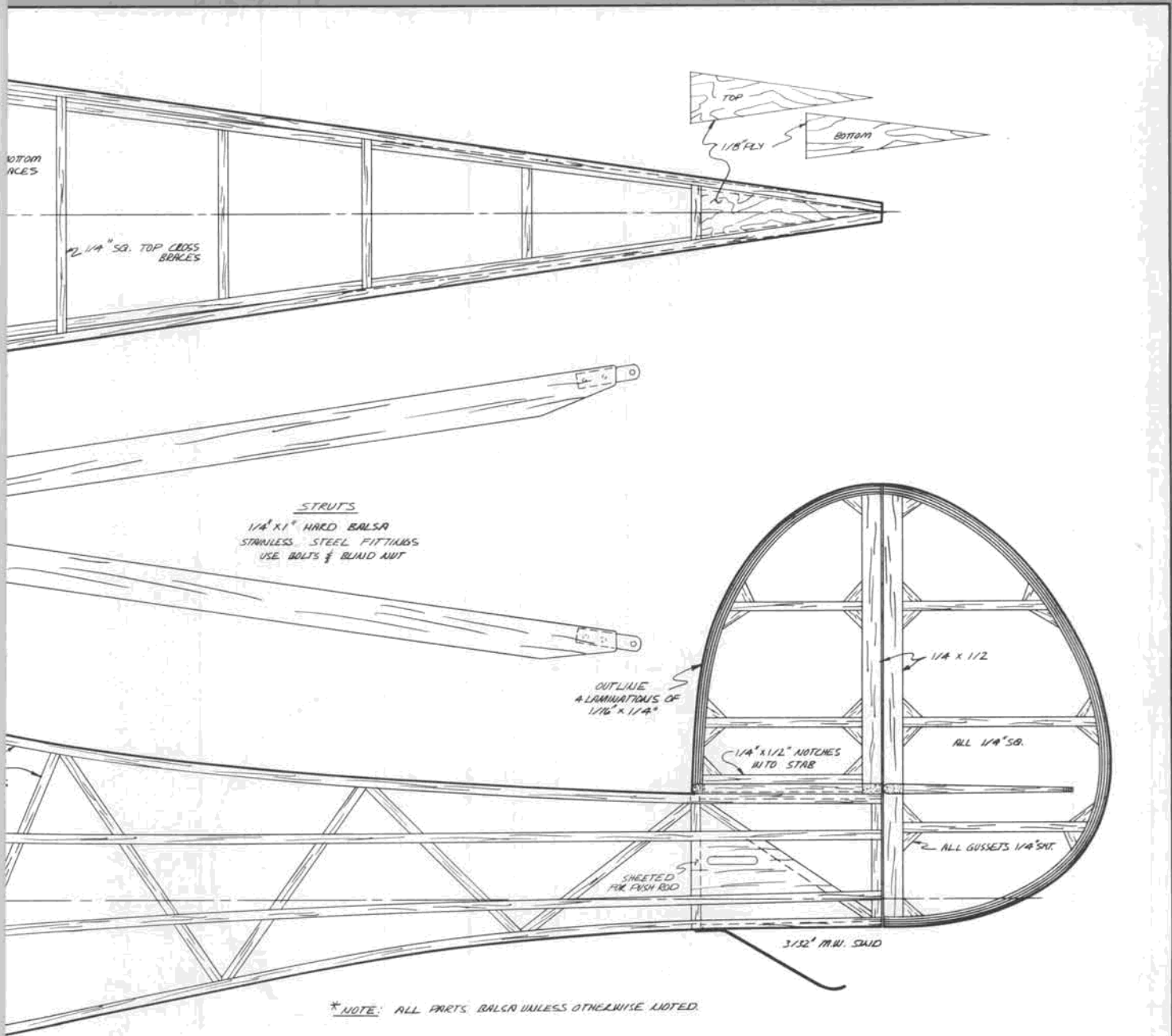
The construction is quite straightforward, just like any other old-timer R/C. The wing uses a two-spar,



Looking like a fuel tank, the Astro 25 electric motor is mounted below the thrust line of the belt-driven shaft. Air cooling scoop will direct air into drive-battery compartment. Another scope directs air out.







STRUTS  
 1/4" x 1" HARD BALS  
 STAINLESS STEEL FITTINGS  
 USE BOLTS & BLIND NUT

\*NOTE: ALL PARTS BALS UNLESS OTHERWISE NOTED.

# THE MONOCOUE

A SCALE MODEL FOR 'ELECTRIC

DESIGNED BY: BOB BARKER  
 DESIGN FOR MR. BY S.A. AMERSON

SPECS.

SPAN	90"
WING AREA	1300 SQ. IN.
LENGTH	57"
WT.	7 LBS.
POWER	1/8 HP 25% WT. REDUCTION

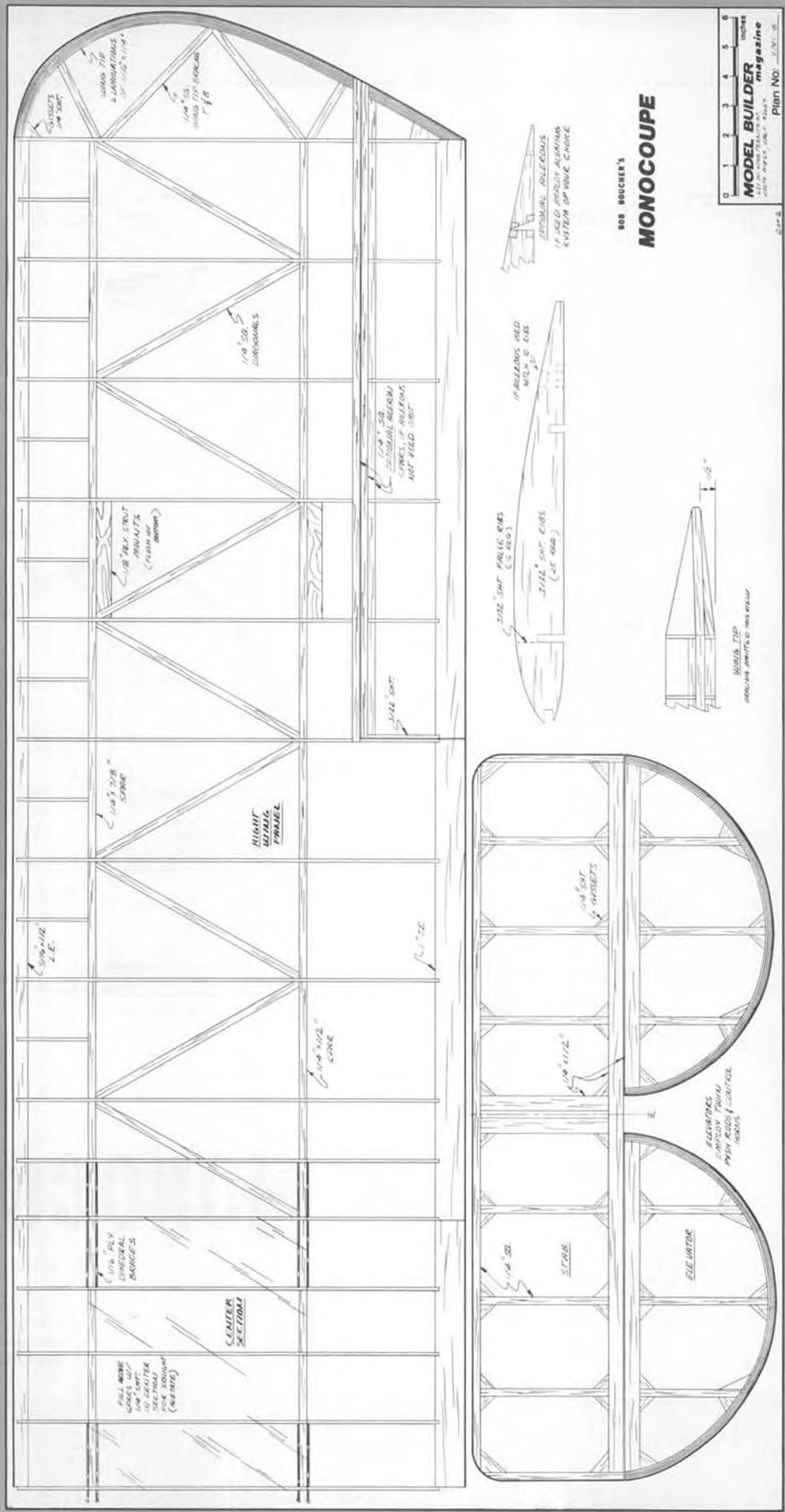
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 Inches

**MODEL BUILDER**  
 magazine

401 W. HANCOCK ST.  
 COSTA MESA, CALIF. 92627

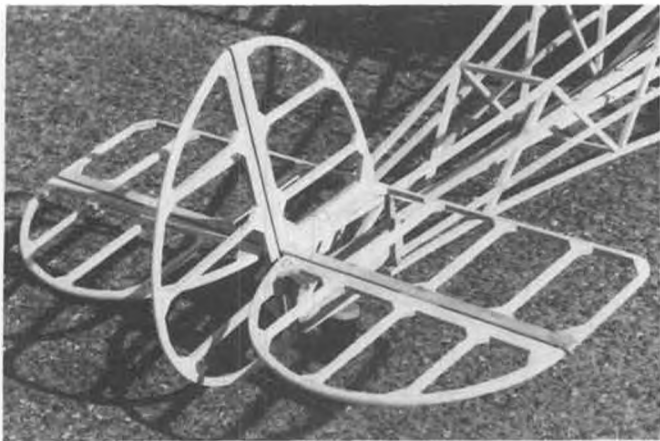
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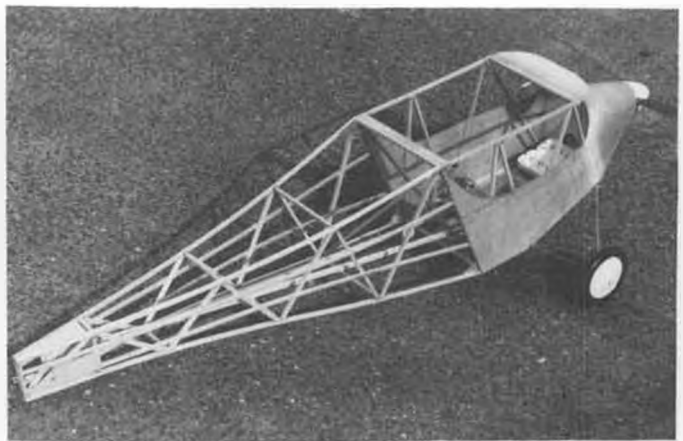


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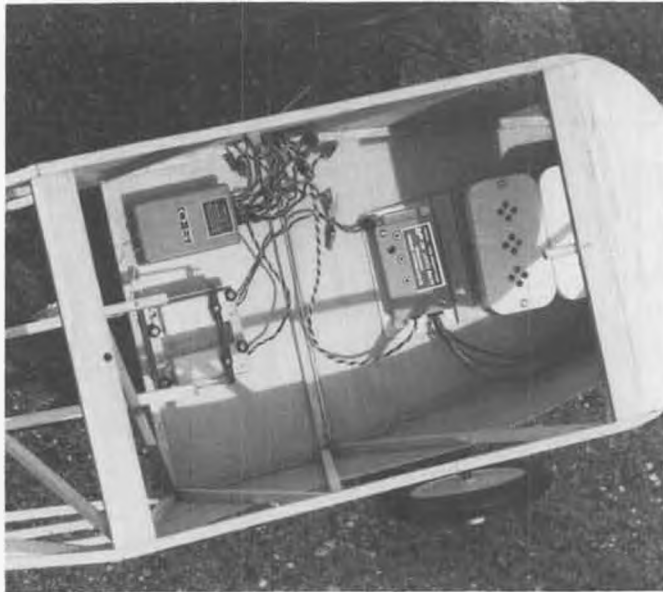
**BOB BUCHER'S  
MONOCOQUE**



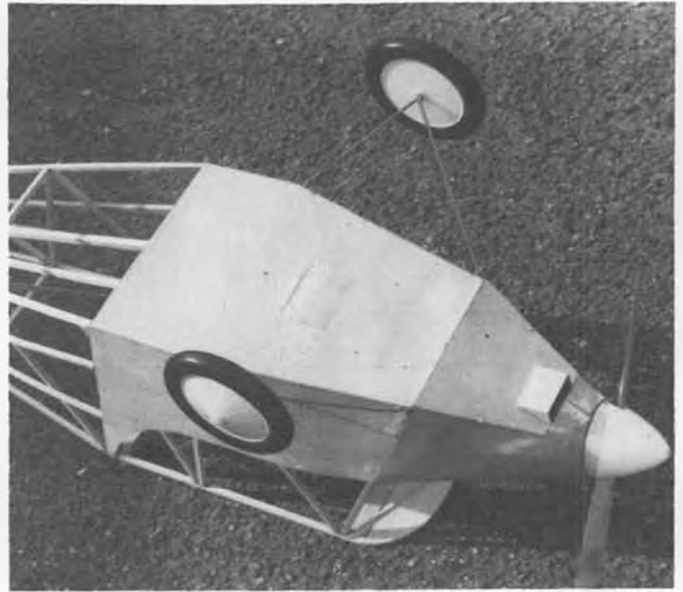
Round tail outline is made up of laminated 1/16 strips. Gussets add strength, prevent warping.



Fuselage construction is extremely light, yet strong. Note drive battery location on cabin floor.



S & O radio looks lost in huge cabin. Electronic speed control just behind drive batteries.



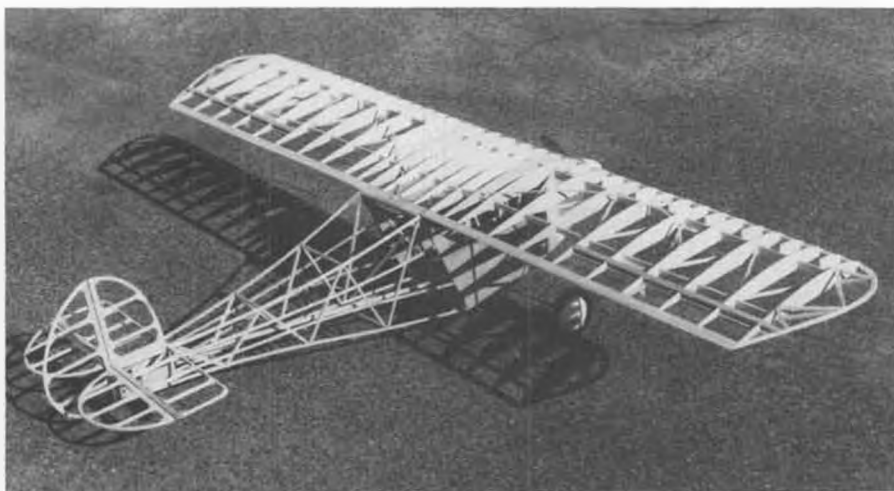
Bottom view shows inlet and outlet air scoops...Essential to prevent overheating of drive batteries.

open frame construction, with working struts. Don't leave these out. They greatly increase the bending strength of the wing, and make it torsionally stiff, to eliminate flutter. The model was built with ailerons and no dihedral, but will also fly very well, with 2 inches of dihedral, on

rudder and no ailerons. The half-ribs extend back to the main spar and prevent the fabric from sagging between the ribs. The tail surfaces are laminated from 1/16 cap strip stock and are quite light and strong.

Before covering the airframe, components weighed as follows:

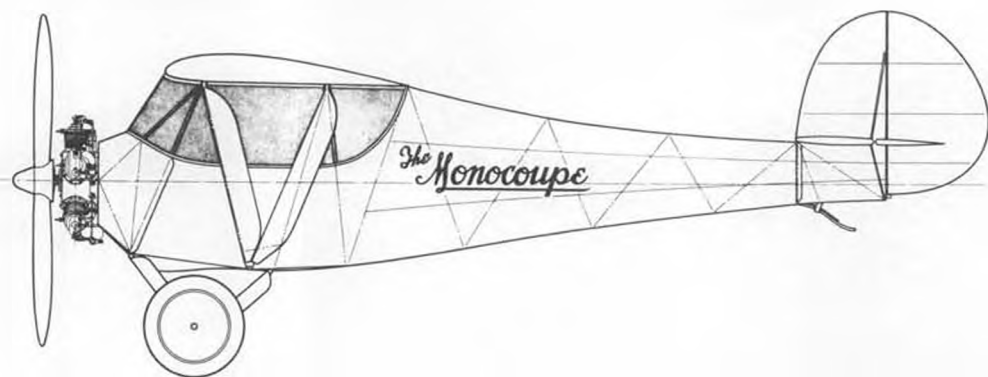
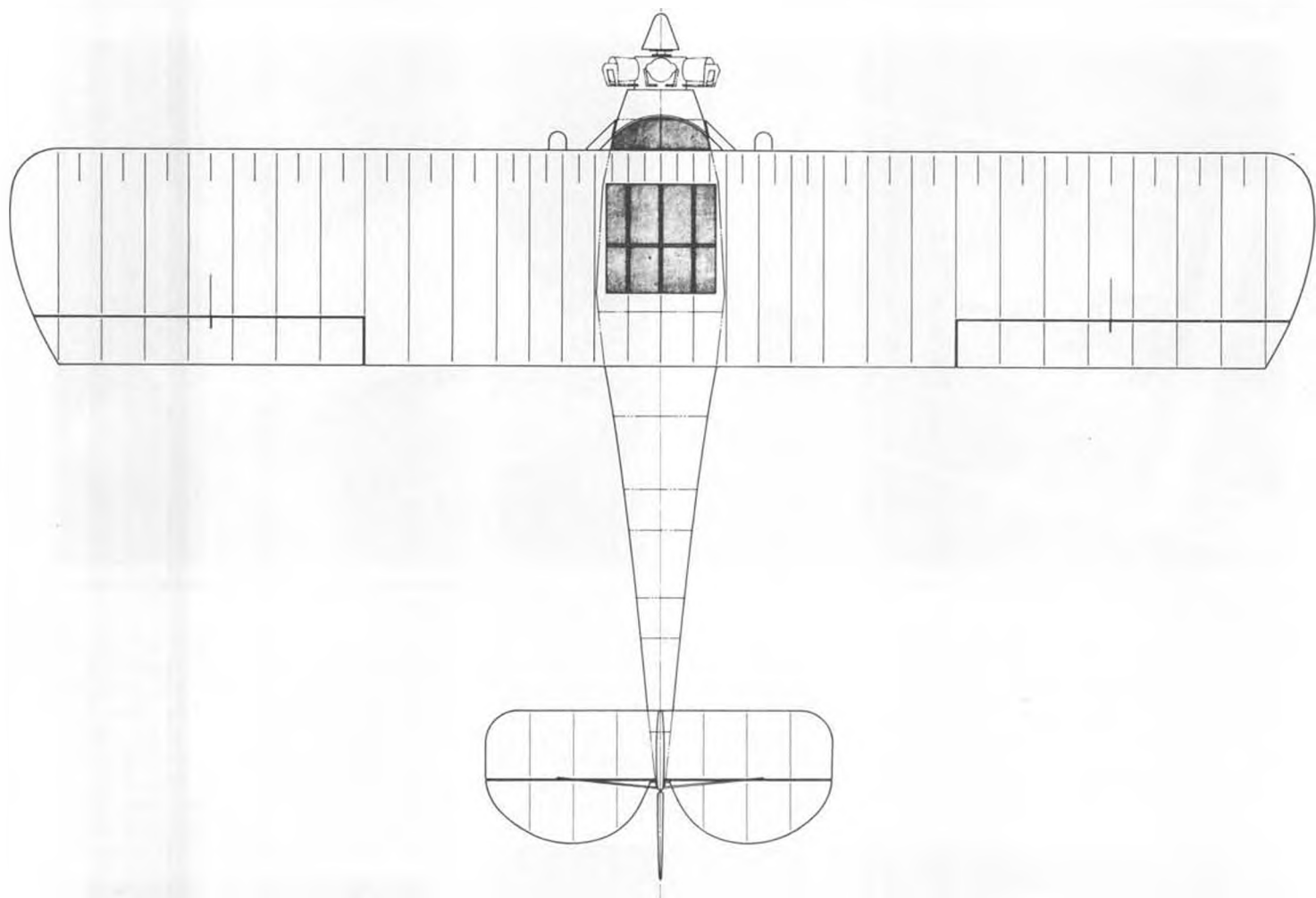
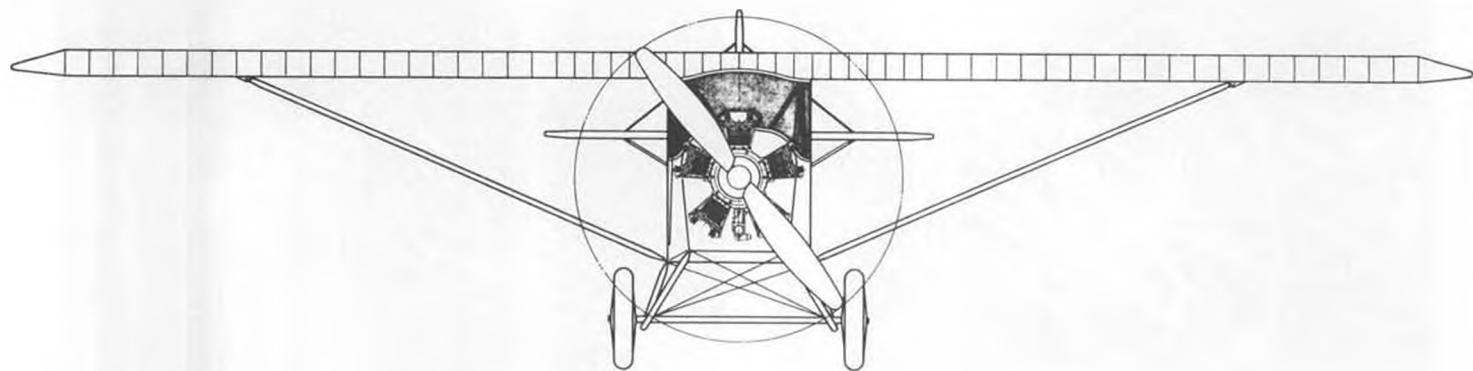
wing 15 oz., fuselage 16 oz., and tail group 3 oz. When all rigging and covering was added, the airframe weighed slightly over 3 lbs. Not bad for 1300 sq. in. wing area and a fuselage almost one foot high and one foot wide! Cover the fuselage sides and make up the cowl from 1/64 plywood. The fuselage bottom is made from 1/16 plywood. Williams



The completed framework is very light, weighing just over 3 pounds with covering. Wings show slight droop, as struts were not in place for this photo.



Flaring for a landing. Wheels scale to 6 inches. Largest Wms. Bros. are 5-inch.



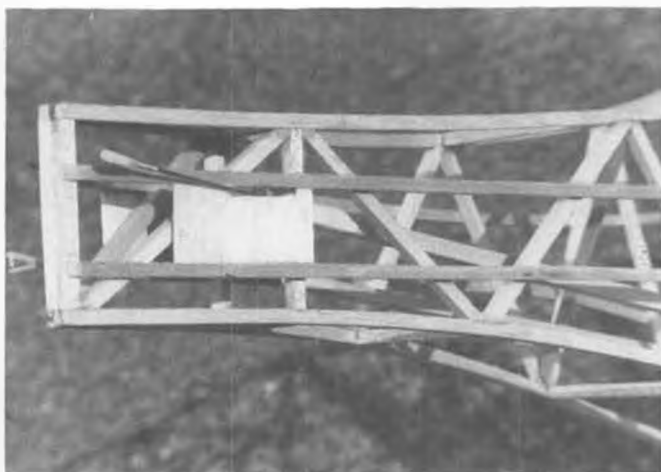
This 3-view courtesy of John W. Underwood, from his book, "Of Monocoupes and Men". Copies of complete book available for \$4.95 . . . Heritage Press, Box 167, Glendale, Calif. 91209.



Wing structure is light. Ailerons not separated at this time. Note Nyrod control tubing.



One bolt and one dowel hold wing in place. Struts are functional. Cap ribs if using silk and dope!



Sheet filling between stringers provides slots for control push rods.



Simple wire struts plug into brass tubing. Add fairings to improve their appearance.

Bros. 2-inch scale Pratt & Whitney cylinders were used to make the engine. They are about the right size, and can be modified to look quite like the Velie cylinders . . . especially for standoff scale. The Astro 25 is almost completely hid-

den within the cowl, only the cooling air inlet giving its presence away.

The Velie was a very satisfying project, and is perfect for we old-timers whose reaction time is slowing down a bit and who can't see those small jobs too well anymore.

These big birds gather a great crowd, and are very pleasing and relaxing to fly. Try one and bring back the good old days.



Bob Boucher with his Mammoth Monocoupe, during first flight tests. Design is enlargement of his Astro Flight 50 inch kit for 1/2A glow or .05 electric.



Dave Lloyd's F8F Bearcat, with .60 powered DuBro gear reduction, takes off at Morgan Hill, California, during 1978 World War II "Scramble". Complete story and photos next month. Monty Groves photo.

# 1 TO 1 SCALE

By BOB UNDERWOOD

There once was a modeler named Fred

Whose scale models flew like lead  
When he went to the field  
The model's fate was sealed  
And he'd find all his friends had fled.

## WEIGHT AND WAIT

A common problem many scale modelers seem to share on a regular basis is the battle of weight. Akin to the problem which exists in an anatomical way, the weight seems to settle in the rear-most portion of the model. There it runs headlong into the weight-moment aspect of modeling. Simply stated, that says that very ounce placed back there takes a bundle in the beak to balance.

There are ways to overcome this problem, most of which you may already use, but let's bring them to the front once again.

1. Select only canards or flying wings to build.

2. Carefully, very carefully select the materials for the tail portion. Very often we overbuild the tail feathers and really don't require as much structural strength there as we put in. Search your hobby shop for the lighter contest grades of balsa. You'll actually come up with two benefits this way, in that you will not only save a few ounces, but the material is so much easier to work with through all the steps.

3. Make it "holey". On some types of aircraft, a sheeted surface is built up with ribs and covered with

fabric. By using a sharpened brass tube, you can punch out or cut holes between the ribs in the sheeted material. It may seem like precious little weight which is saved, but remember, an ounce is an ounce is an ounce. . .

3. A big weight adder occurs when you use finishing resin over balsa sheet and fail to spend the extra time to really sand it down to the very minimum. Have you ever paid close attention to the weight of

a can of resin? Sand, my friend, sand!

4. Built-up surfaces can be made much lighter than solid sheeted ones in many cases. In the event we use solid types, we often make them of thicker stock in order to give them a better appearance. This is a virtue of the built-up type, since they tend to look more realistic, while actually weighing less. True, they may be a bit more time consuming to produce.



Dale Sebring's scratch-built Macchi 202 takes off at World War II "Scramble" for its last flight. One of several unexplained crashes. Monty Groves photo.

5. Watch the primer and the paint!

The weight problem in general, as far as our model is concerned, can be a very serious one. This is especially true with many of the more interesting subjects that have small wing areas or very highly tapered wings. One very often hears or reads reports of models that "fly well" with very high wing loadings, perhaps in excess of the 40 oz. range. Very often these are accidents looking for a place to happen.

Assuming that you have used extra caution in building the tail portions and are not required to add large amounts of weight to the front to balance, you can concentrate on several other areas that might result in weight savings.

Some brands of wheels are quite a bit heavier than others, so shop around.

Substitute other materials (1/64th plywood for aluminum or Sig's Lite Ply for regular aircraft grade).

Lighter, smaller servos, especially for low load situations such as throttle or retract four-way valve movement.

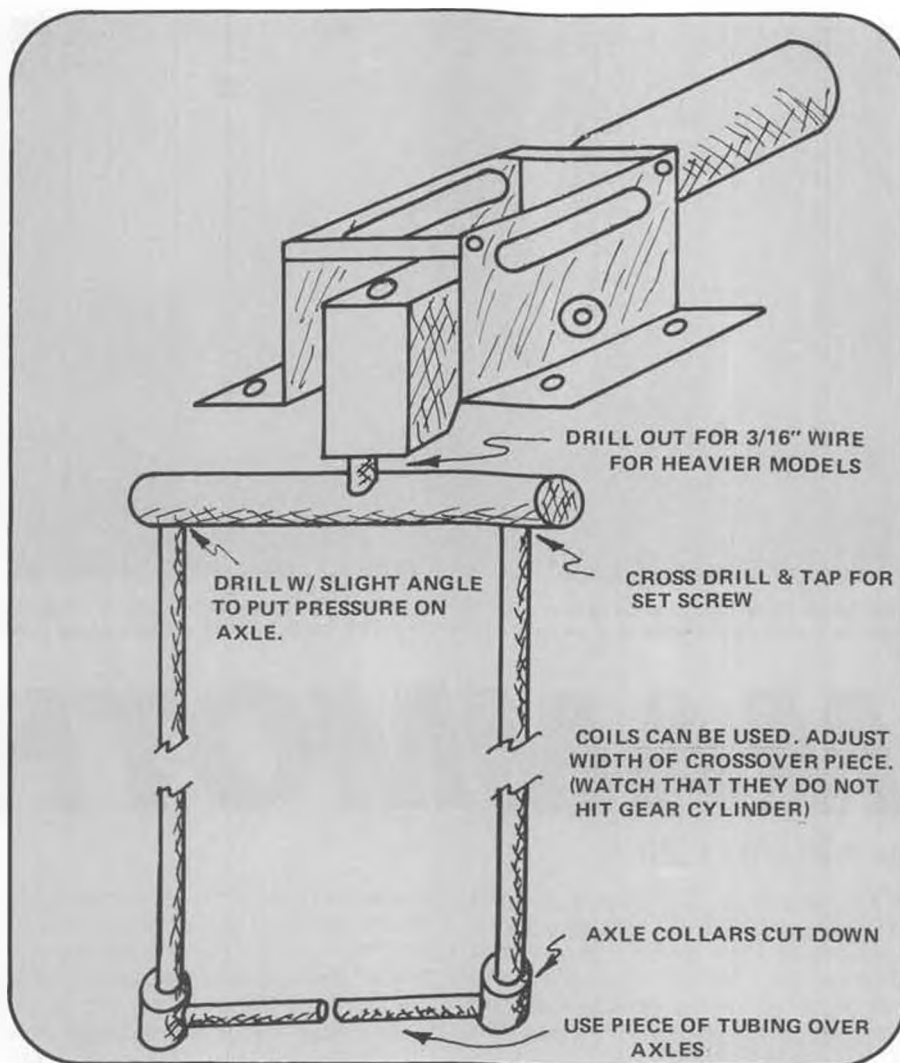
A very cautious use of epoxy or other adhesives of the non-evaporating varieties.

Consider whether you really need those three coils of wire in the landing gear. One may do it, or if your flying will be primarily off of pavement, perhaps just a straight strut.

Is the wing a foam core? Lightening holes may not mean much in the weight of the foam, but don't forget the adhesive.

There are, of course, many other areas of weight saving concern. It would be well for you to analyze these as you work. It also helps to weigh as you go, since it can help you on future subjects as you anticipate the ultimate weight of the model.

At the head of this section I used another "weight" in the form of "wait". Modelers often will utilize available time in such a manner that as the first contest approaches, things must be rushed to completion. We follow that with a frantic trip to the field for a test flight, saying to ourselves all the way, "It's not windy, it's not windy—". In the process, we've overlooked a few small details. There is a loose bolt here and a rubbing thing there, and certainly one of those cute little screws that holds the servo arm on just happens to be missing. (On the elevator or aileron, of course). The idle isn't set right and since you had the wing upside down on the workbench when you set up the ailerons, your right turn on takeoff strains the



model through the trees that are on the left side of the runway. When in doubt, take the extra day or more to check things out. When in doubt, wait!

#### THE NOTCHING OF THE EDGE

After almost a year of building, it's finished. There never has been a masterpiece like this one. It's right to scale, even to the wart on the pilot's right hand. The finish is flawless, and the 6,432 rivets are fantastic. The next thing to do is to record it on film. As you move through the door the wing suddenly grows and the door jam leaps out at it and bingo, right there in the trailing edge is a big notch. You've notched the edge.

A help for this problem, as well as the difficulty that comes from trying to get an even edge on the trailing edge, is to try using aluminum tubing attached to the trailing edge on the wing and tail surfaces. If you put it on before the final sanding, a very even rounded edge can be achieved. The instant glues and baking soda for any small gap will do a fine job of holding it on. It does help to sand the tubing beforehand.

This type of edge is much more

resistant to unsightly notching, and even if you give it a healthy bang and dent the tubing, it is very often possible to smooth it out with a pair of needlenose pliers.

The tubing comes in 36 inch lengths, or can be spliced with short lengths of smaller tubing or wire. The length is then bent to smoothly follow the contours of the trailing edge. If you can spare the few additional ounces, give it a try.

#### UP AND AWAY

The scale scene has seen the arrival of many new and improved brands of retract gear in the past few years. We can take care of rotating gear, tail wheels, and special sizes with little problem. There are several types of aircraft that use gear that retract straight rearward and have double strut legs (some forward). There is often a concern that standard main gear will not stand the load when operated at an angle that is 90 degrees from its regular position.

For the last 6 years, such a set up has been used with little or no problem on a Russian model that I have been flying. A Rhom main gear

*Continued on page 98*



Dr. George Clapp, dental surgeon from upstate New York, built this 1/4-scale Sopwith Triplane. Quadra powered, it weighs 19 pounds, and is built entirely from bass and plywood...no balsa. It's his first R/C model! Photo on right answers obvious question.

# MAMMOTH SCALE

By RON SHETTLER

• On the long flight to Toledo, I tried to prepare myself to look at our section of the hobby represented there as seen through the eyes of the person who was not yet bitten by the large model fever. Often, when you are as enthusiastic about large models as I am, all else would become background and foreground if you didn't force yourself to look at the whole picture.

Although it wasn't long before I became totally afflicted again with the thrill of the new 'big' model products shown there, I was able to last long enough (just) to have formed an objective opinion of where we are going. We're *definitely* here to stay!!

I have never seen a more spontaneously enthused group of people in my life; manufacturers and users alike. Nor have I seen a group of

manufacturers more concerned about getting you the products which are suited for the safe operation of these models for your enjoyment; manufacturers who, in many cases, have been relieved of producing for price or gimmickry, possibly for the first time; pioneers such as Carl Goldberg and Roy Scott (Micro-Mold of England) who are really interested in providing a control linkage to suit our more demanding needs, and those which existed previously; Bob Dunham, who will be working on a servo of industrial grade that hopefully has something far better than four grommets for mounting, a much better gear train which can easily accept gear change ratios to adjust one basic servo to all our needs, built-in waterproofing that works, and improvements in servo lead

outlets and servo arms. The large models have given people like Bob an opportunity to start fresh in servo manufacturing, not further miniaturizing an old product. In manufacturing, our concern is not always: Can we make it better, but will you accept it if it's that much different than what you are presently using? However, the more applications our products have, the more value we can give you for your hard earned modeling dollars.

Because of a remark made by Bill Northrop, this will only be a partial list of new products available or about to be released and/or developed for large models. It appears that **Model Builder's** new articles were so long that his regular column (May issue) was limited to one page! (With all his spare time, he'll have to build another model just to keep



Jim Messer and his 1/4-scale Ercoupe. Span 7½ feet, weight 16 pounds, Quadra powered.



Dr. George Clapp and his fantastic Sopwith Tripe, "Black Maria",





Cox Roper 1.4 cu. in. ignition engine powers this Pfalz A-2 by Chuck Nellis. Span 8½ ft., 16 pounds.



Pfalz features actual wing warping for scale aileron action. Bob Dunn, left, holds on while Chuck cranks.

busy!) Speaking of models, Toni Clark, of Practical Scale in Germany, just got his Piper J3 Cub kit to us in time to show at Toledo. Designed expressly for the Quadra engine, it is exact 1/4 scale, but engineered for everyday flying from rough fields that would ground 99% of the models we normally fly. (That's where the word, "Practical", comes from in his company's name.) Also shown were the plans for his 1/4scale Tiger Moth, approximately 7-1/2 foot span, which will also soon be sold as plans only, full kit, or any parts of the kit. Toni's Cub kit was given one of the highest compliments it could have been given in that Hazel Sigafuse (Queen Sig) will have Maxi Hester (Queen's toy-maker) build Toni's kit as an exact duplicate of her clipped wing J3, even to using some of the paint left over from the full-sized job. It will naturally be Quadra powered. Once they fly a 'Mammoth Scale' model it won't be long before they also come out with a large model kit despite their denials now. If they ever do, it has to be a good one.

E.W.H. Specialties Inc. doesn't even call its aircraft kits models, but

Quarter-sized aircraft kits. The Puma is a model designed to fly, and will take a modeler from his first aircraft to one he will never outgrow, if flying is what he wants to do. It uses aircraft grade fittings throughout, and is definitely something to be looked at by people who want an industrial grade mini RPV. Since parts are cut on precision machinery, it's possible to buy spare parts to repair or replace parts needed later and they will fit with the same precision the original ones did. Judging from the way the airplane is built, I think the spare parts will be more of a service than a money-making proposition. I also have a sneaky feeling that these parts, as well as other materials they offer for original 'home built' construction, will end up in many mini aircraft around the world.

Concept Models' Big Fleet biplane (all 86 inch span of it) screams realism right down to the smell of the gasoline fueled Quadra engine. It is capable of aerobatics, and will separate the men from the boys when the how, when, and where the sticks are moved, far outcrying any spin button, roll button, etc. ad-

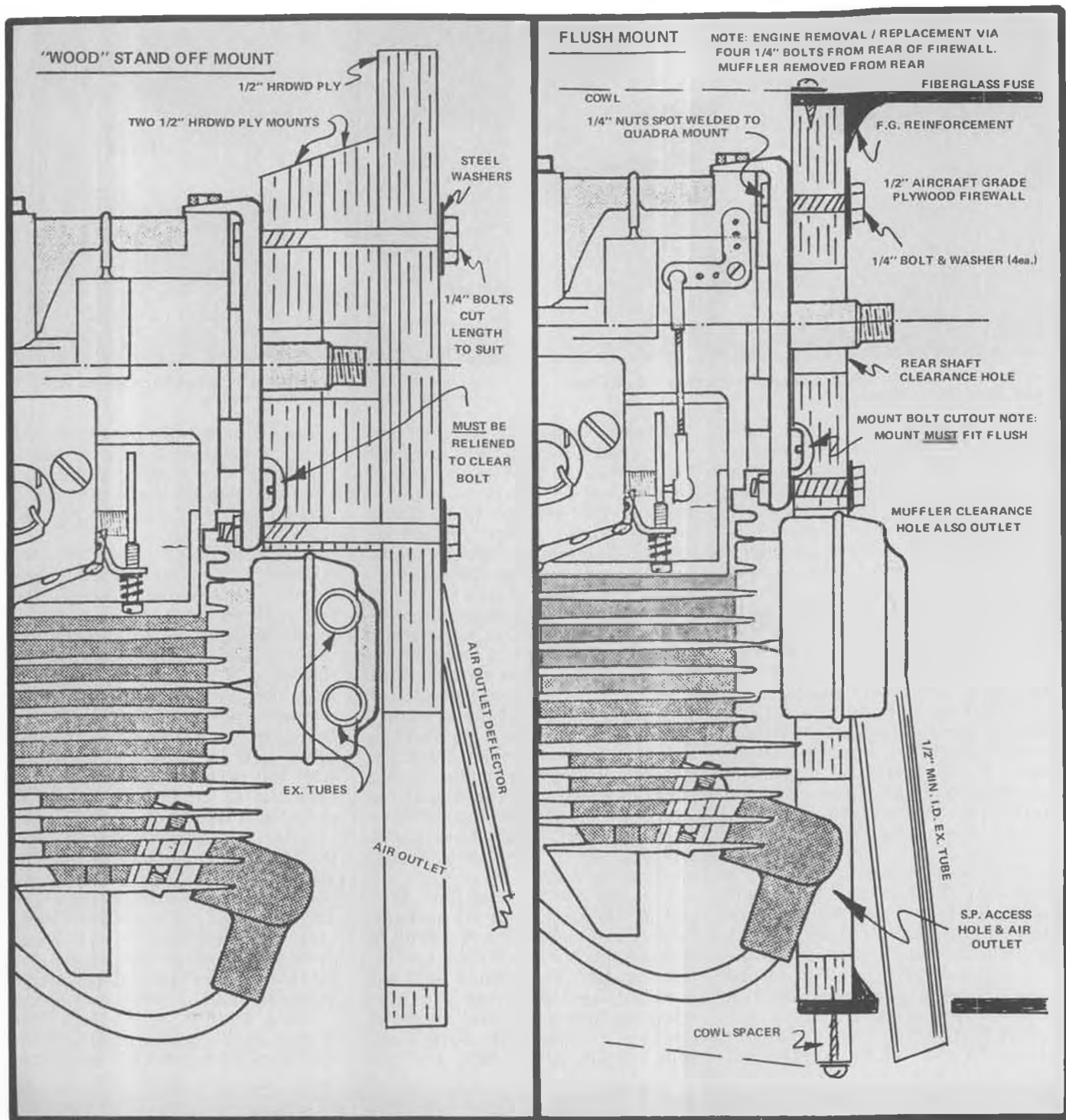
vantage obtained in pattern aircraft today. Even if not flown to 'world standards' they look good, because even mistakes look real and realism is what sets the large aircraft apart from the rest.

Bud Nosen and I had only a few minutes to speak to each other after the show. In the past, it was difficult for us to recommend each other's products because his aircraft and our Quadra engine were not designed as a team. Many modelers have modified his early aircraft for use with the Quadra, O&R, Roper, Rhino, etc. and have had a ball, but other people have had problems with the power and related problems the Quadra produced in his airframe. I would say that the most successful aircraft produced were the Mr. Mulligan and Gere Bipe, but after seeing his Mr. Mulligan do continuous knife edge figure eights and other really 'come alive' maneuvers, Bud feels that his new Thunderbolt and pattern aircraft, soon to be released, will have Quadra-type power in mind in their construction.

Andy Sheber, who, with Pete Waters, really spotlighted the flying end of very large models (aerobatic)



Bob Dunn's magnificent Boeing P-26A "Peashooter". Span 78 inches, chord 20 inches, 16 pounds, Quadra power. A graduate engineer, Bob has built models since 1940.



at the recent Vegas meet, showed their Pitts pipes and and Kraft Super-Fli in 1/3-scale and also the new 'Super Drive' for the Quadra which will allow use of 24 x 10 inch props, (approximately 1/3 scale) run at 4500 rpm with the engine running at its own best torque and hp/fuel economy, speed and load. Since the Quadra engine already has an adequate flywheel, the belt life of the unit is no longer a factor. Sufficient tooth contact and far lower belt speeds make it a totally successful unit.

Twin Quadras have been used as 'sustainer power' for full-sized hang gliders. The limitation for takeoff

power has been the ability to swing props larger than 20 inches and still allow the engine to run its best. This is another example of how multi use of a product is going to give the mini aircraft or modeler a break in price, technology, and availability. The fastest expanding field in aircraft is mini RPV's, and modeling as a result, is being recognized as a highly technical field with more and more modelers being recognized for their engineering, craftsmanship, and flying ability. Perhaps now, some of the billions of dollars being spent worldwide on the light aircraft industry, flying fields, navigational aids, search and rescue, certifica-

tion, etc., etc., will find its way into our sport/hobby, and we as taxpayers, might receive back some of the funds we pour into full-sized aviation. I see no difference in whether my enjoyment is achieved by flying around an area in an aircraft capable of little else than recreational flying, or by flying my model, during which I am bound by the rules applying to full-sized aviation but receive none of the advantages. The old story that models don't provide a useful function no longer applies. The technology developed by our sport/hobby is probably the best bargain our respective nations have received.



Cowling and cockpit close-ups of Dr. Clapp's Sopwith Triplane also reveal a multitude of rigging wires. Covering is silk and dope. Routine assembly must need check list!

Where else can one get so much for, relatively, so little?

Modeling has expanded into many commercial fields. At Toledo, Roy Lever, of England, showed me pictures of a 4-engined Lancaster bomber, 20 foot span, to be powered by 4 Quadra engines. Before opponents to large models cry out, "I told you so", let me say that this is a commercial venture. It is registered as an aircraft, certified as such, and operated as such. I doubt that there is more than one full-sized version of this aircraft now flying. The affection for the 'Lanc' (or respect if you were on the other side), and many aircraft like it, could hardly be expressed in a bronze statue or even the real thing decaying on a cement pedestal in many parts of the world, as still and lifeless ghosts of the past. Dynamic models make it come alive again for those who were there, and history reincarnated for those who weren't.

Recently a team of Vancouver, B.C., Canada modelers flew a float equipped model over 40 miles of open sea successfully. Their greatest accomplishment was that they did it safely and with the approval of all authorities. Also, they provided the media with good technical copy, etc., which is going to go a long way towards presenting our hobby in a correct light. The general public is not aware of the standards which our hobby has reached. They will be more respectful of our requirements when they are.

What do all these and other achievements mean to me, the modeler? One thing, for example: too often I have seen people ashamed of their hobby (other than in the company of other modelers who 'understand'). How often have you hobby shop owners been confronted by a customer who assured you that the radio he was buying was for his son? He didn't mention that



Bob Dunn's expression tells you how well the P-26 flew. Southern Tier Aero Society (STARS) president Geo. Privateer holds.

the son was only 6 months old. Personally, I'm very proud of what we modelers are doing, and feel that I would have more difficulty explaining my fascination for hitting a little white ball around various manicured lawns and something which looked like an Army assault course, especially when I said I did it for exercise, while driving my golf cart from one deliberate attempt to lose the ball after another. Yet golf is so important that they build freeways around courses. I doubt that they would be so considerate if it was the only flying site the modelers had.

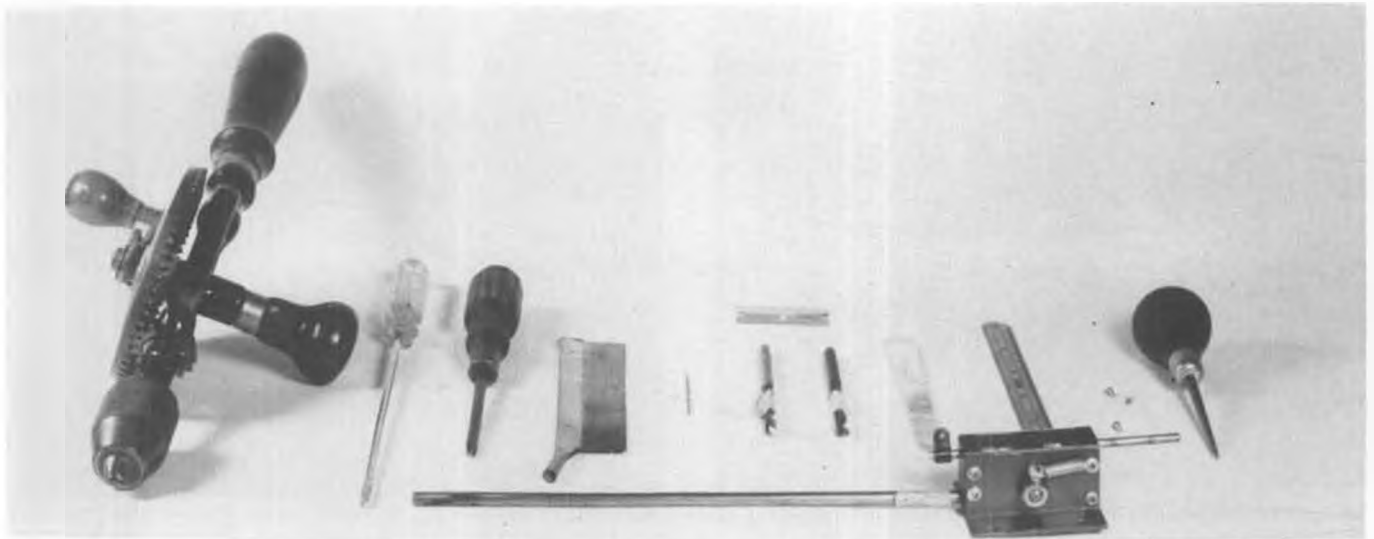
Don't get me wrong . . . I like golf. It only illustrates what can be done with a proper presentation. The amount by which we can enjoy and expand our hobby is directly proportional to the number and quality of our flying sites. If we can't speak out with pride for our sport/hobby in public, we'll never obtain sufficient new flying fields or retain our present fields. If we need to justify our hobby, some of the past and future accomplishments might give

the average modeler the conviction he needs to ask for and expect equal consideration.

Now to get back to the new products shown at Toledo. Eastcraft Specialty Products Inc. displayed its on-board starter for the Quadra. It is greatly simplified, in that glow plug lighting is not necessary, and the rear shaft allows easy access to the starter drive. Here again, is an example where possible commercial applications can share in development costs to give us better products for less cost. The capability of shutting down an engine in flight for surveillance purposes or air sample tests, etc., and restarting after the mission is complete, opens up a whole new field to the boys who fly models for work. Some of the technology and materials which they have produced will also be available to us now that we are also being recognized. I have been invited to submit a design concept proposal for a major government project, and one of the specifications is that it 'must be controlled by a standard model aircraft type radio link', which indicates they are satisfied with the quality, operation, and service of the radios we take for granted in our hobby. I hope you, the modeler, will join us at **Model Builder** in taking a little time out to recognize the men in the model radio industry who made it all possible.

Almost forgot to mention what we had in our Quadra booth at Toledo. Besides the aircraft and marine versions of the Quadra engines, we showed prototypes of two new hand-held and operated recoil starters, one to work off the Quadra's rear shaft (excellent for boats, etc.), and one to work off a special prop nut for normal front starting. These utilize roller one-way clutch bearings, which eliminate slip but allow

*Continued on page 128*



Tools required to perform "operation" on retract. Only one missing is Pana-Vise "operating table" that holds mechanism while making modifications.

# • MODIFYING • RETRACTS

By COL. BOB THACKER . . . Most commercial retractors rotate 90 degrees from lock-to-lock. However, this isn't too swift on a tail-draggin' scale ship with dihedral. There is at least one way to solve the problem.

## MODIFIED RETRACTS

Most of us try to figure things out after we've started a project, and this is typically a tale of what you are going to do when you're building your current dream ship and you discover that the retracting gear devices you have will not retract and extend 86 degrees!

I was whistling along with the Howard Hughes H-1, and thought I could use the Goldberg retractors I had on hand and modify them in some way. But after taking a look at them, I had to abandon them and look for something that could be modified in my shop with just the hand tools that most any hobbyist has in his possession.

I took a look at most all types, but Bob Violett's retractors, made by B&D Enterprises, can be modified to retract and extend less than 90

degrees. So, this little tale is how to do it and what tools to use, with a little photo assistance to help as we go along. Yes, I know, Mr. Editor, that Rhom makes a set of retractors specifically for the FW-190, however, I do not know if they are 86 degrees or not. I'm going to show us how to modify Bob Violett's gears for almost any degree of retraction and extension.

The first thing I strongly recommend, particularly if you are building a scale bird, is to modify the retractors so they will take 3/16 wire instead of the stock 5/32. What you do is take any size drill between the 5/32 and the 3/16, clamp the pivot block in a vise, and very slowly run the drill through, as shown in photo No. 1. Next, take a 3/16 drill and ream the hole to size, then jab a stub

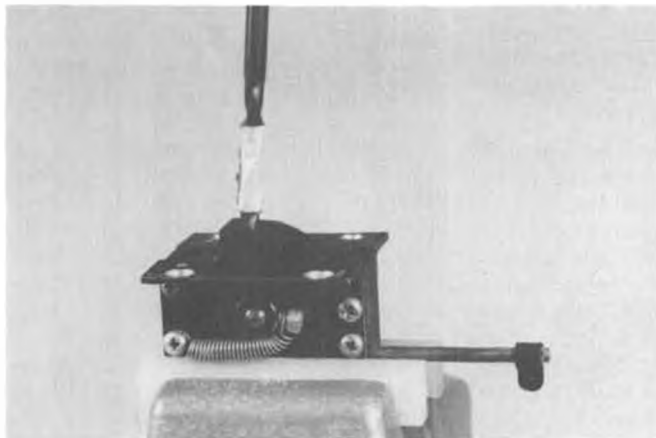
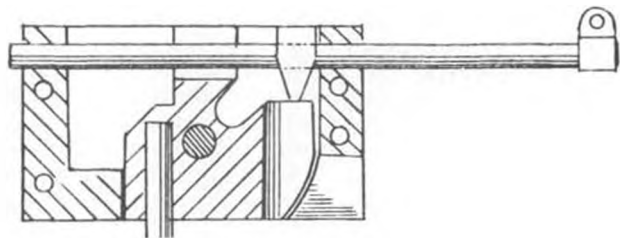


Photo 1. Drilling out trunnion to take 3/16 wire landing gear strut.

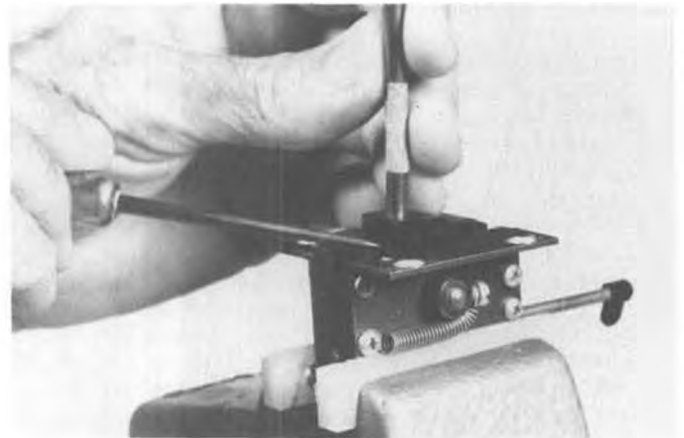


Photo 2. Marking trunnion for location of stop-bolts.

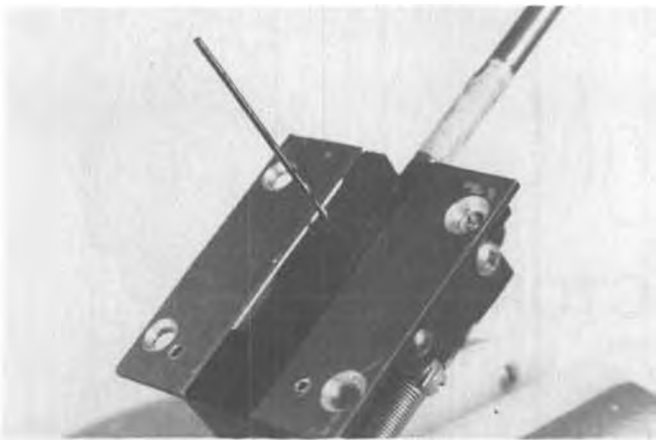


Photo 3. Drill holes just short of scribed line. Drill size selected so bolts will self-thread.

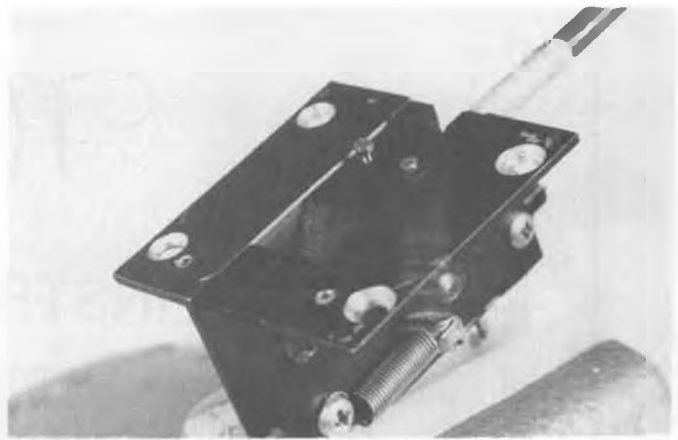


Photo 4. Hex-head brass bolts (0-80) self-threaded into drilled holes (No. 58 for 0 80 bolts).

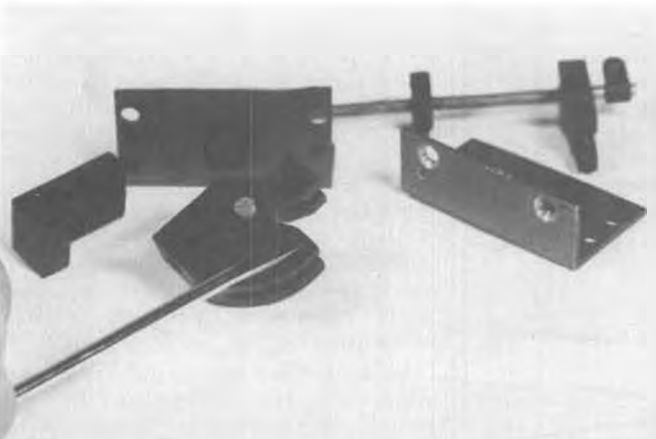


Photo 5. Screwdriver blade points to area to be cut for proper locking.



Photo 6. Scribing line to indicate portion to be cut away.

piece of 3/16 wire into the retract system to use as a gauging device. Now, lay the extended gear over the front-view on your plans and see how many degrees of travel you will want . . . or, you can use a protractor to figure it out. Now I'll show you how to start modifying it. Incidentally, if I haven't already told you, this is *one* way to do it, I'm not saying that this is the *only* way to do it, but it is the way that I have accomplished it, and it really works very, very nicely.

Let's extend the gear and scribe a mark on the landing gear trunion, as shown in photo No. 2. Now, retract the gear, put it back in the vise, and drill two small holes just short of that

scribed line (see photo No. 3). We're going to put small brass hexagon-head bolts in these holes, which will act as spacers and stop the gear extension at the exact number of degrees desired. You can obtain these tiny bolts in the train department of your hobby shop. Select a drill size that will allow the bolts to self-thread into the trunion block. I used 0-80 bolts and a No. 58 drill bit. Screw the bolts almost all the way into gear rotational trunion (see photo No. 4). Now let's extend the gear and, looking at the front-view of the plans again, line up the gear with the bottom of the wing and see if we should run those bolts a little in

or out in order to get the gear to stop at 90 degrees to the horizon line. If necessary, you may have to run the bolts all the way in and then file the heads slightly.

Okay, now that you're happy with the geometry at the present time when the gear is down, you will notice that you cannot lock your gear in the down position, and that is the next thing we'll take care of. We are going to have to modify and shave off the landing gear trunion rotational molding to the same amount of depth that you blocked the gear from going all the way down. So we will now take the gear

*Continued on page 124*



Photo 7. Cutting away material with Zona saw.



Photo 8. Final trimming of cut with finger nail emery board.

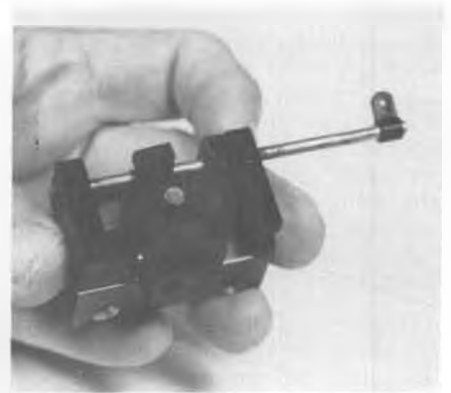


Photo 9. Checking modified mechanism for proper operation.



# Flight

## INSTRUCTOR

Conducted by

DAVE BROWN



• I've finally started receiving some feedback from our readers regarding this column, and it is gratifying to me to have it so well received.

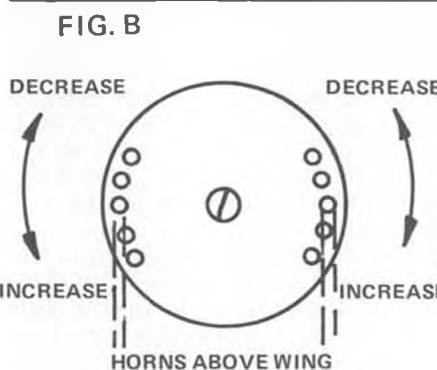
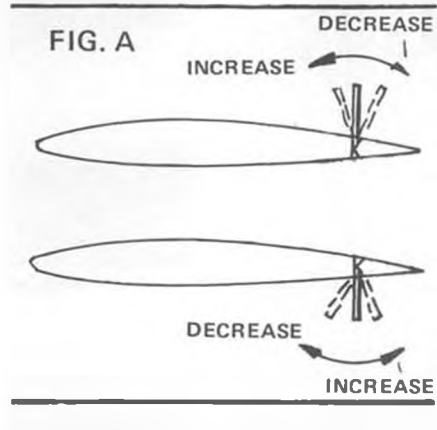
At Toledo, Phil Kraft spoke with me about the column and commented that he disagreed with my statement that toe-in would work on a two-wheel gear airplane, as the full scale Pitts uses toe-out. He may well be right, but ironically, Art Schroeder, in his column in the May issue of M.A.N. came to the same conclusion I did. It is interesting to find that even the Masters of this sport don't always agree on many things, and may well be both correct. Anyway, thanks Phil, for taking the time to read this column and commenting on it. It's great to know that even "god" reads my column.

In my last column, I mentioned that I would discuss aileron differential this month, and this subject is probably the most intricate of any aspect of model aircraft trim. Among the experts in this sport, there are as many different theories and techniques on differential as there are experts! My experience with differential has been that each airplane is slightly different, and you cannot say that a Phoenix, for instance, needs "X" amount of differential as this will vary not only with weight and balance, but with airspeed as well.

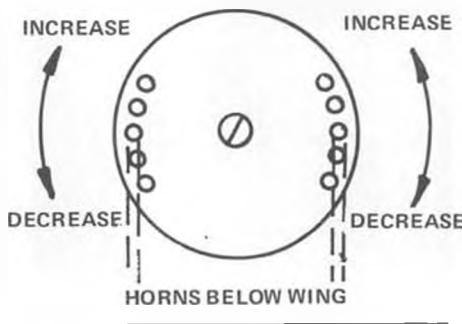
What we are striving for is an airplane which will roll about an axis drawn through the centerline of the fuselage. Bear in mind that these adjustments can only be optimized for a given airspeed, and anything you do to significantly change the airspeed will require "tweaking" the differential and that the differential must be adjusted for the best compromise for your particular pattern.

The first thing I do when checking the differential adjustment on an airplane is to simply do a few rolls and watch how the airplane reacts. If it does what I call an "inside" barrel

roll, it will require an increase in differential. I refer to an "inside" roll when, for example, if you roll to the right, the airplane appears to be rolling around the right wingtip rather than the fuselage. If the



NOTE: BOTH PUSHRODS SHOULD BE MOVED TOGETHER



airplane appears to be doing an "outside" barrel roll, it needs less differential, or perhaps even reverse differential. An example of this is if the airplane is rolled right, it appears to be rolling around the opposite (left) wingtip rather than around the fuselage centerline. In an airplane with the differential severely out of adjustment, the axis of roll may not even be on the airplane but at a point some distance off either wingtip.

Now that we have established the objectives and gotten an idea of which direction to go, we come to how to physically change the amount of differential. Adjustments can be made by either bending or repositioning the aileron horns or by offsetting the pushrods on the servo output wheel. If you have rack output type servos, then you can only adjust differential at the control horns. When using the horn adjustments refer to Fig. "A", and when using the output wheel adjustments use Fig. "B". I normally use the horns for aileron differential, as discussed here, and the output wheel for adjusting differential throw, as we discussed last month (confusing ain't it!!!).

It is important that you notice that the adjustments are different for airplanes with the horns above the wing then those with the horns below the wing.

Once you think you have the differential adjusted to make the airplane roll axially during three rolls, try the following to fine tune it. With the airplane going straight away from you, pull up to vertical and do a half roll. Watch to see if the airplane "sidesteps" (vocabulary compliments of Roy Pinner). If the airplane "sidesteps" (continues vertical but has moved sideways to a line parallel to entry line) in the same direction as you have rolled, then it indicates that you need a little more differential. If it "side-

Continued on page 115



Arie (Harry) Hakkert's Gipsy Moth takes off in chilly Nova Scotia, March, 1978. Half throttle on Quadra gets it in the air. Moth cruises at 1/3 throttle.

# GIPSY MOTH *Addendum...*

Since publishing of the Gipsy Moth construction article in the June, 1977 issue of MB, we've had quite a few interesting letters from builders, telling of their experiences with the project. Here's two of the best.

Since publishing the plans for our 7-1/2 foot span Gipsy Moth in the June issue of MB, we've had quite a few letters from modelers who are in the process of building or have finished their versions of the Moth. Two modelers who have completed and flown their Gipsies, have sent us very informative letters describing their specific modifications, which we thought would be of interest to other builders ... First, Arie Hakkert, Dutch born modeler who now lives in Halifax, Nova Scotia.

"Let me start by saying that if you find this letter a trifle loose and minced up, there is a good reason for it, i.e. 'The Maiden Flight(s) Of My Gipsy Moth'.

"I'll try to keep my cool and control the excitement as well as I can, and give you a more-or-less reasonable account of the chain of events started last year when I read your article in **Model Builder** maga-

zine. But first, let me introduce myself.

"My name is Arie Hakkert, my friends call me Harry, and I am 57 years old. My modeling career spans approximately 15 years, mostly in R/C, and includes a 3-year stretch as Zone Director, Atlantic, for M.A.A.C. My interest is the period early twenties to late thirties, when an airplane looked like an airplane and not a guided missile.

"Among others, I have built and flown the Ryan STA, PT 17, and Lou Proctor's Antic, along with many others requiring a bit more building skill than the usual slab-sided affairs we see so many of. I further despise foam, plastic, cardboard, and all the other junk that takes away from my building pleasure. Now back to the Gypsy.

"After reading your article, I was instantly sold and sent for the plans. I had, for some time, contemplated

building a quarter-scale, after being convinced by Dick Phillips, who was at that time, also a Zone Director. After studying the plans, I decided to make some changes (forgive me) and install a Quadra engine swing-



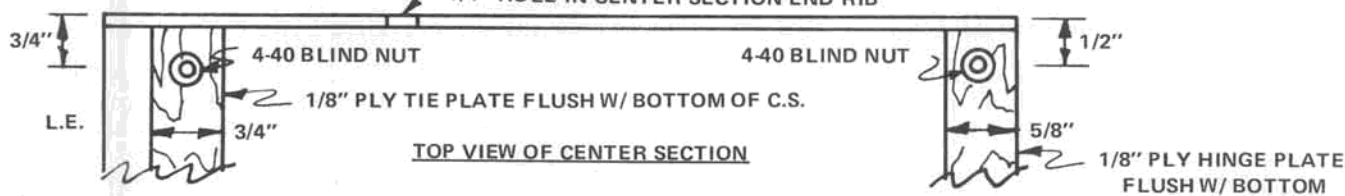
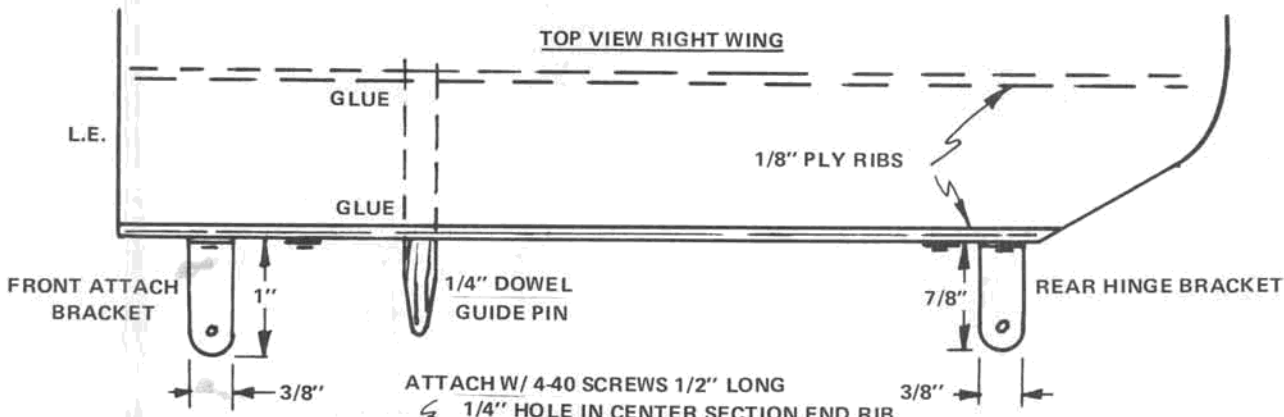
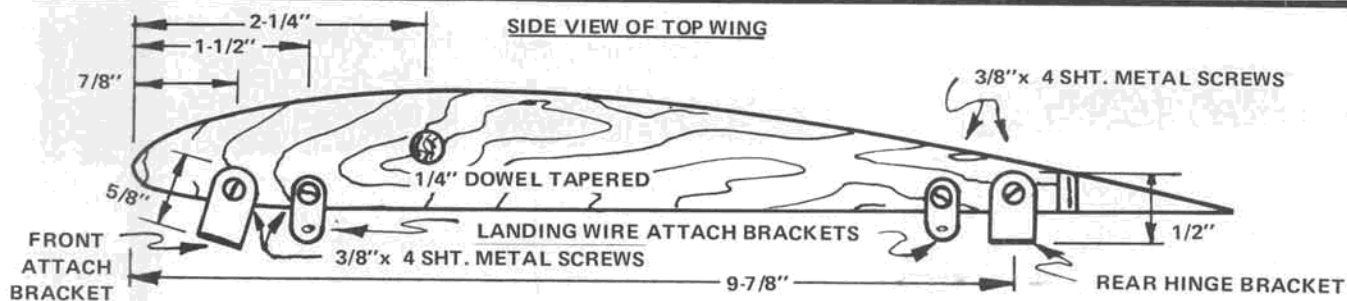
O.U. Larsen's Gipsy Moth makes low turn in Marietta, Georgia. Webra .61 power.



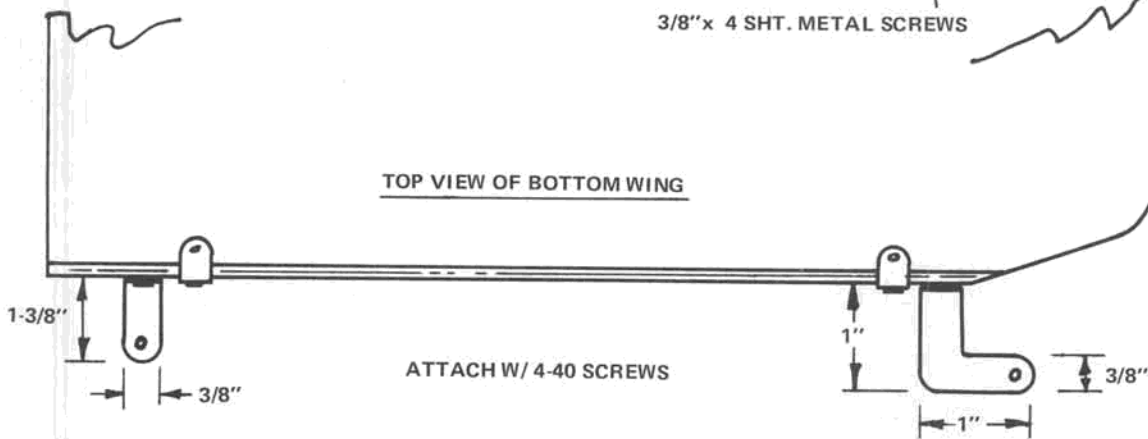
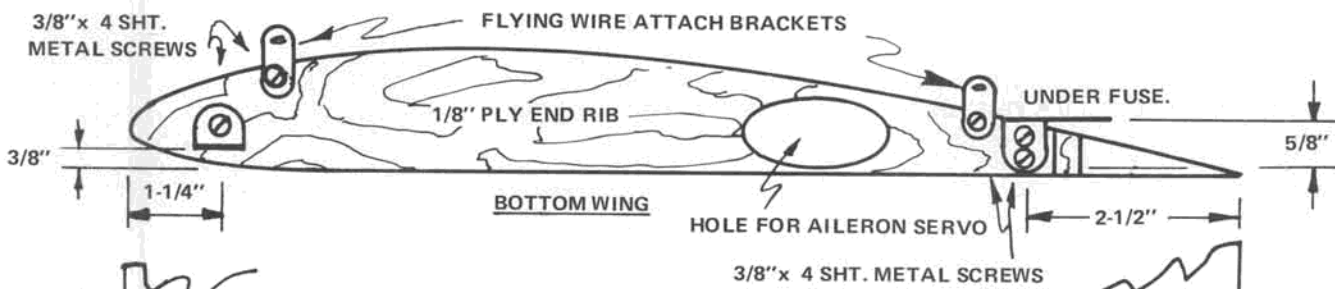
Arie Hakkert gets ready to crank while test pilot Dave Smith holds on. Brrr!



O.U. Larsen, designer of the Moth's folding mechanism as described on the next two pages.



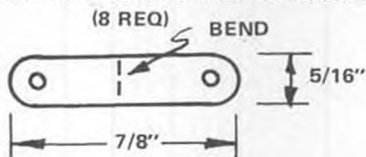
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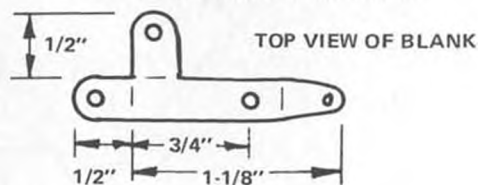
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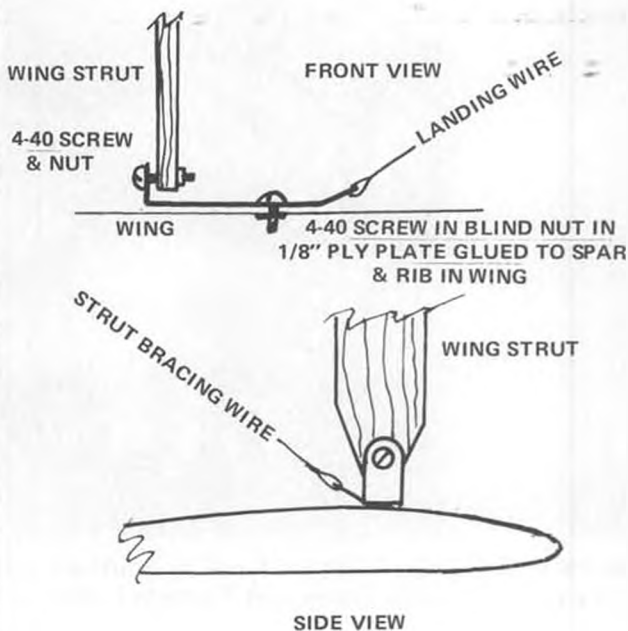
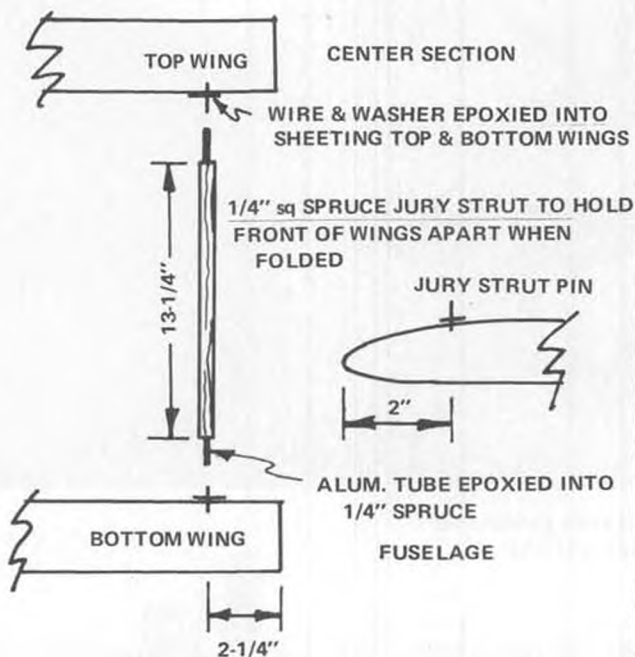
### FLYING & LANDING WIRE ATTACH BRACKETS



### WING STRUT ATTACH BRACKETS



NOT TO SCALE



ing an 18 inch prop. I also felt more comfortable with a higher wing loading; our weather in good old Nova Scotia is notoriously windy and pretty rough for 9 months of the year (we fly year 'round) so I aimed for 20 oz. per sq. ft. She came out at slightly over 19lbs., so I came close.

"The building started in Aug. '77, and she flew March 26, 1978 (Easter).

"Before going in a long drawn out description of her charm, beauty, character, breeding, class, personality and soul, let me give you some of the technical details.

"As I said before, the engine is a Quadra swinging an 18x6 Punctilio



With wings folded, Moth fits in O.U.'s Toyota Corona Mark II station wagon.

prop.

"Since the engine weighs 3 pounds (nose weight), I substitute a considerable amount of spruce in the horizontal stab and rudder.

"I further did not spare the 1/8 ply (my kind of piloting requires something sturdy), and in general, beefed up the structure wherever I felt it would help.

"The horizontal stab was permanently glued in place, all hinging was done per plan, and because of the added wing loading, I doubled up on the copper tubing for wing bearers by simply sliding a fitting piece inside and soldering the ends.

"A change in wing strut retaining was made; the struts are held in place with a 1/16 wheel collar.

"The wheels are 6 inch Du-Bro balloons, and a total of 18 turnbuckles fitted, i.e., flying and landing wires, inter-strut wires, rudder control and elevator control.;

"The radio used is a Kraft Bi-Centennial 5-channel with KPS 15 servos. As a precaution against radio interference, I fitted a piece of aluminum foil between the engine and radio compartment, but the set worked flawlessly.

"The installation of the Quadra necessitated a deviation from scale in the front end. I didn't really care, because she is not meant for compe-

tion, but just plain pleasure.

"She is covered with yellow Permagloss Coverite (5 rolls) and her registration letters are taken from the log of the Halifax Flying Club, which owned two Gipsies destroyed in a hangar fire in the late fifties.

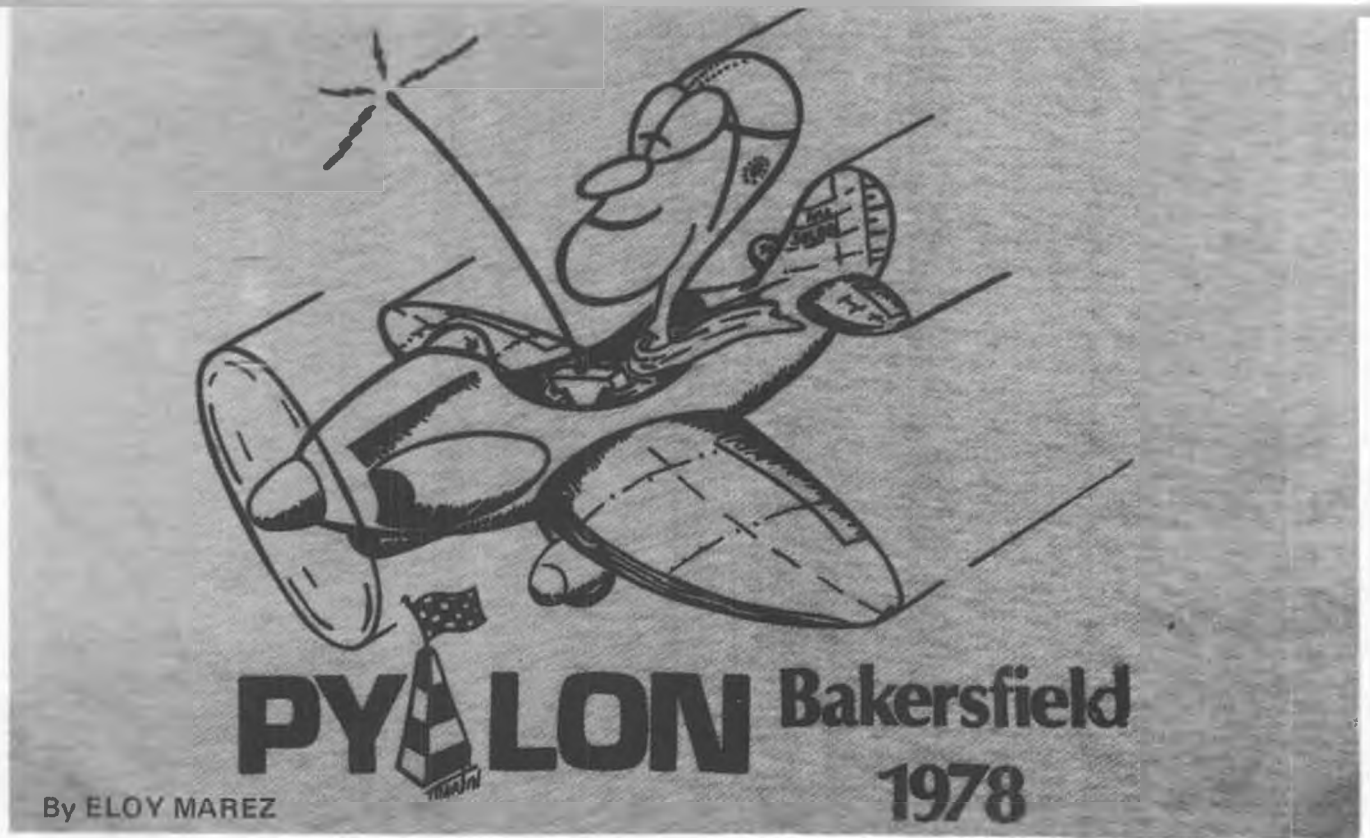
"I changed her landing gear to a single 3/16 wire, and made a total of 7 hatches for good accessibility. She carries a servo in each lower wing panel connected with a 'Y' connection.

"Now the flying: Sunday, March 26, temperature 2° C/36° F, wind app. 15 to 20 knots, place: Canadian Airforce Base 'Shearwater', paved

Continued on page 119



Designed for compact storage, folding wings also handy on model.



When they talk about "The Big One" in Southern California pylon racing, the reference is to the annual Formula I affair at Bakersfield.

• I believe it is horse racing that is referred to as "The Sport of Kings". To me, if any part of aeromodeling deserves the title, it is R/C Formula One racing. And for those of you who will write in to disagree, the name is NOT Elroy!

And for those same disagree-ers, you'll probably be happy to learn that we here on the West Coast have been seeing a steady decline in racing activity, with the possible exception of 1/2A's. And if any doubt existed in anyone's mind, Bakersfield 1978 should have removed it. Instead of the usual 100 plus entrants, only 41 Expert and 43 Standard Class flyers showed up this year to try their latest designs, ideas, and luck.

Conspicuously absent was the Mexican racing contingent, as well as the Japanese team that has shown up other years. But it wasn't only a California race; there was the usual sprinkling of East Coasters, as well as a camper-full from the Pacific Northwest, and many of the familiar as well as some new Canadian faces.

The why of the lower interest has been the subject of much discussion in this area, and while there are many opinions, it seems an impossibility to pin down the exact reasons. The subject of cost always comes up, though I for one don't believe it is that alone, as racing has always been expensive. As for "the same guys always win", I don't think that is it either. It is always that way in



Walt Riese, Idaho, takes No. 2, Jim Booker calls. Expert 8th.



Bob Brogden holds on while John Brodbeck, Jr. needles K & B in his "Polecat".



Expert winner, Tom Christopher holds up ship for flagman identification.



Ron Sheldon's 1/4-scale Cosmic Wind comes in for landing.

any competitive sport; for at least a few seasons, there are always the consistent winners, the almost-rans, and the up-and-comers. And the consistent winners don't stay there forever. Look at the list of this year's winners. Tom, err, Bob Brogden, Bakersfield '77 winner is not there. In fact, he had such poor scores you'd think he was at his first race, placing only 30th.

Terry Prather wasn't in the running either. While he was doing his usual beautiful flying, one thing or another kept him down in 15th place.

Even the "Florida Flash", MAN's Jim Maki, who usually does quite well, certainly earned the worst crash award the hard way, with what must have been the most colorful airplane at the meet, which he scattered all over the countryside just after rounding Number One. I didn't hear the results of the autopsy, but from where I sat it did not look like a classic over-roll during the turn, but more like a sudden full-controls movement.

None of this is mentioned to belittle either Bob's, Terry's, or Jim's efforts, airplanes, or skills. I mention it only to make the point that we all have good and bad days, and consis-



The small, medium, and large of it! Terry Prather's QM, Rusty Van Baron's Form I, Ron Gilman's 1/4-scale.



New handling techniques required for the biggies. Maybe this is class for slow-down proponents.

tency on the part of the not-so-expert sometimes results in winning, or at least better places.

Anyway, with the reason for lower attendance being unknown, those of us who came to Bakersfield for the 1978 Formula One Pylon Races had a good time, as usual. This year, the weather gods favored us with not too extreme temperatures in either direction, and while there was usually a breeze, it was not dangerous to the flying and kept us all more comfortable. If anyone at all suffered from the weather, it was our Canadian friends who are not used to even the moderately high temperatures, and did not have time to adjust. I'm sure they all agree the slight discomfort was worth it, since they fairly well dominated the Standard Class, as the standings show.

We were treated to lots of good racing, though this year the number of crashes seemed a bit high. Everything came together conditions-wise Sunday afternoon, with all the

*Continued on page 127*



Try this with your Q.S.! Brogden identifies for flagman.



Jim Shinohara calls for Kraft's Dave Shadel (Expert 6th).

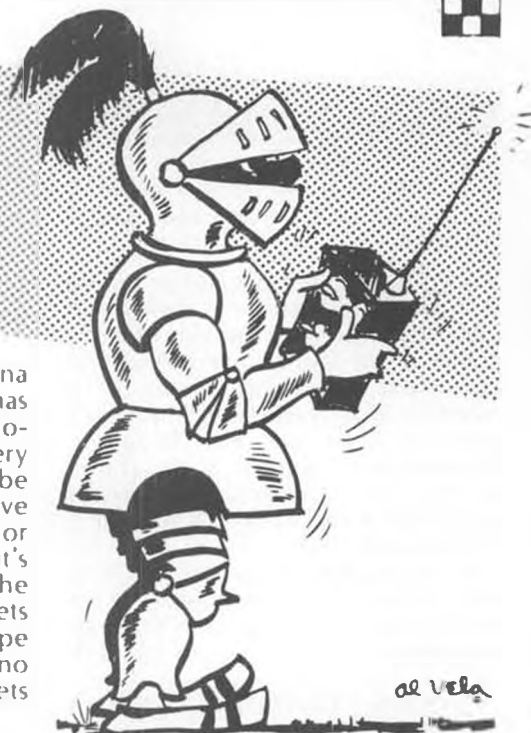


Frank Leggio flags off Tom Christopher's winning bird. Would shallower climb save a second?

# PYLON 'GO FAST AND Turn Left!'

By JIM GAGER

PHOTOS BY AUTHOR UNLESS NOTED



## TOLEDO '78

Not much new in the works for racers. The only new airplane we saw was a Q-M version of the Midget Mustang by Jim DeYoung; the kit should be available by the time you read this. We've ordered one and when we get it, will give you our opinion of it. Naturally, we've lost his address, so how 'bout sending it to me, Jim?

Big Art's Models is coming out with a Formula 1 version of the Little Mike . . . that's a pretty mid-wing aircraft with the horizontal stab set about halfway up the vertical fin. Still in the prototype stage, it will be available later this summer.

From Pactra Industries, better known by its trade name of Aero-Gloss, comes a new two-part epoxy paint. This product lacks the ingredients that cause your skin to redden and itch when it gets on you, and also eliminates irritating fumes that can cause respiratory problems. Claiming to withstand fuel mixtures in excess of 50% nitromethane, with the tough, flexible durable finish we've come to expect from epoxies, it widens our choice of finishing materials. Send for their spec sheet, at P.O. Box 4153, Philadelphia, PA 19144.

Prather Products, 1660 Ravenna Ave., Wilmington, CA 90744, has introduced a new type of micro-balloons. White in color and of very fine size, they are claimed to be easier to work with and to not leave pin holes when mixed with epoxy or fiberglass resin and sanded. And it's true, we obtained a bottle of the product and used it in making fillets around the stab. It works into shape very smoothly and there were no pin holes to be filled after the fillets were sanded.

Coverite, 2779 Philmont Ave., Huntingdon Valley, PA 19006, has come out with a new product called Glaskote, which is a clear, high-gloss finish that goes over any type paint. Intended to be a durable high-nitro-resistant finish, this product should allow you to paint your Formula 1 aircraft with easier-to-handle paints such as dope or automobile lacquers, and ink panel lines or rivets all over your plane, and use decals or instant lettering to your little heart's content, knowing that you'll be able to protect it all with a coat of clear "Glaskote".

Our old modeling friends at Pettit Paint, Inc. (Hobbypoxy), 36 Pine St., Borough of Rockway, NJ 07866, have come out with two new products:

The first is Formula 3 Epoxy Glue with a special formula to control viscosity that will allow it to be applied to thin edges, vertical surfaces and other areas from which normal type glues would run off, or drip or sag. Should be perfect for many building applications in racing aircraft. Their other new product goes by the identification P.F.C. H85, and that doesn't stand for Private 1st Class, but Polyester Resin Filler Compound. A white polyester resin in paste form, it should take the place of having to mix micro-balloons and resin or epoxy to make a filler for those nicks, dents, and chips that develop from building and hangar rash.



Jim DeYoung's version of the Midget Mustang, at Toledo Show. Soon available as kit.



Bob Reuther's Form 1 "Polecat". Complex paint job reflects faith in longevity of aircraft!



Stu Richmond's QM P-39 from R/C Etc. kit. Done in very visible red and yellow.



Wayne Yeager's beautifully painted Prather Toni Form I. Auto lacquer and Imron top coat.

If we've missed any new items that would appeal to racers, we'd appreciate it if you'd drop us a line so we can pass the info along to the rest of our readers.

Toledo was, of course, even more crowded this year than in the past. With more and more people entering our hobby and attending these trade shows, it's very difficult to see everything and talk to everyone, so if we missed your booth or new products, please excuse us and we'll catch you at the races.

An item was passed along to us by our old racing buddy, Allen Booth, that seems to be a natural for anyone involved in modeling, and having used it for several weeks, we now wonder why someone hasn't marketed it with the airplane hobby in mind. We're talking about a disc sander available from Merit Abrasive Products, Inc., 201 W. Manville, P.O. Box 5447, Compton, CA 90224. Allen found this item in a small "man-n-pa" discount store, and neither he nor I have ever seen anything quite like it. It's a disc sander made to fit the Dremel-like tools with 1/8 inch shank arbors. The discs are 1-1/2 inches in diameter and snap onto the hard rubber mounting disc. This allows for a smooth, flat-backed sanding surface without a center

screw hole to gouge the surface being worked. The kit we purchased includes nine abrasive cloth discs (3 fine, 3 medium, and 3 coarse grits) and the disc holder. The company also offers a booklet of home workshop sanding tips.

#### PROFILE OF A RACER TERRY PRATHER

At thirty years of age, this racer has already left his indelible mark on the racing scene. A competitor from the word "go", Terry started out the way many of us did . . . in U-control, at the formative and impressionable age of ten. Rat racing and combat were Terry's primary interests in C/L, and before long, his competitive nature became evident as he fought his way to Junior Combat Champ at the 1967 Nats.

As with many of us, the sight of an aircraft flying without strings attached led him into R/C, in 1969. Pattern was the "in" thing at that time, but when Terry saw his first pylon race he knew that this was where the action really was. He competed in his first race in 1970, flying modified Stafford Minnows (the wood Little Toni version). *(Ask him about his experiments with installing and flying an R/C system in a C/L combat ship! wcn)*

Starting out in the model business on a very small scale, making Prather Prop Balancers, he soon became dissatisfied with the caliber of engine rework available, and began doing his own work. His business marketing major from Cal State was of little help in running a lathe or mill, and it became necessary for him to teach himself the machining business. The first engines he made were for himself and some friends, as a part-time operation. As the "Terry Tigers" became more and more successful (evidenced by his '71 Nats championship), it wasn't long before the demand for them grew, almost forcing Terry into the rework business.

While the amount of rework time that goes into a "Terry Tiger" is spread over several weeks due to having parts batched together for machining and honing, the actual time spent bringing each engine up to Prather standards works out to approximately five or six hours. This does not count time spent on reworking parts that ultimately get rejected in the final quality inspections and test runs. Incidentally, the customers do not get rejected parts and are not charged for rejected and replaced parts, even though it may

*Continued on page 107*



Power sanding discs with 1/8 inch shank. See text.



Bob Violett and Polecat in booth at Toledo Show.



Terry Prather, subject of this month's "Profile".

# FUEL LINES

GEORGE ALDRICH



OTTO BERNHARDT

DALE KIRN

Send in your questions, relative to glow or ignition engines, and these experts will give you the correct answers.

## GEORGE ALDRICH

• Human nature is still the strangest of man's gifts on this green (sometimes) earth. When we first started messing around with tuned exhaust systems back in the 1960's, they were exasperating, to put it mildly.

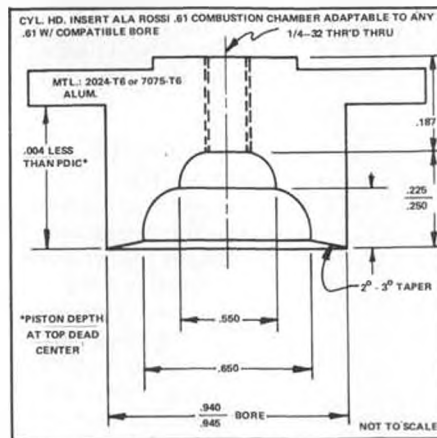
Now, over ten years later, there are a number of engines on the market that employ a tuned pipe/muffler system which not only delivers extra power, but is much less critical to operate. When these engines first appeared about two years ago, we figured only the hard core competition fliers would go to the trouble and expense involved with these super power "monsters". To say we were wrong, is an understatement.

Hardly a week goes by that we don't have a number of inquiries about tuned exhaust engines for pattern and/or sport flying. As we have mentioned before, most of these engines are coming from countries that do not use any nitromethane in their fuels. The normal fuel used in Europe is 80% methanol and 20% lubricant. Such mild fuel allows much higher compression and closer head clearance than can be used with nitrated fuels.

Last year, U.S. Pattern fliers were burning up, blowing up, and in general, detonating just about every engine run with the pipe. There were a few bugs in these engines, but the problems would have been reduced at least 50% if nothing but the F.A.I. 80-20 fuel had been used. Most were running 15% nitro, with some really pushing by using 25%. This much nitro with the head design in most of the engines, just pounded the rods, bearings, etc. all to pieces.

After the world championships last year, we did some testing with head design and fuels for piped-pattern engines. For those of you who care to experiment, the sketch this month gives a good starting point for a head design that will allow the use of higher nitro fuels. As can be seen, it's based on the "double-bubble" head we developed years ago for the old Super Tiger G-40, and current X-40 engines. By keeping the primary chamber constant, the secondary cham-

ber can be varied, to adjust plug depth, and slight variations in the compression. Head clearance can be set up at .004 to start with, and shims added until the glow plug will last for at least 8-10 flights on a given percentage of nitro in the fuel.



Another finding that really indicated these engines were over-compressed for nitro fuels came about when we were testing our Piped Pattern fuel. We got identical RPM readings on fuels with 10% nitro and 2% nitro! Then when put down on idle, the 2% juice idled considerably better. On high speed, the 10% nitro had a distinct pre-detonation cackle.

Due to the added heat and RPM from the pipe, we didn't find any standard fuel that was completely adequate. With a big .61 punching over 18,000 revs, some added lubricant to any fuel, originally formulated for open or muffler exhaust systems, is welcome.

At this time, only OPS, Rossi, Super Tiger, Fox, and Webra offer their engines ready for the pipe. Fox offers his pipe as an accessory item and Super Tiger did not ship a pipe with their new X-60. Latest word is that Super Tiger pipes are on the way from Italy and should be available by the time you read this. Super Tiger will also have an X-45 front rotor, rear exhaust, piped pattern engine very soon.

Several of these engines are employing a slide valve throttle now that is very positive, due to its linear action. Top pattern flyer Steve Helms tells me he found his OPS Big

Red 60 with slide valve throttle worked best with a Perry pump, instead of taking piped pressure off the manifold. Apparently, the steady pressure from the Perry pump eliminated loading up, upon recovery from maneuvers where power was cut back.

The beautiful Rossi 60 had problems with the rod and rear bearing last year. Rossi has a new rod, bronze bushed at both ends now, with lube holes instead of slots. If you're not religious in oiling the Rossi after every flight, you can still have rear bearing problems. We understand the importer, Bill McGraw, of Bill's Miniature Engines, 1325 Carol Dr., Memphis, TN 38116, has found a stainless steel replacement bearing that pretty well eliminates this problem.

We have heard of numerous other engines that broke shafts, rods, etc., the O.S. 60 FSR and Kraft .61, to mention only two. Let me hasten to point out, that with a muffler or open exhaust, these are two fine engines. My test Kraft .61 punches 14,500 on a 11 x 7-1/2 Super M and 15% Magnum Power fuel... the most we've seen from a non-piped pattern engine. And, no one builds a nicer engine than the O.S. FSR series. The fact remains that these engines were not specifically designed for the pipe... if you blow one up using the pipe, well now, ahem, err, ah, see ya' around fellers!•

## DALE KIRN

• The 1/2A engine field has lost one of its greatest designers... Bill Atwood. Bill passed away on April 28th, at his home in Laguna Beach, California. The list of engines that Bill designed include many 1/2A engines such as the Atwood .049 Wasp and Shriek, and the highly successful Cox Tee Dee .010, .020, .049, .051, .09 and .15. Many of these engines have dominated the winner's list (and AMA records) since they were first introduced in 1961. Of the Tee Dee series, the only engine that was improved from the basic design was the Tee Dee .15. It was replaced with the Cox Special .15, then the Mark II .15, and more recently by the Conquest .15. Each one of these improved versions were Bill Atwood developments. The remaining Tee Dee engines still dominate their respective classes, which is the finest tribute any engine designer can hope for. Bill Atwood earned this reputation and will be missed by all.

The question that comes up most often by 1/2A engine users is, "What can I do to get more power out of my Tee Dee .049 (or .051)?" This is not always an easy question to answer, as I have no idea what

condition the user's engine is in at the present time. I have seen brand new .049 (and .051) engines RUINED ON THE VERY FIRST RUN by so-called "experienced" modelers. The biggest mistake is using too much nitro too soon and expecting the engine to hold a steady needle valve setting under these conditions. The only time you can get away with this is when you have a fairly loose fit between the piston and cylinder. Most new Tee Dee engines are usually fit a little on the "tight" side. This is done to assure a longer life at peak power. A sensible break-in period is required. Most Tee Dee engines are ready for peak performance after approximately 30 minutes run-in time.

There are several things that can be done to improve engine performance. Listed below are four quick ways of improving performance, assuming that your engine is properly broken in and is producing "average power":

#### 1. GLOW HEAD/GASKETS

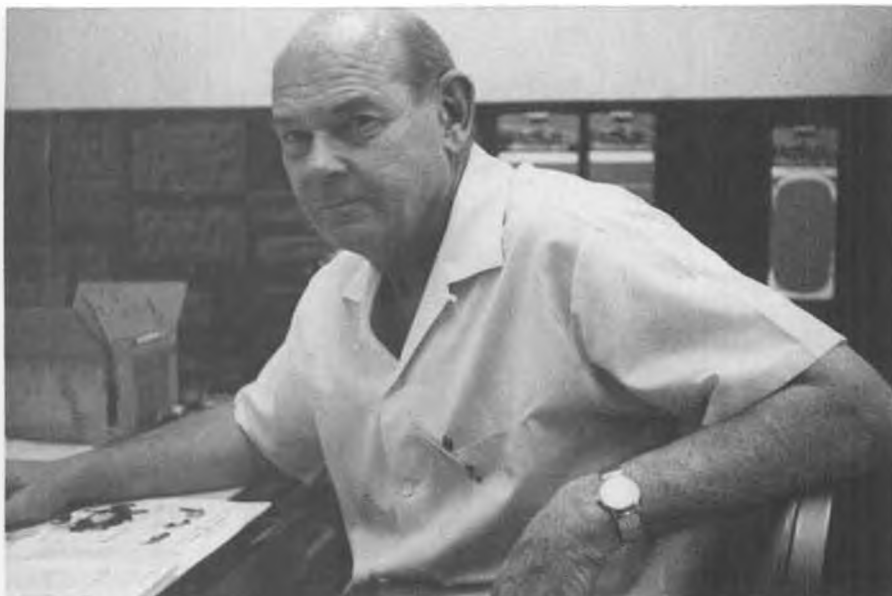
All Tee Dee .049 and .051 engines come equipped with three copper head gaskets (.005 thick). Remove one gasket after the engine is broken in, and it will pick up about 200 rpm. Remove another gasket for an additional 200 rpm. Leave the last gasket in for a proper seal.

Three other glow heads are now available . . . not produced by Cox. Kustom Kraftsmanship offers a "shaved" Cox No. 1702, which will increase rpm; the amount of increase will depend on prop size and fuel used. GloBee has two new glow heads that also produce very good results. The "Sport" plug is about equal in performance to the Cox 1702 head. But the "Racing" plug will produce the advertised 1000 rpm. However, using the Racing plug can damage your engine due to the extremely high compression ratio used. The connecting rod is usually the first thing that lets go. Recommend that you experiment by adding gaskets under this plug (up to a total of 5) until you are satisfied with the starting ease and power output.

#### 2. OPENING VENTURI HOLE

Another 500 to 800 rpm can be gained (depending upon prop and fuel combination) by enlarging the size of the venturi hole. Stock size is .116 diameter. A significant increase will be seen by drilling (or reaming) this hole out to .128 diameter. Once you have done this, you will have to use some type of pressurized fuel system, as the engine will not develop enough suction to allow for a consistent engine run in flight.

The easiest pressure system is the bladder type (see last month's column). The other method is to pres-

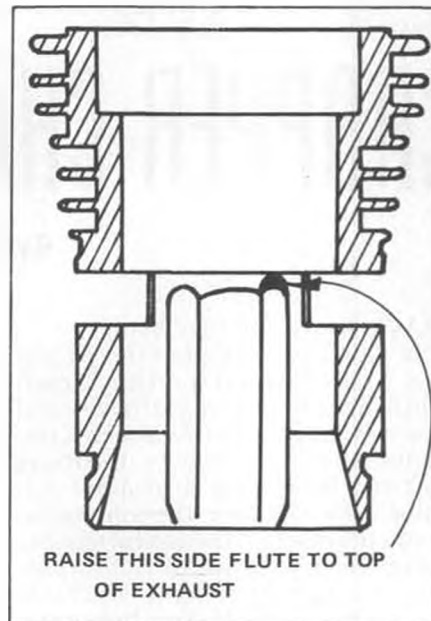


Bill Atwood, Supreme model engine man for many, many years, passed away on April 28, 1978.

surize the tank with engine crankcase pressure. Here you have two options. 1) Drill out the pressure fitting on the plastic carb housing per the Cox Tee Dee instruction sheet. This permits crankcase pressure to be forced out through the crankshaft port opening. 2) Another, simpler way to pressurize your engine is to obtain a Kustom Kraftsmanship pressurized backplate with a ball-check valve. This one produces the best results, as there is no danger of flooding the engine when refilling the tank. The venturi hole can be drilled larger than .128 diameter, but doing so will cause the needle valve adjustment to be very critical and hard to duplicate flight-after-flight.

#### 3. CHANGING CYLINDER BYPASS PORTING

All Tee Dee .049 and .051 cylinders use the same style bypass ports. An additional 500 to 800 rpm can be gained by raising two of the smaller



side flutes up to the top of the exhaust opening (see Fig. 1). Depths of bypass grooves (small side flutes) into the cylinder wall on the .049 should be between .480 to .485. On the .051, this measurement should be between .490 to .495. If you go deeper than these dimensions, you will probably slow the engine down.

Best way of performing this operation is with a 1/8 diameter Dremel carbide cutter mounted in a drill press. If you don't feel up to trying this, a reworked cylinder can be obtained from Kustom Kraftsmanship.

#### 4. SWAPPING ENGINE PARTS

Nearly all serious 1/2A fliers own more than one Tee Dee .049 or .051. You will soon discover that by swapping various parts around, significant rpm changes can be realized.

*Continued on page 107*



So what's new about gear reduction? This ignition .60 with 1-1/2 to 1 reduction gearing built by Otto Bernhardt in 1946.



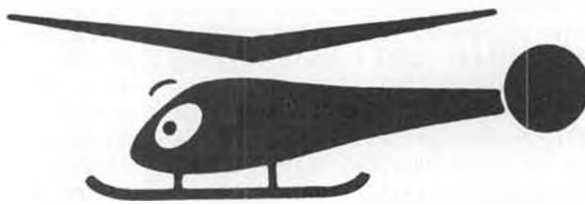
Kim Tucker flies Kavan Jet Ranger on roof of Long Beach Convention Center. Hmm . . . nice spectator.



John Simone, Jr., with 4-bladed Rev-olution mentioned in text. Flew under this bridge.

# CHOPPER CHATTER

By JOHN TUCKER



PHOTOS BY AUTHOR UNLESS NOTED

## MACS SHOW RUNDOWN

In April, we attended the Model and Crafts Show at the Long Beach Auditorium. Usually, this annual event is held at the Anaheim Convention Center, however, the move to Long Beach was a pleasant surprise. The outdoor demonstration area consisted of a beautiful lagoon, complete with island and footbridge and the Queen Mary at dockside across the harbor! The helicopter pad was on the edge of the lagoon, and was more than adequate, with unrestricted airspace above. The footbridge did pose a psychological problem though, especially after Ernie Huber struck the railing with his Jet Ranger and dumped his chopper into the lagoon. Non-plussed, he stepped out of his trousers, took off his shoes and plunged in to salvage what was left of his bird. One of the guys took a snapshot of Ernie in his shorts as he dived in, and later gave it to him as a souvenir. I tried to get it from Ernie for the magazine, but he wanted no part of it. No way! Ha!

Eventually, the bridge became center stage when the fliers realized they could stand in the middle of the arch while putting on their flight demos. This gave them unrestricted vision and even provided a new stunt to try out. Do you remember

the movie "Blue Max", where they flew the WWI fighters under the bridge? You guessed it . . . a couple of pilots finally had to give it a try! Several successful passes under the bridge were negotiated, but one finally went swimming before that activity was terminated!

John Simone Jr. put on a beautiful demonstration of precision aerobatics with his standard Revolution, equipped with the new rigid-rotor/collective pitch system. This modification uses no fly-bar for stabilization and the control inputs go directly from the swashplate to the main rotor blades. John also demonstrated his new 4-bladed rotor system on another Revolution. Watching this chopper fly around the sky tends to make goose pimples raise-up on the back of your neck when you realize the tremendous power being developed in that rotor disc! It appears to have unlimited capability, if you're pilot enuff' to handle it! John advises they have already flown a 5-bladed rotor and are in the process of completing another with 6 blades!

Take a close look at the photograph of the 4-blade rotor head on Simone's machine and you'll notice an inverted spun aluminum dish with 4 stub-shafts and balance weights locked in strategic loca-

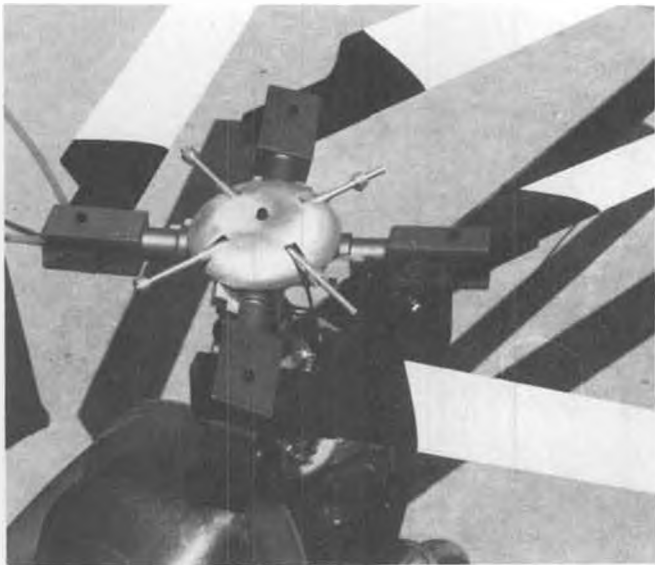
tions. When I first noticed it, I tried to figure out what function it had . . . I "peeked" under the shell but it was too dark to see what was hidden there.

Finally, I couldn't stand it any longer and asked John Sr. what it did. He said it was his son's idea and he had promised not to reveal its function to anyone. He did give me a hint though; he said one of the show people had jokingly placed a small decal on one of the rotor blades and John Jr. simply adjusted one of the balance weights on the stub shaft and said it would be okay now.

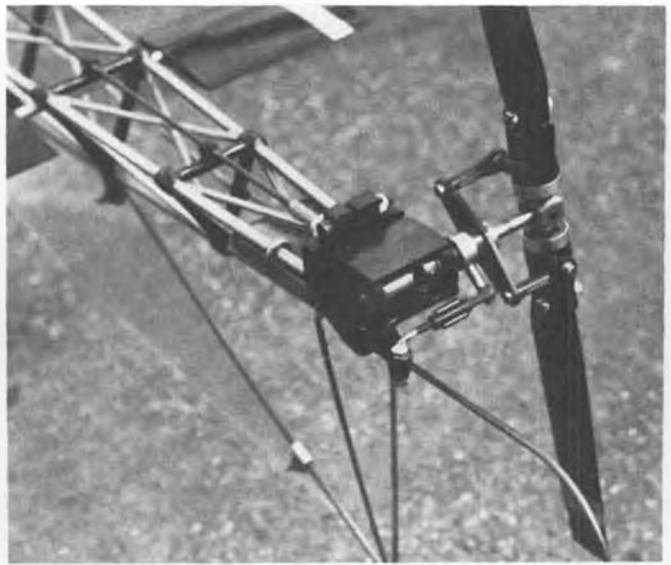
Well, that didn't help too much, so I asked one of the other salesman at the booth and he replied he didn't know too much about it, but the word at the plant was, it diverted the airflow around the rotor disc! More questions resulted in different answers, none of which really gave me any information until I finally got John Jr. cornered at the demo site. He laughed and told me it really had no purpose whatsoever, except to stimulate the imagination! He made it just because it looked good and would cause much inquisitiveness among the curious. Now that made more sense!

I have since seen the identical device on a Hughes 500 (real heli-





Simone's 4-bladed rotor head, blades folded. Aluminum "cap" and balance stubs mentioned in text.



Modified Alouette II tail rotor control modification, as described in text.

copter) in San Jose, and I now wonder if the Hughes Helicopter Corporation would go to all that bother just to change its looks? I also wonder if John's explanation was just another tall story, or is there really a purpose behind it? What do you think?

John Gorham and Walt Schoonard showed up with the new Schluter "Heli-Boy". They had a booth at the show where several choppers and other Schluter products were on display. John was a little reluctant to put on a demo in view of all the expert fliers with the factory demo teams, however, he finally fired up and literally "blasted" into the sky. It's really pointless to explain the extreme maneuverability of the Heli-Boy, and John Gorham is no slouch when it comes to putting on a show with it!

I do, however, want to describe the most fantastic maneuver I have ever witnessed with an R/C chopper. A few weeks ago, Larry Jolly was doing outside loops with his Heli-Boy, and I thought that was the ultimate, but this particular demo topped them all! John had flown his chopper up to about 100 feet to demonstrate his 6- or 7-turn Hammerhead Stall . . . a short dive for speed followed by a vertical pull-up and then full tail rotor control for the fastest rotation you've ever seen. As it spun around in yaw, it started to descend on the backside of the Hammerhead, getting steeper and faster until it finally became inverted and stabilized into an inverted flat spin! This lasted to within 10 feet of the ground (no foolin') and the crash was only a split-second away, when John rolled it over and flew merrily away into a steep Chandelle! The crowd roared and even the other demo pilots were astounded.

After he landed, I asked him when he had learned to do that? His response was, "Hell, I didn't do it . . . the machine just fell into the spin and before I even recognized what was happening, it was on the verge of crashing. My last minute reflexes said to roll it out, and I did, and it worked perfectly." Surprisingly enough, John was able to duplicate the inverted flat spin (this time deliberately) and recovery technique on a later demo flight. At his booth, he projected a movie which showed John Minasian tail-sliding a Heli-Boy, accidentally, from 50 feet to within 2 feet of the ground, and making a smooth recovery by pushing the stick forward into level flight. This kind of control response is certainly indicative of the new-generation choppers. I wonder just how far we will be able to go in another short year or two?

Representing Kavan at the show, were Ernie Huber and his Jet Ranger and Manfred Heid, of Nurnberg,

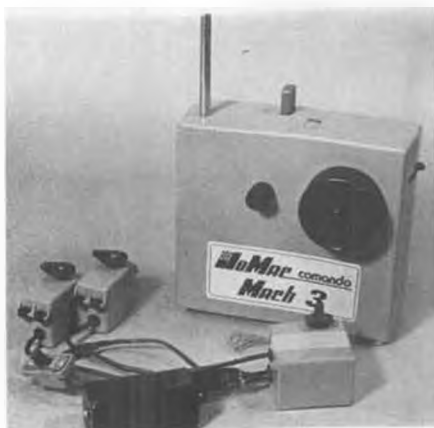
Germany, with a Jet Ranger and Alouette. As I mentioned earlier, Ernie lost his chopper in the lagoon and was unable to get it back into the air. Manfred had barely lifted off when he realized his engine just didn't have the power to get higher so he cancelled out that flight. Earlier attempts to get the Alouette airborne were also unsuccessful (again, engine problems, I believe). After working most of the night, they changed engines and Ernie decided to do the demo on Sunday with Manfred's Ranger. Considering all the tough luck they had the previous day, and the fact Ernie was flying a strange chopper with a German transmitter, he put on a fine show . . . but it wasn't up to his usual brilliant performance. Next time, I'll bet they have spare machines and extra support!

Several months ago, I showed pictures of an Alouette tail rotor control modification which was

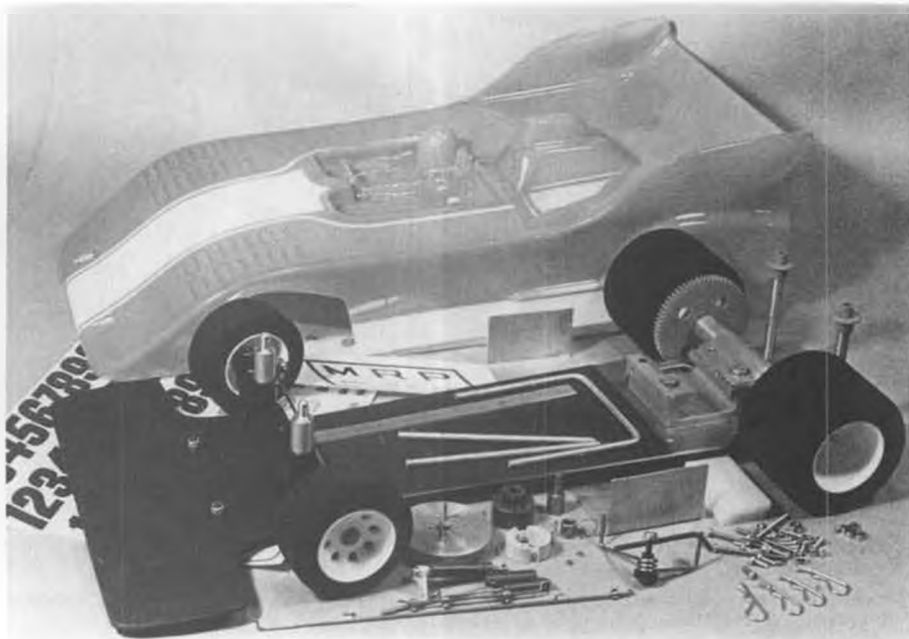
*Continued on page 120*



Ernie Huber, Kim Tucker, and Manfred Heid (l to r) on Heli-pad at Long Beach Convention Center. All flew Jet Rangers at show.



MRP 1/8 SCALE RACE CAR  
AND  
JOMAC COMANDO MACH 3  
RADIO



## PRODUCTS\$ IN USE\$

By DAN RUTHERFORD

• Regular readers of **MB**, and even a few readers who are irregular, may recall that I tested an MRP 1/12 scale class "B" car awhile back. At the time, I could have cared less about R/C cars . . . all I really wanted was a car that would pull some decent wheelies and terrorize medium-sized dogs. In that test, we tested the car/engine/radio combination real well, and found the unit to be a good product . . . but it sure wouldn't do any wheelies. . .

But things are looking up. You see, now I have an MRP 1/8 scale car to play with. First day out with it, I was tiring of trying to keep from hitting the concrete curbs in our street, so ran the car down the cul-de-sacs away. Turned around,

eased into the throttle, let it pick up for about 30 feet and then hit the throttle hard. The engine belched once, caught hard and flat commenced to cook that car up the street at an outrageous rate. About the time I was considering backing off, either the front tires hit a small rock or the real tires hit a clean spot and got super-bite for a second, because that hummer flat lofted the front end and carried it for about 20 feet.

I was ecstatic. The neighbors made their kids go inside. Our dog whined and hid under the van. The sun shone. All was right with the world. I had an R/C car that would pull *wheelies*. I did say I was ecstatic, didn't I? Really!

But of course, I am getting a little ahead of the story. Let's go back to early February '78. The scene is the office of Don McKay, at JoMac, makers of the Jerobe R/C cars and distributors of the MRP line.

Dirty: Hiya, McKay, what's up?

Don: Busy. Can't make the electric R/C cars fast enough. Whaddya want?

Dirty: Well, I went to a SARCAR meeting last night and realized that the first 1/8 scale race is less than a month away.

Don: So?

Dirty: Uh, I've been kind of planning on racing 1/8 this next year.

Don: So?

Dirty: Well, if I'm going to race, I better be getting a car together, pretty soon, right?

Don: Right.

Dirty: Whattsa matter, you forget?

Don: Forget what?

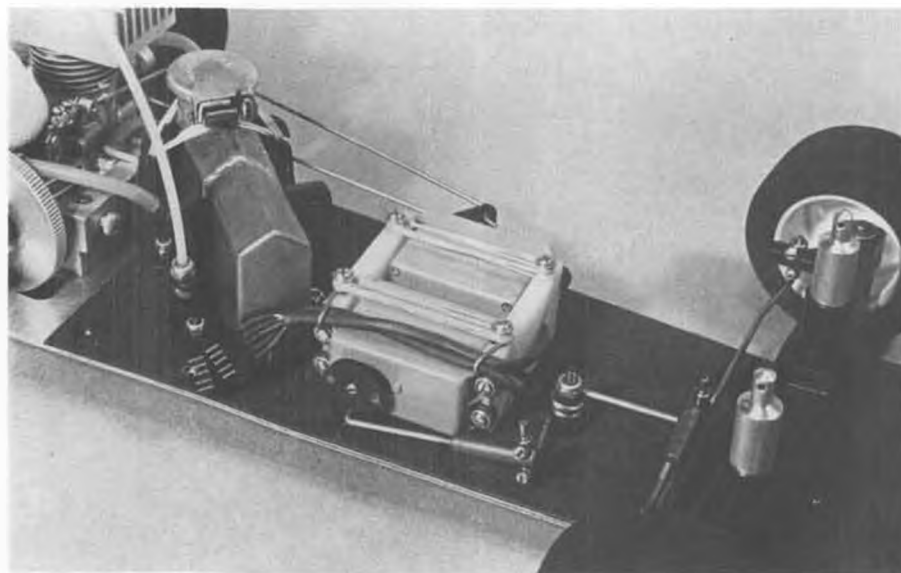
Dirty: Jeez, a few months ago you offered to set me up with an MRP car and a JoMac radio if I wanted to race 1/8 and would do a product test on everything.

Don: I did?

Dirty: Never mind. Say, you don't have Gene Husting's phone number handy do you. . .?

Faster than you can spell a certain 10 letter word, I was walking away with an MRP kit car, complete with painted Abarth Can-Am body, and Monica was packaging a JoMac modular radio.

Back to home it was, all giggles and chuckles as I went through the car parts, trying to figure out exactly how to build it up. Before getting too far, it was pretty obvious that I



Servo and tank installation. Dan used Hi Johnson adjustable tank (built to 4 oz.). Kydex brackets.

was going to have to pick up a few more items.

First thing to pick up on was a new noisemaker for the car. As I see it, there are only two choices here, but I really didn't want to bother with a K&B (Veco) 19 and installing the McCoy conversion, so I got a new K&B .21.

The K&B .21 is the overwhelming favorite in R/C car racing, not because it is American made or anything like that, but because it flat makes more horsepower than any other engine in this class. In fact, if the K&B .21 has any shortcoming at all, it is probably that it simply makes more power than most drivers can handle, especially on go-to tracks where the traction is lacking.

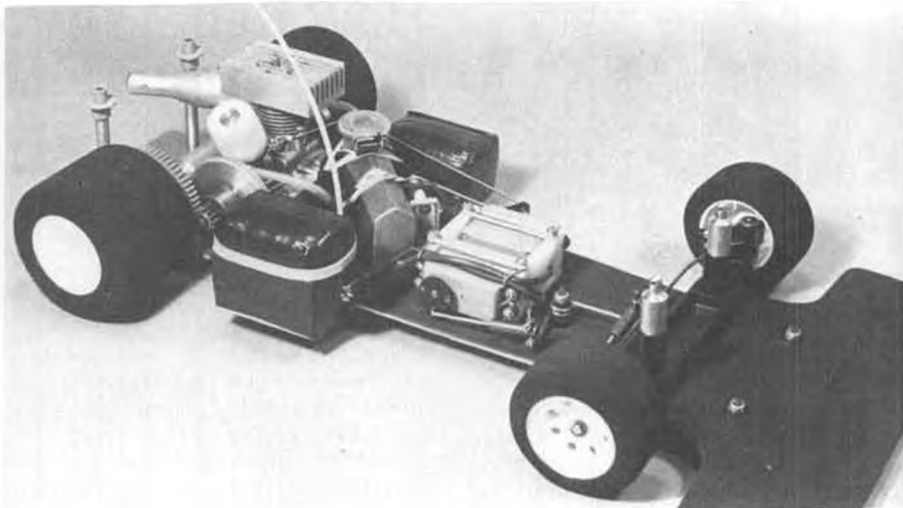
Knowing beforehand that I wouldn't be able to effectively use all of the power on tap from the K&B, I installed an extra .012 head gasket, left the stock carb on, used a lot of clutch slip, ran the engine on slow fuel, and with a rich needle setting. Right, I am actually taking a high-perf engine and making it very mild. May seem to make more sense to run a milder engine in the first place, but not so. As I (hopefully) get better at driving, I can go to fuel with more nitro, pull the head gasket, tighten up the clutch some, and maybe install a Perry 60 pumper carb. This is a lot easier than trying to get more power out of a mild engine, and shows the versatility of the K&B .21.

To keep the K&B from frying, I installed an R&A heatsink head; to keep junk and crud out, but let air in, an Associated air cleaner was installed; to keep breakage down, an R&A rod was fitted to the crank and piston. I don't know if the custom rod is really necessary, especially with the engine being detuned so much. But it is a well-known fact that if anything in a K&B .21 is going to pop under extreme conditions, it will probably be the rod.

Last thing to add to the engine was a McCoy magnesium muffler. Doesn't muffle very damn much, but does get the exhaust glop out the back of the car. With the installation of the muffler, the engine was ready to go. The add-on stuff (head, muffler, etc.) only cost about \$50.00 (gag).

The MRP kit contains everything necessary to put the car together, and the front end and rear power pod are already installed. The front bumper and rear body tubes are also installed for you, but as there are several different ways to mount the radio gear, servo saver, tank and linkages, all of these pieces must be located on the chassis pan by the builder.

*Continued on page 120*



Completed MRP car, ready for body and serious crashin'. No parts have failed since rough testing program began.



Another angle on completed car, with body in the background. Receiver and battery pack mounted on side pans.



Photo taken after several practice sessions and one race. Body is Abarth Can-Am, in orange. Wing tubes bent forward for more down-force at rear. It works!

# R/C FORUM



With

**Hal deBolt**

● For a change we are seeing something sneak quietly into R/C that brings up a number of interesting points. In addition, this could be the ultimate in the development of R/C systems as we know them today. This month we will discuss the introduction of the marvelous micro-miniature systems now being offered.

Rather than just concentrate on the new system's merits, let us see how far we have come since multi R/C was born, and where the improvements lie. In so doing, I do not wish anyone to think I am "dwelling in the past". We all want to look to the future. The knowledge and experience I gained with time can be useful when subjects like this need discussing. For my part, I am ready and able to "swing" with any cat who comes along today.

So you think that you have it tough! You went out to get a new system to use with the cute little 1/2A scale job that is still in its neat pre-fabbed kit. Then, too, you will need a system for the slim new high performance glider you just finished. First consider the size. It is terrible that most AVERAGE SIZE systems will barely fit into your latest projects. Worse still, they retail for over \$300, and the tightwad dealer will not discount them at least 50%. You might just HAVE TO go for one of the new micro-miniature systems which may even fit a PEANUT SCALE, if one gave it a good try. However, the darn micro system lists for over \$450 and the discount is lousy. You even start thinking there must be other sports where things have not gotten so far out of line. Maybe you SHOULD CHECK INTO them. Thinking that way, you had better believe you have a BIG SURPRISE coming, for you have no idea how well off you are in R/C. In spite of things in general costing more these days, the new miniature systems are really tremendous in performance, and usability, and actually cost less than their huge ancestors. That is complete progress! Before we get into a discussion of the merits of the micro-miniature systems, let us look back and see what their ancestors were like. Being able to see just

## How to get the most in performance and reliability from your Radio Control System.

● Mail in your questions or concerns. ●

how well off you are will make the pill more palatable!

As you know, "in the beginning", we had only single-channel radios. A great deal of time and development was needed just to create such radios, let alone the control actuators. Of course, even then, the aircraft needed more than just one control to be really successful. However, this story is multi-controls.

When the radios were FINALLY conquered, we could think of more controls. Initially, an additional control came from "mickey mouse" development of the rubber-driven actuators. Happily, I was able to develop the motor-driven "Multi-Servos", which did away with the 25-cent rubber band, at least. In addition, the "Multi-Servos" provided the foundation that showed the way to make MULTI-CHANNEL servo control feasible. As it is today, the servo was the basis on which the entire R/C system was developed.

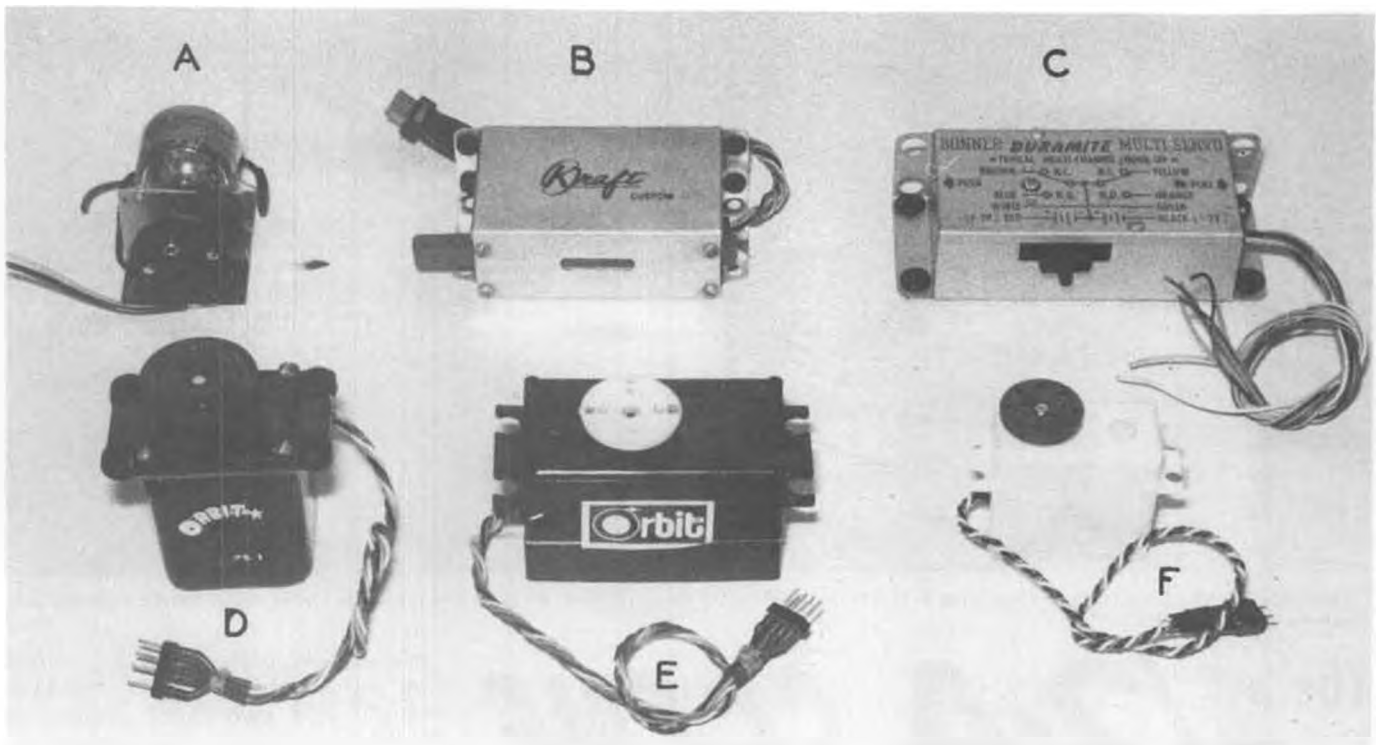
The first really successful multi-systems were developed by Rockwood, of California, and Schmidt, of Erie, Pennsylvania. The Schmidt system was the first available commercially, Rockwood never did get into any real production. Of course, others soon jumped on the bandwagon, but Frank Schmidt was the pioneer. Fortunately, at the time, I was available and more than eager

to do the test flying for Schmidt. In fact, this work resulted in some of the fondest memorable flying experiences of my life. You have to realize that for flying model aircraft, multi-control R/C was as looked forward to and as equal in accomplishment for model aviation as the first step man took on the moon was to space technology. The excitement was every bit as great for us as it was for Neil Armstrong!

Having been there, we have facts and figures available to make comparisons. You may consult the accompanying chart and the cold hard facts that are evident. For instance, a reduction in weight from 36 oz. to 5.5 oz. has to be impressive! Then there is size. In how many of today's models could you find 112 cubic inches of space in which to stuff the R/C gear? Mammoth scale is about all we have today which could accommodate it! Can you even remember



This is a removable R/C unit as used in a multi model during the late 50's. In this case, a 5-channel "Bramco" receiver operating multi-servos. The battery on the left is the "B" battery, the pen cells were the "A" and servo supply. The lower servos were "multi-channel" types, each requiring two channels for operation. The upper servo was a "single channel" type used with the 5th channel for engine control. This "unit" or box measured 3-1/2 x 4 x 8 inches, weighed 36 oz!



A. Single channel "Multi-Servo" operated from "carrier type" receivers. Required 4 pen cells for operation. B. Early Kraft reed servo which used rack and pinion linear output. Required two channels and 8 pen cells for operation. C. Famous Bonner "Duramite" reed servo, which became the most widely used of all reed servos. Note wiring diagram on label; you wired the connectors yourself, after purchasing them separately. D. Original "Space Control-Orbit" analog proportional servo. Used German "Micro-Mo" motor. E. First of the "digital" proportional servos as produced by Orbit. Very similar to today's servos, except that it used a "split" battery supply. Many still in use today. F. For comparison, the 1978 Pro Line PLS-1 standard size servo.

a "B" battery? How about an "A" battery? What do you mean, "The servos require separate batteries?" "How come you cannot charge them?" Ni-Cds were nothing but a dream in some scientist's mind! Of course, Ni-Cds are the secret of today's R/C reliability. It would be hard to estimate the number of really good models that have gone to "airplane heaven" because of dry batteries.

"Boy these Ni-Cds are expensive", says today's R/Cer when a technician tells him they need replacing after 4 or more years of usage.

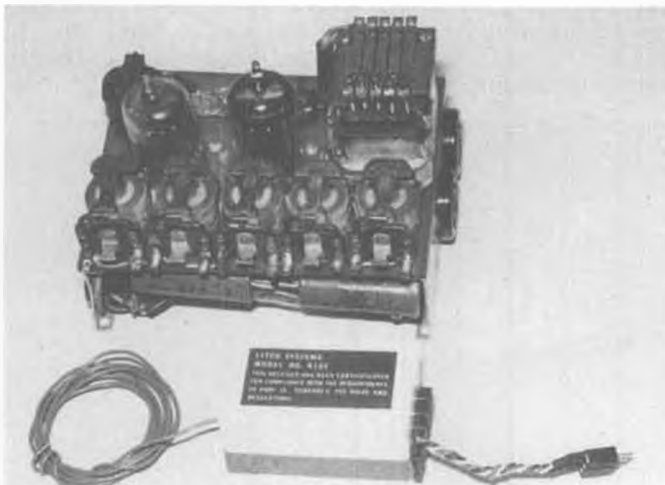
Would you believe that it would cost nearly \$50 to load a Schmidt rig with dry batteries these days? If you did any flying at all, you would have to load it at least 3 times each year?

Then, even after having purchased the 50 bucks worth, you would have to tear them out of their packages, rewire them for R/C usage and repackage again; a normal chore for a day's flying with dry cells. Typically, even the AGE of the batteries was so important to reliability that the "smart R/Cer" soon developed a deal with the local battery distributor, who would advise him when a

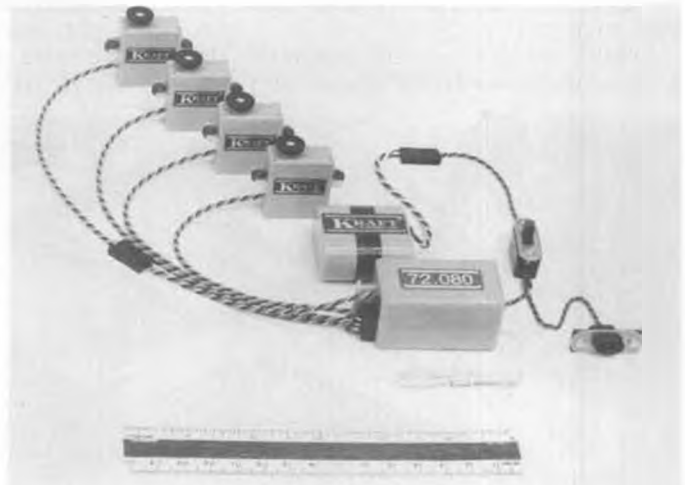
fresh shipment arrived. Batteries are still a short coming with our sophisticated systems, but surely things have improved a little bit! Before you complain too much about the Ni-Cds, remember that Armstrong used basically the same type which you do, only more of them. The "Space People" would marvel at the reliability we obtain with only one system. They would never take off with less than THREE back-up systems!

The secret, of course, to the progress was the transistor, which

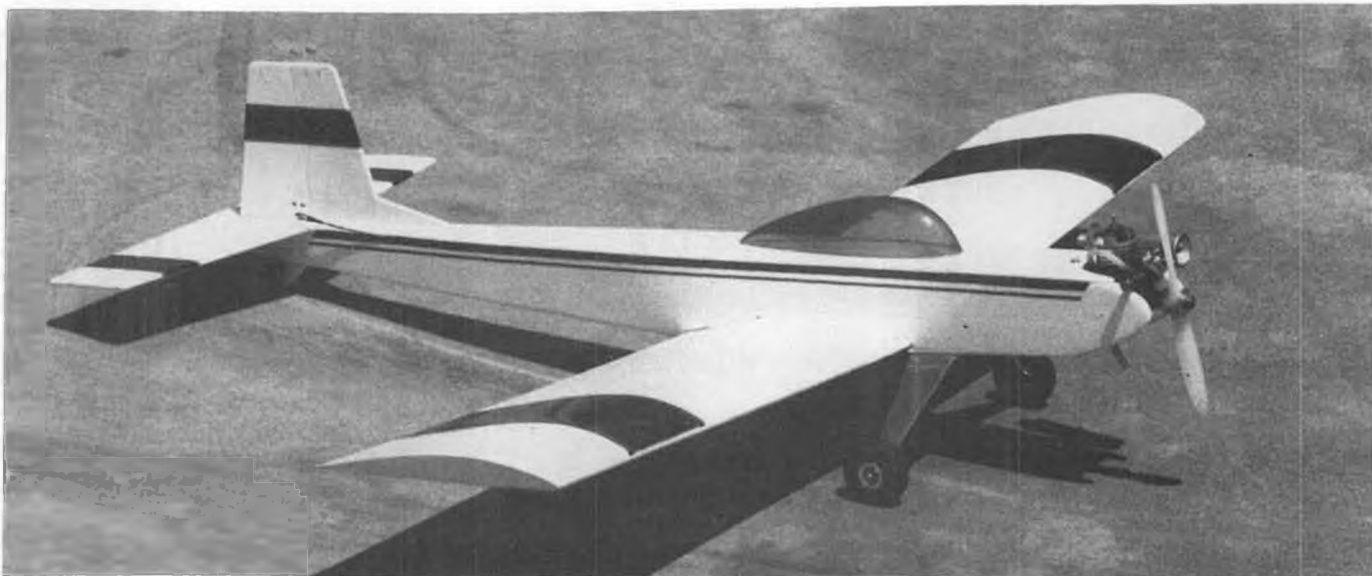
*Continued on page 130*



Schmidt 5-channel reed receiver. Provided 3 controls, weighed 8 oz, required 7 oz. "B" battery and 2.6 oz. "A" battery. By comparison, miniature receiver shown weighs only 1-1/2 oz. and needs only an ounce of batteries.



Latest Kraft "little stuff" totals under 6 oz. KPR-7L, KB-4L, and KPS-18's.



"Two-For-One." You can build this low wing T-10A from the standard Bridi T-10 kit. All parts included. Make your choice before building (particularly the fuselage!).

# The 1/2-A SCENE

By LARRY RENGER

• The annual gaggle of shows is just about over. Here in Los Angeles, we had two model shows just a week apart. Your author had an enjoyable time talking to many old friends from all over the country. There seems to be a consensus that the 1/2A product sales are hanging in there, while sales of slightly larger .10 size aircraft are growing.

Don Dombrowski, hero-leader of House of Balsa, agreed that his models generally fly very well with .09 and .10 engines plus throttle control. Don even related to me of one modeler who put a full five-channel radio with retracts in one of his FW 190 kits. Performance was very nice too!

While we are on .10 powered House of Balsa kits, here is a letter

which describes the ME 109 shown in the photo. This really sharp airplane was built by Walt Winberg, 9380 Gormond Rd., Richmond, B.C., Canada V7E 1N5.

"Dear Larry:

"Browsing through the fabulous May issue, I came across your plea for photos of .10 powered models.

"Photo enclosed is, of course, a House of Balsa ME 109. However, a few changes were made to it to accept an A.M. 1.49cc diesel.

"Modifications to install the well-used A.M. were slight, although it's a close fit! The wing was moved ahead 1/2 inch, wing fillets added and pilot with oxygen mask, reflector gunsight, and armor plate added for a little extra realism.

"As we fly off grass, the landing

gear was eliminated entirely, including the mounting blocks, to shave weight and gain more realism in flight.

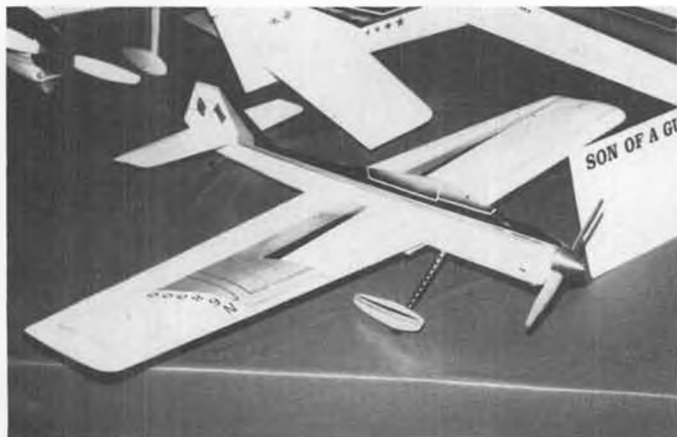
"Wings are silk covered, Aero Gloss finish; bottom of radiators are covered with 1/64 ply to act as a skid. All up weight is 19.8 oz. on Cannon Radio and an 8 x 4 prop. It's an exciting performer.

"It will climb straightaway from a hand launch and despite increased travel on elevator, will not stall in a tight turn with full up elevator due to the terrific torque that a diesel has under load.

Sincerely, Walt Winberg."

(Walt Winberg is best known to MB readers for his compressed air engines and models. Quite a contrast to his ME 109! wcn)

ACE R/C showed its new Alpha Trainer. Tom Runge pointed out that this model which he designed, is very rugged, and fast building due to its plywood fuselage sides and the foam wing construction. The engine on this model is a Cox Medallion .09 R/C. Control is by rudder and elevator, in addition to the throttle,



Bob Whitely is ready to try for No. 3 win at Nats in 1/2A Aerobatics. His best "little one" yet!



AM .10 diesel powered House of Balsa ME 109, by Walt Winberg, Richmond, B.C. Canada. No gear, for grass field.



Complex internal ducting of Midwest A4D-1 Skyhawk for 1/2A power.

although the throttle is optional. Tricycle landing gear makes takeoff and landings much simpler than with the taildragger configuration. The nosewheel takes a lot of shock away from the structure in hard landings. Tracking on ROG takeoffs is easy, even without steerable nosegear. Just hold a tad of down elevator for the first twenty feet of run to keep the nosewheel tracking until you have enough speed for the aerodynamic rudder forces to take over. The model then becomes as steerable as if the nosewheel were movable. All you have lost is the ability to taxi while steering; even that might be faked by taxiing at low speed, pulling full up and hard rudder while goosing the throttle briefly. Try it and let me know if it works!

A relatively new company on the scene is Flight Dynamics, Inc. It comes to us from Portland, Oregon, the city that gave us Jim Walker and his line of products many years ago (remember the Firebaby trainer?). Anyway, FDI has three kits for .051 to .10 size engines so far, and some fabulous models planned in the near future. First model they did was the P51-B shown in the photo. This model features a magazine size, photo-illustrated instruction manual, all machine cut parts, molded canopy, and would you be-



Ace R/C gets in the .10 market with this Alpha trainer. Very easy to build. A good first airplane.

lieve, retract mechanisms for the main landing gear. All this for only thirty-two bucks! The two other kits they feature are the AT-6 "Texan", and the Douglas A-26C "Invader". The Invader shown in the photo was on display at the MACS show. Decor was as used in Vietnam. Note all the nifty gun and rocket detail in addition to the camouflage scheme.

Joe Bridi had a surprise for me. I knew that he made a high wing trainer in the .10 size, what I didn't know, was that the kit features all the parts necessary to build an alternative low wing version. The "new" model, known as the T10 A, is shown in the photograph. You could easily add ailerons to this one, though it is normally set up REM,

three-channel. Power on this prototype was an Enya .09; you can tell because the exhaust is on the left side of the engine, a very distinctive feature. The kit is intended as a "first model", so the wing is flat bottomed, construction is rugged and simple. The low winger uses two wheels, the high wing, three. Two wheels have less weight and drag, well in keeping with the more aerobatic low wing version. On this size model you can still hand launch very nicely to get around takeoff problems inherent in taildragger aircraft.

Next model is Bob Whitely's 1978 1/2A U/C stunter. Look out world, he really did it proud this year! Bob

*Continued on page 113*



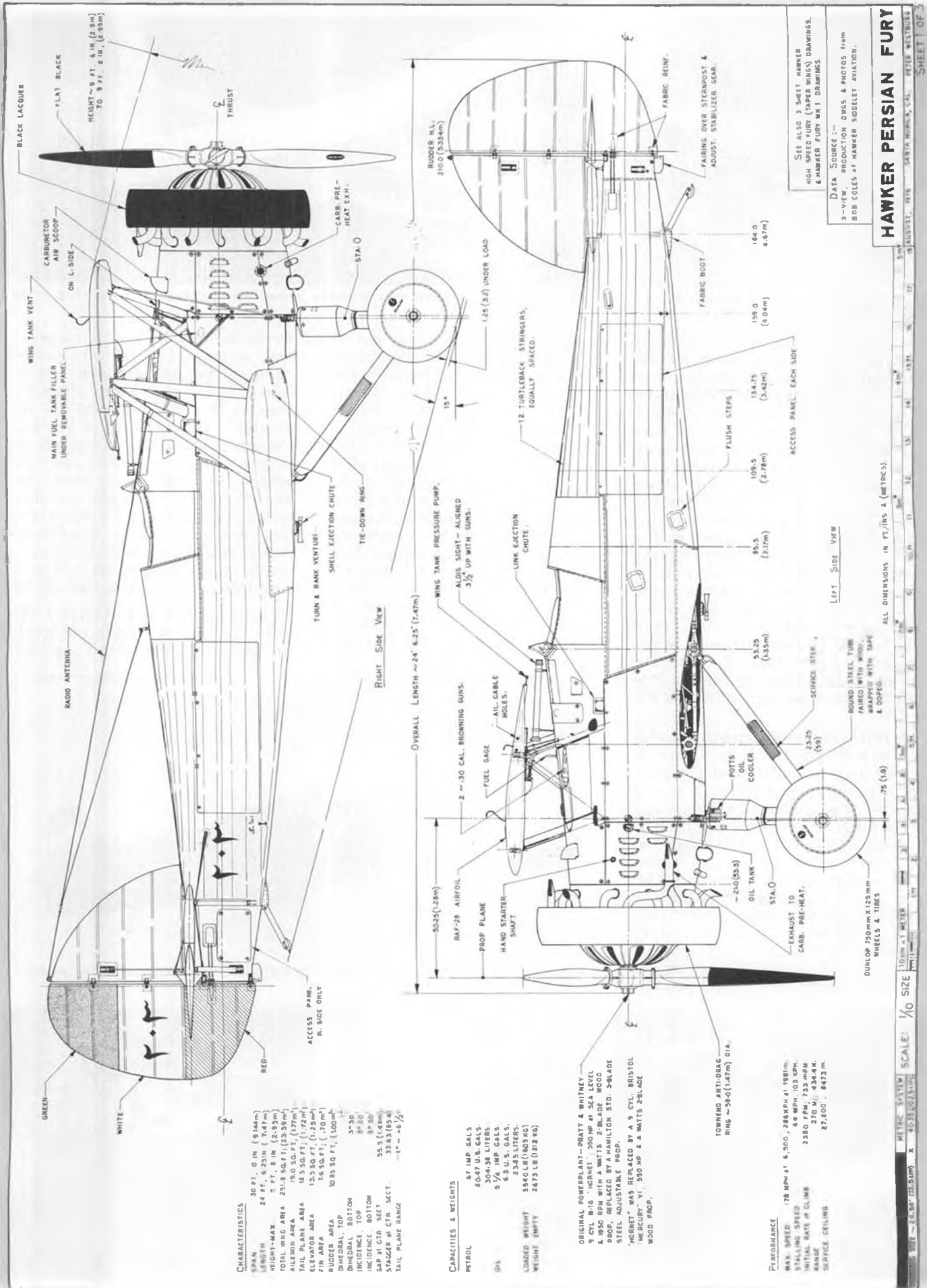
Flight Dynamics includes retract mechanism in its P-51B kit! Plans show mod to "A" configuration.



A-26C Invader done up in Vietnam decor. New kit from Flight Dynamics for two .10's.



Ken Willard's four-airplane formation flies as one unit. One engine, one radio. Wow!



SEE ALSO 3 SHEET HAWKER HIGH SPEED FURY (PAPER WINGS) DRAWINGS, & HAWKER FURY MK I DRAWINGS

DATA SOURCE - 3-VIEW PRODUCTION DIMS & PHOTOS FROM BOB COLES OF HAWKER SUBELET AVIATION.

**HAWKER PERSIAN FURY**

METRIC SYSTEM SCALE: 1/10 SIZE 100mm = 1 METER

ALL DIMENSIONS IN FT./INS & (M/DCS)

30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60

100 110 120 130 140 150 160 170 180 190 200 210 220 230 240 250 260 270 280 290 300

1000 1100 1200 1300 1400 1500 1600 1700 1800 1900 2000 2100 2200 2300 2400 2500 2600 2700 2800 2900 3000

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Cooling problems with the crankcase shutter on the Pratt & Whitney Hornet engine were serious enough to warrant changing to the Bristol Mercury VI radial engine. The Mercury was designed with an exhaust ring in front of the crankcase, making it suitable for desert operation.

# The FOREIGN FURY

## PART ONE

By PETER WESTBURG

The excellent performance of the Hawker Fury attracted the attention of foreign air forces during a tour of the European continent by George

Bulman, Hawker test pilot, who demonstrated the original Hornet prototype. The Yugoslavs were the first to buy, sending a delegation to Brooklands. Six Furies were ordered and completed in the same three-week period with first 21 RAF Furies. Sometime later, a second order for ten Furies followed. The Series II Fury had a cantilever landing gear and a thinner belly radiator and was the fastest Fury of all with a top speed of 242 mph. It may seem strange that the British were willing to export a fighter airplane faster than the standard RAF Fury; it is not so strange when one recalls that the Low Wing Fury or prototype Hurri-

cane was on the boards in October of 1933, and that it flew in November of 1935. And, low on the horizon, was the Spitfire.

The Portuguese took delivery of three Furies in June, 1934. The Kestrel engine was down-rated from 525 hp to 515 to give the airplane more endurance, the Portuguese using the airplane primarily for patrolling their borders. An interesting but unconfirmed story is that one of the Portuguese Furies was shot down by mistake during the Spanish Civil War and went down in the open sea.

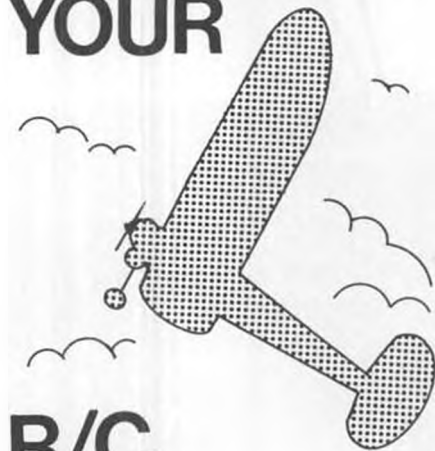
Three Furies were also delivered

*Continued on page 109*



Good performance of the Hawker Fury made it a much sought after fighter for the air forces of foreign countries. The Hurricane prototype having already flown, the biplane fighter was sold to a half-dozen European nations, with both the inline engine and radial engine.

# THERMAL SOARING YOUR



# R/C OLD TIMER



The author checks controls on his Strato-Streak while assistant holds. Everything turned on? Left is left?

By DON BEKINS . . . Getting your ship up to soaring level is only a very small portion of the total flight. Keeping it up there, after the engine quits and after the others have had to land, is the real science of soaring.

• The only difference between flying an old-timer and a glider is the method of getting the model in the air. Deriving the benefit of thermal activity is a matter of recognizing the updraft when your model passes through it, and then getting in it and staying there. Once that is done, then you must get the plane down on time and hit the proper spot, if you are flying the limited engine run events. Here is a summary of Mark Smith's comments, with some of mine added.

When you arrive at a field, look for the "hot" spots; a building, dark roads or fields, or other landmarks that can produce enough radiant heat to start thermal activity. Don't forget that line of contestants' cars from which those shimmering heat waves rise at mid-day! This is a part

of getting to "know" the field.

It is most helpful to have an "assistant" who can help in spotting thermals and educating the timer in reading the watch and calling count-downs. Before takeoff, the assistant should hold the plane and confirm with the pilot that he has the transmitter and receiver ON, with all controls operating properly. When the model is off and climbing, the timer should call the time every five seconds of engine run to fifteen seconds, then call each second as it is ticked off. At eighteen seconds, the pilot should give some down elevator and cut the throttle. The reaction time for the movement of the stick and the mechanical cutoff will give a perfect twenty second run.

Now the model is gliding and

properly trimmed for straight and level flight. In Mark's words, "Don't stand there and watch it fly . . . stare at it, concentrate, bear down and look hard. Watch for the faintest wiggle, bump, or deflection from its flight path. Don't let anyone distract you by talking; thermal soaring is work! Keep upwind, set up a search pattern, and stay alert. Hunt, trading altitude for distance. If the airplane is in 'down' air, get the nose down and get out of there. Usually strong down currents are an indication that a thermal is in the vicinity. Other indications are circling birds, a sudden change in temperature, or a sudden wind shift. Be alert."

"As you practice [old-timer R/C] soaring, you will find yourself being able to sense the location of a thermal. If the airplane will cover enough ground, the chances are good that you will find rising air. When in the immediate vicinity of a thermal, the flight path will be deflected, depending on the location and strength of the thermal. If the airplane passes along the edge, it will raise one wing. Turn *into* the wing that raises, as the model is just outside the thermal. If the tail raises, the airplane is flying through the thermal, so press on until the plane regains a normal flight altitude. Then turn and plunge into the center of the thermal. Start a large easy circle. If the plane ascends on one portion of the circle and descends on the other, move the pattern over toward the ascending portion. Keep working until the



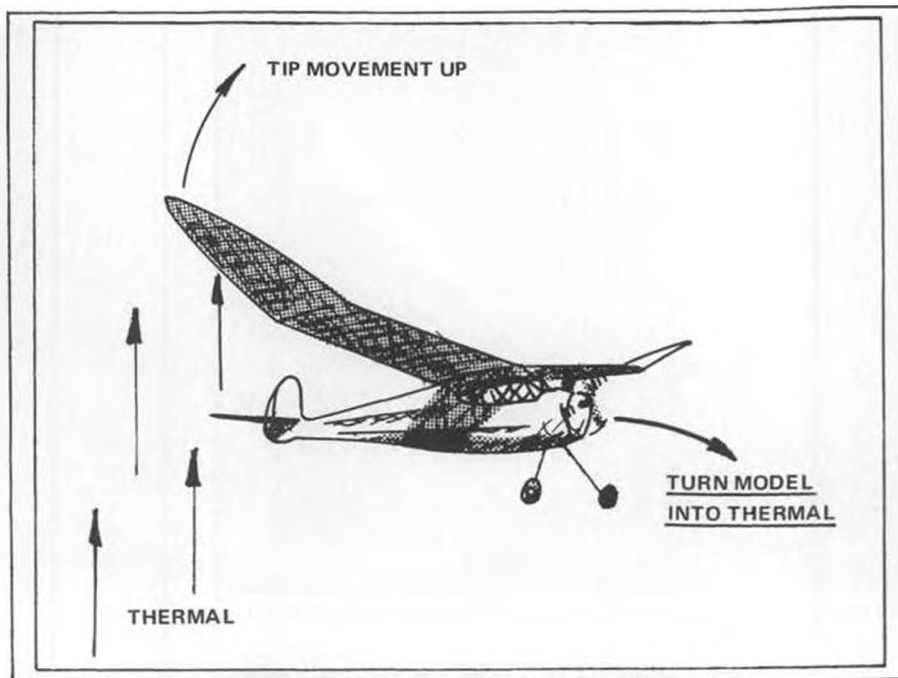
A Clipper Mark I makes one-point landing in fifty-foot circle, right on time.

model is going up at a high rate. Security is a thermal!"

Mark Smith's advice continues, but I would like to add a short note. How do you tell when the airplane is going up? When the model is overhead, this is nearly impossible to perceive. Therefore, I make it a practice to move the model upwind to approximately a 45° angle. At that position, it is easy to detect the altitude changes immediately. Once you are circling in a thermal, you can set down your transmitter and let your airplane do what it does best . . . soar. If it passes overhead or through the sun, don't worry. Your model is stable and will continue flying as a free flight, in the trim that you have set. Only when the model stops going up, or is too high, or too far away for visual contact, do you disturb the trim and bring the plane back. Thermals move with the wind direction . . . downwind.

Mark continues: "As the plane moves out of visual range, get the nose down and head back. Return to the area where you found the last thermal, and set up another search pattern. . ."

Finally, the plane has been up as long as required. It is time to establish your landing strategy. At the John Pond Commemorative, in Santa Maria, California, each fall, the requirement is to hit a fifty foot circle at exactly five minutes of duration. Time over or under is deducted from your time in the air. If you are way up, then you had better start down with one and one-half minutes to go. In any event, start your descent at the latest, one minute before touchdown. Have the timer call off the elapsed time every minute during the flight so you are fully time-oriented. At one and one-half minutes to go, have the time called every fifteen seconds. Stay upwind during the descent. At one minute to go, you should be about one hundred feet off the ground. Turn downwind and pass to one side of the spot in a shallow dive. At thirty seconds you should be on your final approach, aimed at the fifty foot circle. Keep up your speed. Your distance downwind is determined by your airspeed and the velocity of the wind. If the wind is blowing at 15 mph or more, do not get downwind of the circle. Control the speed by the attitude of the model: Nose up, slow; nose down, fast. Move over by the circle and set-up your pattern. The timer should now be calling the time every five seconds. At fifteen seconds he should count down every second, and your plane should be ten to fifteen feet off the ground. If your plane has sufficient speed, you



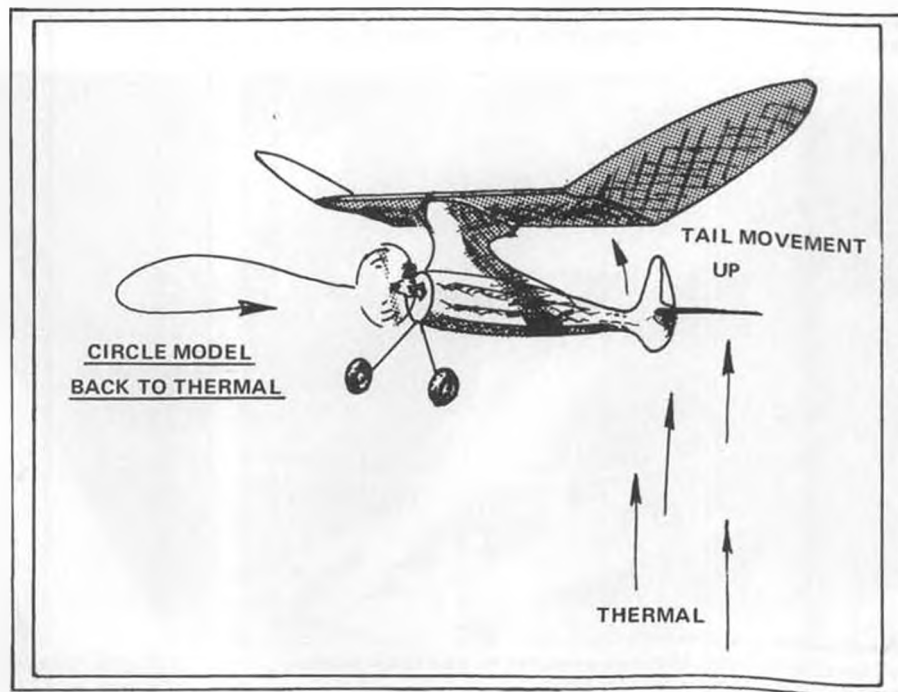
can make it touch the ground just as the timer calls one second to go. By the time he reacts and pushes the button, you should have five minutes to the second, and a spot landing. Remember, it is better to pick up the extra points by hitting the spot than to miss it and touch down at the exact moment.

Now a word or two about flight attempts. If you have a foreshortened engine run or poor engine performance, it is far better to take an attempt by letting the engine run over twenty seconds, or in the case of a short run, getting the plane down under forty seconds. Remember, you have six attempts for three official flights. Don't tempt fate by trying for that elusive thermal if you

don't have maximum altitude!

So there is a proven formula for contest wins. In the words of Mark Smith, "Prepare the airplane and yourself. Mental attitude has a lot to do with R/C thermal soaring. A positive thinker expects to find a thermal and when one is found he is ready to work it. A negative thinker does not expect to find a thermal, so he does not really look for one . . . Think positive! With all that down air, there has to be a thermal there somewhere."

Remember, practice will help win contests. ●





Phil Merrick's modified "Little Swallow" over the Pacific Ocean at Torrey Pines.

# R/C SOARING

by Dr. LARRY FOGEL.

PHOTOS BY AUTHOR

• Different strokes for different folks! For example, Bob Simon has shrink fever. His latest creation spans all of 25 inches, and is a fully-controlled two-channel rig. This vest pocket edition flies remarkably fast for its size and is a bit squirrely ... but that's half the fun of an aerobatic machine.

Ken Bates, of Ann Arbor, Michigan, displayed his new Manx at the Toledo show. This 104 inch span flying wing employs the 1295 square inches in a 16:1 aspect ratio. The wing itself is a 12% thick NACA 23012-75 section. As it stands, it operates at 8 ounces per square foot, but removing wingtips cuts the

span in half and increases the loading to 11 ounces per square foot.

The trick here is Ken's use of separately operated spoilers as a means for turning the craft in flight.

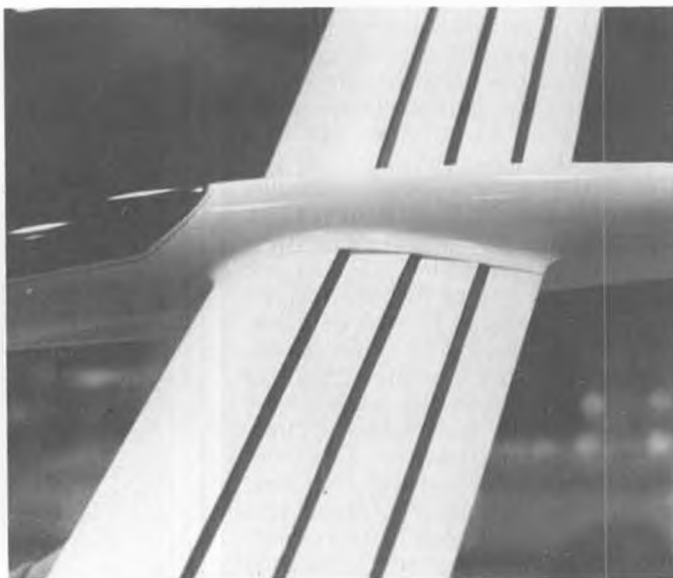
Raising a spoiler reduces the lift and adds drag on that wing, producing a coordinated turn. Ken argues that the high aspect ratio required a low dihedral angle and since adverse yaw would result from ailerons (even with differential throw), it's better to use separately operated roll-spoilers. Ken reports this craft is fast in flight, and smooth in takeoff on the winch. We wish him well in his further exploration of flying wing designs.

Al Nagele, of Wilmette, Illinois, exhibited his new LNG 3100 (L, N, and G being the initials of his three daughters). The wingspan is 123 inches, in very much Cirrus planform, but with three terraces on the aft portion of the upper surface.

These are fixed steps, intended to improve the thermal efficiency of the aircraft. Al claims 12 percent more distance in a dead air glide through the use of this feature. The wing has 795 square inches of surface. He operates the aircraft through a Du-Bro mixer at 42 ounces, using a 130° V-tail. Al uses a transparent plastic cup under the tail to further cut the drag. This is a



Ken Bates, Ann Arbor, Michigan, exhibited his new 104 inch span Manx at Toledo. Uses spoilers for turns.



Al Nagele, Wilmette, Illinois, says these "terraces" improve thermal efficiency by 12 percent.



Bob Simon's pocket slope soarer spans 25 inches. Controlled by 2-channel rig, it is a bit squirrely, but very aerobatic.

new design, one worth watching.

All in all, the Toledo show was a crowded experience. Lots of people and lots of things to look at. I recommend the experience for one and all.

Don Edberg and Alex Mladineo, of the Torrey Pines Gulls, took advantage of last Sunday's good air to seek their two-hour thermal qualification for LSF level V. I watched while their planes moved as tiny dots under scattered white clouds. They asked for help with binoculars and all eyes, to keep the aircraft separately identified, from entering the cloud, or from being lost from sight against the nearby blue background.

All went well, until the atmospheric shifted. Don came down six minutes shy. Alex made his two hours, but with the landing inhibited by a drained battery. I'm sure Don will be successful in his next try.

Steve Neu, also active on the local scene, has been flying a radio equipped control-line kit through extravagant aerobatics. He recently made a one-point landing that was worth picturing. Fortunately, there was absolutely no damage.

Phil Merrick modified a Little Swallow to provide his own kind of aerobatics thrills. He swoops within inches of the cliff, dives near to the ocean surface, and banks out with La Jolla in the background. It's a beautiful sight to see.

Last month, we had some advice from Fred Weaver on how to win contests. Perhaps it's equally important to advise the novice, so that he will get all possible joy out of this sport/hobby. While instructing at the cliff, I often hear myself saying: "Is your sailplane properly balanced (the center-of-gravity being near the main spar)? Are the wings straight? Is there wash-out in the tips (a slight upward tilt of the trailing edge)?" If all seems right a test glide is always in order, but even before that, let's verify the directions of the controls. Right rudder

produces a right turn. Up elevator produces pitch up. You'd be amazed how easy it is to connect the controls backwards. Are the control surfaces "tight"? Excessive play can cause flutter and/or a double-neutral (two different neutrals, depending on the direction of approach).

Launch it level and at greater than stall speed. Too much speed causes "ballooning." An immediate down command is then required to avoid the impending stall. Too little speed produces uncontrolled "flight."

Once aloft and suitably trimmed, try to minimize the number and amount of stick movement. It's smooth flying that pays off. Every wiggle of the plane loses energy. Usually the twitchy fingered pilot ends up overcontrolling. He can't tell which response of the plane is due to which twitch. Take small, slow corrective action. In general, overcontrol is the biggest problem for the novice.

Beginners often experience "porpoising". The trick is to get ahead of the plane . . . to anticipate where the nose will go and counteract that movement before it happens. Adequate pitch control is a prerequisite to performing maneuvers in the



If it wasn't for normal size transmitter, Bob Simon could be giant in this photo.

horizontal plane. But too much sensitivity here can make smooth flight difficult.

Try to follow large circles in the air without loss of altitude. The greater the bank, the less the vertical component of lift . . . so you must compensate for the bank angle by adding some "up" stick. The greater the bank, the more "up" required. After gaining proficiency in making smooth circles, try tighter circles, then horizontal figure-eights.

Practice stall recovery. Drop the nose slightly to gain speed, pull the stick back, watch the stall . . . and the recovery as you pull the stick all the way back, holding it there until you've regained level attitude. It's



Nothin' like good coordination. Last month we featured a story about 1977 NSS Award Program winner, Fred Weaver. This month, we have his photo.



Steve Neu made this dramatic one-point landing with his converted control line kit glider. Absolutely no damage.

fun to try loops. Here again, large circles are safer than small ones.

When you're tired, turn downwind for your landing, but watch for the notorious downwind unexpected stall. Recognize that the ground speed is higher when you're going downwind. Resist the temptation to save every bit of altitude as you start downward. Here again, maintaining sufficient airspeed is essential to keeping your sailplane controllable.

If you're coming in short, don't lift the nose to "stretch it". That will produce more drag and your sailplane will lose energy and altitude even faster. If you're going to overshoot, raise the nose and mush along for a bit, then level out and rejudge the expected touchdown.

Don't just "let the landing happen." Visualize the pattern well before you descend. Practice "landing" on a fictitious runway, located

about 30 feet in the air. As they say in full-scale training, "A good approach makes a good landing."

If you have spoilers, set these for the desired rate of descent as you begin your landing approach, closing them down just before touchdown. Here pitch control is the key to smooth landing (with a wide circular approach used to avoid any sharp changes in pitch required to counteract the loss of lift due to the bank angle). By the way, Don Edberg, an expert pilot, uses different modes of control for landing different aircraft. On his Aquila, he presets the spoilers then guides the plane down using the elevator. On his Aquila XL, he controls the pitch during final approach by using the spoilers. On the Kestrel 17, I simulate full-scale performance and use the spoilers to control rate of descent while keeping pitch constant.



Alex Mladineo and necessary equipment for successful 2-hour thermal flight.

Flaps are great for final approach, provided you don't neutralize them during the last few feet. That would produce a sudden sharp increase in the rate of descent. It's always a good idea to keep it simple when learning. Performance is made more by the pilot than the plane. ●



Phil Merrick's "Little Swallow" flirts with instant destruction along the cliffs at Torrey Pines. Tip of La Jolla (La "Hoya") appears in the background.





Rod Carr's "Flying Eagle" 50/800, now handled by Up-the-Krick-Boatworks, Glenolden, Pa.

By ROD CARR

• A recent column rambled on about the present state of affairs within the ranks of "organized" model yachting activity. Compared to the more technically oriented articles, this one generated a number of responses. Since they are the personal observations of interested skippers within their own fleets, I have chosen to reprint them with the names and locations removed. This should not lessen the impact their words have upon the yachting community, but just avoids acrimony and hard feelings at home when somebody finally tells it like it is.

The following one absolutely got me. What a situation to develop in an activity in which we are taking part for recreation!!

"I was interested in your article in **Model Builder** magazine, where you said that a lot of the old skippers are dropping out.

"In 1976, I won 66 out of 93 races that I was in, plus four regattas. I soon found out that I was the most hated skipper in the club because of winning so much. I have been sailing for over 20 years, the past six years in R/C competitive racing. Most of our members had only 2 or 3 years experience, so obviously I should win more than my share of races. So last year, I didn't enter any regattas and when I raced with our club I held back most of the time to



The Soling's hay-day . . . Pitman, N.J., 1974 Colonial Regatta.

# STRICTLY SAIL

let someone else win. I don't think holding back is the answer to the problem. If the best skipper in a club retires this does not solve the problem, because the next year, some other skipper will become the best skipper.

"I believe the new skippers should realize that it takes time and study to be a good skipper and to work hard at it and someday they will be the best.

"We have a new club here and we are trying to teach the new skippers that sailing is fun and that racing and winning is secondary. I am sure people like you and some of the dedicated members in the AMYA will come up with a solution."

This struck a particularly responsive note within me, as I too had tried "dropping out" in hopes that as the trophies were spread lower in the fleet, new interest would develop. I had a disappointment, as it turns out that there is no relationship between winning a trophy and being responsible enough to shoulder your share of the fleet's work load.

Another approach to fleet management is for one guy to do it all. This works as long as he is around, but lose him and the fleet dies within a single season. In my local club, this was the state of affairs inside the electric/steam scale bunch. We had a real spark plug. He was this end of the country's answer to Glenn Staubit. But once he got

fed up with doing all the logistics and trying to keep some sort of a schedule going, the whole thing folded overnight. A major problem within that effort was finding some sort of a central focus to which all could point their energy. A similar situation can exist in a model yacht club. In the following letter, we see a club being held together by one fellow:

"You have heard from me before, but this time I'll write in answer to your column in **Model Builder**. I have used many of the hints and construction methods you have printed in **MB**. In the March/April issue, you talk about membership. I remember writing to you and asking about how to handle a club effort. You gave some solid advice. 'SAIL,' you said, 'be at the lake at the same time on the same day of the month (2nd Sunday, 3rd Saturday)'. That did the trick.

"I know that a few dedicated members do all the work, are responsible, and the others just ride along. As long as we don't get kicked in the teeth, that's okay. My club is only 22 members and our winter meetings draw only 50% attendance (That is a damn good draw compared to what other club's draw. Rod). If we hold a vote, such as whether or not to go to sail control, whatever 3 or 4 of us say, the others seem to be happy. If I ask someone else if they would like to be the club

Continued on page 135



Extra channel control lever mounted on MRC test transmitter.



Year-and-a-half old MRC 775, Spickler Quickie, K&B 40 combination. All used to check out the 6th channel addition.

## MRC ✦ 5 to 6 ✦ CHANNEL CONVERSION

By ELOY MAREZ . . . Here's a simple expansion/conversion you can accomplish without having to understand all the mysteries of electronics.

• The MRC 755 R/C System, subject of our "Product\$ in U\$\$e" report (MB, December 1976), has been a one-airplane radio. It is still installed in the same Spickler "Quickie" that was used for test flying. In all that time, over fifteen months of at least three-weekend-a-month flying, this R/C system has not given the slightest problem. It has yet to miss a signal, or to be glitched. Because it has been so trouble-free and perfectly dependable, and because I really like the feel of the all-metal open gimbel, it has become one of

my favorite radios.

With one exception . . . it has only five channels! And often, while considering a new project, I would think: "Too bad I can't use the MRC, it doesn't have enough channels". Finally, at one of these times, I decided to explore the possibilities of adding a sixth channel. It turned out to be really simple, and since I am a tinkerer and happened to have the parts on hand, the whole thing was done the same evening. It works perfectly, and I am going to present a step-by-step procedure for those

of you who would also like to upgrade your systems.

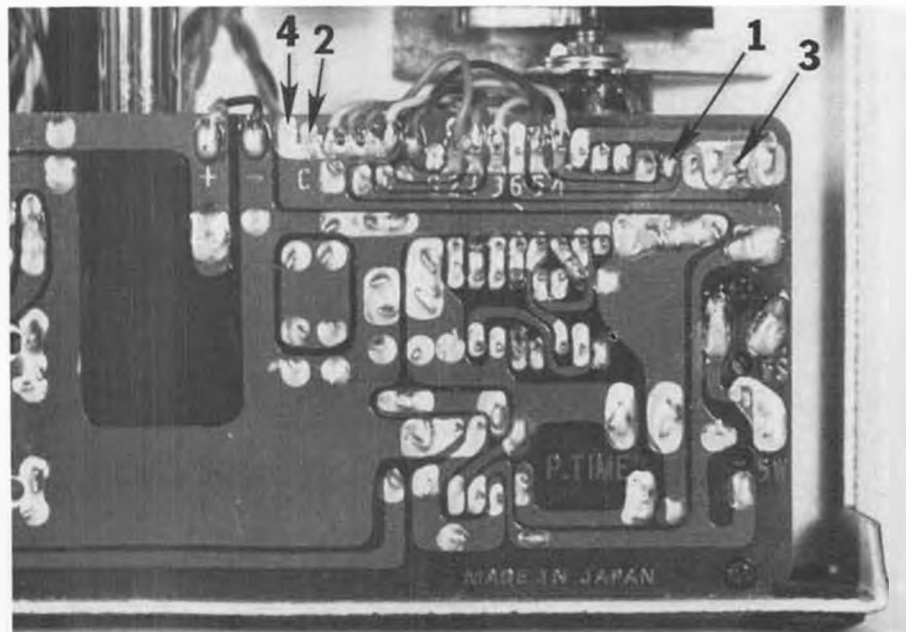
It does not require any electronic background or experience to make the conversion. However, a word of caution! If you are the type who continuously builds two left wings or two right wings or two right fuselage sides; if you hook up ailerons backwards, or forget to plug them in and then try to take off; or if you can never get your engine to idle, maybe you aren't quite ready to tackle the insides of your radio. However, if you are an average builder and flyer who can read and follow instructions, and can make four solder connections, you can be 100% sure of success in converting your MRC 775 from a five to six.

You will need the following parts, all available from MRC:

- 1 — Aux Channel Assembly (Dunham's R & R Type)
- 1 — Pot Element, 10K Ohm
- 1 — Receiver Single Servo Harness
- 2 — 6-inch lengths of wire, one black and one white
- 1 — MRC Servo of your choice.

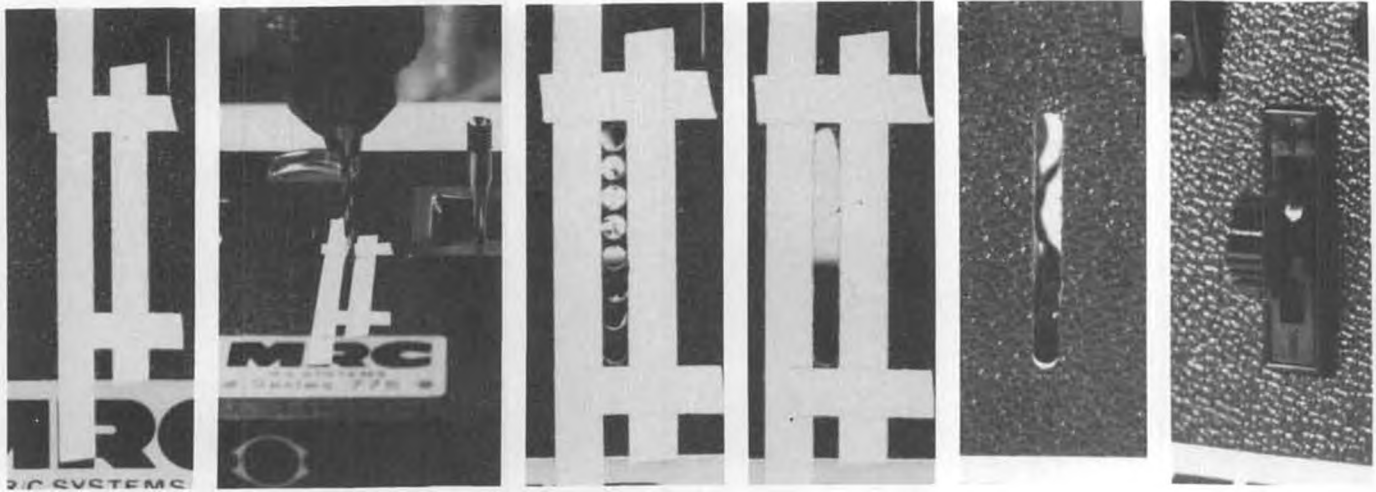
A package of all these parts, less servo, is available directly from Model Rectifier. Address your requests to Frank Ritota, who has promised to expedite such requests. The price is \$9.50, postpaid.

The MRC servo is strongly recommended so as to keep everything perfectly compatible and to prevent future service problems. Quite often, a mixture of system components of different brands will result

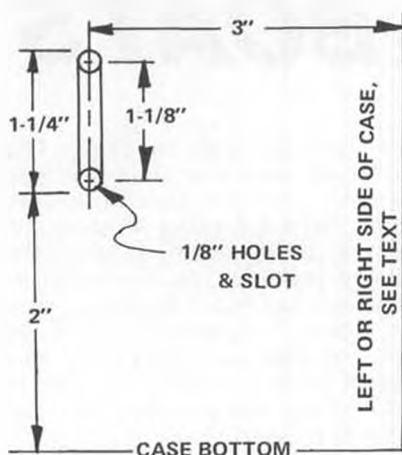


Transmitter PC board, showing location of modifications. Numbered areas are explained in text.





Steps in mounting 6th channel control assembly. Tape marks slot area and protects case. Last photo shows optional knob press-fitted onto lever. Text explains all of above steps.



in mismatches that show up as glitches, or one of the items might have a problem that shows up only when everything is operated as a system. In such cases, it is difficult to have everything checked and serviced together. MRC should not be expected to have parts, data, and experience to service a Brand-X servo, and by the same token, Brand-X Electronics is in the same boat with MRC equipment. And of course, neither would or should be expected to warranty a part, or a system using parts, that they don't sell. Keep it simple, keep it all the same brand. Remember, the airplane you save may be your own.

The conversion consists of cutting a slot in the face of the transmitter, installing and wiring in an aux. channel assembly, and adding a servo output harness to the receiver.

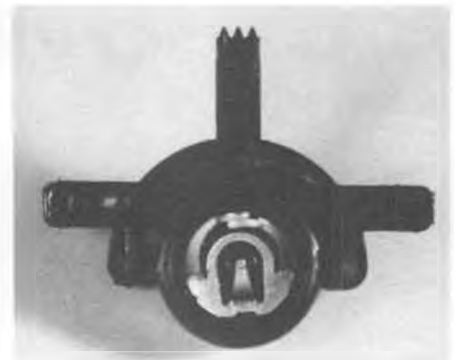
First things first; Remove the rear cover of the transmitter by removing the four sheet metal screws that hold it on. Don't wrestle with the cover, it will come off easily if you set the transmitter on your knee, with the sticks pointed towards you. With your fingertips, press in on the sides and away at the same time.

Now comes the big decision . . .

where to put Channel Number Six! On most transmitters, as on MRC's 776, this lever is found directly under the switch, centered on the front of the case. Unless you have large hands, this position is a little awkward to get to, but it is the best the manufacturers can do for us, as they don't know which mode you fly or which hand you will use to operate this lever. So we wind up with a compromise. In our case though, we know the mode, and we know which hand is to be used, so we can place the control in an optimum position, slightly off-center in the direction of the operating hand.

Being a Mode One flyer, the most suitable for me is on the right side of the transmitter, to be operated by the right thumb. That way, I can keep my left thumb on the elevator control in case altitude correction is called for such as during flap operation with the sixth channel. Bob Aberle and other Mode Two'ers will probably want to use the left hand for the additional control. Whatever is natural and comfortable for you is correct.

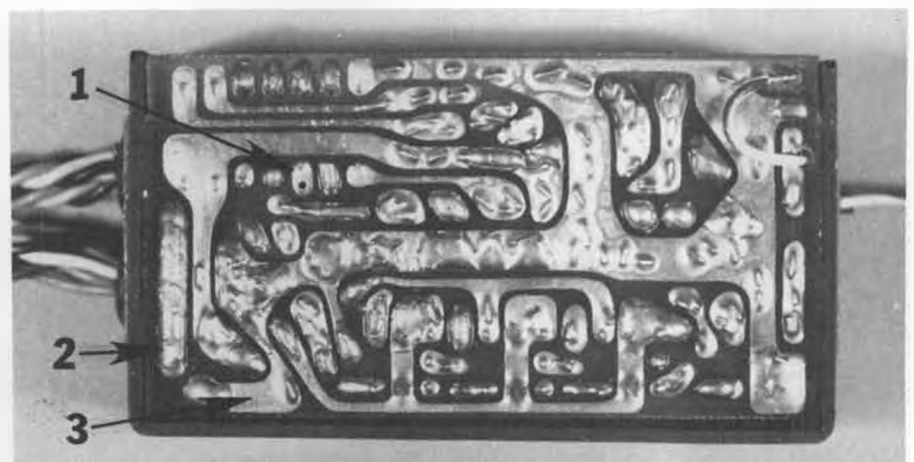
*Continued on page 116*



Inside of aux channel assembly. Note wiper arm position. See text.



Pot element installed. Arrow denotes center contact. Note lock screws.



Receiver PC board, showing location of numbered areas described in text. 1, Signal. 2, Red wire. 3, Black wire.



Bernie Rich's twin Super Tigre powered original design storms along on wind-created rollers.

# R/C POWER

By BOB PREUSSE



PHOTOS BY AUTHOR

# BOATS

• The Offshore class, which consists of "deep-vee" hull designs, has become one of the most popular new growth areas in both NAMBA and the IMPBA. The versatility of the "vee" allows the boater to be competitive in enduro type racing or heat racing in the monoplane classes. And thanks to such manufacturers as Dumas, Wardcraft, and 3-D Models, the beginner is able to purchase a very competitive fiberglass kit which allows for almost guaranteed good performance.

I recently attended and participated in a semi-enduro race hosted by the Minute Breakers of La Grange, Illinois, in April. Being a foul weather month which normally has strong winds, it seemed like the

only type of event possible would be of the deep-vee variety. Thus it was decided to run three complete rounds of ten-minute enduro heats.

The boat with the most total laps after three heats would be the winner. To keep the format simple, boats were grouped into two engine sizes: over .46 and under .46.

To add a little interest, the boaters competed on the "M"-shaped course which requires the boats to turn sharply and also be capable of the left turn. Needless to say, the competition proved interesting, because at no time could you back off the throttle, it was everyone against the clock. Bill Pistello, of Villa Park, Illinois, turned in three consistent runs of 16-1/2, 18-1/2, and 17 laps for the high total of 52 laps in the over-.46 class. Bill's "Sesame Street Express", which is a 3-D Models hull sporting a popular threesome of Bert, Ernie, and Cookie Monster in the cockpit, also

won the high point trophy. The under-.46 class was won by Skip Horstman, with a twin .21 powered design. Skip turned in 46 laps, and check out the photo showing the linkages and tuned pipe installation.

Rather than make this just a contest report, I would like to share some of the successful tips the boaters attending this race used to make their deep-vees trim and perform properly.

**1. Corners on lap strakes and chines tend to be rounded on fiberglass hulls.** To increase efficiency of the wetted surface, it is advantageous to sharpen these rounded corners to keep the drag effects of water to a minimum. I have found two ways that seem to do the job. One method is to block-sand the top of the lap strake, back and forth over the length of the hull. Be careful that you do not wear a groove on the inside area where the strake meets the hull. Sand until the



Skip Horstman's twin 21 powered deep vee. Complex exhaust throttle linkage.



Joe Soltis, a second-year boater, built this version of the popular Wardcraft boat. Design capable of 50-60 mph.



Gary Preusse used electric starter to fire up his Wardcraft. Note gloves. Brrrr!



Business end of a deep-vee. Three-bladed J.G. props becoming popular on hot ones.

corner is clean and sharp.

Another method is to cut the rounded area away with a file at a 45° angle. Next, apply a strip of plastic tape on the vertical side of the lap strake so that the tape extends slightly above the strake's running surface. Prepare a mixture of micro-balloons and polyester resin (should be of putty consistency). Apply the resin to the filed area. Due to shrinkage, apply the mixture slightly above the running surface. Because you added micro-balloons, the excess will block-sand nicely, yet give the resin strength. Some boaters also fill the filed area with epoxy paint, again block sanding to get the sharp edge desired.

**2. Trim plates are necessary.** If you want your deep-vee to trim properly, in all types of water conditions and competition, then trim plates are a must. Trim plates can be made of brass, aluminum, or stainless steel, and are offered separately or in hardware packages by numerous manufacturers. Several boaters at the meet have found that the stainless steel plates by Steve Muck's R/C Model Boats, 6003 Daven Oaks Avenue, Dallas, TX 75248, seem to have the length and area necessary to handle the bigger .60 hulls.

And don't forget the turnbuckles to keep the plate from bending under stress in rough water. An alternative to turnbuckles might be the new heavy-duty threaded push-rods and metal clevises from Sig Manufacturing Co. Inc., 401 S. Front St., Montezuma, IA 50171. An easy way to make the necessary fittings on the trim plate is to silver solder 4-40 nuts to the rear edge of the plate, normally two or three, depending on the length, will be sufficient. In the May, 1978, issue of **MB**, refer to Eloy Marez's article on the

correct techniques of silver soldering, for some helpful pointers. The Sig pushrods attach to the 4-40 nuts. You will now be able to give the plates fine adjustments and then see the effect on the hulls performance.

**3. Balance point.** With enduro racing there is, of course, a need to add more fuel capacity. It is desirable to keep this added weight near the balance point of the hull. As fuel is consumed, changes to the balance of the boat will affect its performance. Several of the contestants, including yours truly, started the first heat with too much fuel ahead of the balance point, keeping the hull wetted too far forward. Only after some of that extra fuel was consumed did the hull loosen up and really start to move. Plan ahead and carry only enough to finish the length running with a couple of ounces to spare. Keep unbalanced weight to a minimum.

**4. Reliability.** To help your fiberglass deep-vee lose any water from the hull collected during competi-

tion, drill a small drain hole in the transom through to the belly of the "V". Any water will run along the bottom of the "V" and out the transom. I have found this very useful on my twin .60 Dumas hull.

**5. Electric Starter.** Most boaters now use electric starters for the glow engines. With a LeMans start, the rope trick is not always the best idea. In case the starting belt might break, have a second belt around the driveshaft, laying on the bottom of the boat ready for emergency use.

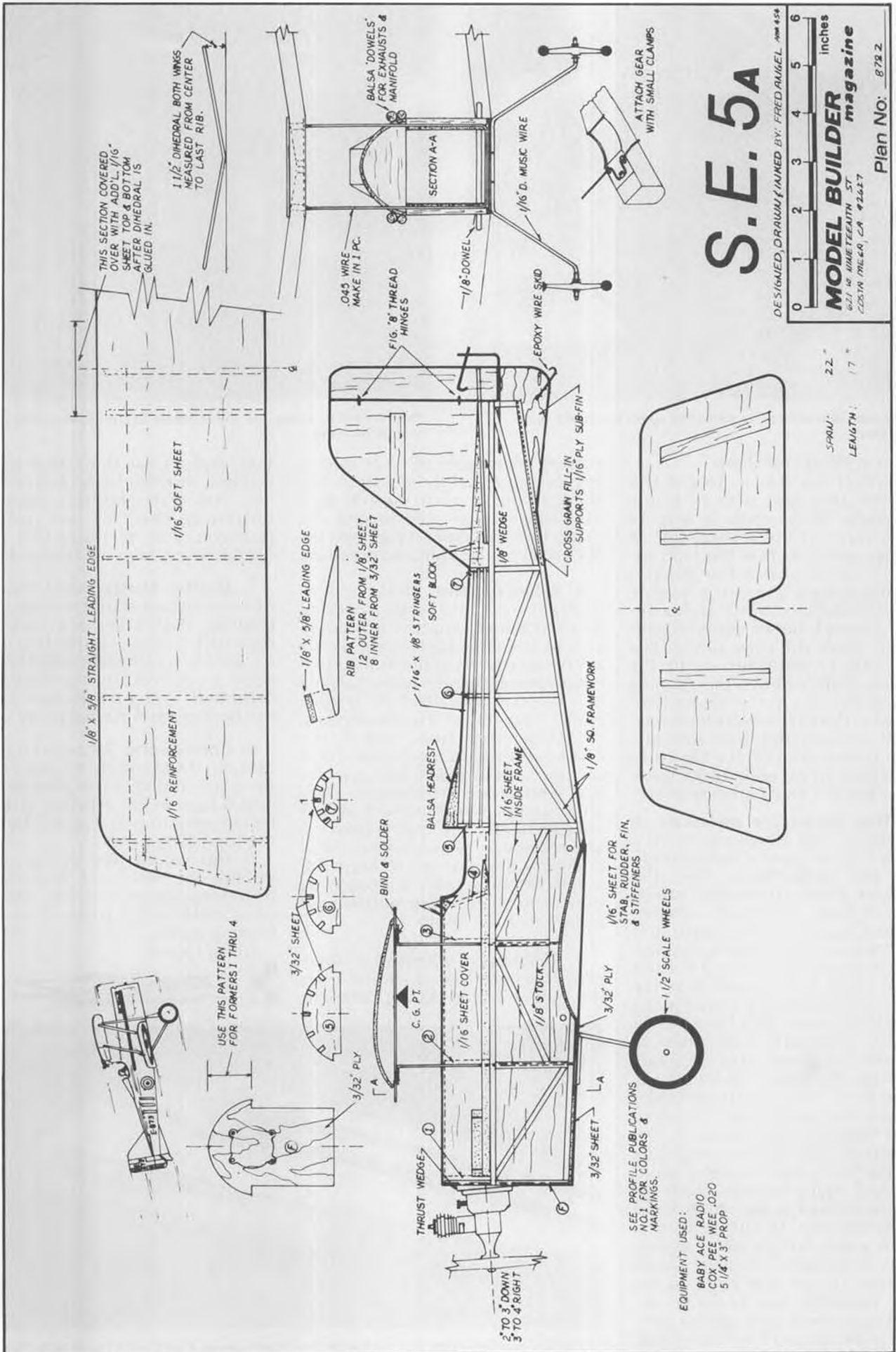
**6. Consistency.** Set an even pace through the event. Do not pour it on for 4 laps and then run slow for the next 5 laps. In Bill Pistello's victory, he ran smooth (same speed) during the total 30 minutes.

If you would like to have **MB** publish the results of your club's next deep-vee or heat race, send in your notes (and photos) to the boating editor.

Good racing.



Semi-scale Cigarette design, complete with crew. Move camera a little more to the right, huh, Bob?



THIS SECTION COVERED OVER WITH ADD'L. 1/16" SHEET TOP & BOTTOM AFTER DIHEDRAL IS GLUED IN.

1 1/2" DIHEDRAL BOTH WINGS MEASURED FROM CENTER TO LAST RIB.

1/8" X 5/8" STRAIGHT LEADING EDGE

1/16" SOFT SHEET

1/16" REINFORCEMENT

1/8" X 5/8" LEADING EDGE

RIB PATTERN 12 OUTER FROM 1/8" SHEET 8 INNER FROM 3/32" SHEET

1/16" X 1/8" STRINGERS

SOFT BLOCK

1/8" WEDGE

CROSS GRAIN FILL-IN SUPPORTS 1/16" PLY SUB-FIN

1/8" SQ. FRAMEWORK

BALSA HEADREST

1/16" SHEET INSIDE FRAME

1/16" SHEET FOR STAB, RUDDER, FIN. & STIFFENERS

1 1/2" SCALE WHEELS



USE THIS PATTERN FOR FORMERS 1 THRU 4

3/32" SHEET

3/32" PLY

THRUST WEDGE

C.G. PT.

1/16" SHEET COVER

1/8" STICK

3/32" PLY

1 1/2" SCALE WHEELS

SEE PROFILE PUBLICATIONS NO. 1 FOR COLORS & MARKINGS.

EQUIPMENT USED:

- BABY ACE RADIO
- COX. PEE WEE .020
- 5 1/4" X 3" PROP

.045 WIRE MAKE IN 1 PC.

FIG. 8" THREAD HINGES

1/8" DONEL

1/16" D. MUSIC WIRE

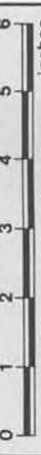
BALSA DOWELS FOR EXHAUSTS & MANIFOLD

SECTION A-A

ATTACH GEAR WITH SMALL CLAMPS

# S.E. 5A

DESIGNED, DRAWN & INKED BY: FRED AMIGEL

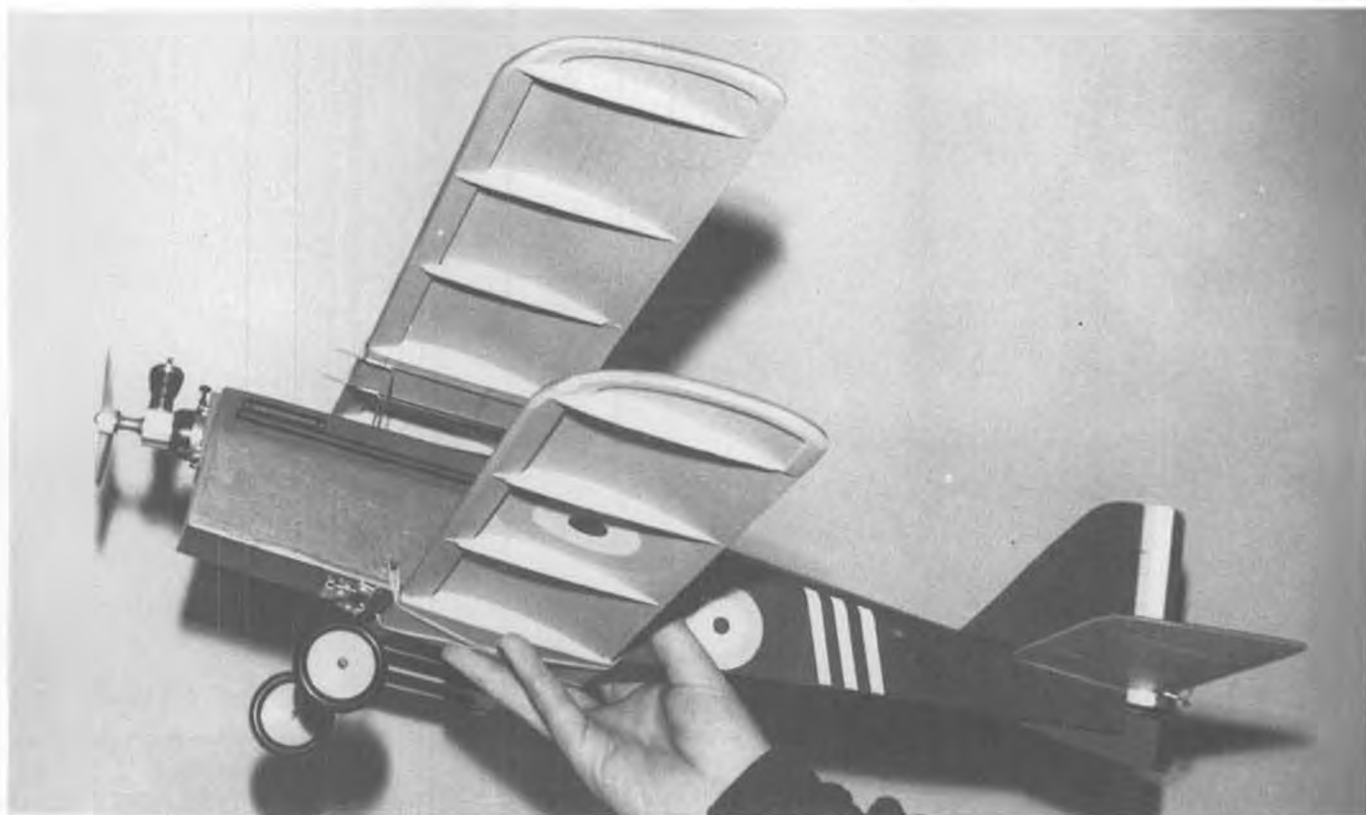


**MODEL BUILDER** magazine  
6021 W. AMMERTON ST.  
COSTA MESA, CA 92627

Plan No. 8722

SPAN: 22"

LENGTH: 17"



# VEST POCKET ◉ S.E. 5A ◉

By FRED ANGEL . . . What could be more appealing than a shelf-sized scale model that can be flown for fun with just enough radio control to keep it almost within arm's reach? 'Til somethin' else comes along, try this!

• There's a strange madness in the modeling world, and, it's almost an incurable disease. In their definitive study, "Balsaritis: The Social Disease of the '70's," the eminent psychologists Mixmasters and Jackson have been able to clinically isolate some of the symptoms. In an early chapter, they state. . . "and so in our studies, we have been able to pre-diagnose that 'balsaritis' will occur when the following conditions have been met:

1. The modeler, through parental or marital pressure, must clean his workshop.

2. Since he is a collector by nature, he will save everything of potential value, i.e. pieces of balsa, wire scraps, the top of a used bottle of glue, etc.

3. As the workbench clears, a reverse action syndrome takes place. One hand puts away a box of pins while the other takes out a dusty, small displacement engine. The Wonder-Blunder Eight-Channel rig goes on the shelf and mysteriously, a lightweight pulse system appears. A 10-ounce tank is cleaned and stored in a drawer, while unconsciously, the other hand reaches for a bottle of Zap.

4. The subject's furrowed brow starts to clear, as an idiotic grin spreads from ear to ear.

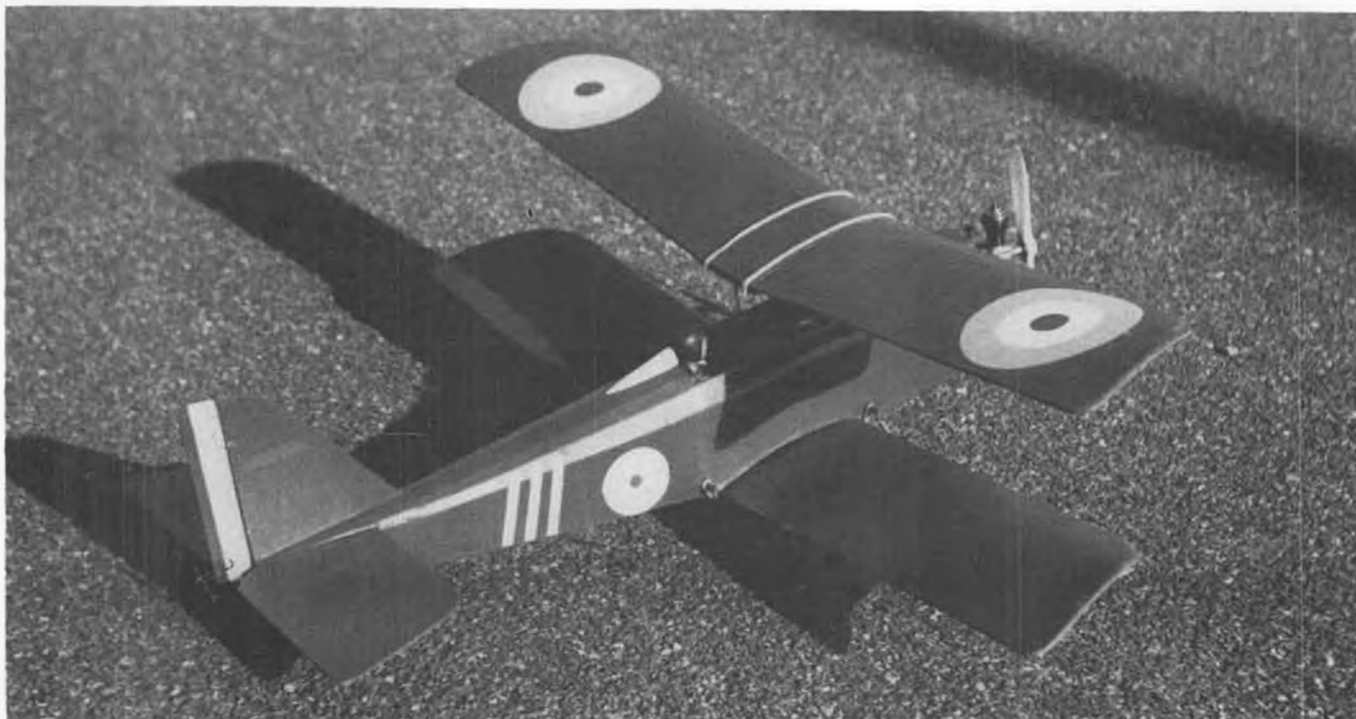
5. Conclusion: deep state of 'balsaritis.' Symptoms will diminish when subject starts to doodle on a

piece of drawing paper, and a modeling project is started."

Sounds familiar? Ah yes, then you've suffered too! Read on, 'cause I've got a sure cure with the little S.E.5a presented here. I suppose a



Small Ace transmitter indicates size of this little semi-scale bug. What's that funny white stuff in background!?



Little scale SE5A is the ultimate in simplicity. Basic design could be enlarged slightly to take 2-channel radio, but pulse-rudder is still a lot of fun once you get onto it.

couple of things triggered this model: first, somewhere in the darkening corners of my senile brain I remember the fun I had with Knobby-knee Northrop's "Lil' Beau Bipe," a mini-model that goes back many, many, many moons ago in the days of rubber band escapements, in which the sequence of flying went something like this . . . press the button once for a left-hand turn. Lookey there, it worked! Now watch while I press again for right . . . Press . . . Nothing . . . Press, press . . . PRESSSSSSS! Crunch.

The second stimulus was the fun I had with the Baby Ace System, flying a small glider in my back yard. Stealing the basic design from Will, Jr., and with the reliability of this outstanding pulse system, it was an easy job to design this model. With a snappy Cox .020 Pee Wee in the nose, it has a lively performance.

Soooo . . . clean up your bench and let's whip one out.

I suppose if you're in a hurry you could use 1/16 sheet sides for the fuselage, but the 1/8 framework is kind of fun to build, especially if you remember those good old "measure-cut-and-swear" days. After building two identical sides, sheet the inside nose section from motor mount F to bulkhead 5 with 1/16 stock. Mark and groove this lamination to receive the cabane struts. Then glue the motor mount to the nose and the bulkhead 5 with the matching bottom crosspiece. Make sure everything is lined up true. Next, carefully form the cabane struts and epoxy in place as shown.

A small scrap piece will sandwich them in the grooves.

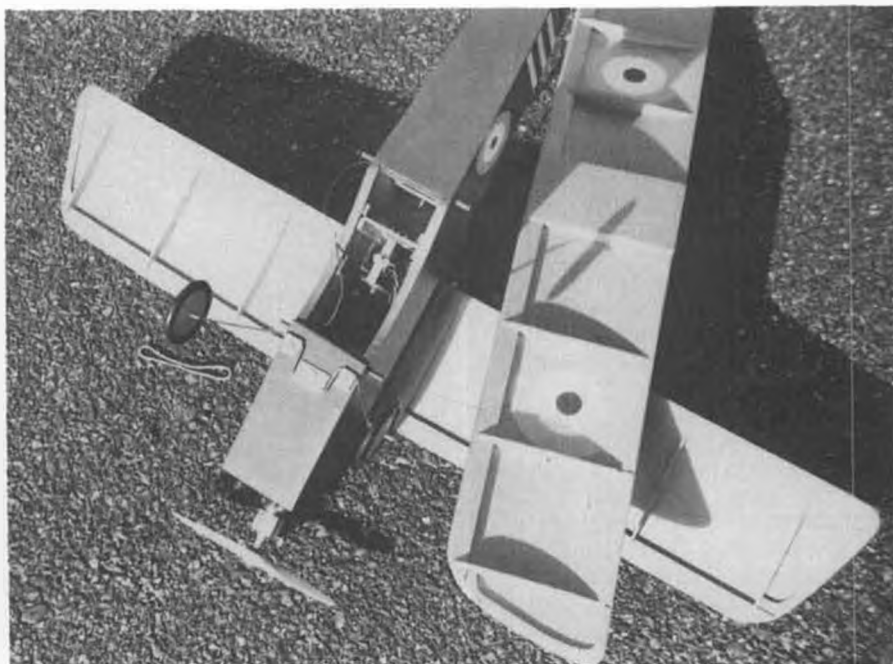
Formers 1 through 4, which are identical, are glued in place, as well as the plywood landing gear plate and the bottom nose planking. You can add a larger tank between Formers 1 and 2, but if you do, make sure to fuel-proof the compartment. Now you're all set to pull the tail together and add the rest of the formers and the crosspieces on the bottom. Add stringers, front sheet covering, ply sub fin, and the motor wedge.

The tail surfaces can be made in a

matter of minutes. Be sure to glue in the stiffener inserts. Also note the tail incidence wedge which is glued to the fuselage before mounting the stab. Next, glue the fin to the stab and both tail blocks.

Before covering the body with lightweight silkspan, plan your actuator installation. It's a lot easier to get those big clumsy fingers in the open framework than after you've hidden everything. Follow the recommendations of your radio manufacturer. If using the Ace system, the actuator slides in a

*Continued on page 124*



Bottom wing is hatch cover for radio installation. Note pulse actuator. Wing construction is a modified Jedelsky.



Carl Hatrak sent us this photo of the Trenton Model Airplane Club coming home from the 1938 Nats in their 1928 Chevy school bus. Carl is the one kneeling on the far left, and Mickey ("Trenton Terror") DeAngelis is fourth from left, holding tip of pennant. All right, you Old Timers out there, how many of these guys can you identify? Photo was taken by Bill Giblin with a 116 box camera.



# PLUG SPARKS

PHOTOS BY AUTHOR

By JOHN POND

• Texaco! What a great name to conjure up visions of big gassies floating high in the blue, against a fleecy background of cumulus clouds. Absolutely nothing like it!

If it sounds like this is where you came in last year about this time (you faithful reader, you!), you are absolutely correct, as we are going to talk about probably the greatest weekend yet in old-timer competitions (the SAM Champs excluded, of course).

There now being eight chartered SAM Chapters in California, it was no great surprise to find a few dates overlapping. What really put the kibosh on the California schedule was the unprecedented amount of rainfall in the West. When cities like Los Angeles, that normally get 13 to 14 inches of rain per year, receive better than 33 inches, you know things are going to be a bit wet.

The first thing to happen was that the SCIF Kick-Off meet for 1978 got washed out (Literally! All roads were blocked over the Los Angeles hills). This necessitated the moving of this two-day meet to April 8th and 9th,

the day of the SCAMPS Texaco Annual (sometimes known as the "Dawn Patrol"). In addition, during the day, the SCAMPS ran the 30 Second Antique Event, along with several others, to fill out the day.

Just about this time, J.G. "Bud" McNorgan decided to stage his "Brown Jr. Only" contest, a Texaco

type meet with the requirement that Brown Jr. motors be used for power. For a first time, this turned out to be a real first-rate meet, as the rules placed a bonus on those models built after the style of the early birds; i.e., silk doped covering, painted color schemes, original ignition systems, and the restriction of three-to-one fuel (3 parts gasoline to 1 part SAE 70 wt. oil).

To top it off, Pond and his SAM 21 cohorts put on the Fourth Annual SAM 21 Texaco R/C Meet. There were models all over the place! If you never saw any big ones fly before, this weekend was the time to see them.

Thanks to a write-up by Bob Oslan, appearing in the SCAMPS



"Wanna crank on my engine for a while? I'm pooped!" Art Watkins, of Mt. View, Ca., trying to get the Madewell 49 in his Buccaneer to make some noise. Ship is the original 1935 version.



George Perryman and granddaughter Stephanie with (l to r); Lanzo Stick, Korda Dethermalizer, and Joe Ott Sunspot. All winners at Riverside Nats!



What do you think of that trophy? Hal Cover, sans beard, accepts Senior Sweepstakes Trophy from Col. Paul Watson at 1956 Calif. State Champs, Moffett NAS.

"Hot Leads" newsletter, we have some excellent reports to plagiarize. After all, how could anyone possibly be all over the field at once? In addition, we will also have some of Ken Sykora's inimitable bon mots from the SCIF "Flight Plug", that simply should not be overlooked.

As Bob Oslan reports, those faint hearted modelers who stayed home missed one of the most gorgeous days of all. Best part was that intensive rains had produced the most lovely carpet of grass on the Taft field; so much so that takeoffs were always a problem as a result of all the drag. For a change, there were no dust devils or trash movers; however, this did not prevent the posting of many good flight times. With all the activity, there was no excuse for not flying.

The Dawn Patrol (run this year by Bob Oslan) got started promptly at 6

a.m. (Bob had set up at 5:30 a.m. Good freezing weather!). Bob made a particular point of being ready, as that early bird, Sal Taibi, always wants to fly promptly at 6 a.m. Sal was a trifle late this time, appearing at 6:05. Bob was so frozen by this time, he could hardly (!) needle Sal for his "late" appearance.

True to tradition, Sal did make the first flight, putting up his Vivell 35 powered Powerhouse for 16:45, when it disappeared in the morning haze. Taibi got real lucky, as his brand new model was found later in the day, floating in the aqueduct. We didn't get the name of the hero who fished it out (a no mean trick!).

Cliff Silva (the wheelchair speed demon who builds the darndest big models you would ever want to see) proved this year was no exception for large entries. When his 14 ft. Roll Berryloid model suffered broken

motor mounts, he promptly hauled out a ten foot Fiske-Hanley 1937 Texaco winner. Observers on the side commented this was the closest thing to indoor flying; as one wag (Sykora) said, it flew slower than microfilm models! However, Cliff ran out of luck this year, and finally had to give the trophy back. You couldn't say he didn't try, with three different models!

The columnist (Pond) provided a considerable amount of amusement, as his struggling engine (a Baby Cyclone) simply was not running well enough to lift the nine-foot Miss Model Craftsman. Even Sal Taibi gave it the special Texaco takeoff (grabbing a wingtip and literally flinging it into the air), yet the model dropped back into the grass. Despite Otto Bernhardt's expertise and exhortations, the Baby Cyclone would not turn up to the



The guys to beat in R/C Texaco: Karl Tulp, left, and Don Bekins, both from San Francisco area.



Virgil Rice built his Zipper with sliding pylon to enable him to use different engines while maintaining the same CG. Photo in 1940.



expected rpm. Finally, when all else failed, a clear path was found, the model carefully launched, and the darn thing actually took off and flew with no help!

Also noted was a considerable amount of "defugalty" in fueling Pond's model. Using Spiro Nicholaw's fuel, the one-gallon can had to be tipped up carefully to fill the fueling syringe. With the gallon can less than half full, when asked to tip up the can, Pond promptly poured fuel all over Oslan's shirt. A slight delay ensued while Oslan changed shirts.

Again the routine was repeated, this time with Oslan standing carefully out of the way. However, Bob overlooked the position of his foot and his shoe was immediately filled with gas. Good thing that Leah (Bob's wife) was sitting at the table! As there was a considerable amount of grousing to be heard in the early morning air.

As with most Texaco contests, luck plays an important factor. Bud McNorgan (the eventual winner) brought out a Dallaire Sportster that spun all over the sky. However, when he hit one of those rising columns of air, the spin turn matched the thermal, and away the Dallaire went. Frankly, the flight wouldn't have been ten minutes, but the Texaco couldn't have gone to a better guy in its 12th year since inception. Results looked like this:

1. Bud McNorgan ..... 31:26  
(Dallaire/Brown)
2. Jim Adams ..... 24:41  
(Ehling/Baby Cyke)
3. Terry O'Meara ..... 24:00  
(Scram/Cannon)
4. Art Watkins ..... 19:45  
(Buccaneer/Madewell 49)
5. F.L. Swaney ..... 19:07  
(Powerhouse/Vivell)
6. Walt Parker ..... 19:00  
(Ehling/Brown)
7. Cliff Silva ..... 18:40  
(Ehling/Baby Cyke)
8. Dick Rowe ..... 17:58  
(Powerhouse/O&R 60)
9. Al Hellman ..... 15:00  
(Lanzo/Super Cyke)
10. Phil McCary ..... 13:52  
(Clipper/Vivell)
11. Spiro Nicholaw ..... 13:25  
(Scram/Super Cyke)
12. Leon Nadolski ..... 5:36  
(Polly/Atwood 49)
13. John Pond ..... 3:54  
(Miss M.C./Baby Cyke)

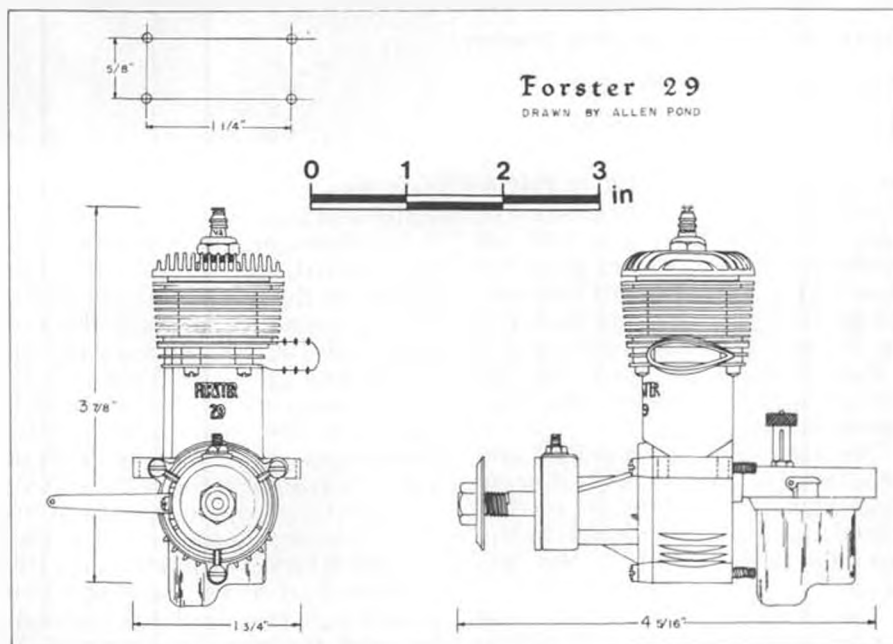
In conjunction with the SCAMPS Texaco Contest, Bud McNorgan came up with an innovation of having old models powered only with Brown Jr. motors. Herb Wahl (of Wahl-Brown Motors) kindly donated one of his \$140 specials to help promote interest in this event.



Carl Goldberg with original prototype Zipper, built in 1938. The model has seen better days. Now resides in Russ Barrera's National Model Airplane Museum at Morgan Hill, Ca.



Bud McNorgan, of the SCAMPS, did a beautiful job on this rare English Premier Lion. Looks like a Wahl "Anniversary Brown" in the nose. Tailless Powerhouse in background.





Hal Atkins prepares latest mini-ship, powered by his Trojan engine. Pic taken at the Old Rosecrans and Western site, 1937.



Otto Bernhardt (Mr. 77 Products) put front rotor assembly on side-port Ohlsson 60. Ship is wife Marge's "Trenton Terror."

The best thing about this meet was the winning of first by Bill Cohen's model. Cohen had broken his leg in a motorcycle accident the previous week, and had to depend upon his old Wyoming buddy, Tom Heiser, to do the flying for him. Tom's flying was probably the best therapy for bedridden Bill. What else can a buddy do for you?

Prizes were impressive to say the least, with the Brown Jr. Motor leading the list, followed by the K&B Perpetual trophy, and three trophies donated by **Model Builder**. Other prizes included P&W kits, Pond

*Continued on page 100*



Bob Jesperson, the "Milford Fox", did a great job on this Weathers "Mystery Man". Wonder if he's going to use the drop-off landing gear?

## "RECORD • • HOUND" ...020 REPLICA...

**OLD TIMER Model of the Month**  
Designed by: Henry Struck/Dave Sweeney

Drawn by: Dave Sweeney

Text by: Bill Northrop

"RECORD HOUND" .020 REPLICA

How time flies! It seemed like only a few months ago that we published an article and plans for Henry Struck's "Record Hound" design, and yet, when we looked it up, it was exactly two years ago!

Dave Sweeney designed the .020 version to follow closely the construction of the original.

The wings are very standard, and need no explanation. Stab ribs are shaped after the framework is completed, in a manner similar to the construction of Taibi's "Powerhouse."

The original .020 rudder was formed of 4 laminations of .020 by



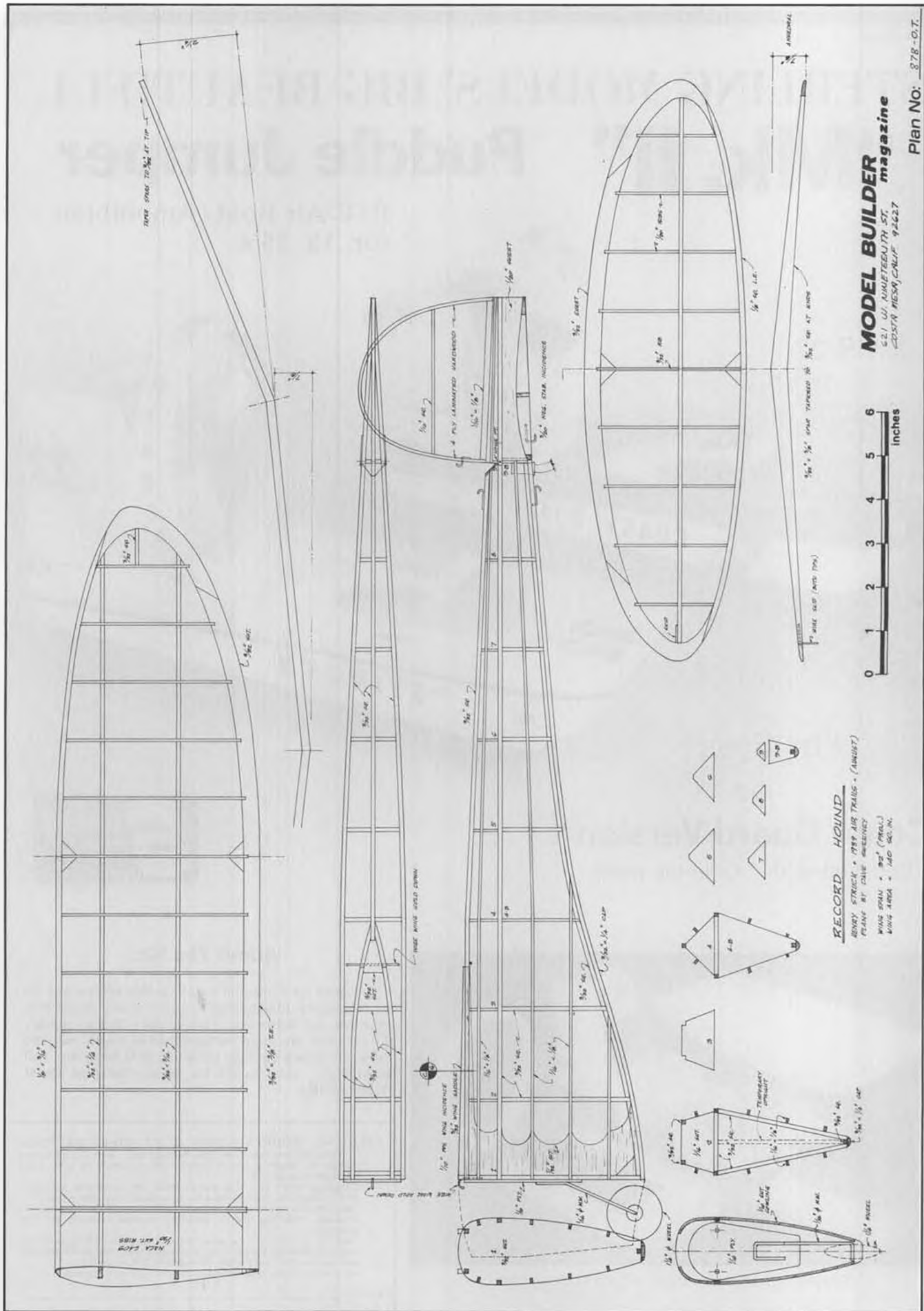
1/16 bass or spruce, soaked in hot water and bent around a cardboard form. However, Dave recommends the substitution of a 1/20 sheet rudder, as the original warped badly after a couple of hours in the sun and nearly caused a serious accident.

The fuselage is a simple crutch-type framework, with the top half built first. The engine was inverted in the original, and there is plenty of room to invert it in the replica. Dave mounted the engine upright in his prototype replica for easier starting.

**IMPORTANT:** When building the bottom half of the fuselage, the crutch must stay absolutely horizontal, with no up or down warps or

pulls, as any variation from horizontal will change the wing and stabilizer incidence settings.

For a dethermalizer, Dave hinged the whole rudder-stab assembly at the point shown on the plans. He used a nylon R/C hinge, cut to size and epoxied to 1/16 sheet balsa glued between the crutch longons. A pin-type hinge was used on the prototype, but Dave suggests that a new "live" hinge might overcome the pin-type's tendency to become wobbly. He points out that a friend built the model with the stab hinged at the rear, allowing the leading edge to drop down for dethermalizing. ●

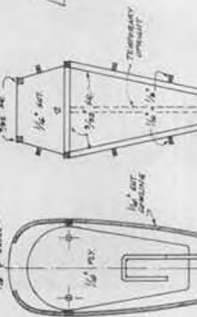
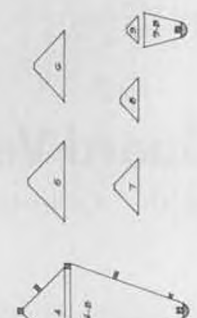


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Plan No: 378-D.T.



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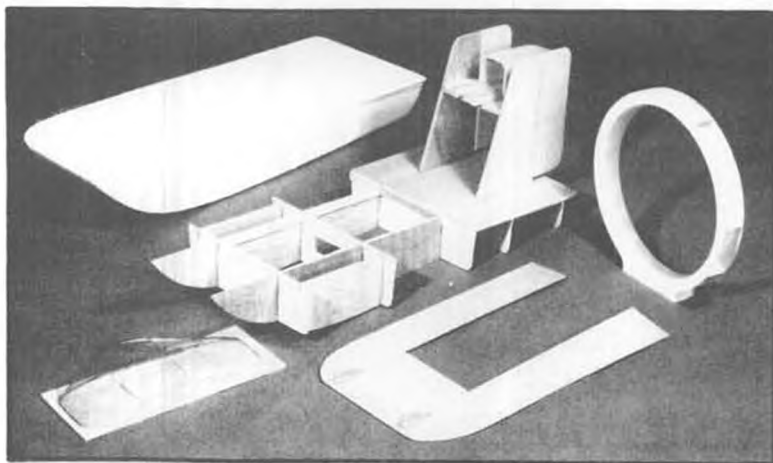
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Frame Photo Reveals Simple-Rugged Construction

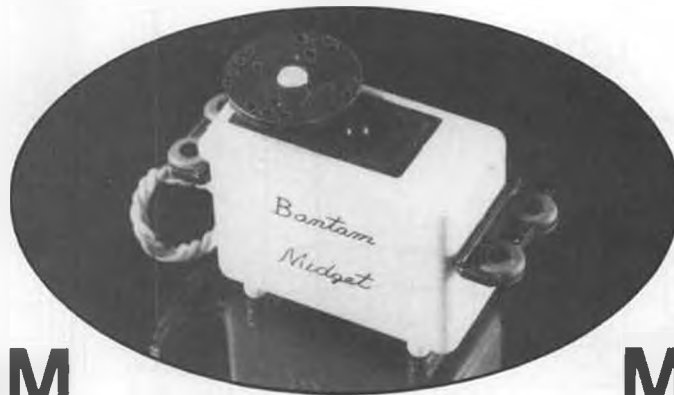
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"Ostriches have wings and are generally built like birds, but cannot fly."

• Our thought-provoking lead-in line this month is by Igor Sikorsky, from his book "Story of the Winged-S".

**MEN ARE NOT BUILT LIKE BIRDS EITHER ... HOWEVER...**

Worldwide attempts to fly by muscle-power are beautifully documented in a television special entitled "Icarus' Children: Birds Do It ... So Why Can't Man Fly?" Featured are some of the earliest photographically recorded attempts (mostly failures, but a few partially successful flights). Then, a fairly comprehensive review of the various contenders for the Kremer prize, culminating in the triumphant accomplishments of the "Gossamer Condor". By all means watch your TV guide for listings of this fascinating presentation.

And speaking of the Gossamer Condor, Emmanuel Fillon, of France has a scale model of same already flying! Powered by an electric motor, the craft includes an articulated pilot who gives the appearance of pedaling. For others who may contemplate such a project, the March, 1978 *Aeromodeller* contains suitable 3-view drawings.

Paul MacCready, driving force behind the Condor project, is also

well-known as an international soaring champion, but we were somewhat surprised to learn that he had also been an advisor and consultant on aeronautics for "The Book of Knowledge".

#### THE PASSING PARADE

A number of famous aviation personalities have "gone West" these past few months. Among them was Doug Bianchi, of England, who constructed aircraft reproductions for such movies as "Those Magnificent Men in Their Flying Machines" and



Granger Williams is going 100% scale on this .60 powered R/C Gee Bee R-1.

"The Blue Max". Our condolences to his wife and son, who will continue to operate the business that Doug founded.

Neil Williams, internationally celebrated aerobatic, movie, and demonstration pilot was lost while ferrying an aircraft from Spain enroute to England. Neil's aviatrix wife, Lynn, and two mechanics also perished in the crash. Williams had become virtually an instant-legend in aeronautical circles, when he

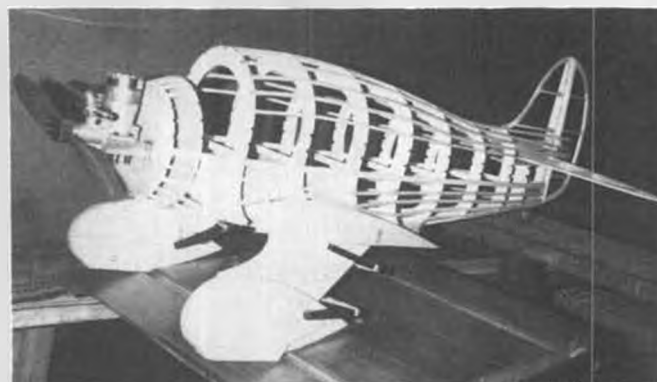
*Continued on page 109*



Full-size reproduction of Gee Bee "Z" nearing completion at Flabob Airport, Riverside, Calif. Owner Bill Turner, builder Ed Marquart. Warren Shipp photo.



Hannan-built "no-Cal" Gee Bee R-1, is profile flying novelty.



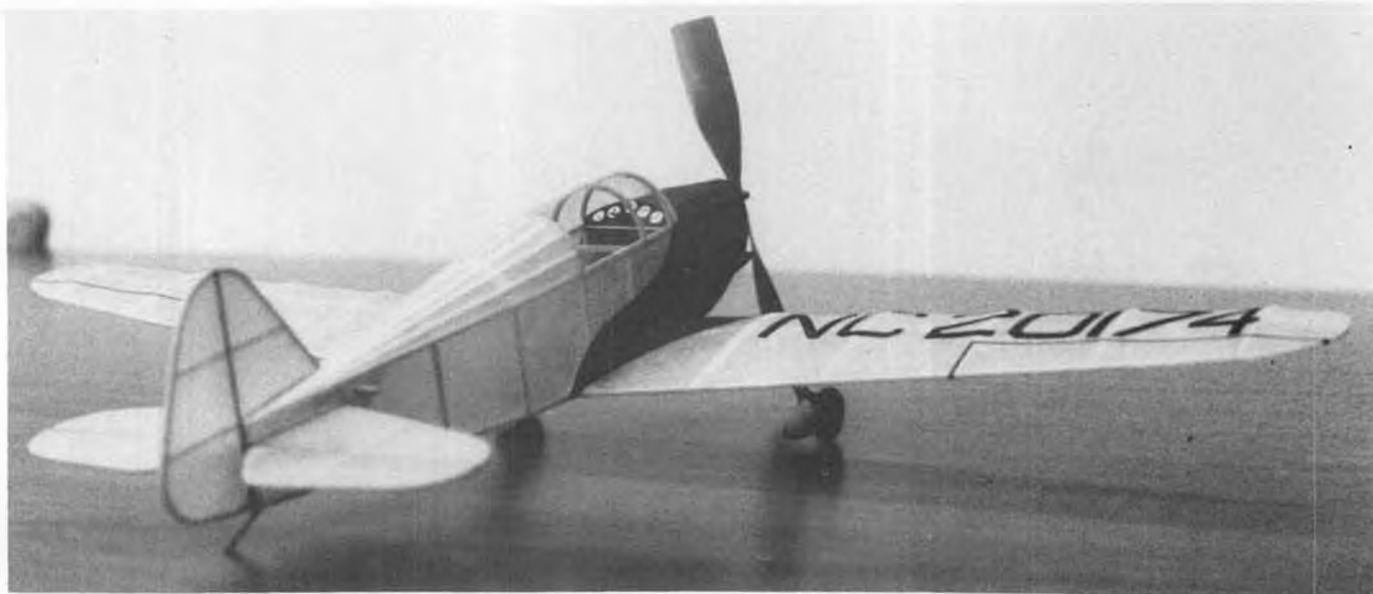
Gee Bee "Eightster", by Dick Gleason. Photo from John Pond. Might be R/C, though not mentioned.

# FREE FLIGHT AND CONTROL LINE

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CONTROL LINE . . . . .	86
"PHOENIX" C/L STUNT . . . . .	89
PEANUT DEPERDUSSIN . . . . .	91



Moments after veteran Q.T. Flyer Jim Adams released his Comet Clipper, for an official flight at the VAMPS Annual, Las Vegas, the stab DT'ed, and the ship did about 7 or 8 loops before impacting, with little damage.



"Allied Sport", built from Golden Age Reproductions plans by Tom Sanders, Santa Ana, California. See nose block mounting tip illustrated below.

## FREE FLIGHT SCALE

By FERNANDO RAMOS

• Summer is almost here and so is the date for the Scale World Champs. I want to pass along the latest and final information regarding the F/F Scale portion, which is unofficial as far as the F.A.I. is concerned . . . but not to us! Mick Duce, who is organizing this whole show, has indicated that interest is high and that he has received many inquiries regarding the contest. The judging for the models will take place on Saturday and Sunday, August 5th and 6th, with the flying taking place after 5 p.m. on the evenings of those days. The entry fee will be 5.00 sterling, or its local currency equivalent. Accommodation fees at the Liverpool University Halls of Residence, 40.00 for the six days, no reduction available for shorter stays, unfortunately. A banquet is planned for Wednesday evening of that week, at a cost of 6.00 per person. Therefore, the total cost for the whole show will be

around 51.50£. (That's about \$100.00)

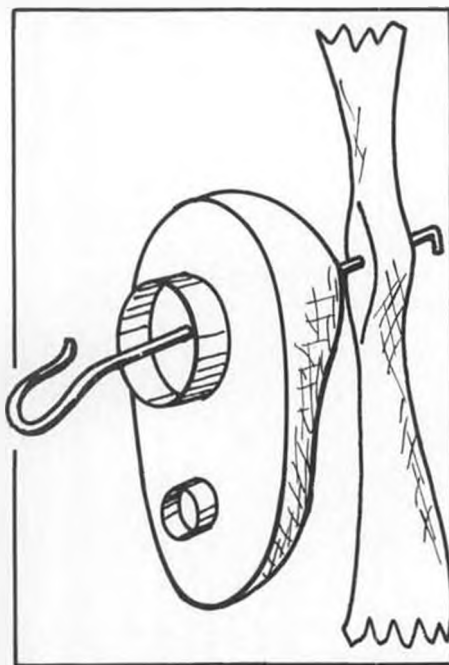
Remember, that you do not have to attend in person to compete. Again I want to remind you that we must have a good showing if we are to have F/F scale represented at the World Championships in the future. They are planning to have three separate events: gas, rubber, and indoor Peanut. The deadline for entries to be received in England is July 1st. (*Too late when this appears. wcn*) If you will be needing accommodations, you must notify Mick well before this date. His address is: Mr. M. Duce, 20 Granville Road, Southport, Merseyside, England. As a suggestion, several Flightmasters are going to send their models in the same box and share the postage. One method of packing is to place the model in a plastic bag. Then surround the bag with styrofoam peanuts. This is probably one of the easiest and yet effective ways of doing it. You may want to include

another empty plastic bag so that when the box is unpacked, the "peanuts" can be placed into the spare bag ready for use for the return trip.

This month, I was to have a completed model of Flyline's Heinkel, all covered and test flown. Well, it is covered, but unpainted and certainly not test flown. I have been busy trying to ready a few other models for the Flightmasters Semi-Annual contest. So the report will have to wait another issue. Deadlines just come too quickly! However, I dis-



Tom "modernized" construction with sliced ribs, and laminated wing tips and tail surface outlines.



Tom Sanders uses aluminum tubing for both the noseblock locator and a key. Large tubing is 3/8, small is 1/8, sharpened and used as its own drill. About 3/16 protrudes from noseblock after being cut off.

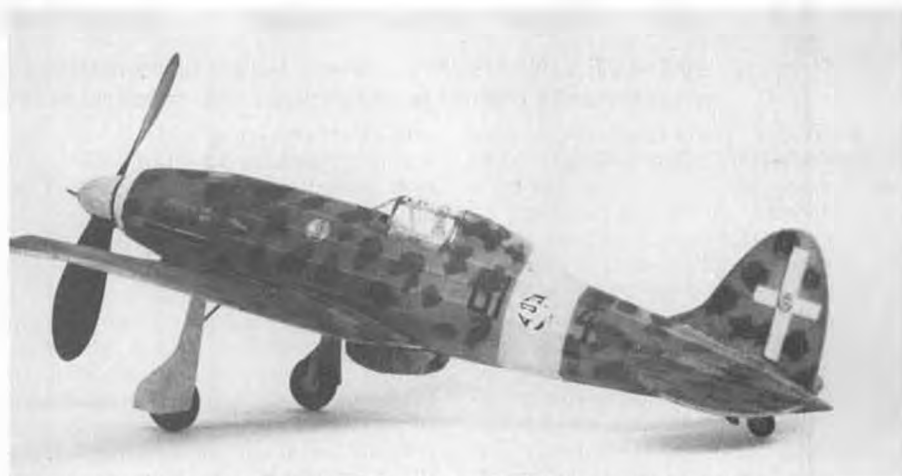




Mark Fineman, Hamden, Connecticut, built this 30 inch span Monocoupe from Megow plans. Modifications include 1/16 sheet filling in forward fuselage (Cleveland style) and turned balsa wheels.

covered another interesting approach to covering models with compound curves. Probably one of the biggest pains in covering a model with Japanese tissue is when you cannot cover an entire side or panel with just one large piece of tissue. This is especially true when you are covering a fuselage which has several compound curves. The usual procedure for covering this type of fuselage, is to cut long narrow strips that fit perfectly between rows of stringers. This is particularly tedious, since overlapping of the tissue is not desirable. Well, I have found a method that greatly simplifies this task. Those of you who have read this column for any length of time, realize that I always use thinned-out white glue for covering my models with tissue. It is quick, no sanding is necessary, as when pre-doping surfaces for covering between coats, and it makes a neat job.

I have added a couple of twists to this method that makes the job even better. That is, to put the tissue on wet. Anyone who puts on wet tissue usually uses the dope/thinner method, but I have found that using the white glue and wet tissue works extremely well. Just a brief rundown as to how this is done: Coat the outer edges of the area to be covered with the thinned-out white glue (about 60% glue to 40% water). Take the piece of tissue to be used and atomize a fine mist of water on the dull side of the tissue. Carefully place the wet tissue onto the glued surfaces and smooth out. You will find that by wetting the backside of the tissue only, that there is plenty of time to pull and stretch without fear of tearing. Now there is the new gimmick for covering fuselages with



Scratch-built M-202 (see page 26) Peanut scale, by Mark Fineman. Weighs 1/2 ounce.

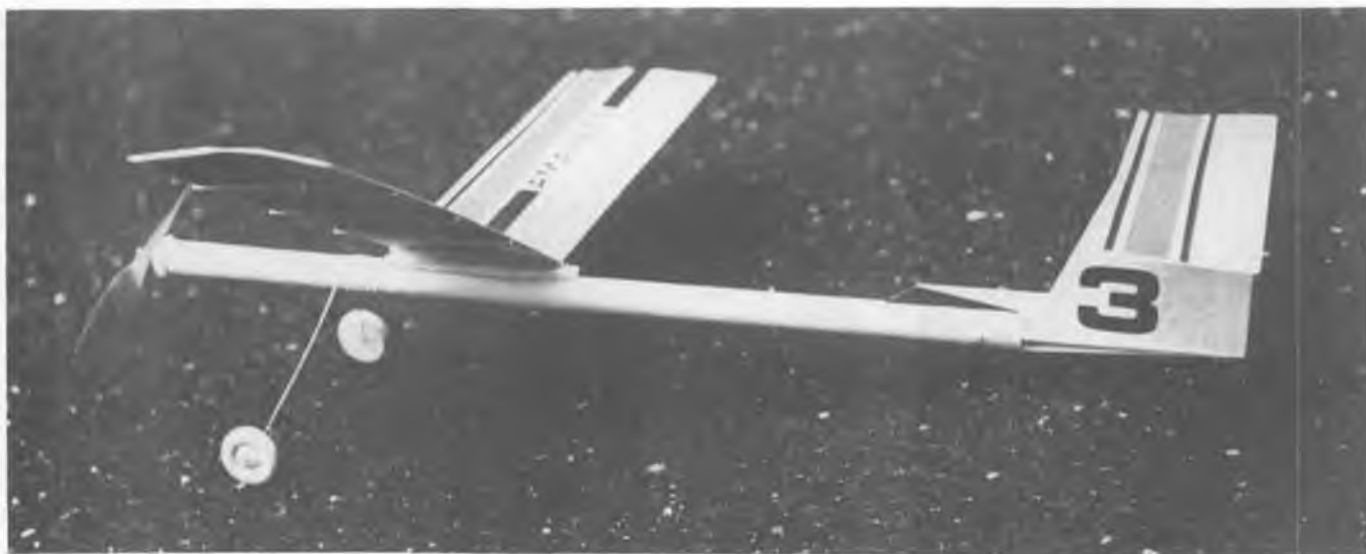
compound curves. I pre-cut a piece of tissue much wider and longer than necessary, and then I carefully brush a thin coat of glue onto the stringer. Globbs of glue is undesirable, because the glue will ooze out from underneath the tissue and adhere to the surrounding tissue. This makes a poor looking covering job. I then wet the strip of tissue with a fine mist of water. It is then placed onto the pre-glued surface, carefully followed by pulling and stretching. When the tissue has dried completely, I carefully tear the tissue. It will tear only up to the glued edge. It leaves a very neat seam. Repeat the process for the rest of the fuselage. The only thing you have to be aware of is that the grain of the tissue must run the length of the fuselage, otherwise this system will not work. If you are in doubt as to how the grain runs on tissue, there are two very simple things you can do to find out. One is to hold the entire sheet up to the light; the grain should be discernable. If not, tear

off a piece from the corner of the sheet. With the grain, it will tear easily and cleanly. Against the grain, it will do neither.

Wings and tail surfaces can be done by the wet tissue/glue method just as easily, but I usually do the tail surfaces dry, followed by water shrinking then pinning down flat to dry. On the wings, I have found it easy to cover the bottom first, since they are usually flat bottom, and this is done dry. The top surfaces are done wet so that the best covering job is obtained. As soon as the top surface has been covered, I spray the bottom with water and the wing is then pinned down flat to dry. This prevents warping.

Incidentally, Cliff McBaine has passed on a neat little hint that helps eliminate warping. Cliff is an unlimited and Wakefield rubber competitor, with lots of experience. I had asked him once if he ages his frameworks prior to covering (Some old-timers age their model's frame-

*Continued on page 114*



# TUBE-BEE (OR NOT TO BE?)

By DAVE LINSTRUM . . . Every hobby has something useful for another hobby. In this case, rocketry and Polaroid photography make practical donations to the cause of model airplanes.

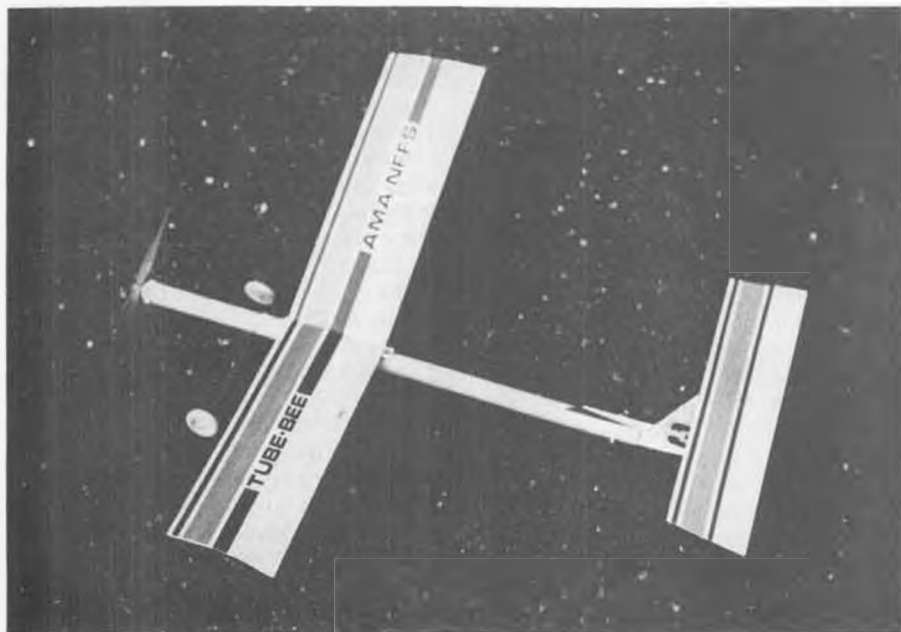
• Often the inspiration for a new design is some ordinary item used in an innovative way . . . this may be a new material or model product, or even a product from a related field. Necessity being the mother that she is, the birth of a new invention can be aided by a bit of adaptation. In the case of this racy little "rubber band" model, the foundation for the design was based on the impregnated cardboard Estes rocket tube, commonly used as the body for model rockets and easily available in most hobby shops. The tube form is the most efficient, strongest structural type for the weight, and a natural for enclosing a rubber motor

and attaching wing and tail. Forming a nose block/prop shaft bearing is not so easy, but we happened on another "recycled" item here . . . the end-cap for a Polaroid black-and-white film coater is an exact fit on the Estes tube! The balance of the model is quite standard Jedelsky all-balsa construction. This is attractive, quick to build, requires no tedious covering, stays warp-free, and best of all is very sturdy. Wood selection is not critical on a sport model like this (it might be on a contest rubber model) but it does help if you can obtain straight, unwarped, quarter-grain (look for the speckled appearance on the sheet) balsa in the 8 to 15

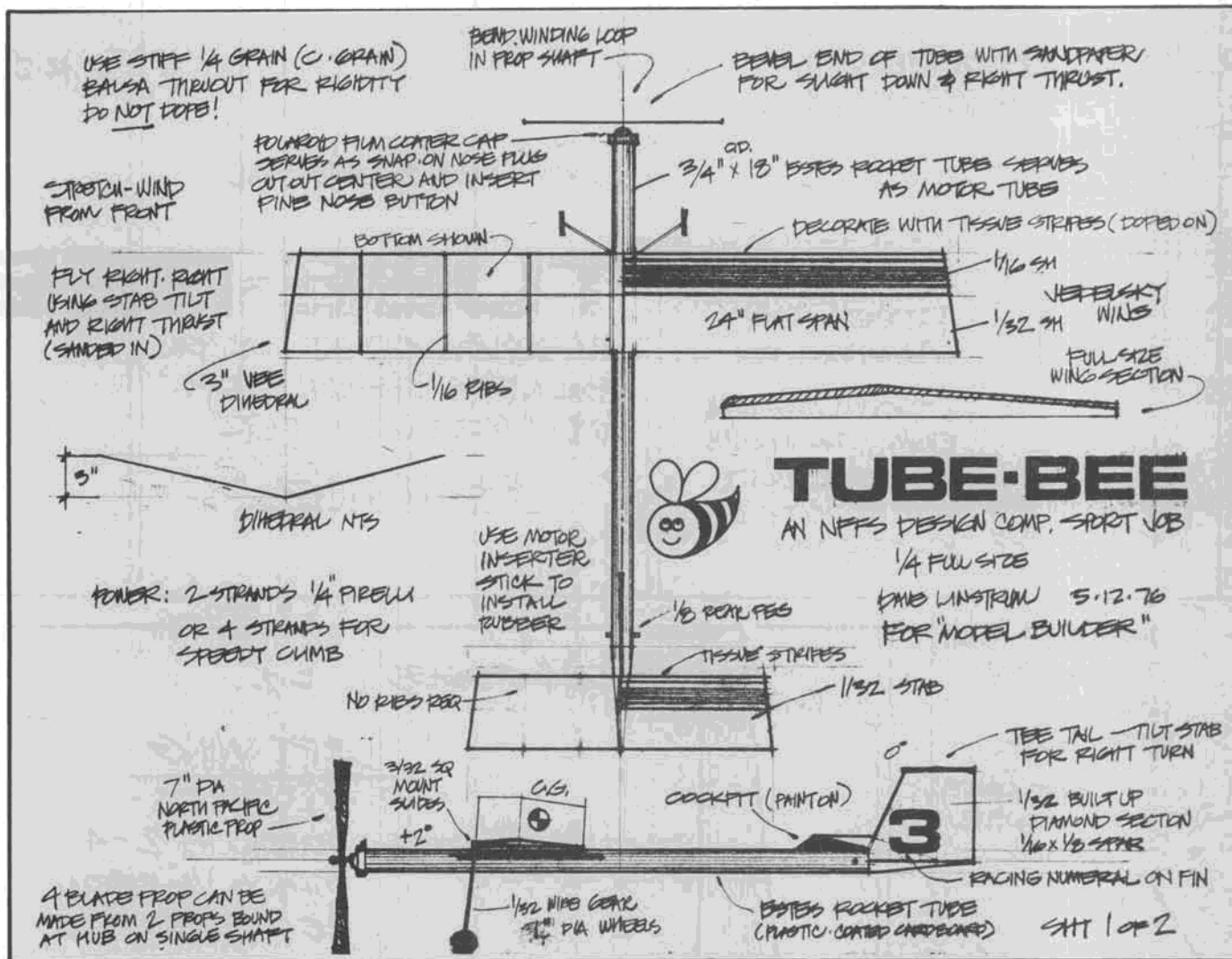
pound-per-cubic-foot range.

Since the plans are presented full size here, all you need do is remove them from the magazine to start building. You may wish to make a xerographic copy of them to use as building template material, and to preserve your magazine from damage. Assemble the items in the building Bill of Materials and collect your best modeling tools, including an Uber Skiver, single-edge (non-stainless) razor blade, small straight pins, and a small building board. A basswood drafting board or small sheet of smooth plywood will do. Note that this model is mostly built "in the air", rather than being pinned down to the plans as a built-up, stick-and-tissue type might be constructed. We suggest that you use an aliphatic resin glue for assembly; Franklin Tite-Bond and Sig Bond are good. No doping or finish is required (unless you plan to fly in the rain, you silly bee!), but you may wish to add colorful trim with Magic Marker felt tip pens or Spra-Mark dye. The original had doped-on tissue trim stripes. This motif could be duplicated with chrome mylar graphic tapes and trim tapes like DJ Multi-Stripe.

Now that you have all the materials at hand, what are you waiting for? Let the balsa chips fly! We suggest you build the fin/boom assembly, wing and stabilizer first so that they can be drying while you work on the body. This won't be long, since the body is produced by Estes, ready to use. All you have to do is glue on the 1/4 square balsa wing mount, cut a hole for the rear



Nice long flights should be normal with this sport model. Rubber motor goes almost full length of rocket tube fuselage. Fun ship for tyros.

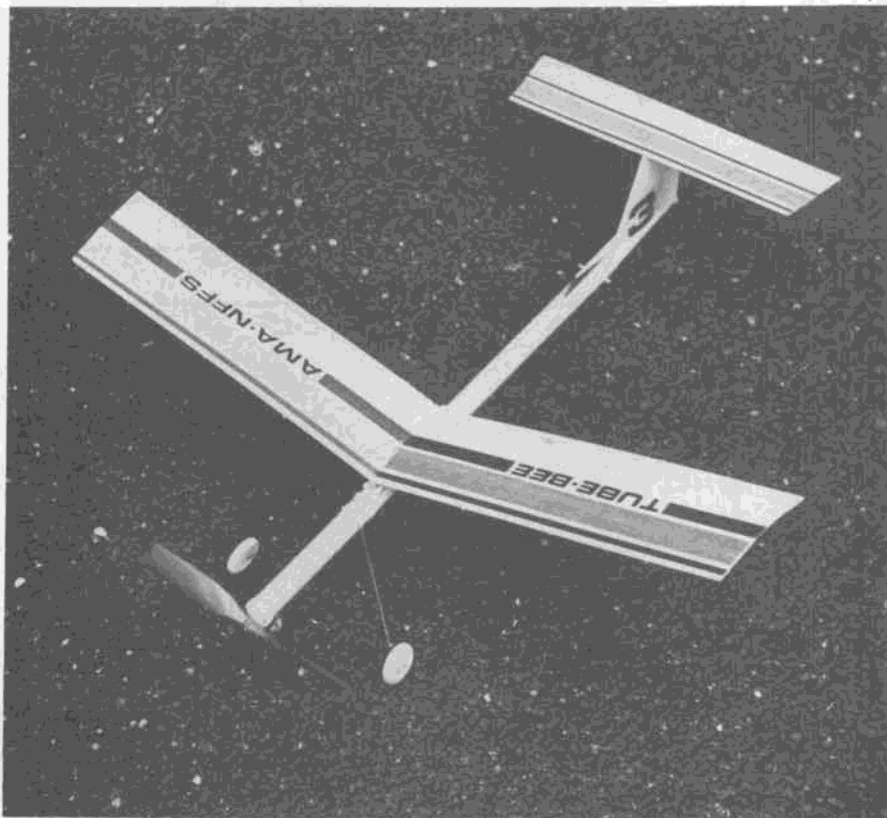


FULL SIZE PLANS ON NEXT TWO PAGES

motor peg, and add the tail assembly, which fits inside the rear of the tube. How simple can you get?

Cut the wing leading edge and trailing edge sheets to length; you can assemble wing full span, even though only half the wing is shown in plans. The cut for dihedral break in center can be made later. Glue the sheets together after matching the edges; some trimming with a steel straight-edge as a guide may be necessary to get a tight joint. Cut out the ribs and then mark their positions on underside of the wing... a single line with a Flair pen is enough. Turning the wing upside down on the board and shimming up the LE as shown in the detail, you can easily glue in all the ribs. Note that the center ribs are thicker; this allows for beveling them for dihedral with a sanding block, much as you would the wing of a hand launch glider. After the wing is dry, cut the center ribs and sheet surface apart and bevel to dihedral angle. Get a tight joint... it must be strong. Five-minute epoxy is a good way to glue this particular joint, but use it sparingly; epoxy is heavy. Tite-Bond will work okay.

Continued on page 125



DECORATE WITH  
TISSUE STRIPES

R.1

R.2

R.2

© 1970 DAVID B. LINSTRUM

# TUBE-BEE

ALL BAUSA SPORT RUBBER  
FOR NFFS DESIGN COMP.  
AND "MODEL BUILDER"

## RIGHT WING

BEVEL DIEDRAL  
JOINT A LA HLG

RUBBER HOOK  
FROM BENT PIN  
STRETCH WING BAND  
FROM HOOK AROUND  
AND UNDER BODY,  
BACK TO HOOK IN  
X-FASHION.

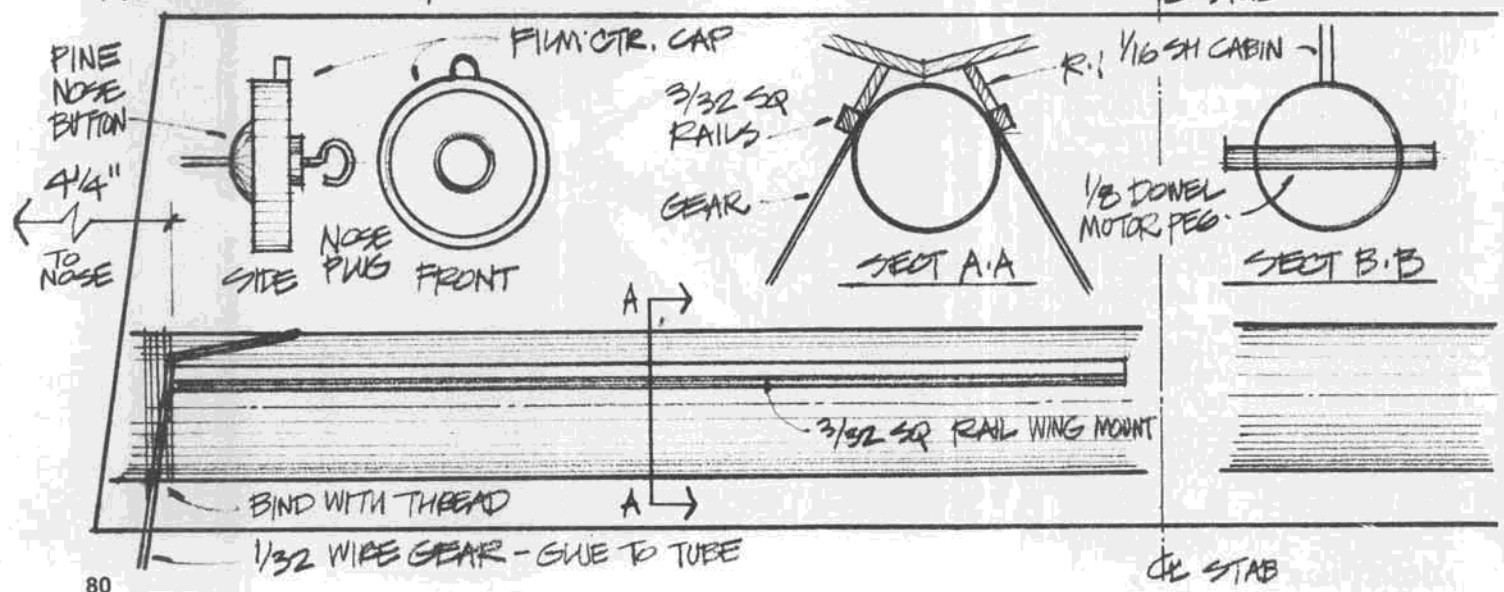
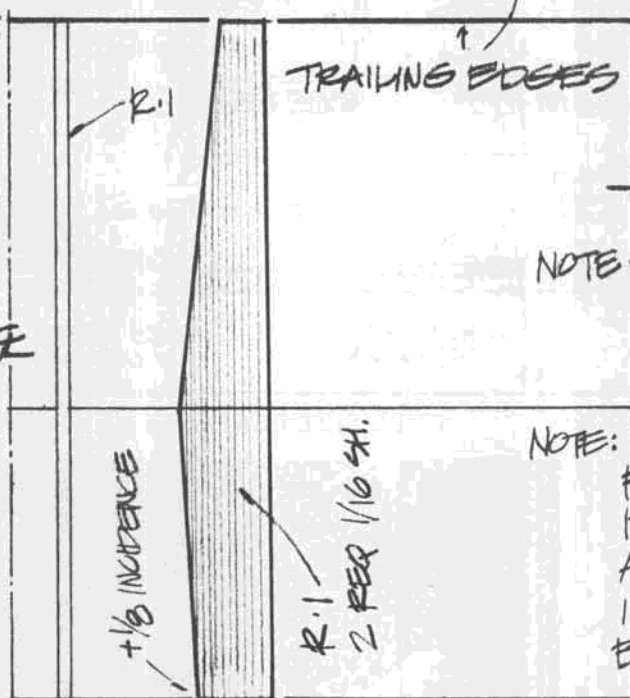
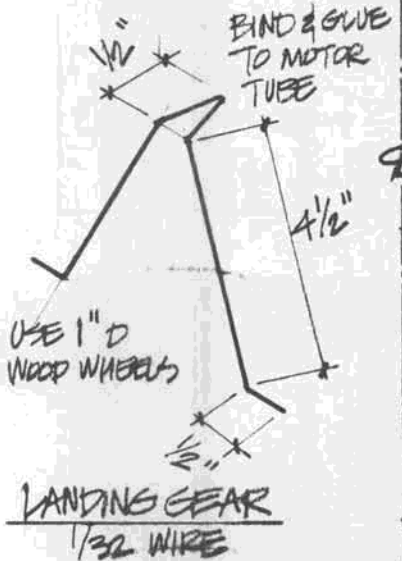
THESE RIBS SLIDE  
ON 3/32 SQ  
RAILS ON  
MOTOR TUBE

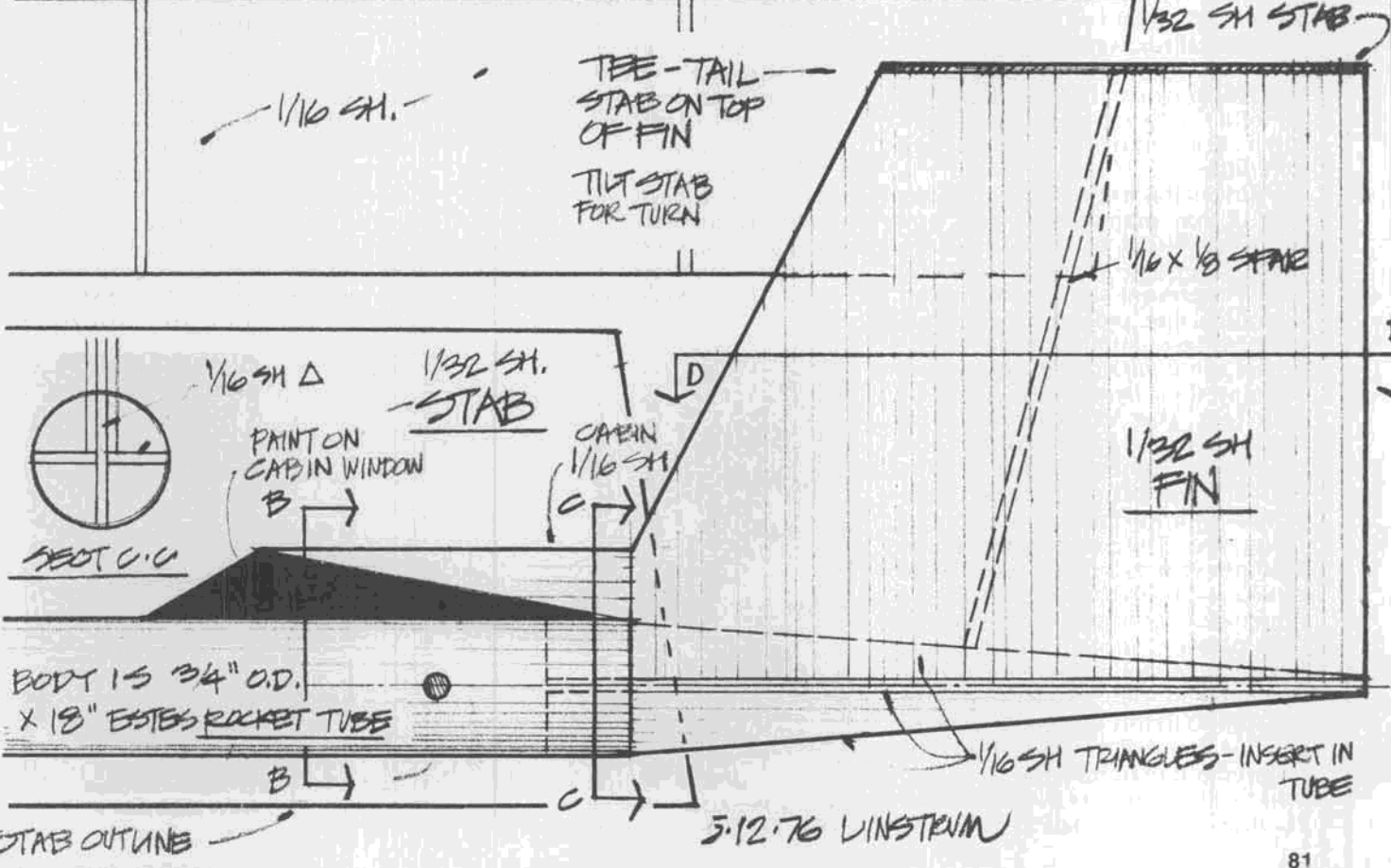
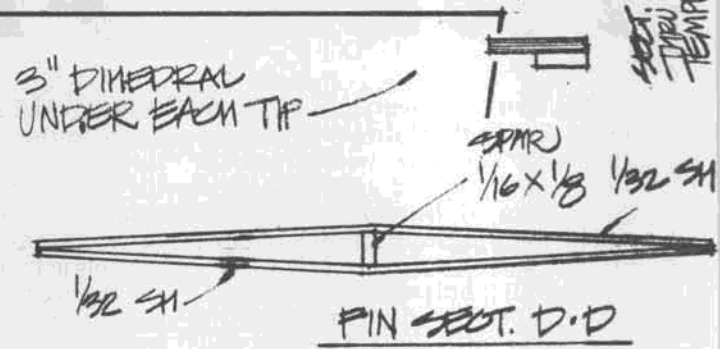
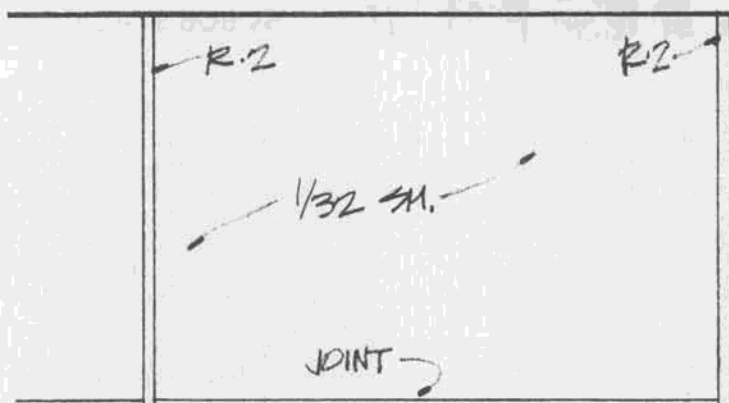
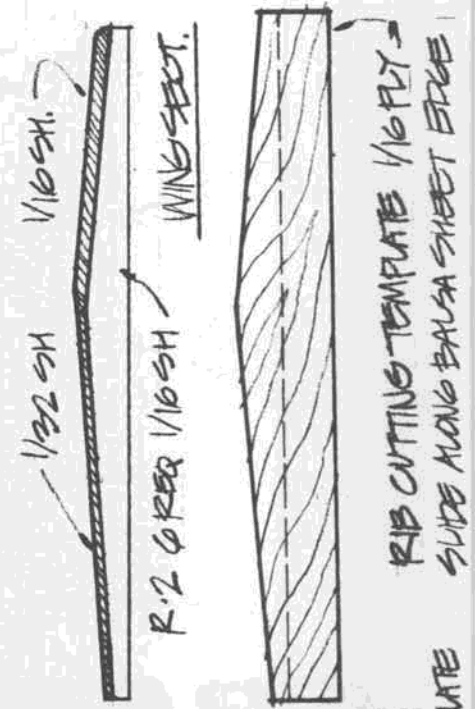
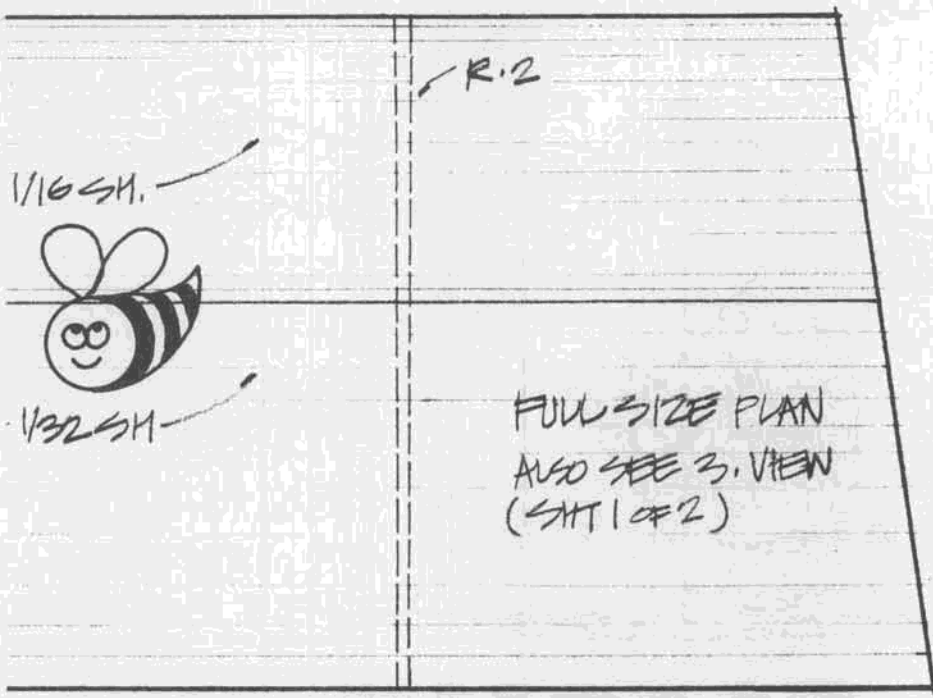
TRAILING EDGES

## LEFT WING

NOTE: POWER IS 2-4  
STRANDS 1/4" PIRELLI  
USE 7" PLASTIC PROP

NOTE: NOSE PLUS IS POLAROID  
FILM COATER END CAP -  
IT FITS BESTES TUBE  
AS A SNAP. ON CAP,  
INSERT PINE NOSE  
BUTTON IN CTR. OF CAP.







# FREE FLIGHT

By BOB STALICK

• Whyzzit that everyone picks on Dirty Dan Rutherford? Why do free fliers even care what the ukie fliers are doing and vice versa? The June issue of **Model Builder** featured some more friendly criticism of our esteemed (well, semi-esteemed) control line columnist. And this criticism came not from the typewriter of your F/F editor but from others on the **MB** staff. I guess I know the reason. Model builders of all interests, whether it be R/C, U/C or F/F, really have more in common than they would care to admit. It is to the benefit of the hobby in general that we depend upon each other. Without each other, we have very little.

Witness the entire issue of flying sites. I read many newsletters, and although most of them are free flight oriented, there are several which represent substantial interest in control line and radio. Almost all, at one time or another, have experienced some difficulty in getting and keeping their flying sites.

In fact, the latest issue of the Minneapolis Model Aero Club newsletter comments that a large part of their last meeting was consumed with the issue of obtaining a flying site. They committed up to \$400 per year as a rental fee, if a site could be found which could be negotiated for this amount. Further, they passed a motion which would have allowed for an increase of \$2.50 per entry in their season's contests in order to defray the amount necessary for rental of a field. It should be pointed out that this is the same club which co-sponsored the Blaine-Hastings FAI F/F Finals in 1976, and

which had had some difficulties in keeping the site for that finals. I am not sure what the solution is, but I do know that with the R/C fliers using mufflers on their engines in order to not offend the local non-modeling types, and with free fliers having to go further and further out into the country in order to find a location, the control line boys have their problems, too. We can band together and maybe succeed in finding suitable facilities for our hobby, or we can go our own ways and postpone the inevitable.

On a related note, it is with some humor that I read the accounts of Lake Elsinore being full of water . . . an oddity in sunny So Cal that has made news. I have also been informed that the Taft F/F site is not a windy, blowing sand field, but at this time (April 29), is actually sporting a cover of grass. Will wonders never cease.

## MYSTERY MODEL FOR AUGUST

Laminar flow airfoil, shoulder wing, and equipped with a cabin, this model was touted as a competitive contest ship under the one-time weight rules imposed on free flight models. A quote from the article about the airfoil goes like this, "We are still using the same airfoil sections that we were using fifteen or more years ago, despite the fact that the airfoil section is of primary importance in determining the extent of a model airplane's success!"

Makes you wonder how far we've come since then . . . or if the entire gist of the philosophy surrounding the design of this little 1/2A ship was in error. There are very few laminar flow airfoiled shoulder wing ships winning on the contest circuits today. Anyhoo! If you know the name of this ship, drop a card with that info on it to Bill N at **MB**, and with a little luck and the right



Rosemary Hutchinson, chief kit maker and general overseer at RM Enterprises, shows off Zingo A-B Gas, FAI Power model kitted by RM.

answer, you can win a nice prize.  
**THREE-VIEW OF THE MONTH...**  
 Jilliby A/1 (F1H)

This little glider was designed by Dave Tongway, and flown to first place in the 1977 Australian Nationals. With some changes being adopted by the CIAM as it affects this class of model, and with the current discussion going on around the F/F circles as to whether to adopt the CIAM (FAI) changes or to maintain two A/1 events, it seemed appropriate to present an A/1 glider which, although not really a state-of-the-art model, is indicative of a design which would be worthwhile to build and fly in competition. Some features:

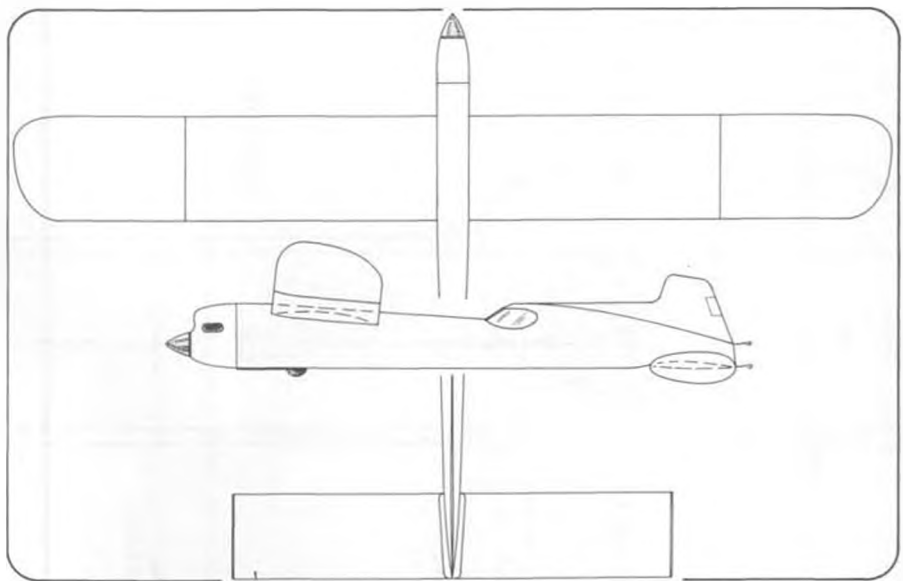
1. The wing is solid balsa; the planks comprising the wing are glued together on a form which has the shape of the undercamber. The form is 1/2-inch solid balsa, glued to a 1-1/2 inch thick kiln-dried hardwood base board. The balsa block is planed and sanded to shape, using plywood templates and a long sanding bar. This maintains its integrity year-in and year-out and can be confidently pinned into anywhere. Top camber is also planed and sanded by a similar technique. Finish is a plasticized nitrocellulose lacquer (to prevent warpage) over superfine Japanese tissue.

2. Fuselage pod has a 1mm ply core, with balsa cheeks. This is glued onto a piece of 3/8 inch square "engine bearer" type hardwood which has a circular turned end to fit the fiberglass boom tube. The tow hook screws into the hardwood, and is a simple L-shaped device fashioned from 1/8 soft welding rod with a Whitworth thread. Wing mounting is via a 1-1/4 inch wide piece of 1mm ply conforming to the wing undercamber. Rails of 1/16 balsa support the wing dihedral.

3. Performance: Jilliby is equally at home in calm or wind. It won the recent Aussie Nats, the last two rounds of which were flown in a gale. It has very smooth towing characteristics, and is easily flown through turbulence, behaving more like a lightweight A/2 than an A/1. The 3-D turbulator is a great help in getting consistent performance and works particularly well on the Thomann F-4 section. Swoop/dive stalls are nearly impossible to induce. It has won a first, a second and 3 thirds in the last 6 contests.

**DARNED GOOD AIRFOIL...**  
 Olofsson A/2 Stabilizer

Recent correspondence with Lars Olofsson on the issue of airfoils, has brought this airfoil to the August issue of **Model Builder**. Unfortunately, there are no coordinates plotted for it, as is our usual practice,



**AUGUST MYSTERY MODEL**

but the shape is presented for you in approximately the correct size for most installations at 10cm (3-7/8 inch). Other dimensions are included in the following descriptions provided by Lars. "I also tried a new tailplane section, that really works well on my new A/2 models. After the first contest, I totally broke the stab on my Nova (a British design by Jim Baguley) on its last flight. And that model features a normal, high-lifting stab. The new stab uses a semi-symmetrical section. It's 8% thick, with the high point at 30%, flat on the underside from 10%, with a 2.5mm upswept i.e. and 0.7% nose radius. I also use 2 turbulator threads at 7 and 23%. The already good stall recovery was better, and the angular difference between the wing and stab was as low as 2.5 to 3 degrees. On the original, the difference was between 4 and 5 degrees. The CG was at 55%. Improved the zoom launch, too. Try it sometime."

**RUBBER STOOGIE**

For those of you who don't fly outdoor rubber models, the whole idea of a stooogie probably conjures up visions of some dumb looking guy walking around the contest field poking his finger through the tissue coverings of your model while exclaiming, "Gee, it's only paper!" However, such is not the case with the rubber stooogie (No, Dirty, it's not the same Twit dressed in a rubber suit). This here rubber stooogie comes to you courtesy of El Torbellino (San Diego Orbiters), and is in the form

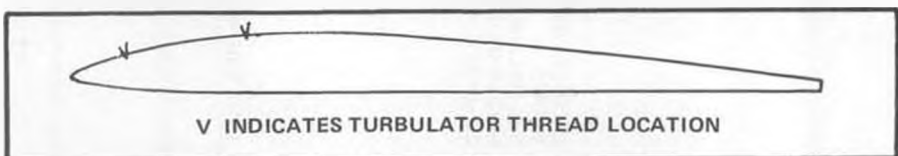


Rob Ludwigsen, Roselle, N.J., built this 1/2A based on May's Mystery Model design "Near Miss", back in 1961.

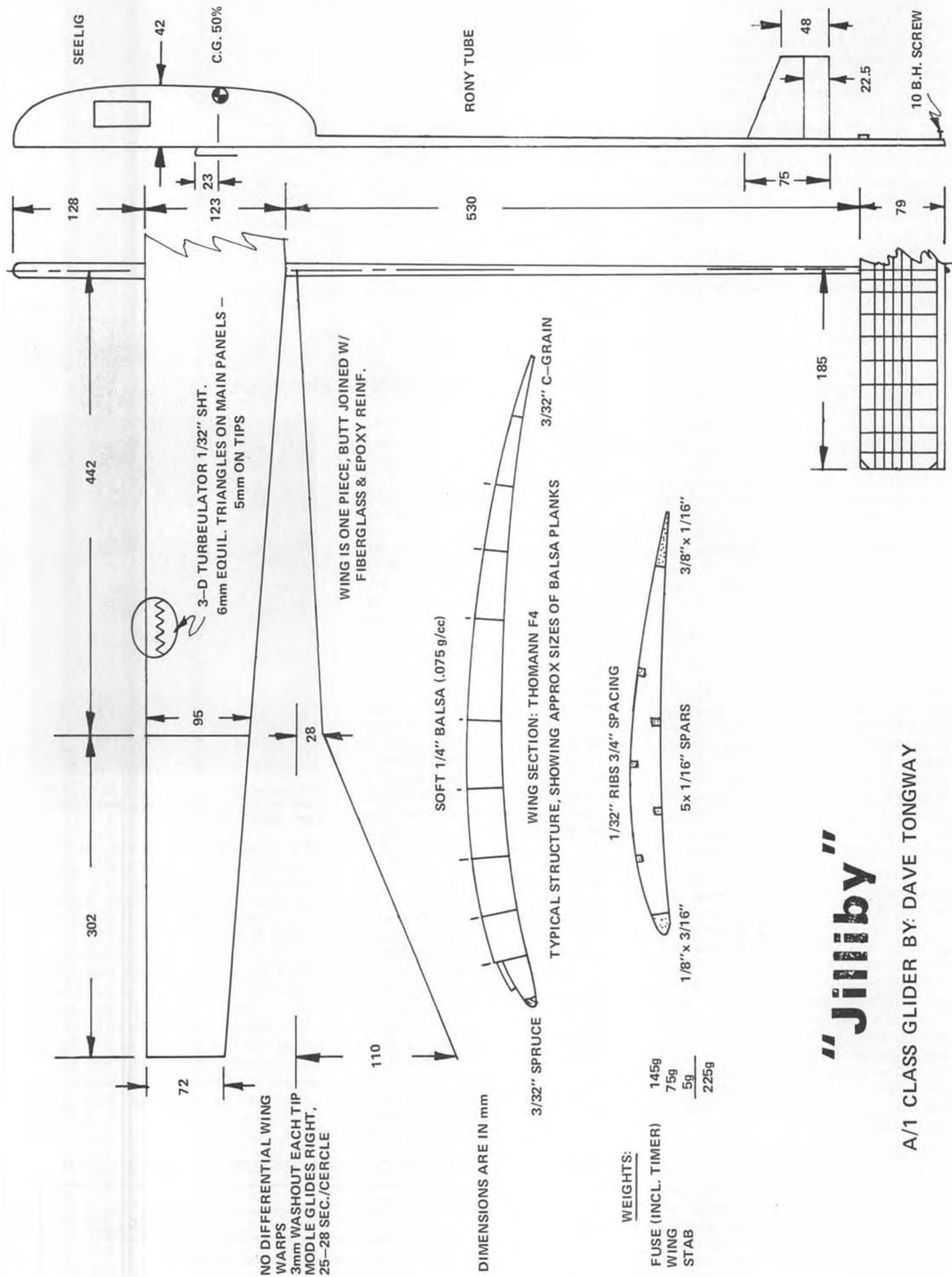
of a detailed sketch of the one used by Bill Bogart in holding his rubber powered models on the field so that, without additional help, he can wind them himself. I think the sketch is self-explanatory.

There are a couple of additions which can be made to Bill's device to make it even more versatile. Example: current rubber model technique uses a couple of wire hooks to allow winder extensions, holding the wound rubber motor while the prop is attached, etc. Holes drilled in the stooogie or on the post can provide a good location for putting these wire hooks when not in use

**DARNED GOOD AIRFOIL – OLOFSSON A-2 STABILIZER**



V INDICATES TURBULATOR THREAD LOCATION



# "Jibby"

A/1 CLASS GLIDER BY: DAVE TONGWAY



(Saves looking for them in the grass after the model is launched).

The need for such a stooge is brought home if you are flying at a meet where you cannot park your car near the launch site, or if you need the car to go model chasing. Anyhow, the one in the sketch can be made by the most klutzy of us.

#### VERBITSKY TIMERS

Lars Olofsson also writes that he has obtained 3 timers from Russian Power Flier, Eugene Verbitsky. Lars comments, "The best I have ever seen. We checked them under a 25x magnifying glass and found out that they are camera timers, probably the best made anywhere. We compared them to a Minori camera timer (identical to your K-Mart timers). What a difference. After that, Verbitsky put a lot of work into the timer. A new first gear and a spring box of magnesium are featured. I don't know if I'll ever put them in a model, or just look at them and get inspiration. Sometimes I really need that."

Lars provided no information as to how available these timers are, or at what cost. If I locate this information, be sure you'll read about it right here in **Model Builder**.



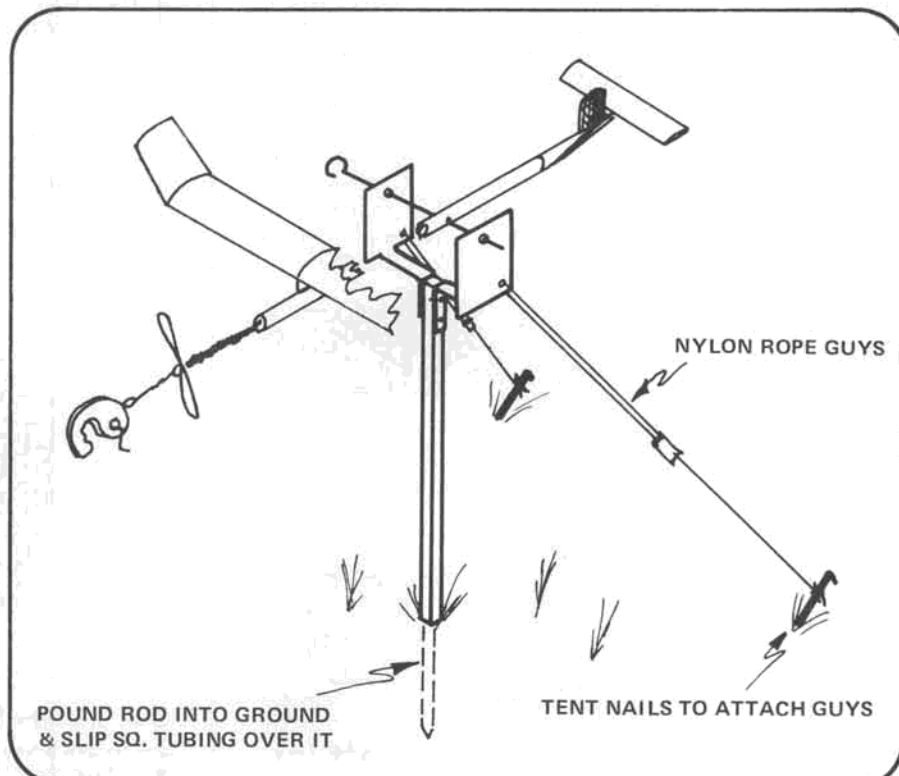
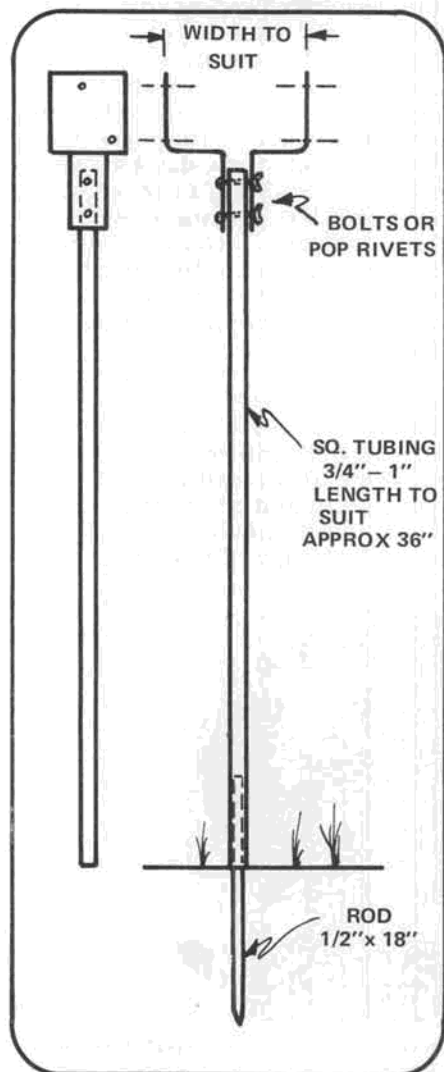
Marc Hutchinson holds pappa Tom's 1/2A Maverick model . . . just announced as a NFFS Ten Models of the Year selection . . . the Maverick, not Marc.

#### POST WAR OLD-TIMERS

You have to imagine the scene. Here in the Western part of the state of Oregon, and 5:30 a.m. on a weekday morning. The phone rings with ferocity, and a sleepy F/F editor

rolls over and turns off the alarm clock. The phone rings again. Finally, the handle is found. A cheery and very British voice on the other end informs me that I am talking to Jim

*Continued on page 129*





Al Rabe's F-51 stunt ship. Photo taken at Riverside AMA Nats by Will Nakashima.

# C

## ontrol line

By "DIRTY DAN" RUTHERFORD

### BLADDER GRABBER '78

Usually held in the early fall of the year, this annual Combat meet was held in April, for several reasons. And it looked as if our contest didn't take well at all to being shuffled around like that. First off, the big-bucks prizes (Phase Linear stereo goodies) that have become a legend with Combat fliers, weren't available. Our beautiful weather went away for most of the Big Day, leaving a field full of medium soggy fliers. Rich Brasher didn't show up to defend his previous B/G win. And much of the Combat action was only so-so.

In fact, all of us found it very difficult to believe that we were involved in a meet even remotely connected with the N.W., let alone a "Bladder Grabber". I guess it just

goes to show that luck is a very real factor in Combat and/or that the speeds have finally become high enough to mess things up a bit. Actually, I don't feel that the present speeds of Combat planes (which admittedly are kinda high) has that much to do with it, because as the speeds go up, you just gear your reactions up another notch and get it on.

But these and other things had to run through your mind as you witnessed B/G '78 and saw one Big Gun after another fall, usually to dumb luck enjoyed by many not usually associated with being HDCF's (Hot Dog Combat Fliers). If nothing else, B/G '78 was a real lesson in humility for many of us, especially myself, when I lost my match in the first round. When flying Condor Legion

double-elimination against a heavy field, a first-round loss is almost impossible to overcome.

The above is not meant to take anything away from Tracy Brazzle, who fought it out to the last and won the last match of the day with a nice kill. Tracy is always in there trying hard, and has become a pretty fair Combat flyer . . . Tracy is never an easy pick in a match, but even he felt it was too good to be true when he was loaded down with the huge first place trophy.

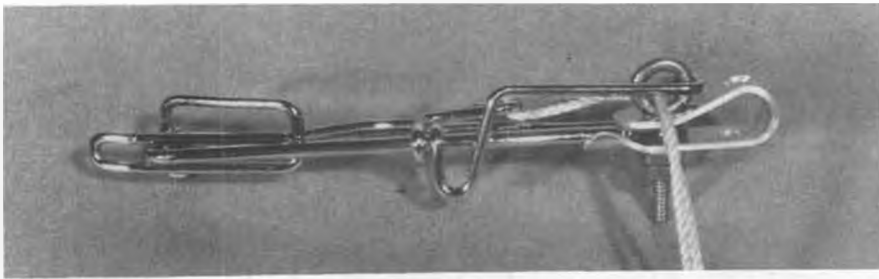
Several guys came down from Canada to try their luck with us in their first for-real Combat meet, and one came second (my apologies, all I can remember for sure is that his last name is Cox and he is short!), so they went home a bunch of planes lighter and very happy. Ken Ferris, Tracy's



Les "Flipper" Pardue shows us his good side while rubbing his TR's nose in the dirt.



John Ballard is one of strongest Rat fliers. Does weight training to get in shape for racing season.



Skinny version of a bos'n's whistle? Probably not. Tune in next month for answer.

flying partner, just kept winning match after match, finally placing third. Ken is one of those few who is persistent enough to tough it out in an area where Combat competition is tough in the first place, and due to the policies of the sanctioning body (the AMA, bozo) Ken has had to duke it out with very experienced fliers contest after contest. Not many will take the road Ken (and Tracy also) has taken, but in April of '78, it finally paid off for him.

While I'm thinking of it, do you ever wonder how many people who are potentially good fliers and a real asset to the sport, whether it be C/L or F/F, have been run off by the outdated Junior/Senior/Open classifications with which we continue to be burdened? I've thought about it a lot. And didn't like the conclusions I came up with. R/C has shown the way on this matter.

#### TRASH CAN

Not a new section for this column, it all falls under the Trash Can heading already, but a new event introduced into this area by Charlie Johnson and Greg Hill, who flew up from San Diego for the Bladder Grabber.

Rules for Trash Can are very simple. A large trash can is placed on the edge of the flying circle. One at a time, the contestants fly their models, the idea being to do a wing-over into the trash can. First one to

hit the can dead-center wins. If no ones plugs it in, measurements are taken to see who came closest, and he wins.

The evening before B/G '78, a group of us were drinking beer and Charlie told everybody about this exciting new event. Nobody took it very seriously. But the next day, Don McKay proposed that, after the contest was over, we fly Trash Can with leftover Combat planes. Nobody was overly excited, because all of us had good models with us, not the junk you would bring if you knew in advance you were to fly Trash Can. The catch here was that since Don retired from Combat (his retirement ended, and then started up again, with the start and end of B/G '78) he has been making those R/C race cars, running under the JoMac (Jerobee) label. Right quick, Don offered a ready-to-run 1/12th scale R/C car, worth over \$200.00, to the first person to plant one in the Trash Can. Interest picked up immediately.

After awarding the trophies for the B/G, we located a suitable trash can. Actually, we just moved the circle over a bit to put the trash can within easy hitting distance. The trash can featured a surround made from 4x4's, and sat on a concrete pad. Very formidable target. In order of readiness to fly, the contestants fired up their engines and



Russ Sandusky, head man of CL-RPM and designer of latest Midwest racer kits.

winged it on in. Marty Phillips came pretty close on his try, as did Bob Smiley. At the other end of the scale was Gurt Frogg, who had been sipping fine white wine since the end of the second round. Gurt missed by 24 feet. That's right, 24 feet!! Gurt was heard to say something about the wine being of a very good year.

Ken Burdick, believe this or not, entered the *same plane* three times in the Trash Can event. Granted, it was getting quite beat looking, but Ken kept on trying. After a series of truly delightful crashes and near-misses, it was finally Greg Hill's turn to fly. Charlie and I got him fired up and launched and Greg did several laps level, getting set. Up and over the wing-over, then straight down at the ground, Greg decided at the very last split-second that he was off the mark and pulled out no more than two inches from the top of the trash can. After a few more level laps, Greg decided he was ready . . .

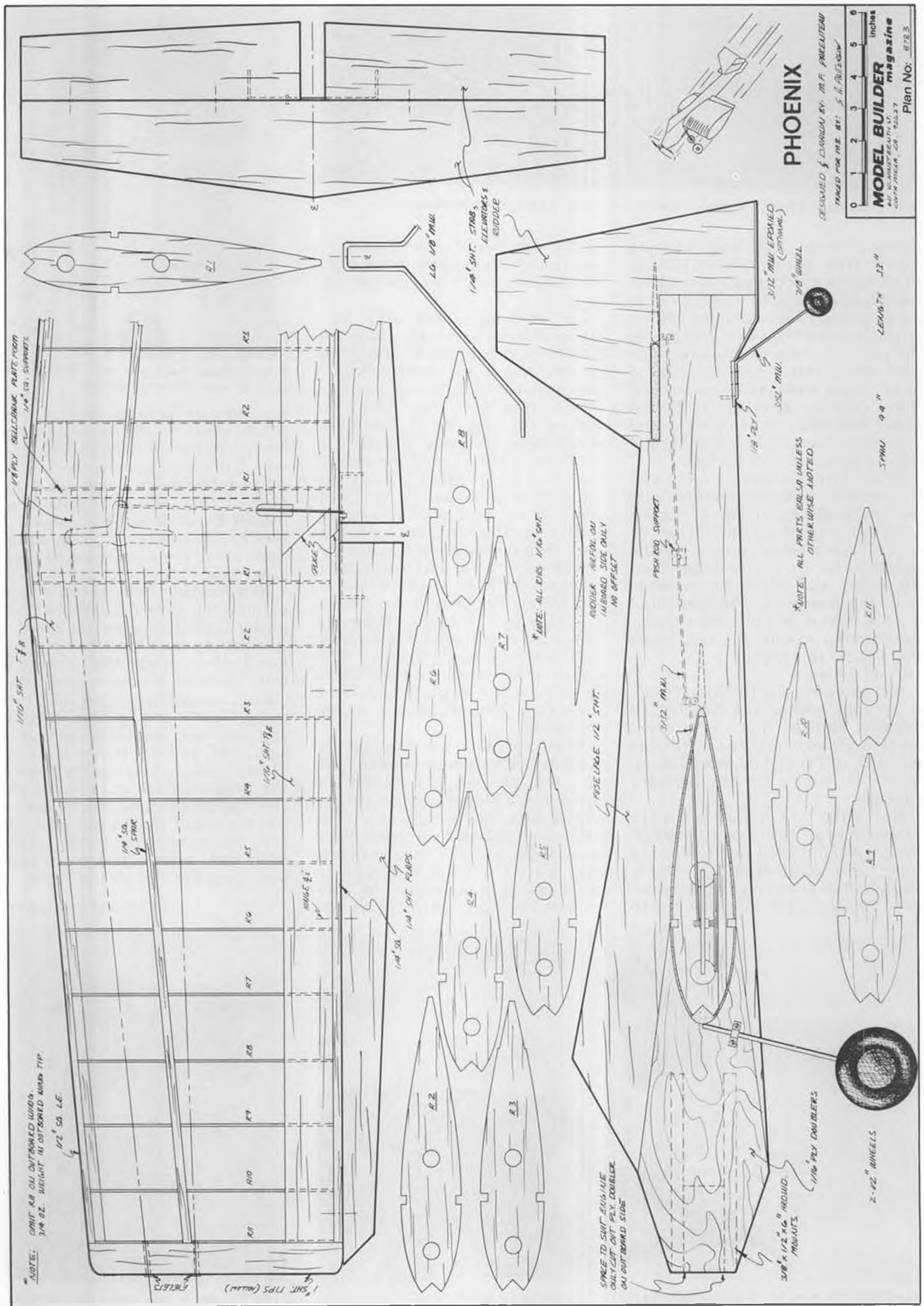
*Continued on page 112*



Stan Clough warming up TR engine before a heat race. Dieselizeed K&B 15 for power.



Living TR legends; Don Jehlik, left and Herb Stockton. At '77 Nats.





# PHOENIX \* PROFILE STUNTER \*

By MIKE PARENTEAU . . . A good stunt trainer doesn't have to be ashamed of its looks, even if it's a "No-Cal" (profile fuselage). For .29 to .36 engines, it has a wingspan of 44 inches.

• I am basically a builder and not a terrific flyer. I also have built most of the profile control line kits available. After a while, they all began to look the same, so I tried my hand at designing something that I thought looked different. The result is the 'PHOENIX' . . . a profile stunter with a 44 inch span, full operational flaps, tapered wing, that will take a .29 to .36 engine. Mine is powered by a Super Tigre G35 on suction with a 10-6 prop. The original was a tail-dragger, but I added a tail wheel the second summer I flew it, and that greatly improved the takeoff and landing characteristics for hard surfaces.

## WING AND FLAP ASSEMBLY

Start by covering the plans with wax paper or Saran Wrap, then cut out all ribs. Splice and pin the bottom spar in place on a building board. Cut the T.E. pieces from 3 inch wide stock. If 36 inch stock is used, it will be necessary to splice the T.E. in the center. Pin the T.E. to the board, then pin all ribs in position on the bottom spar. Remove the pins holding the spar to the building board and block it up so the trailing edge of the ribs can be pinned in place to the T.E. splice and pin the L.E. in position on all ribs, and glue all ribs to the bottom spar, T.E. and L.E. Leave assembly pinned to the board and allow it to dry overnight. Then glue the top T.E. in position.

Cut out the bellcrank floor from

plywood and drill a hole in it for the bellcrank bolt. Insert the bolt from the bottom of the floor and attach with a nut on the top. Place some epoxy on the head of the bolt, epoxy the 1/4 sq. floor supports to the floor, and then epoxy the floor assembly in position between the center ribs. Next attach the L.O. wires and flap pushrod to the bellcrank. Now, slide the L.O. wires through the ribs, starting from the center and slip the bellcrank over the bolt. Fasten the bellcrank in place with a nut and place a drop of epoxy on the nut to keep it from vibrating loose.

Splice the top spar and glue it in place. Add the center sheeting on the top of the wing. Notch the sheeting for the pushrod exit. While this assembly is drying, carve and hollow out the wing tips. Drill holes in the inboard tip for the L.O. wires and install tubing or eyelets for bushings. Epoxy 3/4 oz. of weight in the outboard tip. Attach the tips and allow the entire wing assembly to dry thoroughly. I allow at least 48 hours before I remove the wing from the building board. This extra drying time will help eliminate wing warps.

Remove the wing from the build-



Profiles can be beautiful. Phoenix paint job tends to disguise the slender fuselage.

ing board, add center sheeting on the bottom and add the T.E. cap strip. While this is drying, cut and shape the wing flaps and join them in the center with the control horn assembly. Now carve and sand the L.E. and T.E. cap strip to shape. At this time, I mark and cut slots in the wing and flaps for the hinges, but *do not* join the flaps to the wing at this time . . . see assembly step.

#### TAIL ASSEMBLY

Cut and sand pieces to shape, join elevator halves with control horn assembly, and hinge elevator to stabilizer, using your favorite hinge method. Cut the rudder from sheet stock and sand it to the shape indicated on the plans. Notice that only the inboard side of the rudder is air-foiled, since it is not offset when it is attached to the fuselage.

#### FUSELAGE ASSEMBLY

Cut the fuselage from 6 inch wide sheet (or splice together from 3 inch sheets). Cut out for the wing, allowing a 1/4 inch behind the wing for the flap joiner wire to move freely. Also cut out an 1/8 inch slot in front of the L.E. for the landing gear. Cut out for the engine and engine mounts. Make sure to measure the engine you're going to use and space the engine mounts accordingly. The engine mounts on the plans are spaced for the Super Tigre G35. Epoxy the engine mounts to the fuselage. While this is curing, cut out the plywood doublers. I only notch out the inboard doubler as necessary to clear the engine. Feather the edges of the doublers at this time to make final sanding easier. Epoxy the doublers to the fuselage and place a weight on them while they are curing. Round all edges of the fuselage except where the stabilizer will be attached. Bend the landing gear and tail gear as shown. The landing gear is placed in the slot in front of the wing and held in place with L.G. retaining clips. The tail gear is attached by cutting a groove in the bottom of the fuselage and drilling a hole. Fill the groove and hole with epoxy and insert the tail gear.

#### ASSEMBLY

Insert the flap assembly in the wing cutout and slide the wing through the fuselage. At this time, I install the flap to the wing with the hinges. This is not as difficult as it sounds. (An alternate method is to hinge the flaps to the wing as the end of the wing assembly step, then cut out a section of the bottom of the fuselage to allow the wing and flaps to be inserted as an assembled unit. Replace and epoxy the piece cut out of the fuselage.) After the flaps are hinged to the wing, epoxy the wing in place and allow it to cure thoroughly. Epoxy the stabilizer/elevator assembly in place and then



No mistaking the profile thickness in this photo! Junior member of family (sorry, no name given) shows bottom of Phoenix.



For control line flying, who needs a full-width fuselage? After all, this is all the pilot sees while flying . . . we hope!



Some other Parenteau projects; Lil' Damik, Big Damik, Super Pup, Super Dawg, Old Baldie(!).

the rudder. After allowing sufficient drying time, sand the entire plane lightly.

#### FINISHING

Most builders have their own method for finishing, but, for those who don't, here is mine. After final sanding, put on two coats of Sig Lite Coat clear dope, sanding lightly after each coat has dried. Now cover the wings with SGM grade silkspan (that's right, I still use silkspan!!). Put on enough coats of Lite Coat to fill the silkspan. This is followed with

one or two coats of sanding sealer over the entire plane, wings included. Sand thoroughly after each coat. Now, put on the color to suit your wildest (or most modest) desires. The original Phoenix was painted white with metallic green trim (When using a light color for the base, it is advisable to paint the entire plane silver or gold as an undercoat before adding the base color). Follow the color with enough coats of clear dope to allow for

*Continued on page 125*



Pilot of Dep is a Peanut shell, marked in the style of Mr. Peanut. Streamlined for 1913!



It's a big spinner, but avoids necessity of making up dummy rotary engine.



# 1913 DEPERDUSSIN

By A. A. LIDBERG . . . Whether you happen to like this little sausage or not, there's still a valuable lesson to be learned on the technique of building with foam, so slow down and take a longer look.

• This model was designed and developed as an experiment in construction techniques. I wanted to see how foam handled and how well it could be used to duplicate the shape and appearance of a monocoque fuselage. Light flying models have traditionally used formers and stringers to duplicate this type of construction, but the resulting surface is far from smooth and detracts from the scale appearance.

Deperdussin seems to have originated monocoque construction, so one of their planes is an appropriate example. The fuselage on the full-scale racing plane was made up of 3 layers of tulip wood glued together on a form. When dry, the form was removed and the shell was covered on both sides with fabric which was glued on and varnished. The thickness of the finished shell was about an 1/8 inch. Conventional wood ribs and spars covered with fabric were used for the wing and tail. Flown by M. Prevost, this plane won the 1913 Gordon Bennet race at Rheims, France, averaging over 124 mph on the 124.3 mile course. The plane is a true pioneer, considering its vintage and its accomplishments. Due to legal and financial problems, Armand Deperdussin's firm went bankrupt. Under the guidance of Louis Bleriot, the revived company was known worldwide by its initials (SPAD), the designation of its WW I fighter plane.

Because this model project was an experiment, some lessons were learned, so I can share the failures as well as the successes with other modelers. I started by making up some test sections of foam to see how it reacted to various model

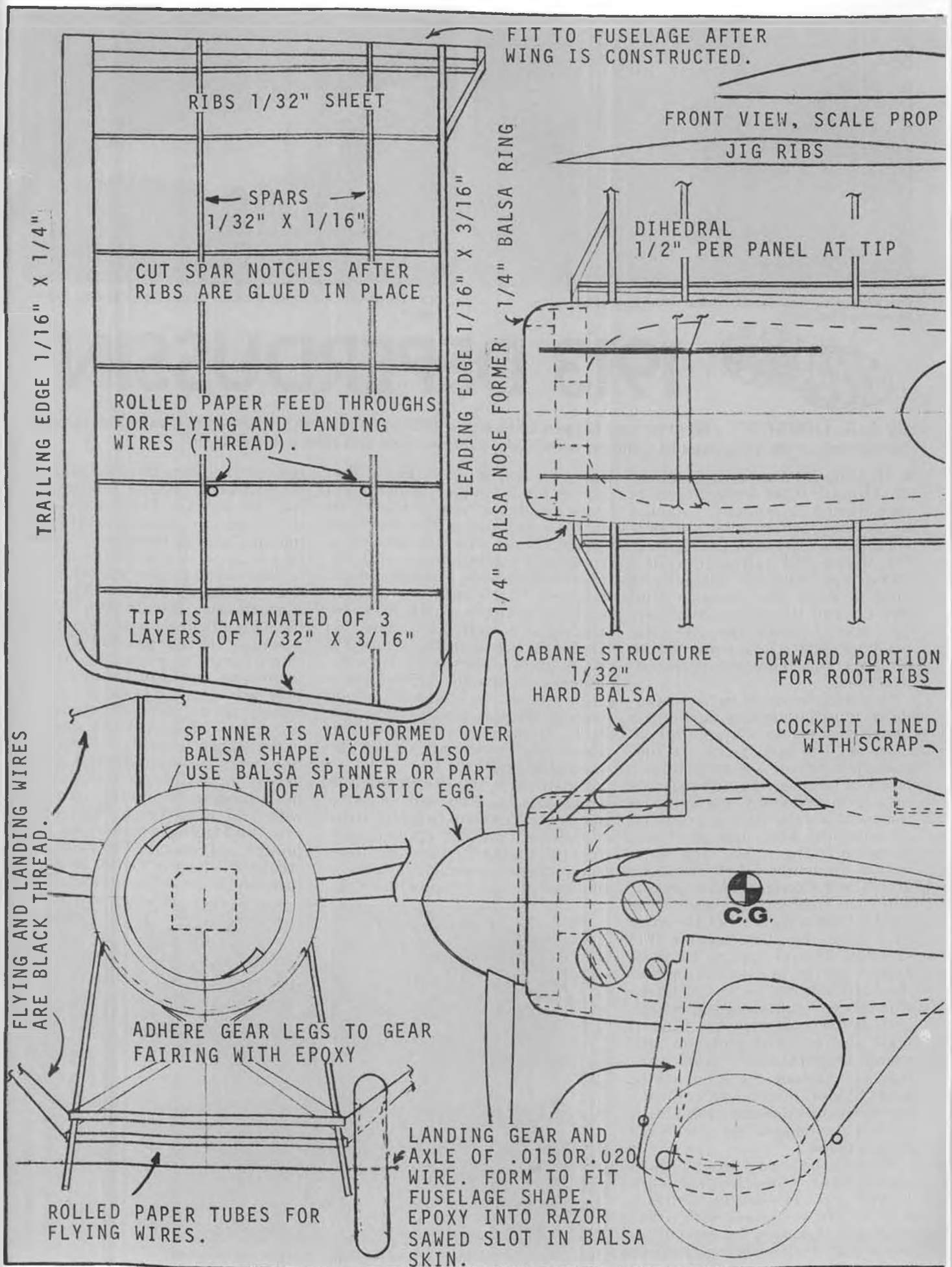
finishes and glues. I knew that conventional model cement and dope could not be applied directly to foam because of the dissolving effects. White glue was applied to smoothly sanded foam and appeared to provide a usable surface, but one that could stand more surface strength. Next, silkspan, applied with both white glue and Titebond, was tried. This seemed to be a good compromise between weight and strength. The best choice at this point was Titebond and one layer of silkspan, which produced a fairly strong skin. White glue acts about the same but cannot be sanded smooth.

I then made up a foam fuselage which was covered with about 6 pieces of silkspan (to conform to the cylindrical contour) applied with thinned Titebond. After the fuselage had dried overnight, I put on a thin coat of nitrate dope with micro-

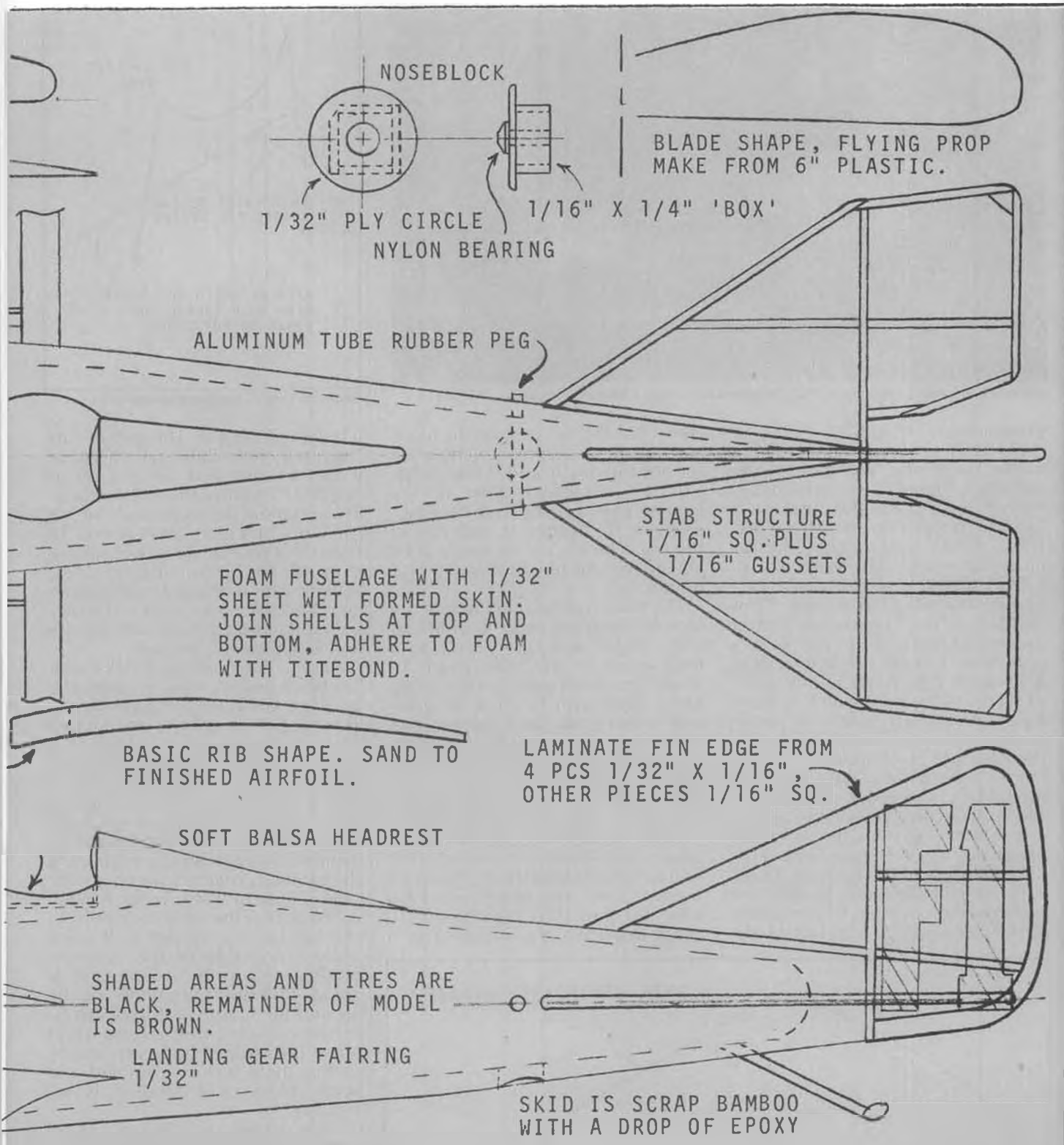
balloons added to fill in the pores in the silkspan. During the next 20 minutes, wrinkles began appearing in the surface, and as another 20 minutes passed, the wrinkles grew larger until the whole fuselage looked like a prune! While nitrate dope ordinarily dries quickly, and especially so in the 10 or 15% humidity of the Arizona desert, the porous nature of the silkspan had allowed dope fumes to penetrate to the foam, and the foam "went away". This was quite a setback, and I moved on to some other model projects for a few weeks. My interest in the Deperdussin plane remained however, and eventually I came across an article by Hal Cover, describing foam models covered with 1/32 sheet balsa. That article provided the inspiration for this project, as balsa plus Titebond glue creates an effective barrier between foam and dope, while producing an



There's plenty of clearance for large props with scale gear legs and wheels.







WHEELS TURNED FROM 1/4"  
SOFT BALSA ON 1/4" DOWEL  
CENTERS.

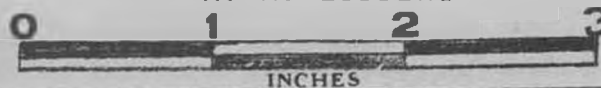


WHEEL CENTER TRIM PATTERN

PEANUT SCALE MODEL

# 1913 DEPERDUSSIN

**MONOCOQUE**  
DESIGNED & DRAWN BY  
A. A. LIDBERG





Landing gear details. Wheels are BIG! Covering seam shows slightly on fuselage.

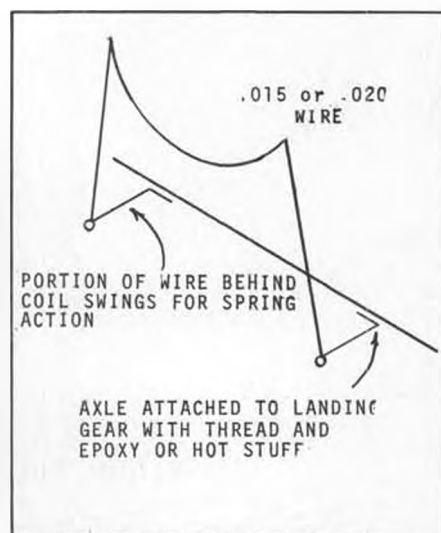
extremely strong model.

Throughout construction of this model, remember to keep it light. Although limited in wingspan by the Peanut scale rules, the fuselage is long in proportion to the wing. Thus, excess weight near the tail must be offset by more ballast weight at the nose, resulting in a heavier-than-desired model. Construction of the fuselage is the most interesting part of the model, so let's start there. Get some light insulating foam from a building supply store, or scraps of foam from an R/C flyer. You won't need much; 2 pieces measuring 1 x 2 x 10 inches will make the fuselage. Tack-glue the pieces lightly together to make a 2 x 2 x 10 inch block. Trace the side view of the fuselage onto one of the original 2-inch sides, so that the joint between the blocks becomes the vertical centerline of the fuselage. Leave a bit of extra material around the outline when cutting, which can be easily done with a hacksaw blade.

Now trace the top view on the block and cut it to shape. Cut the nose former and ring from 1/4 inch balsa. Cut the noseblock hole in the former, glue the ring to the former, and glue the former to only one of the foam blocks . . . so you will be able to split the blocks apart later for hollowing.

The body is circular in shape at the former, becomes more oval-like at the cockpit, and tapers back to a knife edge at the rear. Begin to shape the foam with a very sharp knife. Sand with No. 100, progressing to about No. 320 paper. Exercise some caution in carving and sanding, as the foam will tear or crush if you use too much pressure. Don't cut out the cockpit yet, as it would complicate the covering process.

Now, separate the foam blocks along the original seam, using a thin knife, in preparation for hollowing. I used a piece of copper electrical wire formed into a bulged "U" shape in place of the soldering tip in



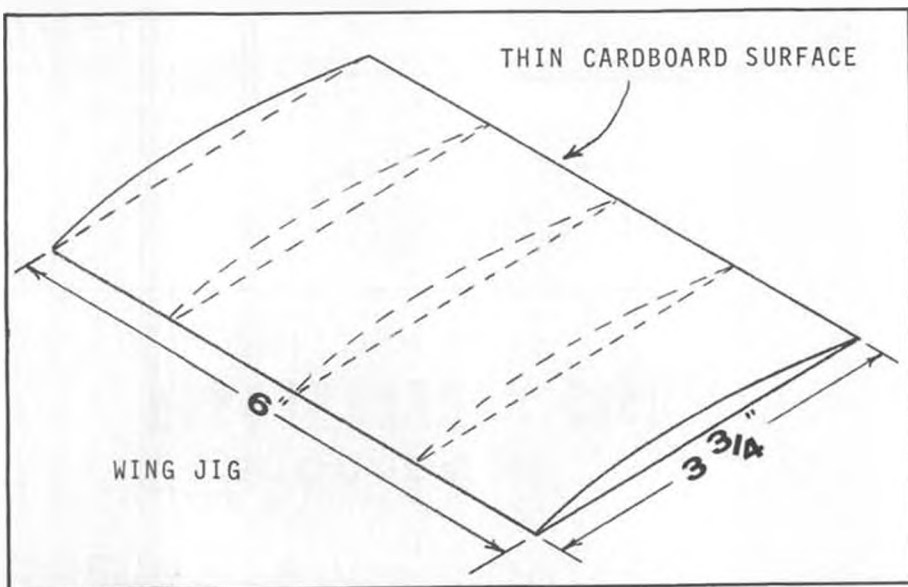
Isometric view of landing gear and axle.

a Weller solder gun. This gadget cuts foam at a controllable rate, because it can be switched on and off as needed to control the temperature. Try to hollow the foam to about 1/8 inch in thickness (less if you're brave, but you run the risk of cutting through to the outside surface), leaving a bit more near the landing gear and the nose former. Hollowing could also be done with a knife and sandpaper, if desired.

Rejoin the fuselage blocks with Titebond and it's time to cover the fuselage. Get some soft, easily bendable 1/32 x 3 sheet balsa and cut two 10 inch long pieces, which will become the fuselage shells. The shell pieces can be sanded quite a bit to lighten them. Leave them rectangular at the front of the fuselage but some material should be trimmed away at the rear to simplify the forming process. Soak one of the shell pieces in warm water for half an hour. Blot the excess water from the balsa and wrap the shell piece around one side of the fuselage, holding it on with masking tape or gauze. Pull the sheet rather tightly around the nose ring. Minor crushing or wrinkling of the balsa won't affect the finished body very much, as the shells will be trimmed and some filling and sanding is inevitable.

After letting the shell dry overnight, trim the top and bottom edges of the balsa so that they lie just at the foam block joint. Put that shell aside and form the other side in the same manner. When dry, trim the second shell to join up to the first shell, and when they are aligned, remove them both for gluing.

Using thinned Titebond, glue both shells to the foam and wrap the assembly with masking tape or gauze, making sure that the shells are joined smoothly. If the shells distorted slightly while they were



Construction of wing jig is described in text.

removed from the foam, some water sprayed on the outside of the balsa should help get things lined up. After another overnight drying, the fuselage is ready for sanding. Now cut out the cockpit, line it with balsa, and make and attach the headrest. M. Prevost did not use a windscreen on his plane, so we are saved from that little chore. Any necessary filling on the balsa shells can now be done with a thick, paste-like mixture of nitrate dope and micro-balloons or talcum powder. Remember that dope will attack foam, so protect any visible foam with a coating of Titebond. Spackling compound could also be used for filling.

Form the middle portion of the landing gear wire to the shape of the lower fuselage curve and then bend down the legs. Form the torsion loops around a nail or round-nosed pliers, and then bend the right-angled ends. Cut a shallow groove just through the balsa shell with a razor saw and attach the gear wire with Titebond or 5-minute epoxy. Attach a straight length of wire for the axle to the landing gear with thread and glue. Make the 2 landing gear fairings from 1/32 medium sheet, with the grain running vertically.

Start the wings by cutting out the jig ribs from 3/32 or 1/8 balsa and gluing them to a piece of thin cardboard (shirt cardboard from the back of a tablet). Using the wing jig saves having to block up the trailing edge and each rib because of the undercamber. Put the wing plan over the jig, cover with Saran Wrap or waxed paper and you're ready to pin parts in place, through the jig, down to the building board. Laminate the wingtip on the jig against a cardboard or balsa form, so that it will have both the right shape and proper undercamber. Then, pin down the leading and trailing edges, tip, and the soft 1/8 inch root rib. Cut each rib to length at the leading edge. Add the leading edge bump and the small rib extensions. Glue in all the ribs, and when dry, remove all the pins and sand the wing carefully, while still on the jig, to finish shaping the ribs.

Now locate and cut the spar notches into the top edges of the ribs and glue in the two spars. Make paper tubes (roll up a piece of paper about 3/4 inch sq. on .032 wire, unroll, put on a thin coat of white glue, reroll, and then slide the tube off the wire before the glue dries) for the thread flying and landing wires. Before gluing in place, cut the tubes so they are flush with the upper and lower edges of the rib. For the left wing panel, make a tracing of the right wing and place it,



Foam hollowing gadget . . . copper wire loop heated by soldering gun.



Winding with spinner cap pulled off. Small bits of Velcro hold spinner to back-plate.

upside down, on the jig. If necessary, a few drops of 3-in-1 oil on the drawing will make it nearly transparent.

Make the stabilizer and fin as light as possible . . . use 1/20 sq., if available. Lay out the stabilizer with the spar in one piece so that the halves will be joined. Laminate the fin edge over a balsa or cardboard form.

Covering the model should be done before assembly. The original plane was described as being chocolate brown in color, so I used some brown tissue from Bill Wilson, an

occasional **Model Builder** advertiser. Cover the fuselage with water-dampened tissue, adhered with thin nitrate dope. Each side of the fuselage can be covered with a single piece of tissue about 1-1/2 inches wide. The dampened tissue will form around the fuselage fairly well, except at the nose ring. A few small razor blade cuts in the tissue will allow some overlapping and a better fit here. The remainder of the fuselage can be covered with 6 or 7 smaller pieces. This particular tissue, when dampened, does not work too



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well for me when using thinned white glue for adhesive, because the extra moisture causes it to separate too easily. In contrast, using nitrate dope as the adhesive, the dampened tissue can be lifted and repositioned as needed. When completely covered, the fuselage should be given a thin coat of dope. Overlapped tissue areas which are noticeably darker than the single layer areas can be lightly sanded to thin them and lighten the color.

The wing panels can be covered dry, but damp tissue does a much better job at the tips. Be sure to adhere the tissue to each rib on the underside. The stabilizer, fin, and

landing gear fairings can be covered dry.

Assembly begins with the installation of the landing gear fairings. Hot Stuff can be used to attach them so you won't have to push pins through a finished surface. Attach the landing gear wires to the fairings with 5-minute epoxy. Make up some long paper tubes for the landing gear fairings and glue them into notches. Make the 2 cabane struts from 1/32 hard sheet, and install them and the bamboo tail skid. Cut a 1/16 sq. notch at the rear of the fuselage and lightly glue the stabilizer spar into the notch. The forward portion of the stabilizer can be held in place

with tape for initial glide and powered flight tests. The tape allows putting in a bit of positive or negative incidence without having to warp a thin surface.

Determine the wing location with the aid of some masking tape temporarily laid on the surface of the fuselage. Make small pinholes to mark the leading and trailing edge locations. Shape the wing roots by wrapping sandpaper around the fuselage and sliding the wing back and forth a few strokes in the area of the pinholes. When the shape is correct, attach each panel with Hot Stuff. The wing and tail surfaces should now be given one coat of thinned nitrate with about 10 drops of castor oil added per ounce to minimize warping.

A thin needle can be used to carry a single black thread through the paper tubes for each of the wires. Don't glue the thread to the wing tubes until you are satisfied with the flying characteristics . . . warps might have to be put in or taken out. Later, when the threads are glued in, add the fixtures at each wing/wire junction. The fixtures can be represented by brown paper measuring 1/8 inch wide at the bottom, 3/8 inch high, and tapered to 1/16 wide at the top.

Make up the noseblock as shown and move on to the spinner. The spinner on my model was vacuum-formed, but due to the need for weight in the nose of this type of model, acceptable alternatives might be a carved balsa spinner or part of a plastic Easter egg. My spinner fits just over a balsa disk epoxied to the back of the prop. The spinner and disk are held together with some small scraps of Velcro fasteners (check the family sewing basket for this), so the spinner is easily removable for winding, yet stays on in flight. An alternate method would be to permanently attach the spinner to the prop, and wind the rubber with the prop/noseblock assembly removed.

The prop can be made from a 6 inch Guillows or Kaysun. If necessary, bush the prop hub with aluminum tubing to match the prop shaft, which will be .032 or .045 wire to fit the nylon bearing. Form a winding loop in the prop shaft and take advantage of the freewheeling catch built into the hub of most plastic props. For some more "working" nose weight, 1/32 plywood prop blades could be wet-formed and glued to a balsa spinner. Plywood blades would offer some latitude of choice for experimenting with blade area and pitch.

The wheels for this model must be light because they are very large in

proportion to its overall size. Mine were made using an electric motor, fitted with a chuck, as a lathe. This can also be done successfully with a hand drill held in a vice or with an electric drill. Rough-cut 2 wheel blanks from 1/4 inch soft balsa, drill a 1/4 inch hole in the center of each blank, and epoxy a 2-inch piece of 1/4 inch dowel into each piece. One dowel/blank assembly at a time is put into the chuck, and a wheel can be shaped by hand or motor power. The wheel can be shaped using sandpaper alone, or if desired, a tool rest can be rigged and small knives or chisels used as turning tools, followed by sanding. Leave the wheel in the chuck and give it a couple of coats of sanding sealer; when dry, sand with very fine sandpaper while the wheel is turning. While rotating the wheel slowly by hand, brush on Floquil Roof Brown for the centers and Flat Black for the tires. With a little practice and properly thinned dope or enamel, you can brush on a clean edge for the tire without benefit of masking tape. Cut the wheel from its dowel mandrel with a razor saw while the wheel is turning slowly. Make a hole for the axle through the dowel center and touch-up the dowel cut with Roof Brown.

The racing number (F-1), engine cooling outlets, wheel center markings and tail surface hinge lines can be done in black tissue or flat black enamel. Hinge lines correspond to the fin and stabilizer spars. No ailerons or flaps were fitted to the wings, which were probably warped for banking. Artist's frisket material works nicely for masking when using enamel as it is so thin that it leaves a clean edge. The spinner, prop, and cabane struts on my model were painted with Floquil Roof Brown, using a Badger airbrush. Some plastics react to Floquil, so it would be best to check your plastic materials with a drop of the paint before proceeding too far. Floquil dealers have a very informative 1-page brochure, as well as a book (for about \$1.50) describing the paint and its uses.

Make up a motor from a 7 inch loop of 1/8 rubber. Heavier models might require wider rubber. Add clay as necessary to place the center-of-gravity at about 1/3 of the wing chord. Starting with the stabilizer at 0° incidence, try a few test glides. Adjust the stabilizer as needed. For the first power flights, try 50 to 75 hand-wound turns. My model required 1/16 of downthrust packing behind the top of the noseblock. A natural turn will probably be present, but unless it's too tight, side-thrust shouldn't be needed. When you are satisfied with the flight

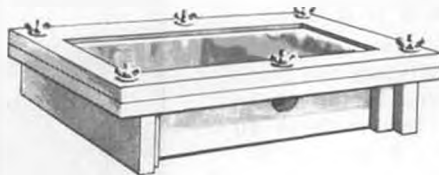


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characteristics, glue the stabilizer and the wing threads in place. Work up to the turn capacity of the rubber, using rubber lube and a winder. Good luck, and have fun with your Deperdussin racer.

My primary scale reference was Volume I of "Racing Planes and Air Races", by Reed Kinert, which contains a 3-view and some excellent photos of the plane. A secondary source is the Nov. 22, 1913 issue of "Flight" magazine, which contains a 3-view showing a slightly different plane with longer wings and an extra set of wires going to about the middle of each wing panel. Study of both sources reveals that Prevost

flew the short wing (20 foot span) version with the single set of wires, and that two other, earlier versions of the plane with longer wings (21 foot, 10 inch span) and doubled wires also competed in the 1913 Gordon Bennet race. These other planes were flown to third and fifth places.

A source of general information and pictures (but no 3-views) about the pre-WW I period is "Contact", by Henry Serrano Villard.





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1 to 1 . . . . . Continued from page 27

body is rotated 90 degrees from its original position. A crossover piece is fabricated from either aluminum or key stock that is available from most hardware stores. The crossover piece is drilled for the struts and the center attachment to the gear body. Holes are then cross-drilled and tapped for set screws.

Lest some of you become discouraged because you do not have a drill press to do this drilling and tapping, have heart. I have made two sets with a hand drill only.

The heavy load directed against the linkages has not proved to be a problem. Replacement of the nylon bushings in the side of the case have required replacement twice during the six years of operation.

It is helpful to drill out the gear to accommodate a 3/16th wire connection between the crossover and the gear body. By using aluminum tubing, the struts may be built up to a more realistic diameter. In addition, this style of gear generally has an X type strut bracing above the wheel that can be duplicated to make the gear more rigid.

If possible, the drilling of the two strut holes should be placed at a slight angle inward to place some pressure on the axle area.

### NASA NOTES

The new scale organization is now well over 300 members, and is distributing both a quarterly and monthly newsletter. Jamie Gielens is presently working on accumulating the material for the information and documentation source list. A first list of this may be in the member's hands by the time you read this. A constant updating will occur.

One discouraging note is that very little information has been forwarded to the Association concerning rules proposals for the next cycle. At the organizational meeting in Riverside last August, John Worth made a very salient point in relationship to rules proposals. He stated that in some ways, our system works in a negative fashion. Changes are made and then feedback is received by AMA, after the fact. One of the hopes for the organization was that such a problem would be alleviated via the information channels and action of the organization. This is not yet happening as it can or should, and soon the warning bell will sound indicating that we are in a new rules cycle. The voting will occur and suddenly letters will appear asking why such action was taken by the contest board.

Association memberships are \$5.00 and may be obtained by writing Noel Allison, 4174 W. 120th St., Apt. C, Hawthorne, CA 90250.

### CONTEST SCENE

July 2: Midwest All Scale Fly In . . . St. Louis, Mo.

F/F Rubber and Peanut, C/L Sport Scale, R/C Sport Scale (two Classes, Novice and Advanced), Static display with best of show and demos. Bob Underwood, 4109 Concord Oaks Dr., St. Louis, MO 63128.

August 19-20: Annual R.C.F.C.B.C. Western R/C Scale Championships Boundary Bay Flying Site . . . FAI and Standoff. Bert (Gabby) Hayes, 4619 Gothard St., Vancouver, B.C. Canada V59 3K8.

August 19-20: Annual Scale Squadron Contest, Mile Square, Fountain Valley, California

R/C Sport Scale (Two classes). Harris Lee, Phone (714) 531-1312.

September 2-4: Kelowna Ogo-

pogo R/C Fun Fly and Standoff Scale, Kelowna, B.C. Canada. (Includes float planes) John Kristensen, RR #1, Pritchard Dr., Westbank, B.C. Canada V0H 2A0.

### SOMETHING OLD . . . SOMETHING NEW

Actually the condition had been noted some years before, but the experience at the Dayton Nats in 1976 made the point rather clear.

At Dayton, the large number of entries required last-minute changes and the addition of a third flight line in pattern. A number of persons at the last minute provided the help needed for the addition. I had a period of time before other responsibilities and helped out setting the transmitter impound. It was interesting to note that a very large percentage of the equipment was within two years old and were of brands representing the larger manufacturers.

Several days later, just as a matter of curiosity, I visually surveyed the scale impound area. There was a noticeable difference in the equipment represented there as compared to the pattern line. Much of it was rather old and in some cases, types which were no longer in production.

Hold on — I'm not a snob, nor am I suggesting that the equipment may not have been satisfactory. Indeed, very often, a well taken care of system may be more reliable than newer equipment. It did seem, however, that more concern was placed on the model than on the equipment which was used to fly it. It does seem, as well, unwise to risk the many extra hours of time, effort, and money required for a scale model to less-than-first-time, cared-for equipment.

We place added demands on our equipment more often than not, due to cowed engines that tend to overheat, added servos for extra options, possibly larger control surfaces with greater loads, and do not keep the equipment sharp with frequent flying.

What I am suggesting is that as a scale modeler, you give every piece of equipment careful consideration and maintenance. A few extra minutes to read some of the other columns in **Model Builder** would prove to be of value. Interesting, useful information has been given in columns by Dave Brown, Hal Debolt, and the engine men, Aldrich, Bernhardt, and Kirn. A little thought could help give you the "scaler's edge."

Some years ago, a modeler friend asked me if I would be willing to fly his very nice scale model while he took pictures of the model in flight. I agreed to do so and we met at the field at a time when we knew there would be few, if any, others around to complicate the session.

Everything was set up, and he handed me the transmitter, a rather old brand no longer produced even at that time. He turned on the airborne system and I flipped on the transmitter, moved the sticks to see if everything worked, and when it did, we set about starting the engine.

I expressed to him that I was not familiar with the engine and he stated that it was indeed rather old.

The drama unfolded slowly since the engine was quite balky. While he worked to start the engine I noticed out of the corner of my eye that the transmitter meter dropped to zero. I moved a control, and indeed, nothing happened.

My voice rang a note of alarm and caused my friend to stand up, reach over, and flip the on-off switch back and forth several times. The meter stayed on and he went back to work on the engine, telling me that sometimes the contacts got a little corroded after it had not been used for some time.

It took several moments for the import of this experience to penetrate my numbed brain. Then I thought . . . "What if we had been in the air . . ." The answer occurred to me that we just might have crashed.

Breaking into his concentration, I suggested that a prudent course of action might be to give up the whole thing lest the radio, with a mind of its own, pursue the same course of action.

We flew the model. He got his pictures. I worried . . . End of thoughts . . .

#### AN ALL-SCALE MEET

The last weekend in April saw the

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birth of an all-scale meet. The well known Mint Julep meet at Rough River, Kentucky, underwent a change between 1977 and 1978, by separating the pattern and scale portions. This was a difficult decision for the clubs involved, and the Kentucky Park system to make, especially since the only date available was quite early for this part of the country. I am certain that as Dale Arvin, the CD, looked out at the last vestiges of what seemed like 50 feet of snow just a short time ago, he crossed more than his fingers.

The gathering was most successful, and will help to point the way to other all-scale get-togethers. The sport scale competition was divided into two classes, Sport and Expert. The twenty-three contestants were almost equally divided between the two classes. The competition was good and sportmanship was outstanding.

The contest management was relaxed, friendly, and designed to make it possible for everyone to "do his thing" in the best way possible. In addition to the competition a number of the contestants brought along other scale models just to fly for the enjoyment of everyone concerned.

It was not specifically my purpose to give contest results here, but

rather to mention that the movement toward all-scale events is growing and appears to be most successful. It allows even a small club an opportunity to present both pattern and scale events without time or personnel problems. The groups which have gone this route and are now beginning to do so are to be commended for their ingenuity and concern.

There will be photos from this Mint Julep event in later issues.

#### SHORT SHOTS

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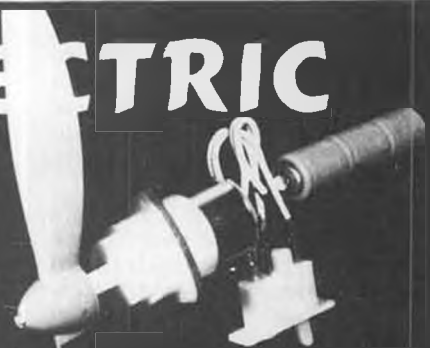
you more than a contest worth of starts and flights. I have used them with inverted engines to start with no problem. There are two of them in my new DH88 twin. Weight is about 6 oz. for the 4-amp type (It might help with that overweight tail problem).

A closing thought . . . Would Gary Player go into a tourney without trying his new putter? Was the first flight on your ship at the contest? One to One, Bob ●



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### Plug Sparks . . . Continued from page 67

plans, and an engraved copper plaque for the best single flight (In this event, all three flight times are added together). Also a Beauty prize was given, and won appropriately enough by Bill Cohen. McNorgan ended up winning the longest single flight plaque. Take a look at these results:

1. Bill Cohen . . . . . 28:32 (Dallaire)
2. Al Hellman . . . . . 16:06 (Lanzo)
3. Bud McNorgan . . . . . 16:04 (Premier Lion)
4. F.L. Swaney . . . . . 10:50 (Long Cabin)
5. Jim Adams . . . . . 8:03 (Ehling)
6. Walt Parker . . . . . 6:44 (Ehling)
7. Sal Taibi . . . . . 2:40 (Long Cabin)

Had enough? Heck, we're just getting started with the write-up and probably the greatest weekend in Old Timer flying for California. So let's get on with the rest of the doings.

The 30 Second Antique Event, run by the SCAMPS, suffered this day from so many other events being staged. This is not to detract from Bob Ellington's fine flying as his Vivell 35 powered Good Guff flew very well (First Guff I've seen fly "Good"). Two newcomers to the old-timer scene, Jim Ogg and Dick Rowe, flew practically identical models and set-ups. We're always glad to see new blood! Results:

1. Bob Ellington . . . . . 11:21 (Guff/Vivell)
2. Jim Ogg . . . . . 8:21 (Powerhouse/O&R 60)
3. Chris Christensen . . . . . 6:46 (Twin Cyclone/Bullet)
4. Dick Rowe . . . . . 3:43 (Powerhouse/O&R 60)

### SCIF KICKOFF

Postponed because of heavy rains and mud slides, the SCIF Kickoff

meet was ably run by Ed Kelly on this weekend. Almost overshadowed by all the Texaco type models (no pun intended), the SCIF club did put on seven events, with President Larry Clark winning the Brickner Perpetual Trophy with a total of 21 points.

Rather than print up the list of winners and their times, the columnist was intrigued by the comments of Ken Sykora, editor of the SCIF Flight Plug and therefore, decided to copy out a few of the better mots.

"Diamond Demons are becoming quite popular. This simple little Ray Heit design by Bay Ridge, for 19/23 size engines, is a great flyer. Bob Osenga had the smoothest flying model at the meet.

"President Larry Clark flew rubber! Well he did, as he also won the Dumbo award when he couldn't get his O/S ignition converted engine to run. Phil Bernhardt pointed out he had his sleeve assembled wrong way around!

"The SCAMPS Texaco and Brown Jr. Events brought out a flock of uncommon oldies. Bud McNorgan produced a beautiful silked British Premier Lion (looks like a streamlined Trenton Terror, if possible!) and son, Kit, had another Limey design featuring straight lines and square tips.

"Several Dallaire Sportsters were out, no doubt due to kits by Wallock (P&W) and Mathes (M&P). Also saw some examples of the original Buccaneer, a pretty ship, and in some respects, better looking than the Super Buccaneer.

"George Perryman, internationally known designer/flyer, was among us like a fox in the hen house. Flew a Lanzo Record Breaker in O/T Rubber and won easily. George is here for three months with Lockheed business from his native Peanut State.

"SCIFer Al Hellman showed up with a brand new Clipper/Bunch combo which was up to his usual



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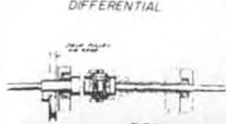
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standard of neatness. He also sprung a new ship on us. It is a huge cabane mounted wing job with an oval fuselage, called the MG. Al sez the plans are available only from the original designer (Mike Granieri), who copyrighted the drawings. (That noise you hear is old John P. grinding his teeth . . . easy does it, John; after all, you do have most of them).

"Welcome sight was Otto Bernhardt, up and around after recent heart surgery. Didn't see him chasing any long flights, but heard he did get caught cranking engines. Mr. Energy! Easy does it, Otto, we want you around for a while!

"SCAMP Hugo Lung with his usual lifetime supply of models. We counted a Scientific Mercury, Sailplane, Zipper, Tambe, and a dozen others. One bystander commented it takes Hugo two hours just to strap all the models together!

"Ole Buddy Carl Hatrak all over the field: timing, helping, and lending a hand on the flight line. Thanks from everyone, Carl.

"Wade Wiley put up his new Guff for a second place in Class A, used an Ohlsson 23 in it for Sunday, and to de-construct the wing. Back to the drawing board.

"The Bakersfield Flash, Chris

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Christenson, demonstrated what a light glow powered Foote Westerner will do . . . straight away VTO climb, smooth rollout, and floating slow glide. He plans to campaign in AMA events. Certainly looks competitive. "Saw a Shereshaw Polly . . . round stringered fuselage, cabane mounted wing with tip pointed dihedral tips . . . pretty Polly!

"Senior statesman in International F/F FAI, Bill Hartill, was visiting and taking photos. Bill is currently producing a labor of love, a free flight book. It will have a bit on O/T flying . . . as soon as we can finish it for him!

"Bruce Chandler's new 'Tiger Shark' Zipper was going great guns for two officials and then something went very wrong . . . Zot!

"And a special round of thanks to Ed Kelley and his bunch, who not only ran the contest, but gathered the merchandise prizes as well. And, to Bob Hunter, who donated Hot Stuff (expensive!) prizes. Thanks, Bob."

Well, you have to admit the foregoing was an unusual way of reporting a meet, but what the heck would an O/T contest be if it weren't for the fun.

### SAM 21 TEXACO R/C MEET

To wrap up the doings on Sunday, April 9, the SAM 21 boys, under the direction of C.D. Pond, ran the Fourth Annual Texaco R/C Meet.

As noted in the SAM 49 newsletter, "Arcing Point", Bob Sliff, news editor, made the comment this was a fine contest and a good showing was made by the 49ers. They liked the idea of pink champagne (iced) for the first six winners. Nothing like adding more fun to the fun.

Flying was very good, considering the low thermal activity. Trust the last one to enter to end up first. Jim Adams, who had been flying free flight all morning, arrived after lunch to enter. Being well after 12 noon, Jim forfeited his first flight, but as he said, it only takes one flight. How true!

Jim promptly caught the only real good thermal of the day with his Laurie Experimental, and proceeded to salt away the meet with a beautiful flight of 45 minutes. Despite attempts at "piggybacking" by Sliff and others, they were too late to enjoy the great thermal. Once it petered out, all models came down regardless of time in the air.

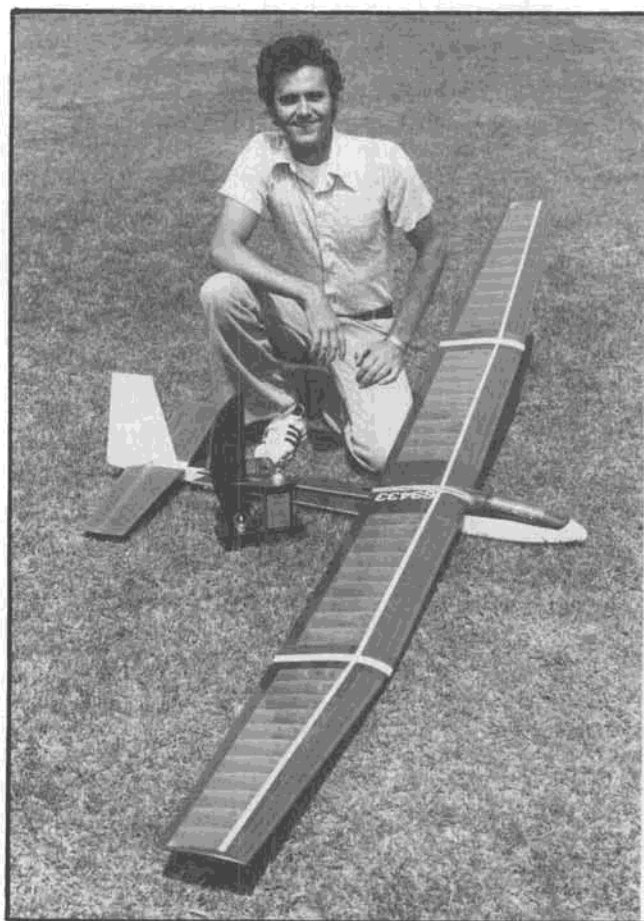
No one had to be ashamed of their particular time, as all models were flying excellently. As a matter of fact, you might say the competition was pretty fair, as it now appears SAM 49 is coming of age and experience. After all, they did capture three of the six places offered. Here's what the contest slate looked like:

1. Jim Adams . . . . . 45:05 (Experimental)
2. Karl Tulp . . . . . 30:03 (KG-3)
3. Bob Sliff . . . . . 28:59 (Ehling)
4. Bob VonKonsky . . . . . 25:03 (Lanzo)
5. Karl Tulp\* . . . . . 21:44 (Dallaire)
5. Bob Ditmer . . . . . 20:24 (Miss Philly)
6. Al Hellman . . . . . 14:17 (MG)
7. Bob VonKonsky\* . . . . . 13:36 (MG)
7. Otto Bernhardt . . . . . 11:12 (Champion)
8. Loren Schmidt . . . . . 10:30 (Dallaire)
9. Ross Thomas . . . . . 8:48 (Lanzo)
10. Loren Schmidt\* . . . . . 8:10 (Miss America)
10. Ernie Payne . . . . . 8:05 (Lanzo)

\*Multiple entries can take only one place.

### ENGINE OF THE MONTH

No question about it, the advent



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## FLASH!

BILL NIBLEY AND HIS PARAGON WON FIRST PLACE  
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of the Zipper gave Class B the impetus needed for development of new engines for this event.

With everyone coming out with 27 to 29 size engines, it didn't take the Forster people very long to realize that here was the bonanza they were looking for. The Forster 99 sales had fallen off badly, as the demand for smaller engines was overwhelming.

In the May 1940 issue of Model Airplane News, an announcement appeared in the Forster Bros. advertisement, with news of a "blessed event". In short, a new .29 cu. in. size engine had been developed by the Forster concern.

This was followed very quickly in the June issue, wherein it was stated that the new engine was now ready for delivery at the price of \$15.50. If you were still doubtful, the engine was to be debuted at the Chicago Gas Show, May 7 to 11.

Finally, in the July MAN issue, a half-page advertisement appeared, with the Forster 29 illustrated for the first time.

Claims of dependable power based on the new rotary valve (actually a rear rotary) were made of 1/5 horsepower; the same rating as a Brown Jr.! What most people didn't know at the time was that all rpm and power curves derived on the Forster 29 were based on the use of alcohol and castor oil, instead of the standard three-to-one gas and oil

mix.

In a review of this engine in the July 1947 issue of Air Trails, using standard fuel, the Forster 29 turned 6800 rpm on a 12/5 Flo-Torque propeller, 7,200 rpm on a 10/8 Mercury prop, and 10,600 rpm on an 8/10 X-Cell propeller. It didn't take the boys long to start using alcohol in the Forster 29 engine!

According to their advertising brochure, the new Forster 29 was a quality engine based on the concern's long experience with the Forster 99. Claims for the superior performance of 1/5 horsepower were attributed to the new "supercharging" rotary valves, special "oilite" high speed bearings, and a new type domed, high-turbulence, high-compression chamber said to result in faster power impulses. In addition to this, a feature called "clutch" propeller lock was advertised as making it the safest motor on the market for not throwing propellers not properly tightened.

The Forster 29 was a good engine and was well made. For the technically minded, the new 29 featured a bore and stroke of .750 x .6718 inches, giving a displacement of .297 cubic inches. Weight was 5-3/4 ounces. The mounting feature was the same as Ohlsson, giving the modeler the choice of beam or radial type mounting. An aluminum crankcase featured cooling fins, as

the Forster people felt this provided better cooling and appearance. An alloy steel crankshaft, hardened and ground to size, was provided, with a tubular crank pin. The alloy steel high dome piston was lapped to a cylinder machined from solid bar alloy steel stock. The wrist pin, of tubular steel, was fitted with "snap" lock retainers. To round things out, the connecting rod was an aluminum alloy I-beam, bushed with oilite bearings.

Like all engines that are not updated to compete with others, in this case the hot K&B Torpedo, the Forster gradually lost sales and eventually, production was discontinued.

For those fellows who are interested in obtaining a post-war model (actually the glow version fitted with timer points) of the Forster 29R or 35R, these are now being manufactured by M-G, based on the old dies purchased from Forster Brothers. Price for either engine is \$49.00, less coil and condenser. These can be obtained from M-G Engines, P.O. Box 6026, Denver, CO 80206.

30 YEARS AGO...

"I was a punk kid of 15," sez Mal Smith (now located in Costa Mesa), "and I was lucky to know fellows like Conrad Renning, Bob Champine (then known as Apgar), and Bob Toft. All these guys aided and abet-



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ted me in my quest to fly GOOD models. Somehow or another, the word got to me (via the good guys) that a new club was being formed.

"When I arrived several minutes early at the Mayor's reception room, who was at the speaker's table? No one else than Bert Pond! I was enough of a reader to know that shortly before this meeting, the Admiral Moffett International Trophy had been awarded to one Vernon Grey of Auckland, New Zealand. This was 1936, and the winning model had been proxy flown by Bert Pond!

"Well, to make a long story short, before the initial meeting was over, I was not only a member of the Minneapolis Model Aero Club, but had been elected an officer (Corresponding Secretary) in the club that later became famous. Who was wearing a grin even wider than mine? Ole Bert, thasswho! From long experience, Bert was wise enough to get one or two young members on the board, along with the older people, that were natural officer material.

"Bert encouraged me in so many ways, some of them diabolically subtle, i.e., like verbally italicizing my name whenever I won a contest, or better yet, did a good job for the club. Yep! That man could do no

wrong in my heart!

"Although Bert had to leave Minneapolis for business reasons, the club lived on and produced some outstanding modelers and remarkable records; e.g., a C/L Jet speed record of 173 mph by Glen Temple and his (late) sidekick, Bob Thor (a flight officer). Indoor microfilm flying by Bob Champine and son, doing three-quarters of an hour? How about Bob Toft's Moffett victory? Several people qualified for the Regional and World levels of competition. To name a few: Ray Lagemeier (gas), Hugh Langevin (Nordic) and even me, with the Class E Cabin record!

"Well, I didn't mean to go on so long, but it seemed important that you should know what a great guy Bert Pond is (You're telling me... all Ponds are great guys... haw!). It was simply great to have been a member of that fine club, the Minneapolis Model Aero Club. Heck, I was even a past president! But now I look back at those snow shoveling days, and am I ever glad to be in Orange County!"

PARDON OUR RED FACE...

We didn't mean to infer in our article on the Central Indiana Aeromodellers (CIA) that they were instrumental in obtaining the use of Wright-Patterson AFB. Harry

Murphy, of the CIA Informer, has notified me of this, and in addition, Bill Hale, of the Central Ohio Free Flight Council (COFFC), says the following:

"Since the 1976 SAM Champs (at W-P AFB), it was only through efforts of COFFC and one man, in particular, that the base has been made available for free flight contests. Dick Smith, COFFC Treasurer of long standing, was that person, spending many hours in conferences with the military and civilian people at Dayton. He has handled an unbelievable amount of paperwork needed to complete the negotiations.

"Finally, after receiving permission of the W-P AFB people, four dates in 1977 were approved. These were distributed as follows: two to COFFC, one to Dayton Wingmasters, and one to C.I.A. This was a real break for the C.I.A., as they had lost their field.

"Not satisfied with 1977 arrangements, this same Dick Smith has negotiated for six dates to hold free flight meets. To show how COFFC shares its wealth, two dates were reserved for themselves, two were donated to C.I.A., one to NOFFA (Northern Ohio), and the last one to be split between Dayton and Cincinnati."

Now, how about that? Dick Smith is to be commended for his extraordinary efforts on behalf of all Midwest free flight modelers. As Hale points out, Wright field is not a complete cure-all, but you can't beat it when all other fields are virtually impossible to obtain. We need more boys like Dick Smith!

DENNYPLANE KITS

Yeah, you read the heading correctly. After considerable heckling from yours truly, and his bosses, Bob and Frank Weir, Ed Kelley is going to produce the Dennyplane Deluxe, complete with cowl.

Using an original Dennyplane kit in his collection, Ed hopes to produce as near a replica kit as possible. Those fellows who have seen the Dennyplane on display at the California Hobbies trade show booth, will be the first to admit, here is a real first class subject.

Ed hopes to have (as near as possible) all fittings, duplication of all parts as originally kitted, cowls, and is planning to have motor mounts set for the Dennyplane motor. This super kit will probably sell in the 75 to 80 dollar range.

In addition, this design, being a natural for radio control, will show all necessary alterations to convert the model to radio control. In response to inquiries, Ed is also looking into the possibility of producing the old Pacific Airmotive motor that



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was the forerunner of the Denny-mite engine.

This might also be a good time to mention that Ed (under the name of the 4 K's . . . four Kelleys, the family helped produce the kit) also manufactures the Buzzard Bombshell and the Korda Wakefield kits. His Bombshell kit was the first O/T kit to appear on the market, and is almost stick-for-stick, the same as the original design. His Korda rubber kit is just as good as all his products. Ed can be reached at 4202 W. 172nd, Torrance, CA 90504, telephone (213) 370-3051.

One of the reasons that this writer is so enthusiastic over the possible revival of the Dennyplane kit is the fact that when the Weir Brothers (California Hobbies) took over the old Reginal Denny Industries, they didn't throw away any of the old items on hand. Hence, a very good facsimile kit can be created. Write Ed and tell him you are interested. ANOTHER GREAT GONE. . .

While sitting in the trade booth in the Los Angeles Convention Center, all during the IMS (International Modeler Show), Dale Kirn came by and dolefully announced the death of Bill Atwood. After a prolonged battle with "Big Casino", Bill finally succumbed on Friday, April 28th, at noontime.

No question about it, Bill was one of the greatest names when it came to engine design and manufacture. At one time, Bill had four different engines being manufactured by different companies. Bill was so prolific, he had to keep getting rid of his present designs to make room for the new ideas.

Before his demise, the writer had a few discussions with Bill in hopes of obtaining some treasured item of his to be put on a perpetual SAM Trophy in his honor. At present, Johnny Johnson and Dale Kirn are looking into what Bill has on hand (everything happened so darn fast that Bill was unable to come up with anything in that short time).

So, if you feel like donating to a great guy's trophy, feel free to send your contributions to this column. We're gonna have a beautiful perpetual trophy!

### TRADE SHOWS

SAM has been getting some pretty terrific publicity through the various Trade Shows. The biggest spread to date has been the SAM Show at Toledo, headed up by President Joe Beshar.

Tom Barnes reported that Joe Beshar had an interesting display which he called "tethered 1/9A", using two models, a six-inch "Fox" and a nine-inch "Guff". The mobile

display (pen cell power) propelled the Guff for 56 hours in the very warm indoor atmosphere. Distance traveled was estimated at 57.98 statute miles, in a two-foot closed circuit. To pep things up, Walt Good showed up to admire his Guff. When asked about the ding on the landing gear, Walt replied nonchalantly, "That's normal".

Tom Barnes, who has been spearheading O/T Static scale, reports that the event at the Toledo Weak Signals Trade Show went over with a real bang, registering 14 entries. Interestingly enough, four were ignition powered, one was rubber, and the three entries that were full documented per the rules, were the ones that won the hardware. Judges were Walt Stevick, Tim Banaszak, Tom Barnes, and Bob Lonseth. Tom Schoneau of M-N-M Radiomodels sponsored the trophies (wotta good man!).

Competition was quite keen, with the Berkeley Brigadier by Gordon Pearson being adjudged a very narrow winner over Bill Kliffel's New Ruler. Actually, scores were identical, and finally, a fifth judge had to be recruited to break the tie. Ironically, the Toledo Blade (local newspaper) had selected Gordon's Brigadier to illustrate their Saturday morning article about the show (The



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judges have also nominated Gordon for a special "silent sportsmanship" award).

Steve Mozurkevich took third place with a gorgeous Scientific Mercury, in white and blue silkspan. Although Tom Ingram's Megow Flying Quaker was not covered with the traditional material, his Monokote work was exquisite, with black over red, and 1/16 wide white edging. The inside of the Quaker was equal to the outside! Might also mention that the point spread between first and fourth place was only seven out of a possible hundred!

Fifth place went to Mike Lasker, with a handsome black and gold Spook. Mike also surprised the judges with a rubber powered Korda Wakefield carrying a 2.6 ounce radio to operate the rudder!

Probably the biggest lesson in tact was displayed by Chief Judge Walt Stevick in determining the winner between Jean and John Van Tassel, who had entered identical Class A Quakers. Although John is an established expert builder and this was Jean's first plane, scores were identical! Solomon, where were you?

In conclusion, Barnes feels these booths at the trade shows are the greatest for atmosphere. With genuine old-timers admiring the display, swapping stories, and know-how to newcomers, the vibrations around the old-timer booth is priceless.

As we have found out West here at the MAC Show in Long Beach and the International Modeler Show in Los Angeles, the fellows keep coming back to the old-timer booths so as to not miss any of the fun going on.

#### SAM SUPPLIES

For a lot of you fellows who have been having trouble locating old-timer items, Tom Cope, of 23262 S.E. 57th St., Rt. 3, Issaquah, WA 98027, is offering all sorts of goodies, ranging from partial kits being manufactured, silk, wood, and condensers, to butyrate thinners and dopes. If you are having trouble in your area, ask Tom for his list of items for sale. You'll get the nicest surprise!

#### THE WRAP-UP

SAM Chapter 7 is the most active free flight organization on the East Coast, if this writer is to judge from their "Yankee" newsletter. The best part of it all is that this group hasn't forgotten what modeling is all about... FUN!

At the close of their latest issue of Yankee, they summarize just about what this columnist has been plugging for years. I quote directly:

"For those of you who do not belong to SAM 7, we invite you to join. We are well organized and fly old-timers within the precepts of the Preamble of the SAM Rules. We

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fly for fun and enjoyment, but the spirit of competition is always present."

Couldn't have said it better myself! ●

### Pylon . . . . . Continued from page 41

be the fault of Supertigre's manufacturing, rather than Prather Products. A record is kept on any engine Terry reworks, as to deck clearances, rpm's on test runs, etc., so any engine sent back for repairs can be brought back to its original specs.

Concurrently with building up the engine business, Terry was still modifying Stafford Minnows in an effort to have THE airplane. Approximately 25 versions were built before settling on the final design. That final design was then translated into the renowned "Little Toni" kit available in fiberglass and foam from Prather Products.

More recently, PP became involved in QM racing, with the advent of its "Little Toni" QM version. Based on the same design parameters as its F1 brother, it proved its heritage by winning the QM championships at the '77 Nats in California, guided by Terry's capable and still competitive hands.

Aside from Terry's own personal accomplishments in racing, the whole fraternity of racing owes a

round of thanks for what has been done for racing; for almost single-handedly, Terry has made it possible for Joe Average Racer to buy a competitive engine and, with moderate building skills, assemble an aircraft to RACE! Thanks, Terry!●

### Fuel Lines . . . . Continued from page 43

Start by interchanging a good cylinder/piston set onto different crankcase assemblies. There can be as much as 800 to 1000 rpm difference here, mainly due to the fit between shaft and I.D. of bearing surface and alignment of cylinder on top of the crankcase. The same thing applies to piston and cylinder sets, as both have a taper. Swapping several Tee Dee pistons into one cylinder often produces good results. The more engines you have, the better your chances of getting a real honkin' "stock" engine. ●

### OTTO BERNHARDT


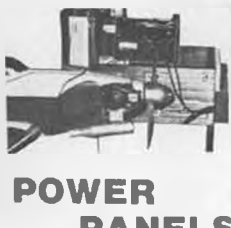
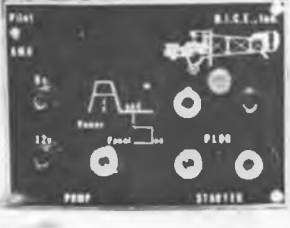
● Last month I rambled on about ignition batteries, hookup wire, etc., but it just occurred to me that nothing was mentioned about the use of booster batteries. Old-Timers who flew models before WW II are well familiar with booster batteries and their importance, but for those of you new to this sport, a few words of explanation are in order.

Booster batteries consist of an external battery pack, which is connected in parallel to the batteries within the model by means of alligator clips or radio jacks, and assist in producing a hotter spark for easier engine starting. Back in the late '30's and early '40's, only carbon dry cells were available to the modeler. Some miniature wet cells made their appearance, but never became really popular. Alkaline and Ni-Cd batteries had not even been invented, and electrical problems were the most common that faced the ignition modeler of that era. Free flight was the order of the day, and, of course, holding the weight of the model down to the bare minimum was essential for a serious contestant.

Someone discovered that once he got his engine started, he could keep it going for a few minutes on a couple of pen cells . . . enough for two or three official flights. But starting that motor with those pen cells was another matter, especially when propping it by hand. (Electric or mechanical starters were only used by the speed U-control fliers).

This starting problem was overcome by connecting a set of large batteries, in parallel, to the model's internal batteries. These batteries usually consisted of two No. 6 dry

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- **Zingo** (FAI or AMA) \$15 (partial kit)

cells connected in series to produce 3 volts, and provided the extra muscle to get the engine started. Once started, these external batteries were disconnected and the two pen cells were able to keep it going.

Booster batteries are as important today as they were in the old days, even though today's modern Ni-Cd or alkaline pen cells will outlast the old carbon cells ten-to-one. Booster batteries will provide you with the very best spark for starting. They allow you to fine tune your engine, check out your flight timer with engine going, or make any other check or test that requires the engine to run . . . all of this without putting the slightest load on your model's internal batteries. In fact, if your electrical system is hooked up properly, the boosters have a re-charging effect on the model's internal batteries. External boosters automatically show the condition of

the internal batteries. If your engine runs smoothly with the boosters hooked up, but misses when switched to the internal batteries, it is a sure indication that a problem exists with the internal set.

"Well," you say, "now that you mention it, what ARE some of the causes of rough engine performance?" Fortunately, in the modern two-cycle engine used in model aircraft, troubleshooting an ignition circuit is relatively simple, and can be performed without special tools or instruments. As mentioned before, the entire ignition system consists of a coil, spark plug, condenser, batteries, and maybe a switch. If defective, any one of these could cause your engine to perform poorly or not at all.

The most common cause of engine missing is dirty ignition points. Unfortunately, the majority of model ignition engines, and especially those of the pre-war era, have very poor ignition point set-ups. Some were excellent, such as those found on the McCoy and Anderson Spitfires, but this was the exception, as most engines were manufactured to sell at the lowest possible price. Very little attention was given to producing a really good point design. Many manufacturers felt that points spoiled the looks of an otherwise attractive engine, and great pains were taken by some to conceal the points in streamlined housings or enclosures. Enclosed points was a major selling factor with many manufacturers, who claimed this as a major breakthrough in keeping the points clean. Fact is, this turned out to be only a gimmick to sell

engines. The points did not remain cleaner, because manufacturers left large gaps in the enclosures where dirt could enter and lodge between the points. This keeps the points from making contact with each other and causes the engine to misfire. Cleaning the points was impossible without first removing the prop and drive washer, and setting the points for the proper gap is a task I dread even to this day. In an Ohlsson engine, the only way to keep the stationary point from turning while tightening the locknut on the outside is to hold the tungsten portion of the contact with a pair of needle-nose pliers. This is a bad practice, as damage could occur to the tungsten. But there is no other way to do it.

My personal preference is exposed points. They can be inspected, cleaned, and adjusted without any disassembly of the engine. Here are a few things to look for in an ignition point set-up:

A. The stationary point should be accessible for cleaning and adjusting.

B. The movable point should have a non-metallic wear point that rides on the cam.

C. The movable point should have close fitting bearings. This is necessary to eliminate any side-to-side movement of the movable point, which could cause misfire.

D. Take precautions to eliminate a short circuit occurring with the electric wire which connects to the terminal of the stationary point.

An engine with a twin ball-bearing crankshaft is the very best type on which to install ignition points.

Ball bearings eliminate radial play in the crankshaft, which would otherwise be transmitted to the cam which operates the points. Any irregularity in the point operation could cause the engine to miss. If the tungsten of the movable point is riveted on, occasionally check to see that it has not come loose. If it is loose, it most certainly will cause your engine to miss.

The second most likely cause of engine misfire is a defective spark plug. This is easily determined by replacing the suspected plug with a known good one, and then running the engine. A defective plug should be carefully inspected for the cause of its failure. Carbon deposits will be most likely be the prime cause of failure, along with excessive gap between the electrodes. Use a straight pin to remove the carbon from the cavity between the porcelain and the steel body of the plug, and a soft fine wire brush for removing carbon from around the electrodes.



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NEVER SANDBLAST THESE MINIATURE PLUGS TO CLEAN THEM. They are actually quite frail and cannot survive the type of cleaning to which you might subject an automobile spark plug. After removing the carbon, clean with solvent and blow-dry the plug with compressed air. Reinspect and clean as necessary. Electrode gap should be .008 to .012 inch. Gently take the center electrode between your fingers and pull on it to determine if it is loose. If it is loose, it can probably be epoxied back into place. There are some good high temperature epoxies on the market today that are capable of securing this loose electrode. Check with your local supply house.

The prime cause of loose center electrodes in miniature spark plugs is the use of certain spring clips attached to the ends of the high tension leads. Sometimes these are hard to install and the modeler has to twist them from side-to-side to fit them to the spark plug. This twisting action tends to loosen the center electrode. I recommend a short piece of .020 music wire bent into a 'U' shaped clip, soldered to the spark plug end of the high tension lead. Bend this music wire clip so that it clips onto the plug securely, but will not vibrate off in flight. ●

**Fury . . . . . Continued from page 53**

to Spain on the eve of the outbreak of the Spanish Civil War. The Republicans first flew them without guns, since none had been ordered, but soon they were armed and embroiled in dogfights with the Fiat CR-32's of the Generalissimo Franco's pilots. One was shot down by Garcia Morato, the rebel ace, and captured by the insurgents. Re-

paired, it was flown, but not in combat. A second Fury was shot down in Madrid and parts of it were used to maintain the third in flyable condition. With one Fury in the hands of the insurgents and one in the Republican Air Force, an international flap arose. Each side complained loudly that the British had sold the same airplane to the other side. His Majesty's government, following a policy of strict neutrality, denied the charges, and the delicate situation finally eased under the pressure of greater events. (Sounds like a familiar story. Will the United States sell the same airplanes to both the Arab nations and Israeli?) ●

*Continued*

**Hannan . . . . . Continued from page 54**

safely landed a Zlin which had suffered a broken wing spar. This cool-headed pilot rolled the stricken craft to the inverted position, thereby relieving the wing of enough stress to permit flying back to the field. Rolling upright at the last possible moment before touchdown, Williams managed a landing just before complete wing failure!

In spite of a shower of acclaim and honors, he remained a very modest gentleman, who took delight in flying every imaginable type of aircraft, from the Shuttleworth Collection antiques, to the most up-to-date equipment. Additionally, he had a natural flair for writing, and described many of his aerial experiences in magazines and books. We had the pleasure of witnessing Williams' versatility in person, and rate him among the best we have ever seen. He was one of those rare talents who performed so smoothly as to eliminate the feeling of appre-

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hension caused by so many "stunt" flyers. Truly an irreplaceable loss.

Locally, another aviation "great", Frank Tallman, is gone. Long associated with air shows and film flying, Frank was also closely identified with the Orange County Airport museum collection established with his late partner, Paul Mantz. Equally at home in a Bleriot or a B-25, Frank seemed to be a pilot's pilot, who could take on the seemingly impossible assignment and make it work. Like Neil Williams, Tallman was gifted with the ability to record his experiences on paper, in a most entertaining manner. Long a friend to modelers, his photograph appeared on the cover of the September, 1973 **Model Builder**. We'll miss you, Frank.

Tom Elliot favored us with a poem which may serve as an appropriate tribute to Frank, Neil and Doug:

HIGH FLIGHT

by John Gillespie Magee, Jr.  
 Oh! I have slipped the surely bonds  
 of earth

and danced the skies on laughter-  
 silvered wings.



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the tumbling mirth  
Of sun-split clouds — and done a  
hundred things  
You have not dreamed of —  
wheeled and soared and swung  
High in the sunlit silence.  
Hov'ring there,  
I've chased the shouting wind along,  
and flung  
My eager craft though footless  
halls of air...  
Up, up the long, delirious,  
burning blue  
I've topped the wind-swept  
heights with easy grace  
Where never lark, or even eagle

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flew —  
And, while with silent lifting  
mind I've trod  
The high untrespassed sanctity  
of space,  
Put out my hand, and touched  
the face of God.

**CO<sub>2</sub> INTEREST GROWS**  
Readers of Dirty Dan's column will be aware that indoor control line or round-the pole flying with CO<sub>2</sub> powered models is the newest thing. Likewise, free flight CO<sub>2</sub> engined indoor aircraft are becoming more popular, both in the United States and England. Alan Callaghan reports almost a dozen entries in an RAF Abington indoor scale contest, with a splendid assortment of subjects, such as a Sig Monocoupe by Bob Jones, a Vickers Vulkan by Bob Vian, and an American Eagle by Harry French (!). Artist Ken McDonough has recently completed a superb Latecoere 14bis and a Douglas World Cruiser for CO<sub>2</sub> engine power.

The engine manufacturers continue to improve their products, as well as offering tantalizing new additions. The availability of larger "fuel" tanks, and multiple hookups of standard tanks enable great duration increases, particularly important for C/L and R/C applications. We note that one company now

features anodized tanks, for which performance gains are claimed. This brings to mind the old Campus engine tanks coated with either red or blue-grey paint. Perhaps some thermodynamist in our audience could explain the advantages/disadvantages of such applications? For example, how would a flat-black tank compare in efficiency to a brightly polished natural aluminum one?

CO<sub>2</sub> engines are being offered in multi-cylinder versions, capable of driving 14-inch diameter propellers. At around the 200 dollar mark, these would seem to be aimed more at the engine collector as a technical novelty, than for practical applications. The horizontally-opposed twins, pioneered by Bill Brown, however, have proven quite popular among flying scale enthusiasts. With two brands now on the market, it is likely that they will gain increasing favor.

Also to be distributed, are the Czechoslovakian MVVS MODELA CO<sub>2</sub> engines. Although the firm experimented with such powerplants in various sizes, it appears they have settled upon a large single-cylinder design, more powerful than any other comparable unit. We hope to test one of these engines and report upon it in the near future.

**HOW TRUE!**  
Bob Underwood, writing in the National Association of Scale Aeromodelers newsletter, offers this sage advice: "... before you cut that piece of balsa, measure... remember, you can't cut it longer!"  
**BIG APPLE?**

We keep seeing and hearing this reference to New York City. Yet, none of our local "transplanted" modeler friends have a clue where the nickname originated. Surely someone out there knows?  
**HANDY HINT DEPARTMENT**

Dave Gibson suggests an alternative method for forming model canopies, in an effort to minimize the thinning that occurs in deep vacuum-formed examples: "By using hot water, the plastic softens right away. The idea is to force the plastic over the mold, and then lift everything out of the water immediately, with the plastic still held tightly to the mold, while it cools.

"The same piece of plastic can be heated and reformed over and over again, but eventually a smokey haze develops. So far, I have tried .003 acetate and some plastic found in blister packs. The results are pretty good."

Phil Koopman offers this advice for using instant coffee added to clear dope for that "ANTEEK" look: It seems the coffee is reluctant to

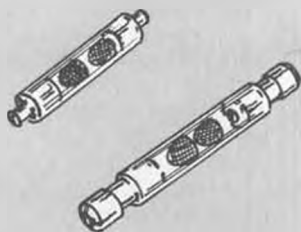
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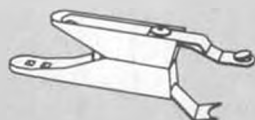


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dissolve in the dope directly. Phil's gimmick is to use a tiny bit of vodka to first dissolve the coffee, then add the mix to the clear dope. He reports the higher-proof booze won't work, but presumably us clean-livin' tee-totaler types could do the job with rubbing alcohol. (*Vodka in coffee! Reminds of the great movie in which Ernie Kovacs poured scotch in his Corn Flakes! wcn*)

### WORDS OF WISDOM

Col. Bob Thacker, on the subject of choosing R/C scale model designs: "I build toy aeroplanes that I like; if they don't fly, I build a different one!"

### GEE BEE'S GALORE

Who would ever have thought that modeling Gee Bee's could become a trend? In the past, most such models were regarded as strictly for static display. But that opinion is being changed, thanks to the relatively small group of people who had the courage to try FLYING reproductions.

It is unfortunate that Gee Bee's have long suffered from a doomsday stigma, brought on by generations of "hack writers", who persist even today. In reality, the machines were carefully designed, wind-tunnel tested, magnificently fabricated, and performed the tasks for which

they were intended efficiently. Further, they were favorably endorsed by the men who flew them. Tom Nallen puts it this way: "The whole design was an attempt to give racing pilots the flight qualities they asked for. People tend to forget, today, that this was a pilot's airplane, and never intended to be flown by old ladies on their way to and from church. Little is mentioned about the 30 hours that Lee Gehlbach spent in the design, with nothing but praise for the speedster."

An elite core of model builders aided by a "supporting cast" of GENUINE historians and people such as Robert H. Granville and "Pete" Miller WHO ACTUALLY PARTICIPATED in the development of the Gee Bee's, are doing much to present them in a better light.

Among the modelers are Vern Clements, Granger Williams, Henry Haffke, Royall Moore, Marion Majestic, Tom Houle, and our own Walt Mooney. Among them they have successfully placed Gee Bee models in F/F, C/L and R/C contests, in head-to-head competition with more "conventional" aircraft.

Gentlemen (and lady Marion!) we salute you, and hope your examples will lead to a greater number of truly exciting flying SCALE models.

### WILL ROGERS REMEMBERED

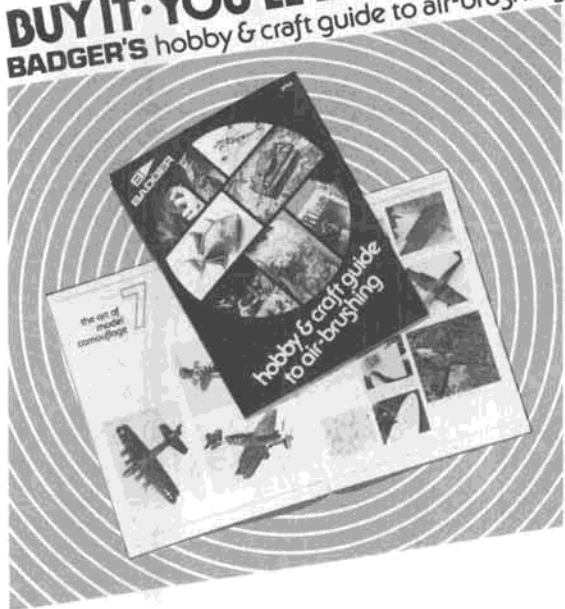
Henry Haffke sent along a fine Golden Age story attributed to Red Woods. It seems that during the early days of Western Airlines, when they had only about four planes and pilots, Will Rogers, one of aviation's staunchest supporters, wanted to hitch a ride to Salt Lake City. However, the airline was on a temporary permit, without a passenger-carrying license. When Rogers was told this, he simply went to the Los Angeles Post Office, got weighed, and flew as airmail! Ditto on the return trip from Salt Lake. How funny he must have looked covered with all those stamps!

We think it a pity there are not more like Will Rogers around today, so capable of slicing through the bureaucratic red tape which exerts such a retarding effect. Unfortunately, aviation progress continues to be hampered by self-appointed anti-aircraft forces. We think we have an answer to the problem that Will Rogers might approve: Every politician or bureaucrat who in any manner inhibits the advancement of aviation, should be refused passage in ANY aircraft. Let them ride railroads instead!



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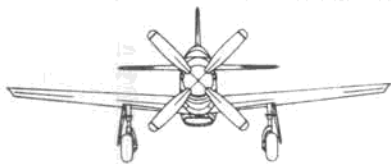
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C/L . . . . . Continued from page 87

up and over again and Greg drove a very competitive, honkin' Combat plane right into the center of the trash can at over 120 mph. I can't tell you how bitchen it was to stand there and witness it. The rush was enough to knock you down when that plane splattered itself in the can. And there was no mess to pick up, it all stayed in the can. Duke will be pleased to know that one of his engines survived this test and is still alive and well, residing in San Diego.

Rumor was around to the effect that the winning model belonged to Greg's brother. No proof was offered, however, and we delivered a ready-to-race Jerobee R/C car to Greg the very next weekend, while in Long Beach for the MACS show. TRASH CAN A NEW EVENT?

You're probably thinking I'm making up all of the above, but I'm not. Although shocking at first thought, the event is really great fun

and a terrific way to get rid of models you no longer use. It could be the simplest event to ever reach the pages of the AMA rulebook. Think about it. Any size model could be used, any line length, as well as engine size, would be fine. Scoring of winners is easy, you either hit the can or you don't and right there is a model stuck up to its bellcrank in dirt to graphically serve as witness to your accuracy.

Lining up the equipment for Trash Can is also no sweat. I mean, all you need is for one guy to be responsible for furnishing a trash can, and you're set. No lap counters, stop-watches, pull-test scales, score cards, judges, etc. One guy can run the whole event and he can even be a contestant.

I know it sounds crazy, but think back about all of the planes you have seen smashed to death in the infamous Balloon Bust event, especially when flown to AMA rules. Better to simply plant the thing in a trash can, in my opinion. Certain death for the model, yes, but the accounts of each crash go on forever. Let's all admit that half of the fun of flying is talking about the last Great Crash. One Trash Can event gives you enough crashes to talk about for years and years, enjoying the telling much more than you would enjoy having the models still intact.

We here in the N.W. will never forget our first Trash Can event, and that we will have more is assumed. Let me know how it works for your group, and of course I want pictures of the event!

Before moving on, I want to tell you that in San Diego they fly Trash

Can a little differently than we did. First, they announce the event beforehand so everybody knows to bring junkers. Secondly, they put the garbage can in the middle of the street. Right, a paved street. Very interesting. . . .

### PRESZLER KILLS 'EM

From a recent WAM newsletter (thanks, Mom) I see that Arlie Preszler, SSG (Super Stunt Guy), won in WW II Combat, a special event flown at the Hillsdale Aero Knights 1/2A Day contest. Arlie was asked to comment on his win in Combat and came back with "I have proven myself and am now retiring." No comment from me would seem to be necessary or appropriate. . . .

Yes, this is the same Preszler who did such a super job for Stunt at the '77 Nats. Arlie will be doing it again in '78. Look for this year's Nats Stunt event to be the best ever, he can really do the job right.

### RICH LOPEZ ATTENDS

### MACS SHOW IN LONG BEACH

I went to the MACS show again this year to represent Model Retailer, and to help in the JoMac booth selling people on R/C cars. Don't laugh, I sold an MRP 1/8th scale R/C car to none other than Phil Kraft . . . forgot to challenge him to a race, however.

Met a lot of people, one of whom was George Mattei, working in the HB booth. George is very involved in Combat and probably best known for his extensive series of articles on engine rework that were published in the MACA newsletter. George and I were discussing the new HB 21 R/C car engine, when he asked my name. I thought "Why not?" and laid it on him about being Rich Lopez . . . and he went for it! Not only that, but later on, I introduced George to Lorna Samuel, Bob Whitely and Charlie Johnson. Only catch was that I introduced Charlie as Greg Hill. The California Flash almost blew it trying to keep a straight face.

Sorry, George, I just could not resist trying the old trick one more time. You were just in the wrong place at the Dirty Time.

### P.S. (PRATHER STUFF)

Terry was exhibiting at the MACS show, of course, and strong-armed me into accepting freebies. The first object to be palmed was a bottle of the new Prather Products After-Run engine oil. Terry says it penetrates well, prevents gumming, eliminates rust from forming, gives longer engine life and easier starts. Also smells good (?). No, I haven't used it yet, but would Prather sell something that doesn't work? No, he wouldn't; get some and try it. For \$1.29 a bottle, it might be very cheap

engine insurance.

Right before ripping off a Terry Tigre, I also got some of the new white micro-balloon filler. The stuff works real well, and the bottle is a handy way to dispense the contents, plus there are no lumps to break up before mixing with epoxy or resin.

I know this is starting to sound like a commercial, but also try the red silicone fuel line made by Prather. This has to be the best fuel line around, if not the cheapest. It is tougher than other silicone line, will stay on fuel nipples very well, and is resistant to the cutting usually associated with silicone fuel line. You'll like it.

#### FOR SMALL-BORE RACERS

Several new kits are now available from Midwest that look good for the speed-crazed Sport Flier or AMA small-bore C/L racing classes (I just can't bring myself to write Mouse Race . . . unless it is in parenthesis).

The Plumb Crazy and the Miss San Bernardino kits resemble their full-scale counterparts, are easy to build, no doubt plenty fast, and were designed by for-real C/L racers, Russ Sandusky and Jerry Kasmer. These aren't kits dreamed up by some designer who has never been let out to play with models he designs, therefore they are functional, yet still attractive. Your local hobby shop has them, take a look.

Due to be released by the time you read this is Russ Sandusky's own Super Mouse, also kitted by Midwest. Designed for the Cox TD 049, it ought to be a hot one, probably the best design presently out for Class II small-bore (1/2A) racing and definitely the best kit for this class. Thanks to Midwest for keeping an eye out for us C/L types looking for new kits.

#### TWA LIVES

If you're new around here, TWA might not mean much, but to those of us who have been around awhile, TWA translates to speed and power . . . and hard to get. Glen Dye has been having his problems getting into full production on the TWA line of engines, but in a recent note to me, he seems confident that things are finally coming along for him, and many of his engines are in stock, or will be shortly. The 29's, 36's and 40's are in stock; a few of the 60's may be unsold by the time this gets to you, and work is coming along on the 15's.

Glen makes beautiful engines; you ought to see his catalog. Something in there for most everybody, including Combat fliers, Speed Guys, C/L racers, Stunt Grunts (look at the 40 and 45 Stunt engines), R/C boat racers, even a 61 Pattern engine for that nondescript R/C event. The 61 R/C is available with a tuned pipe

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and Perry pump/carb combination and is rear exhaust, of course. Wouldn't be a TWA if anything other than rear exhaust was used, right? Anyhow, the 61 R/C ought to be a real barn-burner.

Write to Glen at Performance Model Parts, Inc., 1015 S. 6th St., Minneapolis, MN 55415. Call (612) 339-3805 if you can't wait. In any case, ask for a catalog and ordering information. Glen also makes specialized engine parts, so ask about that too. If you have an idea for tricky porting, Glen can come up with most any kind of piston/sleeve you can dream up, as well as other parts, like rods, cranks, heads, etc.

#### HOW-TO

Unca Bill likes us contributing editor types to throw in a lot of how-to stuff when doing these columns. In looking back over this column, I don't see any how-to stuff, so . . .

We'll talk about how to cover that new model of yours. It is all glued together, everything fits, but you can't figure out exactly how to cover with the tissue supplied with the kit. The instructions are a bit hazy concerning pre-doping the structure, how to stick the tissue in place, etc. Or you have already tried covering the model and it looks like a mess.

First thing to do is to get the entire model sanded down to bare wood. If any covering is on it, rip it off and sand. Get that thing as smooth as you can, then . . .

Go to your local hobby shop, walk right past the dope rack, the stack of tissue, the assortment of brushes. Find the display of plastic film coverings, grab whatever color you like, buy it, go home, read the instruc-



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tions and put it on. It's as simple as that.

(So when do you start on the "How-To"? wcn) ●

#### Half-A . . . . . Continued from page 51

took some of the styling tricks from his Miss Kell design and adapted them to the 1/2A format, to come up with a whole different look. Workmanship is up to his "big plane" standards; guess two Nats wins in a row have gotten him inspired about 1/2A stunt.

The old (MB is not responsible for that adjective, Ken! wcn) Sunday Flier (columnist for "Playboy West Radio Magazine") displayed a unique flying "thing". Ken Willard came up with four pseudo jets flying in formation. The front model has a Tee Dee .09, each of the side ones has one aileron, and the rear airplane has the elevator. I'd sure love to see it fly!

I especially wanted to show one

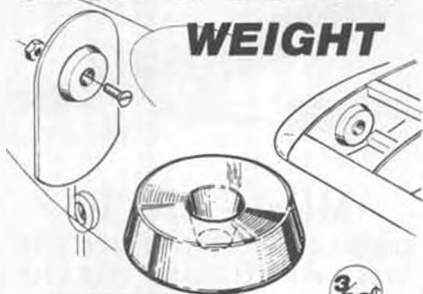
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how to build and fly models is to ask the experts. Don't waste both your time and his by telling him what you have done; they did it too, and probably better! Seek real and specific advice on the areas you find difficult; most modelers will tell you all their best techniques at the drop of a question.

Finally, look very closely at every really good model you get near. You too can build perfectly if you practice and have the drive. The secret is to pay close attention to every step, and do it over if you didn't do it right. Then, like the Hippie's directions when asked the way to get to Carnegie Hall, "Practice, man, practice!"

**F/F Scale . . . . Continued from page 77** work to eliminate any built-in stresses by letting them set for a couple of weeks prior to covering). Cliff told me that he water-sprayed his wings and tail while still pinned onto the board. He felt that once the structure had dried, that the stresses have been removed.

One last remark regarding covering . . . Sometime back, I told you about the use of Dr. Martin dyes, as used on scale models by George James. Since I have been an aficionado of the Floquil paints for many a year, I never found the need to use the dye method. However, I have been working on a WW-I model on which I wanted to get the old linen look, and I felt that I could not get the effect I was looking for with Floquil. I bought Yellow Ochre (No. 4) and diluted several drops with distilled water (I used distilled water only because it was on hand).

The correct dye-to-water ratio is determined by trial. I mixed what I thought was enough dye, then I sprayed a little onto a white file card. I kept adding drops of dye until I had the color I wanted. I airbrushed an even coat of the dye onto the white tissue. The color was nearly the way I wanted it. So after the first coat dried completely, I sprayed on another coat, which did give me what I was looking for. When this dried, I applied one coat of thinned dope to the wings and tail and two coats on the fuselage. This was the only dope applied.

With this technique, there is no need to have your models red, yellow, orange, blue or white only. For antique rubber models, different colors for different effects can be obtained with sensational results, so this method does not have to be restricted to scale only. Some of you have written and wondered where this dye can be purchased. Locally, most good art stores carry the whole line of colors. Also try college book stores. For those of you who do not have access to any, write directly to the factory for sales or information . . . Dr. PH Martin's Dye, Mfg. by Salis International, Hollywood, FL 33020. The local price I paid was \$1.25 per bottle.

Ever tried making exhaust stacks such as found on many WW-I subjects? This can be a real chore if you don't know the simple but effective way of doing so. The key to the whole process is to take several laminations of 1/32 balsa sheet, the number depending on whatever size the exhaust has to be, and glue them cross-grained to each other. When dry, you can cut, carve, or sand without the whole thing falling apart. The exhaust, when finished, can be painted with Floquil's Grimy Black to complete a neat job. So often, a little task can become monumental without these little hints. I just hope they are helpful.

To continue with some more hints. Most scale modelers are familiar with frisket paper. This is another art medium which is often used for airbrush work. Modelers use this paper for making stencils. Frisket paper is very useful, but it has several drawbacks that often make it undesirable to use. The main problem that I have personally found, using frisket paper, is that if the stencil is the least bit complex, when removing the backing, the paper tears very easily. Also, if you are placing it onto a curved surface, like the upper curve of a wing, it doesn't always want to lay flat.

There is another slick way you can make stencils for your next project. Take either vellum or very fine

aircraft, so of course, I ruined the photograph! Midwest displayed its brand new, foam version of the A4D-1 Skyhawk. It had shown only balsa prototypes at Toledo last year. Flight tests of this production version should be complete at the factory by the time you read this column. I do, at least, have an "internal gubbins" view thoughtfully provided me by Ed Rogala. At the time of my discussion with Ed, he still was not sure of the best technique for launching the airplane in "wheels up" configuration. With its low wing, there really is nothing to grab. How about a catapult? Maybe launch inverted and roll it out? Cram an Estes rocket engine up its tailpipe and VTO? You can use landing gear, but the show model sure looked gorgeous in clean form . . . that is the way I would build it.

**BEGINNERS WORKBENCH**

Very short this month: just a word of advice. The very best way to learn

acetate and cut out your stencil. Brush an even coat of one-coat rubber cement onto the back side of the stencil. This can best be accomplished by placing some of the cement onto a piece of light cardboard and squeegeeing the cement on. This provides an even coat. Now you can place your stencil onto your model and spray away. When you have done so, you can remove the stencil easily and place it elsewhere as required. Just remember to spray directly toward the stencil at 90 degrees. This eliminates having any of the paint creep underneath the stencil. Creeping can occur if you spray at an angle, then your job is ruined.

One-coat rubber cement is exactly what it says. Put one coat on and it becomes tacky, and it will remain this way for quite some time. With regular rubber cements, you have to coat two surfaces, let dry, then put into place, similar to contact cement. Not really suitable for making stencils.

While still on the basic subject, one more item that can be of help is a product called architectural sketch paper. This paper comes in a roll, and it is about 8 inches in width. It is very thin, like tracing paper, is reasonably priced, and it can be used for tracing or stencil making. One use is to trace, say a bulkhead from a plan, coat the back with one-coat rubber cement then place onto sheet balsa. After cutting out the part, the template is easily removed.

As you can readily see, there are numerous ways to tackle a problem, and hopefully some of those mentioned this month will prove useful for your modeling needs.

A very fine interesting new Ultra-Lite Aircraft Journal (newsletter format) has recently been published. This fine bi-monthly publication should be of interest to scale modelers with an affinity for ultra-light type aircraft. Future issues of this publication plan to include regular 3-views, photos, and cut-aways of historic ultra-lite aircraft. Their program outline includes ultra-light plans listings, low speed airfoils, powered hand gliders and their progress, etc. The first issue has a 3-view of Sorrell's Guppy (Sorrell is the designer of the Hiperbipe). Peanut fans will be interested in that one.

Editor is John W. Grega, 355 Grand Blvd., Beford, OH 44146. If interested in subscribing, the cost is \$12.00 per year for six copies. Make out checks to John Grega. ●



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### Instructor . . . Continued from page 34

steps" in a direction opposite of the roll direction, it needs a little less differential. If a vertical roll is required in your pattern or is a maneuver you frequently do when poking holes in the sky, then you may have to compromise between proper differential for the horizontal rolls and the vertical rolls. The late Jim Kirkland always adjusted the differential to be ideal in a 45° climb during a split-S, and perhaps he had the ideal method of achieving this compromise.

I had an interesting experience occur during practice in Florida, just prior to the Tangerine this year, involving differential. I noticed that the airplane (my Curare) rolled into the first point of a four-point very easily, but when rolling from the inverted point to the third point it required an excessive amount of rudder to keep the nose up. After considerable thought and a bunch of "flying my hand", I added a little differential and improved the rolling maneuvers considerably. I did this after having flown this airplane approximately 150 flights, which proves that you almost never get everything adjusted perfectly until you have a bunch of flights on an airplane (Now if I could only figure out how to keep everything adjusted perfectly!).

Another neat trick you might try, if you always roll in the same direction, is to increase the throw of one aileron and decrease the throw of other, which will give you aileron differential. Example: if you roll right, then increase the throw of the right aileron and decrease the

throw of the left aileron, if you need more differential. Bear in mind, though, that this will increase the differential in one direction and decrease the differential in the other. It can also be handy for trying a differential adjustment before making a more permanent change, such as bending the horns. As you can see, the adjustment of differential is a long, arduous task requiring the patience of Job and the mechanical genius of Da Vinci but can be very beneficial to your flying.

Now, when we change the balance . . . Oh Hell, we'll get into that next month. Now I'll answer a few questions:

"Dear Dave:

As an aspiring pattern flyer, I am interested in the new trend of using coupled and uncoupled flaps. I notice that you had this sort of arrangement on the Curare that you flew in the Tournament of Champions. I have four questions: 1) for which maneuvers are the flaps coupled and uncoupled? 2) What improvements are brought about by the use of the flaps? 3) How is the auxiliary channel electronically coupled and uncoupled in the transmitter? 4) What sort of linkage do you use to hook up both the flaps and ailerons? Your answers to these questions will be greatly appreciated. Thanking you in advance, I remain. Very truly yours, Richard Schmidt, Bayside, NY".

Dear Richard:

The flaps are a relatively new innovation, and the jury is still out on whether they are helpful. I originally considered them for square maneuvers, but have now settled on using them only for takeoffs, snap-

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rolls, spins, and landing. The main advantage I see to the coupled flaps is that during takeoff and landing, they add a direct lift component to the elevator stick. During spins, they slow the descent and hasten the recovery. The flaps in my airplane are coupled electronically in the airplane, using a channel switcher, rather than in the transmitter. The flaps and ailerons are hinged on a common hinge line and are controlled by concentric torque rods made of brass tubing. It is important that the linkage be arranged such that the flaps work absolutely parallel, as, should you get lead or lag in either one, it will impart roll during

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"Dear Dave:

In keeping with my philosophy of 'build today, fly tomorrow', I'm thinking of my winter '78-'79 project. I have just about decided on building the 6 foot Mercury (Old-Timer). The only aspect of flat-bottomed, light wing loaded models I don't like is their susceptibility to wind, so here is my question: To make the model more versatile with respect to windy/gusty conditions, and overall more enjoyable to me as a Sunday flyer, I'd like to build two wings; one per the 'old-timey' plans and one with modifications. I'd like to: 1) add ailerons and reduce dihedral, and 2) change the airfoil. How much dihedral should I use and what type of airfoil do you recommend? I'm not trying to convert this old-timer into a pattern ship, but I would like to increase the flexibility that a second wing would offer. What do you think? ... Any negative effects I have overlooked? I think your column is a great idea and so is the new format of **Model Builder**. Thanks, David H. Benboy, Medway, Ohio."

Dear David:

Many modelers are now building and flying old-timer airplanes and ask the same questions. First, my

experience has been that with slow flying high wing airplanes, the usefulness of ailerons is limited and in most cases the addition of ailerons to this type airplane is not recommended, due to the problem of adverse yaw. If you must include ailerons, then decrease the dihedral to almost flat and use plenty of differential (see first part of this column) to combat this adverse yaw. As to what airfoil to use, I'd try an airfoil similar to the Falcon or alternatively a full symmetrical section of about 16%.

(If I could put in my two cents... Adding ailerons to a high wing, slow flying Old-Timer is not only sacrilegious, it is, as Dave says, useless... unless you drop all dihedral, and then the ship is just plain ugly! We dropped half the dihedral on our Powerhouse, and unless it's sitting next to an unmodified one, it's not really noticeable. With rudder and elevator, the ship can be rolled in what almost seems an axial path, yet it will barrel-roll with the best of them. Just depends on the "nut" on the stick. It will also fly inverted for as long as you care. With the original underchambered airfoil, it flies very well in strong wind. You just shove on full throttle, hold the elevator stick about halfway forward, and penetrate! Incidentally, the same ship has soared to several Texaco wins, with a best flight of over 54 minutes. wcn)

Keep those questions coming in as they are the backbone for this type of column. Send them to me at: 8534 Huddleston, Cincinnati, OH 45236.

That's it for this month, and for those of you flying in the Nationals "GOOD LUCK", for those of you who are not... perhaps next year.●

MRC..... Continued from page 61

Another reason for putting this control off-center is to leave room on the other side for the future, in case I later need two proportional channels. No, we can't easily make an MRC Seven out of this one, but we can disable the switch-operated fifth channel and use it as proportional. I will tell you how to make this hookup towards the end of this article.

Once the location is decided on, pencil a 1/8 x 1-1/4 inch slot on the face of the transmitter, according to the dimensions shown, on whatever side you wish to install the control. Then outline the slot with masking tape, which serves the dual function of making it easy to see, and also preventing a scratch to the case during the drilling and filing operations to follow.

Recheck your measurements, and plan the drilling or cutting opera-



tion. A drill press is best, and should be used even it has to be borrowed for the operation. Use a new, sharp 1/8-inch bit to drill the holes at either end, then drill a series of holes down the slot, after which you will file out the material between them, using an 1/8-inch round file. The slot can also be cut out faster and neater using an 1/8-inch steel router bit or rotary cutter, such as those available from Dremel. Which ever way you go, the operation will turn out much neater and straighter if you clamp a piece of wood to the drill press table to use as a fence. Holding the transmitter case against it will keep the drill or cutter working in a perfectly straight line during the entire operation.

However, before the first hole is drilled, some provisions should be made to keep filings out of the insides of the transmitter, and your cutting tools out of the components inside. The wiring located just inside where you will be working has enough slack to allow it to be safely taped out of the way. Please tape it. If it gets caught in the cutter, not only will it probably make spaghetti out of it, but the MRC technician who has to rewire the whole thing will hate you. It is also recommended that some masking tape be placed inside, around the proposed slot, with the sticky side exposed, so that it will attract and hold filings and chips as they fly around.

If a drill press is not available, and a hand drill has to be used, be extra careful to keep the holes lined up, so as to prevent a too wide slot. Be sure to center punch the hole location before drilling, and it is probably best to use smaller bits, such as a 3/32nd, and then dress the slot to the required 1/8-inch.

Always work with the transmitter held flat, so that the debris generated will fall down and out of the case. Use a vacuum cleaner and air hose if available. If not, use a clean paint brush and as many deep breaths as you can spare to clean out the insides.

Study the control assembly, note that it will be held in place with two No. 2 sheet metal screws from the inside. There is an outside piece that will dress up the hand-cut slot, as well as provide the holes for the holding screws to go into. The assembly will be installed with the pot facing right, as viewed from the rear.

Note that the Dunham Aux Channel Control can be used as a five or three fixed position, or as a fully proportional control. The fixed positions can be used to set a control at any desired predetermined angles. The positions are determined by four little stops built into

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the control base, a short inspection will reveal how it works. It comes set up for five positions, if three or no preset positions are desired, simply clip out the stops not needed.

At this point, you will assemble the pot element in the holder. Note the pot wiper, located inside the assembly, which is the part that actually moves when the lever is moved. This wiper rubs over the resistor element, changing the effective resistance and eventually winding up as servo travel. Notice that the position of the wiper relative to the lever can be changed by rotating the other end of the wiper shaft which appears externally as

two projections between which a screwdriver may be inserted. With the lever in the center position, adjust the pot wiper position so the outer contact is also centered, i.e., in line with the lever. A later adjustment will be made to perfectly center the servo once the conversion is completed.

Look at the inside of the pot. Note that the resistor element itself is around the outside perimeter, in the form of a round 'U'. There is also a contact in the center. With the control lever in the center of its travel, drop the pot into the holder, positioned so that the outside contact of the wiper will mate with the

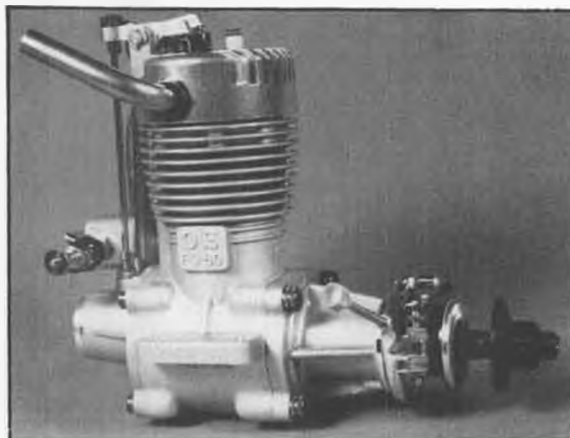
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center of the closed end of the resistance. The pot element is held in place with two 2-56 machine screws which screw into the outside radius of the pot holder. The heads of these screws bear on the pot, and hold it securely in place. Install, but do not tighten these screws.

It is now time for another decision! But it is a small one, so bear with us. It has to do with the direction of servo output wheel travel, versus lever movement. And it will probably only matter in real tight installations where it won't be possible to change the control rod to the opposite side of the servo arm to get opposite surface movement.

Anyway, if you decide you want the servo wheel to move counter-clockwise when you pull down (towards you) on the lever, rotate the pot element 20 degrees clockwise, still with the lever centered.

If you desire clockwise servo wheel operation upon downward movement of the lever, rotate the pot element 20 degrees counter-clockwise. Tighten the screws snugly. Be sure that the pot element is seated firmly and evenly all the way around, and that the lever has full

travel without catching or binding.

Now solder the two wires to the pot. The white one goes to the center solder lug, as identified by the arrow inscribed on the back of the pot. Looking at the pot with the center lug up, the black wire is now soldered to the lug on the left, if you decided on servo CCW, lever down operation. If you want servo CW, lever down, the black wire is soldered to the lug on the right.

Now install the assembly in the case, holding it in place with the two sheet-metal screws. Looking at the assembly from the rear, it should be placed so that the pot end faces right, towards the side of the printed circuit board to which connections will be made.

Now locate the land marked with a 1 on the photo of the printed circuit board. Note the resistor installed on the other side. Unsolder and loosen the top connection of that resistor only, and move it away from the board 1/4 inch or so. It is left connected and supported at the lower end. Clean out the hole in the board, install and solder the striped end of the black wire. The white wire is connected as shown on the

photograph, to a land that up to now has been unused, point 2.

If you have a scope on which to view the modulation pattern, you should now see a proportional sixth channel operating as the lever is moved.

Now, we can turn our attention to the receiver. Remove the cover and study the wiring where it is connected to the PC board. You'll find common lands to which all the red, and all the black wires are connected. These are the power wires, and you will have to drill a No. 67 hole in an unused portion of these lands, and push through and solder the like colored wires from the output harness being added. Drill from the component side of the board, to be sure that there is free space for the wires where it is needed. The other wire is the signal wire, and is connected to a previously unused land, as indicated on the photo. Check these connections carefully, making sure you do not bridge over to any adjacent lands during the soldering.

If everything looks good, plug in a servo and battery, and turn on both parts of the system. Everything should work, except that the servo will not be exactly centered. Do so by holding the lever in the center position, and adjust the centering device on the aux channel assembly, as previously mentioned. Moving the lever should now cause the servo output to rotate about 45 degrees in each direction.

The protruding part of the assembly can be left as a narrow lever similar to those seen on most aux channel and trim controls, or you may install a slightly longer knob which is included. The latter gives you more surface on which to place your thumb, but you may find it creates some difficulty in pre-setting the control to a desired position as it makes it harder to judge the exact position of the lever in the slot. Anyway, the choice is yours.

Now, for the proportional fifth channel as mentioned earlier. Naturally, you'll have to cut another slot on the other side of the case, install the pot and assembly, etc. Looking at the photo of the board again, the white wire should be connected to the land marked 4, right next to the other white wire on land 2. Now, locate the land marked 3, unsolder, remove and tape up the white wire to be found there. Leave the other end of the white wire connected and in place. Insert and solder the new black wire at point 3. And last, remove one of the wires from the retract gear switch located on top of the case, insulate the end and tape it out of the way. A servo plugged into what used to be the retract channel

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will now work with this added proportional control. Center as described, and it is done.

Check to see that you are not leaving any forceps or sponges inside the patient after this operation, and put it all back together and start building something to take advantage of all these added refinements.

The servo of your choice can now be obtained from your MRC dealer, who is also in an excellent position to advise you of the best type to use for your particular requirements.

In the event that you don't care to tackle the installation of an additional channel, you may have it done at MRC in Edison, New Jersey, or possibly at their nearest service center, as listed in the instruction manual that came with your system. The cost of having the channel added, less servo, is \$35, plus postage and from MRC's facility.

You'll enjoy the added versatility of your 775 Plus One, and most important, the added channel will not detract from the operation or dependability of your system. And just look at the other benefit (?), you'll now have one less excuse for not starting that super project you've only been talking about . . . the one that you need six channels for and didn't have.

*Gipsy Moth . . . Continued from page 37*  
surface, lots of room.

"After all the worry and care, her first flight was almost anti-climatic. Test pilot Dave Smith, of Halifax, opened the throttle of the smoothly purring Quadra to about 1/2, and in 10ft. she was off. A gentle climb out, some down trim fed in, throttle back to 1/3, and away she went.

"Pure beauty. Graceful as an albatross in full flight.

"Takeoff and landing is pure delight; she'll lift her tail in 5 feet and if you don't lift her off, she'll run like that all day . . .

"I am now looking for a new project and thinking in terms of a low winger of about 9 to 10 ft. span. Any suggestions?"

Yes. In a couple of months, we'll have a Mammoth Scale version of the new Piper "Tomahawk". wcn.

From an old plain-bearing Fox 59 in a 15 pound Gipsy Moth, to a Quadra in a 19 pound is quite a switch, but proves that the old bird is very flexible about its power requirements.

Here's our second report, from O.U. Larsen, Marietta, Georgia. It's two letters combined.

"When I saw the plans in the June 1977 *Model Builder* for your Gipsy Moth, I knew I had to build that

model. Enclosed are several pictures of mine. I used 1/32 plywood for fuselage sides and made the wings folding for ease of storage and transportation. The plane easily goes into the rear of my Toyota Corona Mark II station wagon. I am using a Webra 61 Blackhead with 14x4 prop. I use a servo for each aileron, which eliminates any push-rods, and simplifies wing folding. Ready to fly, the plane weighs 13 lbs.

"I have had more fun flying this model than any I have flown before. It handles like a full size plane. I have looped, spun, and rolled it. It is as much fun to fly as my full-size Skyhawk. I would recommend this model to anyone who wants something different.

"I am enclosing several sketches which will show the folding wing details on my Gipsy Moth.

"Since I designed parts as I built, you will notice small variations in parts dimensions. The brackets and hinge point pieces could all be made the same size, say 1 or 1-1/4 inches, and blind nuts are mounted so that there is a 1/4 inch space between the wing and/or the fuselage sides.

"I covered my model with Silron and painted it with Sig Cub Yellow and black trim. The exhaust pipe is a piece of 3/4 inch aircraft hydraulic

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tubing welded to the stub of an old muffler I cut down. I am using a 16 oz. fuel tank with the Webra 67 engine."

Here is some more detail on the folding wing set-up.

The front part of the hinge bracket for the lower wing must be flush with the top of the wing surface, as the trailing edge of the wing has to go under the bottom of the fuselage when the wings fold. The May 1977 issue of "Flying" magazine, pages 83-90, show details on the full-size Gipsy Moth.

A Kraft KPS-14 servo is mounted in each lower wing, near the root, and a conventional pushrod and bellcrank system carries servo power to the aileron. The servo cable is brought out of a large hole in the root rib, near the rear hinge point. With flying and landing wires attached to the ply root ribs, there is nothing to disconnect when folding the wings.

All flying and landing wire attachment brackets, and the hinge brackets, are attached to the 1/8-inch ply root ribs with 3/8 inch by No. 4 sheet metal screws and epoxy.

To fold wings, the front attach screws are removed, the jury struts are fitted (these keep the inner wing leading edges apart, maintaining tension in the front landing wires), and the wings are swung back along the fuselage, the bottom wing going under the stabilizer.

Do not omit the 1/4-inch dowel guide pin mounted in the two root ribs of the top wing. This was added to remove the strain of downward pull generated by the landing wires on the front attach bracket.

O.U. made all the attach brackets and hinges from heavy sheet brass. The flying and landing wires are 60 lb. test fishing leader. All turn-

buckles are No. 6 size from Proctor Enterprises.

Prints of O.U. Larsen's folding wing details will be included with all future Gipsy Moth plan sets. •

**Choppers . . . .** *Continued on page 45*

designed to provide a linear response to the tail rotor. The original system has a lever arrangement which gives lots of control in one direction and a small amount in the other. Although I found it perfectly satisfactory, quite a few fliers preferred to modify it by installing a Kavan Jet Ranger bellcrank on the top side of the tail rotor transmission, and using two connecting links to the lever. I have never cared too much for this mod because the main control pushrod had to be removed from its fuselage guides, and re-routed up over the top . . . it just didn't look very professional and the dual pushrod links were cumbersome for such a simple duty.

After a little thought and a few experiments, I came up with a neater installation that does provide linear control. The photo should provide most of the details, but I will mention briefly how it was done.

First, a Kavan Jet Ranger "aft" bellcrank was installed on the "bottom" of the Alouette tail transmission with a metal PK screw, it is positioned so as to place the "post" in the aft position and pointing downward, with the link-arm pointing to the right. The post is trimmed enough to allow clearance with the tail-skid wire. The link-arm is trimmed so that it doesn't interfere with the tail rotor mechanism. The main control pushrod from the servo mixing lever, remains in the original guides and is connected to the link-arm in a conventional

fashion.

Next, the lever with the two balls is shortened, and a single ball attached at such a distance to make the new connecting rod appear parallel to the transmission box. The length of this lever has no effect on control movement, but it looks nicer to have it all lined up. If you're lazy, just leave the two balls on the lever and use either one for the connection. The last step is to bend a 90-degree angle in a short pushrod and attach a ball link on the threaded end. The other end, with the bend in it, goes through the bellcrank post and is secured top and bottom to make a fine fit. I soldered a washer on top and threaded the bottom for installing a lock nut. Make sure there is no slop at this point, since this post and bent pushrod keeps the ball lever from rotating! It may be necessary to experiment with the proper "pick-off point" at the servo mixing lever in order to give the desired control results.

**FINAL APPROACH**

No, I haven't forgotten the Bell 222 fuselage article . . . I just haven't finished it yet. Next issue time should be sufficient to get it painted, installed on the Heli-Boy and photographed. We'll also have the push-rod tool illustration I promised last issue.

BCNU. •

**MRP Review . .** *Continued from page 47*

Although building the car would appear to be a very simple thing, it wasn't, at least not for me. I wanted everything to be just so, and found it difficult to position all of the components on the chassis pan, trying to visualize which combination would work the best and be the simplest. A really thorough and complete set of

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instructions would have helped me here.

Even though I have to complain about the kit instructions, I must admit that there are so many different ways to position the parts that it would be difficult to cover everything in one instruction booklet. And now that I have built one car, the next one would be very easy to do.

Everything fit okay, although the flywheel supplied was designed for the Veco 19. It fits, but pushes the longer K&B .21 a bit far to the left of the chassis. Bob Welch (the one who can't sing) supplied a wheel for the .21 that positions the engine properly, but in turn, the crankshaft has to be shortened about a 1/4 inch. No big deal.

Once the tank and servos were in place, the rest of the car went together pretty easily. A little thought was necessary to get the servo leads and antenna routed, and mounting the switch was kind of a problem. As you can see from the pics, I ended up mounting the switch on the Kydex tank bracket.

The front of the body has to be lifted to turn the switch on and off, but there is no way the switch can accidentally be turned off in the crashin' and bashin'.

The stock servo saver shown is a

bit Mickey Mouse, but it does work okay. Since building the car, MRP has released a new and much better type of servo saver which I have installed. The new unit is also being supplied with the latest kits, so you won't have to use the wire-wound one.

Mounting the Abarth body was easy. Just punch in a couple of holes (the lexan body has dimples in it indicating body post locations), slip on the body, trim some more if it isn't quite right, and then oversize the holes some to allow the body to ride free and separate of the chassis.

Guess that wraps it up as far as building the car goes, but it should be mentioned that it is strongly recommended that all bolts be installed using a liquid locking fluid of some kind. I used the new DuBro (Devcon) Super-Lock A and it works great. All moving parts except the clutch were lubed with MRP's new "solution", which is a great lube with lots of staying power . . . probably the best oil there is for R/C cars and engine assembly.

Someplace in here, Eloy is supposed to do a bit about the JoMac modular radio, so I'll let him handle the boring electronics description.

*(We were going to hold this article until Eloy concluded his test of the JoMac radio. However, as Chuck*

*Hallum had nothing for the R/C Auto News column, we decided not to wait. Eloy's JoMac test will be published next month. wcn)*

My personal feelings about the radio are quite mixed. The fact that this radio was designed for one purpose, that of controlling R/C cars, is as positive as is the knowledge that people actively involved in racing cars designed and built the radio. They know that an R/C car radio has to have very strong output gears, lots of power, and still be fast. And sure enough, this radio is very tough, has a fast transit time, and lots of torque.

As I write this, I have already put this radio through more than it should be expected to endure (in fact, more than enough punishment to ruin the servos and receiver of radios designed for airplane use) and have not had any problems at all . . . Well, almost no problems. At first, I used the standard dry battery receiver pack, and due to having my servo saver a bit bound up, plus the brake set too tight, I sacked out a set of batteries in one practice session. Adjusting the brake, loosening the servo saver, and switching to Ni-Cds (the only way to go) solved that problem.

Not only has the radio held up very well, but I expect it to keep on

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doing its thing for a long time to come. I have friends who run these 1/8 cars and are still using the same JoMac radio they bought several years ago, and they have no trouble with them.

On the other hand, the JoMac radio doesn't look like much. The transmitter case is all plastic and is very Plain Jane. No meters or other trickery and no solid feel like you get with a vinyl clad metal transmitter case.

First peek inside the transmitter case is a bit of shock if you've looked in other transmitters before . . . there doesn't seem to be anything inside, other than a big battery. I know for a fact that good stuff goes inside, but it sure doesn't look very impressive.

Still, my attitude toward a radio is that if it works like it should and doesn't give me trouble, then it is a damn good radio and I don't care what it looks like, inside or out. In that regard, the JoMac radio comes

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That should about wrap things up for the initial look at the car/radio/engine combination. Now the fun part, actually going out and seeing how things work.

First practice session, we went out to a big parking lot with several other racers. They all had competitive cars, so I was able to compare my stock car with proven cars. And the stock car was just too much. I had the brake too tight, so the rear end would slide every time I backed off. The stock clutch had way too much bite, and would transmit bunches of torque to the rear wheels. This, coupled with rear tires that are quite hard and fronts that bite pretty well resulted in a car that was a real handful. Everybody thought it was just me doing everything wrong, but when they tried the car themselves, they knew the car was at fault . . . or at the least it was set up all wrong for the surface we were running on.

Despite all of the suggestions thrown my way, I left the car alone and practiced with it until those hard rear tires were worn out. I knew how to go about making the car more driveable, but my debut in 1/8 racing was close. The idea was to

learn to drive the car as well as possible within a limited amount of time. Even though hard to drive, the car was teaching me to go easy on the gas at all times. I feel that my progress up the learning curve was accelerated by driving a squirrely car that required a lot of attention.

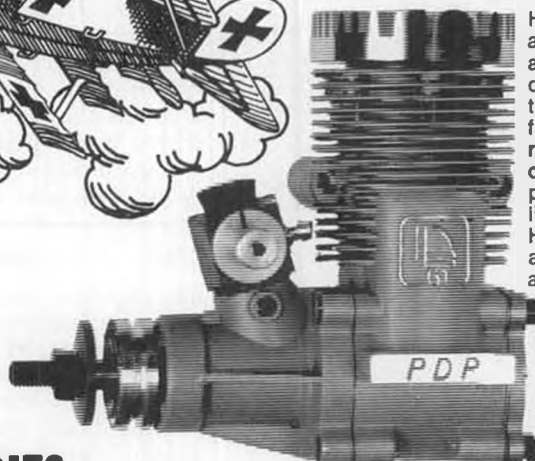
To prove my theory, the night before the first 1/8 scale race, I cut the clutch shoes to 1/4 inch wide (stock width is about 7/16), to promote lots of clutch slip, set the car up with very little brake, opened the needle valve some more, put wheels shod with Associated molded rubber up front, and a pair of the new MRP "D" compound (part number 2358) wheel/tire sets on the rear.

With those changes, the car turned into a real pussycat. Driving it was very easy, yet it was able to cut laps of competitive speed. Practice went pretty well, so I resisted the temptation to lean the engine out some. First heat I got a good start and was leading at lap 8 when the car ran out of gas right in front of the pits. Luckily, that was the only stupid mistake all day, and I ended up qualifying in 5th spot for the "A" main when I would have been pleased with making the "C" main and surprised at making the "B". Ended up 5th out of 6 in the main event, so I didn't blow the boys off, but I was paying attention to what they were doing to drive around me, so they better watch out next time!  
**WRAP UP**

All of these product test articles end up telling you how super the product was and that you just absolutely have to have one to be with it. I refuse to be party to such nonsense, and if you've been paying attention, have already noticed several critical comments, something you just don't see in product evaluation articles. I'm trying to be honest about this, and with that in mind, cannot say that the MRP 1/8 car is the ultimate. After all, it is the only 1/8 car I have ever driven. I do know that with the modifications



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already mentioned, (and which are not common to just the MRP car, all R/C cars have to be set up with a clutch, engine, brake, and front and rear rubber that suit the track being raced on) I have a car that is easy to drive and quite competitive besides. The car is flat working for me, what else can I say?

If you're interested in how the MRP cars do at the top level of competition, a check of the winning makes in past ROAR Nationals shows the MRP cars have done very well here also.

The sport of R/C car racing is picking up fast in popularity. If you've always wanted to get into it, there couldn't be a better time than right now to get started. Stop in at local hobby shop and let them show you what's new in R/C cars, and of course, the folks at JoMac and MRP will appreciate it if you give their products very serious consideration.

For those who read this through to the end expecting a really outrageous story about how I did an endless wheelie with the MRP car, you lose. I've got my car set up so mildly that it won't pull wheelies anymore. Too much clutch slip. Nothing is perfect, it seems. . .

### THE NOISEMAKER

This is the first time I have been involved in a competitive modeling

event demanding horsepower, where I have actually purposely taken some of the power out of the noisemaker. The K&B 21 just has too much of both torque and top-end horsepower, at least for a novice R/C car racer like myself. In fact, I can think of several active, experienced racers in this area who would go faster if they could just detune their K&B's a bit. Coming out of a corner, punching it and doing a loop, instead of going straight for the next turn, certainly increases lap times in a hurry.

As already mentioned, I run the K&B with a .012 head gasket, to lower the compression and make the engine less critical to needle settings. The stock Perry carb is still on, where many experienced car racers use Perry 60 pumper carbs, which work fine in conjunction with muffler pressure. For break-in and the first race, the engine was run on Fox Superfuel. The 5% nitro and 29% oil mix does not a hot fuel make, so therefore I'm cutting out more power but never have to worry about proper lubrication cooling. To really put the lid on it, I generally run a rich needle setting; the K&B just starting to come into a two-stroke at the end of the straight-away. Finally, the idle adjustment on the Perry carb is fat, so that when full

throttle is given, the engine burps once or twice before coming on. Just having a fat idle has saved me a trip into the retaining wall many a time.

To the hard-core competitor used to building in more power, all of this must come as a real surprise. I know that I had difficulty in setting up this motor, taking power out of it every time I made a change. But in the long run, it is a beautiful situation. For the price of one engine, I can run it set up very mildly, while learning to drive the car. When ready for more power, it is no big thing to put the motor back into stock condition, run hotter fuel, etc., rather than buy trick parts or a complete new engine.

If you are interested in getting into racing 1/8th cars, as of this writing, there is only one choice for power, and that is the K&B 21. It is versatile, parts are readily available, it makes more power than any other 21 offered, and there are lots of add-on accessories (air cleaner kits, heat-sink heads, etc.) available from many different sources. The K&B 21 is the best, and I wouldn't say it if I didn't mean it.

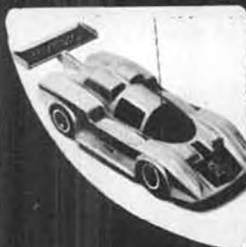


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Retracts . . . . . Continued on page 33

completely apart and take a look at it. In photo No. 5, I'm pointing to the area that we're going to have to slice off, so that the gear will go down and lock very easily.

Put the gear partially back together and, using a steel ruler or a similar straight edge as a guide, scribe a line on the plastic that will serve as a guide for cutting (photo No. 6). Take your Zona saw and cut pretty much parallel to that line (photo No. 7), and if you're going to favor leaning one way or the other from parallel to the line, lean down

to the trunion as you cut.

Now that the gear has been cut off, we're going to reassemble the thing and see how much more finishing we'll have to do. You finish it with two devices, a single-edge razor blade and/or your wife's fingernail emery board. Chances are, it will be too snug at first, so, using a single-edge razor blade and your wife's emery board, trim the trunion block carefully, testing frequently, until the locking mechanism functions smoothly, yet without slop. See photo Nos. 8 and 9. If you goofed just a little, the whole trick and the best part of this whole exercise is that your little

brass bolts can be used as verniers to get very fine adjustment.

Don't be completely satisfied until you have also installed and operated the gear with the helper spring in place. The added tension of the spring may cause some binding that will have to be eliminated.

One final comment. If you turned my H-1 racer upside down, you would see that on one gear, there are two blocks of 1/64 plywood under one end of the landing gear, and on the other gear you'll see that I shimmed it with 1 sheet of 1/64 plywood. So just because somebody has a little bit of literary ability, do not think that everything you see in a model magazine is the gospel truth! We all make little mistakes as we go along. Good luck in modifying your gear. . . .

SE5A . . . . . Continued from page 66

channel just forward of station 5, with the batteries up forward, and the receiver in the compartment between Formers 2 and 3. Finish up the body by covering, adding the cockpit floor, the wing hold-down dowels, and soldering the cross bracing to the cabane. Add the balsa exhaust stacks after you've covered and painted. To make, just slip a square chunk of balsa in your electric drill and spin it to shape while holding a piece of sandpaper against it.

Now the wings. First cut each panel to outline and glue on the 1/8 x 5/8 leading edge. Mark the rib positions. Next, spray the topside of a panel with water, and as it curves, "Zap" in the ribs. "Eyeball" each panel to watch for potential warping. Panels are joined at the center ala hand-launch glider method. 'Member how you used to build them? Blocking up for dihedral and sanding in the bevel? Sure, now you remember. After you have the dihedral locked in, cover the top mid-section with 1/16 sheet. When completely dry, take the assembled wing and sand the bottom of the mid-section on a flat piece of sandpaper. Then cover the bottom mid-section with sheeting. Reinforce the tips with the pieces shown on the plans. By keeping the grain running in the same direction as the wing panel, the reinforcements will follow the contour of the ribs. In an effort to keep weight to a minimum, no covering was used on the wings. Chances are, performance would improve if the bottom of the wings were covered, but being both lazy and impatient . . . well, you get the idea.

From here on out, you can let your creative drive dictate how much effort you want to put in



appearance. I used *Profile Publications* No. 1 for color markings. Three coats of clear dope were followed by a spray coat of olive drab, except for the underside of the wings and stab. A light cream was used on these surfaces. Use sticky Monocote as masking tape. It is a lot easier to cut out circles with scissors than to curve stubborn tape around small circles.

Now for flying. There's a big black arrow on the plans that shows where to balance the model. Choose any other position and you'll have a big black boo-boo.

The launching technique is easy. Just grab the little fighter on the natural holding spot, at the mid-section of the bottom wing, and send it on its way with a straight toss, nose down slightly. Do your first launches over tall grass until you've mastered the technique.

You should be in good shape right about now. Your "Balsaritis" is all cured, right? Wait a minute. Let's see what Mixmasters and Jackson has to say about "Flyingitis". . . ●

Phoenix . . . . . *Continued from page 90*

rubbing out and waxing.  
FINAL ASSEMBLY

No, I didn't forget about the pushrod. At this time, I install the pushrod and guide (bolt and epoxy the guide to the fuselage). Attach the wheels and tank, and bend the ends of the L.O. wires. Install your favorite powerplant (add washers under the front mounting bolts to obtain 1 to 2° of offset) and head for the nearest flying site.

OPTIONS

If you prefer, an adjustable line guide could be installed in the inboard tip. Also, the flaps can be made permanent. In this case, they would be glued on after the wing was epoxied into the fuselage. For flying over grass, more prop clearance can be obtained by omitting the tail wheel. If this is desired, epoxy a piece of 3/32 M.W. to the rear bottom section of the fuselage and rudder. GOOD LUCK!!! ●

Tube-Bee . . . . . *Continued from page 79*

The stabilizer is simplicity itself. . . merely a sheet of wood cut to size, with the center marked on the bottom for the fin. The fin is built up, to provide thickness and rigidity. This is essential for a tee tail configuration (hey — maybe we should have called it the TEE-BEE?) where the stab loads act on the supporting fin. First cut the boom triangles, forming a shape that looks like a spearhead with an X section. Glue the LE and TE of fin sides together with a thin bead of glue. When dry,

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insert the fin spar after bowing out the sides (just like squeezing Charmin). Then add fin to boom, and glue the whole assembly to rear of body tube. The boom triangles must be a snug fit in the tube. The rear of tube is left open, like a jet exhaust. This is so you can see what you are doing when you load the motor. Add the cockpit (use paper cut out with facsimile pilot if you like) which also serves as a dorsal fin. Now glue on the wing mount, aligning carefully with the fin. Then glue the stab to the fin top. No dethermalizer is used on this little ship . . . you will simply have to chase it if it catches a thermal and heads for that Great

Beehive in the Sky!!!

Now you can fit the landing gear (also used for ROG . . . Rise Off Ground takeoffs) to the wing underside and add the pylon ribs to the side of wing center ribs. It is important that these be a snug fit on wing mount, or wing will slide around and skew, even with tight hold down rubber bands. Slip these on the tube, in front of and in back of wing mount. Then affix wing, slipping bands up over mount and ribs.

Note that mount is longer than ribs; this allows you to shift wing to adjust the balance point a bit. Sight along body from front and from directly



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above; wings should be on reasonably straight. If not, now is the time to slice the wing mount off the tube and re-glue it on straight.

Make the nose block from a Peck-Polymer or wooden nose button glued in a hole very carefully cut in the center knob of a Polaroid film coater cap. You can get this at a camera shop if you don't have one.

Insert the music wire shaft (it can be pirated from a Sleek Streak kit, just like the landing gear) and add the prop, making a short 90° bend just in front of the free-wheeler hub. If you want to stretch-wind your motors



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for longer flights, bend a loop in shaft to allow hooking on a Midwest or Marlow 16:1 winder. Now you can slip the nose block/prop assembly on the front of the Estes tube. If you wish, smear a bit of that 5-minute epoxy around the front edge of the tube . . . it will help preserve it. Be sure you don't use such a thick coat that the custom fit nose block won't fit anymore!

Ready to fly? Not quite . . . remember that this is a rubber band model. We suggest you use 1/8 Sig Contest rubber (the grey stuff, similar to what is packed in Delta Dart kits) or Pirelli, if you can get it. Drive two pins in your building board 17 inches apart and make three loops around them with the rubber strip. Tie the ends in a nice tight square knot. Lube your motors (make a few spares) with Sig Rubber Lube or Johnson's Baby Shampoo, keeping lube away from knot (to avoid instant knot slip). Make a motor inserter from a piece of the same birch dowel that you use for the motor peg. Add the paper clip spreaders and balsa spacers to the business end with epoxy. Without this inserter, you will go absolutely bananas trying to dangle the motor down the tube and slip the rear peg through it! With the inserter spread-

ing the rear of motor while you hold motor taut from front of dowel, it is a snap to "thread the needle" with the motor peg. Take a peek at what you are doing through the open rear of body. Now hook front of motor to prop shaft, remove inserter and fit nose block.

Okay . . . off to the flying field. This can be a school yard, local park or meadow. Avoid hard surfaces like parking lots or the street, except for ROG takeoffs. They look smooth, but are very abrasive. Also grass or weeds help cushion the shock of the inevitable rough landing or crash that will occur as you are learning to fly your little bird (no, wait a minute . . . is it a bird or a bee?) at first. You have built a sturdy craft, but it is not indestructible. First try hand gliding TUBE-BEE from shoulder height, facing into the wind (not over 15 mph for best flying) and tossing gently forward. If the model dives, move wing forward a bit and try again. If it stalls (be sure your throw is not at fault) then slip wing back, effectively changing balance point. The incidence shim you added between the pylon ribs can be adjusted if shifting the wing does not give smooth glides, landing about 20 feet away. You can cut a small rudder tab in the rear of fin to give glide turn to the right. Power pattern is also to the right, using a bit of right thrust. Sand the front of rocket tube with a sanding block (motor must be removed, of course) to give this skew to the nose block. Sand again if required, to adjust turning radius. Wide, open turns are more fun on a sport model like this . . . they allow it to fly further.

We hope that you enjoyed building your TUBE-BEE, learning a little about all-balsa Jedelsky (he's the European who invented the butt-joint sheeted wing with exposed ribs) construction and accurate building technique. We know you will have fun flying this little honey (no . . . it's a bee!) especially if you stretch-wind the motor for longer flights. Have a helper hold the rear peg and nose while you attach winder to prop shaft loop, pulling motor out to three times normal length. Begin winding and coming in at the same time; you can put in several hundred turns this way.

Unhook winder and you are ready for a rapid climb, smooth cruise, and long glide in search of the beehive!

**TUBE-BEE BILL OF MATERIALS**  
3/4 inch OD, 18 inch long Estes

Rocket Tube  
North Pacific "Sleek Streak" Prop  
Assembly and Gear (or get the prop separately if your hobby shop has them)

Plastic End Cap from Polaroid B&W

#### Film Coater

Peck-Polymer plastic nose button  
1/16 x 2 x 36 Sheet Balsa  
1/32 x 2 x 36 Sheet Balsa  
1/32 x 3 x 36 Sheet Balsa  
Aliphatic Resin Glue  
5-Minute Epoxy Glue  
1/8 inch Sig Contest Rubber Strip  
(6 feet per motor)  
1/16 plywood scrap  
1/4 square balsa scrap  
1/8 birch dowel  
Marlow or Midwest 16:1 rubber  
winder  
Trim tapes or decorative decals,  
marker pens.

#### Bakersfield . . . Continued from page 39

Experts trying desperately for the magic figure of 1:12. Tom Christopher, the eventual winner, seemed to be in the neighborhood, with two runs of 1:13 plus, but only one flyer, Bob Violet, with his K & B powered "Polecat" dipped further down to 1:12 flat. Needless to say, there was joy in Downey that night.

When the last checkered flag was down, CD Glen Spickler and his hard working crew awarded trophies to tenth place to the Expert Flyers, West Coaster's except as noted.

1. Tom Cristopher
2. Bob Smith
3. Gary Hover
4. Bruce Richmond, Georgia
5. John McDermott,  
North Carolina
6. Dave Shadel
7. Mike Helsel
8. Walt Riese, Idaho
9. Ed Allen
10. Mike Atzei

Standard Class flyers in the Top Ten were:

1. D.M. Rankin, Canada
2. Leonard Yuen, Canada
3. Larry Eckersly, Canada
4. Gary McPike
5. Tony Huber, Idaho
6. Don Kaylor
7. A.R. Livesly, Canada
8. Joe Gautier, Canada
9. Russ Kine
10. Chuck Bantz

Yes, our Maple Leaf wearing friends did themselves proud; there should have been joy in Winnipeg that night, too. And we certainly wish them and all others who traveled long distances to be here, a good safe trip home.

We were also treated this weekend to some exhibition flying by a number of Bridi Quarter-Scale "Cosmic Winds"; on Saturday after the racing, and one heat of racing on Sunday. The workers on the line were not told that anything different was about to take place, and as the fliers and callers walked out,



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Weight:	27 oz.
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carrying or rolling the big birds, one of the lap counters was heard to say "I thought my eyes had gotten better all of a sudden".

It wasn't an attempt to really race, the guys gave themselves plenty of room both on takeoff and in going around the course. These planes were not really optimized for racing, but for sport flying, and it was obvious in the turns and overall speeds. Nevertheless, it was impressive, and a welcome change of pace for all.

These airplanes, originally designed and prototyped by Bob Seigelkoff, of C.B. Enterprises, are now being produced by Bridi Hobby

Enterprises. The airplane spans 64 inches, with a total of 816 squares. It will fly on any good .60, though Ron Gilman's Webra .91 installation obviously gave it an edge for some of the maneuvers. And the sound of that big engine, with its distinct deep powerful throb without any trace of high pitched bark, is most impressive, and indicative of the available power.

These latest of Bridikits, which includes an epoxy-glass fuselage and foam wing, is priced at \$139.95. I had the pleasure of flying Ron's for a few minutes, and found it to be a real pussycat to fly. It is positive but not tricky on the controls, and any

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Weight ..... 42-48 oz.  
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NMPRA used this prestigious event as an opportunity to present High Points Winners shirt for the 1977 racing season. National winners were:

1. Bob Smith
2. Mike Atzei
3. Bill Hager
4. Tom Christopher
5. Tom Castellano
6. Jim Maki
7. Ed Hotelling
8. Jeff Bertken
9. Dave Shadel
10. Pete Reed

West District winners were:

1. Bob Smith
2. Mike Atzei
3. Tom Christopher
4. Ed Hotelling
5. Jeff Bertken
6. Dave Shadel
7. Laird Owens
8. Ed Allen
9. Mike Helsel
10. Ron Schorr

Soon it was time to go home for another year, most of us wearing at least some sunburn, and many of us with another T-shirt to add to the collection, as seen in the photo. The Bakersfield '78 souvenir shirts were available from Don Martin, of Las Vegas, who is soon to have a line of R/C shirts with various designs. He can also do custom designs for your club or meet. The price is right, the quality is high, and those of you tired of going topless can contact Bob at 5132 Del Rey, Las Vegas, NV 89107. His phone is (702) 878-1624.

We will all watch with interest for the rest of the racing season, to see which way the interest will swing. But whatever the numbers, you can be sure that Bakersfield '79 will see

many of us, racers and fans, back again. ●

### Mammoth . . . . Continued from page 31

overrun on start. Also shown were several aluminum front and rear prop shaft extensions of varying lengths, one type with two dowel pins to positively locate prop in any of six positions. This driver has the advantage of requiring that only two holes be drilled into the prop hub and these can be placed in the best location of the particular prop used and the pins can be relocated in the hub to position prop as required. A second method shown used 3M lagging tape to prevent prop slip. Also displayed were some beautiful spinner nuts, large diameter aluminum prop washers, and a hub to utilize 'inner tube' tires. These prototype units were the work of Allan Easthope, of Kelowna, B.C., who operates under the name of Pro Mach. (Prototype Machine Design Service). Allan is now a member of our team. Some of the design challenges were just mentioned to him, and within a couple of days, he came up with not only the solution but the engineering prototype and a set of working drawings for mass production quotes! The marine version of the Quadra was set up with an AMPS prototype propeller designed especially for the Quadra and the new Dumas heavy-duty cable drive 2325, which is an excellent drive system for use with the Quadra. To adapt to cable drive, simply remove the prop adaptor spool (right hand thread) from crankshaft, use prop washer supplied with engine and place next to the flywheel, and install Dumas' new HD cable adaptor, 5/16 inch for 187 thousandths cable.

We were presented with a beauti-

ful cast aluminum muffler for the Quadra. It is designed for inverted installation, has twin stacks, and provides a very good seal to the engine. This unit was tested by both ourselves and the factory engineers, who were impressed by the quality, performance, and noise reduction. It is available from Charlie Mills, of Millmount Enterprises, R.R. #1, Chatham, Ontario, N7M 5J1. Also under development by another highly qualified firm is a tuned pipe to give a significant power increase with far less than 80 DB noise level at two meters. It is gratifying to see how problems are being accepted as challenges by so many highly qualified people.

I have been asked to give a few examples of mounts which suit Quadra-type engines and which will minimize vibration, etc. First let me give you the problem. The latest version of the Quadra weighs approximately 3 lbs. 10 ozs., ready to run. Of that weight, nearly 1-1/2 lbs. is either reciprocating and/or rotating. The majority of this weight is crankshaft counterbalance and flywheel dampening, to smooth out the single cylinder engine as much as possible.

One of the basic engineering principles which you should keep uppermost in your mind is to connect each of the aircraft's components firmly together; i.e. fuselage, tail, wing into one solid unit. This way, any vibration present has to shake the whole unit, not just the tail, wing, etc., which is far easier. It doesn't take much effort to cause a tuning fork to vibrate an individual reed or tine, but tie several of them together and you not only greatly lower the resonant frequency, but it requires many many times the am-

plitude to make the whole unit even tremble. The motor mount should be considered the foundation of your aircraft, and as a foundation, it must be solid.

The mount supplied with the Quadra was designed to be frangible and so to be sacrificed in a crash in place of the expensive block assembly. The problem is that it must have a solid base to bolt to, and if this is of soft wood (which is crushed down when the bolts are tightened) it will cause the mounting plate to be distorted and actually amplify the vibration effects. It won't be long then before the mount starts cracking up due to metal fatigue. Included this month are some drawings of acceptable mounts.

Another point that must be emphasized is that clearance must be provided for the two screws which hold the mounting plate to the rear of the engine. Failure to do so will cause the plate to be distorted and will also result in short mount life and amplified vibration. Continued running with a cracked mounting plate will result in damage to engine, airframe, etc. I have just talked with Edson Enterprises Inc. (the motor mount people), and his new mount for the Quadra should be available as you read this. We will let you know as soon as we have tested the prototype, which will incorporate shock insulators.

The new stock prop adaptor now supplied with the Quadra engine is hex shaped at both ends and provides a larger surface. Its six sides and corners effectively prevent prop slippage, which has been experienced by some owners in the past. I had not experienced this problem because I had always used a Fox spinner. This is made possible with the replacement of the prop bolt supplied with the engine with part #Q1, prop shaft stud and nut, which allows installation of a Fox type spinner.

Because of the interest in the Quadra engine, it was difficult to get away from our booth at Toledo to see what the other exhibitors were displaying. If I have missed writing about something, it is not intentional, and if you'll let me know what you are producing in the way of large models and accessories, I'll be only too pleased to pass on the information. Writing a new article is difficult, because three are already written before you get the first one, and we start receiving your valuable feedback, pictures, diagrams, etc. and what you are doing. I have received a lot of good pictures of very fine models and ideas used in these large aircraft. The problem is that I can't share most of these with

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The Fox 19 defies explanation. It has neither ball bearings or schneurle porting yet in Club 20 Racing it has so consistently outrun all comers that 1977 Club 20 rules handicap Foxes to 6 mm exhaust outlet. Webras, Tigres, Taipans, OSs & Vecos are permitted to run stock. For 1977 the Fox 19 has been given a beauty treatment, an improved carburetor and the crankshaft and rod have been beefed up a bit. We invite you to fit one of these remarkable motors in your model



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Improved for 1977. Case enlarged to accommodate a beefed up rod. New glass bead finish. Leaning out suffered by some of the earlier models has been eliminated. The two ring piston holds compression better and starts readily by hand. Burns less fuel and weighs less. It does not make very good sense to pay \$60 more for a fancy import when a Fox Eagle will deliver all the power you can use. The service on the Eagle is better too. In event of a minus two foot landing you can call the factory direct for parts and have your engine ready to go for next Sunday's flying.



**FOX 45BB RC**  
only 69.95

The Fox 45 BBRC is alone in it's field. Schneurle ported. 15mm crankshaft. Fox patented crankcase. Two ball bearings. Aluminum piston w/ full floating ring. For 1977 the case has been restyled and a new button type head has been fitted. The Fox 45 BBRC is the most powerful 45RC available today. It is also the most rugged and crash resistant. Most 60 size airplanes designed three or more years ago are handled better on less fuel by our 45 BBRC. Try it. You will be pleasantly surprised.



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you because they are either Polaroid color or color prints, which are too dark when reproduced in black and white. If you can take old-fashioned black and white pictures on a contrasting background, and send them to me or **Model Builder**, we and your fellow modelers will be ever so grateful. Don't worry if your models aren't the world's greatest . . . you have lots of company, me included. Just one item you have done differently or have improved on, can make the world's best modelers give you a vote of thanks. Don't forget to include with your photos the technical information and anything else in the way of explanation of the photo's contents. Remember, the

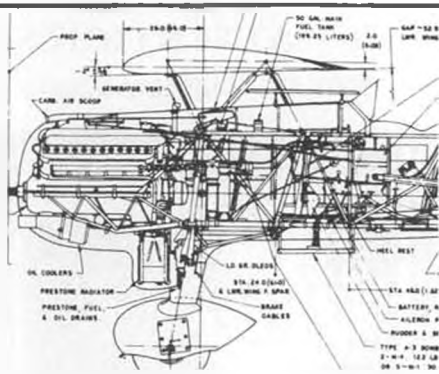
name of this magazine is **Model Builder** and both expert and novice qualify, as it was intended for everyone's enjoyment. ●

F/F . . . . . Continued from page 85

Moseley, from England. Following this introduction is a series of questions about the name of the Mystery Model featured in the May issue, etc. After being on the phone for about 8 to 10 minutes, I realize that the British are running a special event for pre-1960 power models, and since most of the Mystery Models in **Model Builder** Free Flight are just that, it seems that we are an excellent resource. At one time,

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Douglas O-31C/Y10-43	3	8.25
Douglas O-38/O-38B	2	5.50
Douglas O-43A	3	8.25
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Hawker Fury Mark I	4	10.50
Hawker Taper Wing Fury	3	8.25
Hawker Persian Fury	3	8.25
Monocoupe 90A	2	5.50
Sparmann P-1	2	5.50



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**PETER WESTBURG**  
834 Seventh St., No. 6  
Santa Monica, Calif. 90403

various local free flighters and I have discussed the possibility of running an historical FAI Power event. Tom Hutchinson proposed that we fly the models with the engines of the period, with all pertinent rules that applied at that time. Al Grell believes that we might just build an Amazon or Salt Lake City Sadie and power them with Green Head Torp .15s and just show up at an FAI bash with these ships in hand. Might turn a few heads . . . and create a bunch of chuckles. I think that these ideas frequently make the rounds on a cyclical basis. Bob Hatschek is talking up some sort of stepping stone event in FAI Power, in order to induce more participation from newcomers. I have felt that this is a need that should be developed for quite awhile now.

The last time I made a recommendation for change, however, I was soundly booed and hissed. Some crackpot from the Northwest. Now, we have a crackpot from the Northeast. Let's get together and surround them, Bob.

## MODEL AIRPLANES IN THE KINGDOME!!

"Ladies and Gentlemen, may I have your attention please! Today, we have a special treat, as a halftime show of the Seattle Sounders Soccer Match. Today, we have a demonstration of free flight model airplanes."

And so it was. Howard Phillips had arranged for the big halftime demonstration and for 13 minutes, the crowd was entertained. Flying were: Jim Thornberry with Stevo Helmick's Swizzlestick A/2, Ernie Linn and Al Borer with small rubber

powered models and P-30's. Tom Cashman flew his Coupe and P-30 models. Tom also hit a speaker cable, which brought oohs and aahs from the crowd, but the model recovered and completed its flight. Roger Michael got 8 minutes on an untrimmed pennyplane. Jim Walters managed to locate some lift while circle towing at the south end of the Kingdome.

Where there's a will, there's a way, I guess. Good going, guys. TIME TO CLOSE HUMOR. . . Murphy's Laws, or Dirty's Dozen

From the pages of the always well-done CIA Informer, comes the following, from the typewriter of Harry Murphy, editor.

When building and flying a model from a commercial model kit, Murphy's Laws apply as follows:

1. Any balsa strips cut to length will be too short.
2. Any cement, dope, or other liquids included will be dried up.
3. Any parts already cut to shape will be too small.
4. Any printed parts on sheet wood will be illegible.
5. Any watersoak decals included will deteriorate into at least ten pieces when placed in water.
6. Any nuts supplied for use will include those made from stamped tinfoil.
7. The left wing panel will build up to be 2-1/4 inches longer than the right panel.
8. The dihedral diagram will not be to scale and the dimension will be omitted from the plans.
9. Any die cut parts will break when attempting to punch them out.

10. Any \$2.98 Peanut kit will require a set of Hungerford wheels.

11. The plans will state that the completed stab and wing panels are to be perfectly flat, but include spars, i.e. and t.e. strips that will be grotesquely warped, twisted, distorted and alternately soft and grainy.

12. A 2 x 2 inch square of 600 grit sandpaper will be supplied to work down the entire model, including a 4 by 6 inch concrete block supplied for the cowling material.

Enough! Enough, already. If you haven't done it yet, you'd better get on the stick and go out and fly. Or you could wait for another month or two and miss another good season. Whatever you decide to do, **Model Builder** Free flight will be back to haunt you next month.

Happy Thermals. ●

R/C Forum . . . Continued from page 49

replaced the tubes. The transistor opened the door to proportional, but before that it even improved the reed systems. Of course, the transistor reduced the weight and size of the equipment, but of even of more importance was the reduction in battery requirements. From the chart, you can see that the total savings came from almost equal amounts of equipment AND battery reduction.

What is the difference between a tube and a transistor as far as operation is concerned? First, a transistor is a "mineral" device, which will take electricity and AMPLIFY the flow of current. A tube is a "bulb" of glass and metal. As a bulb, a tube must be "lit" by the "A" battery before it comes alive. Once heated up, the "B" filaments can create VOLTAGE amplification. Thus, the "A" battery simply activates the tube, it is the "B" supply which is used to perform the work. Tubes require high voltages and are affected by voltage fluctuations; servos used with them had heavy battery drains. Therefore, it was necessary to keep the servo batteries separate from the radio batteries. "Toy type" motors were used for servos; the exotic servo motors of today were yet to come. The composition of a transistor does the work, not heat, as with a tube.

Therefore, anytime electricity is applied to it, the operation commences. Ni-Cds are STABLE in voltage. As long as the current drain is below their capacity, the voltage remains the same. So, with transistorized equipment you have a low voltage system, and as many PIECES OF EQUIPMENT as you like may be operated off of the single battery source . . . the result being the need

for only one battery, and that being of much lower capacity than with tubes. With the types of batteries required being reduced, and capacity requirement lowered drastically, the greatest saving in size and weight came from the power source.

Today, reliable connectors, and at least one excellent general purpose switch, are readily available. Not so in the past. When you purchased your expensive reed system, you found that you still had to purchase connectors (and the servos) for it and do the WIRING YOURSELF. On top of that, when you went to buy connectors, sub-miniature was something yet to be heard of on the normal market. It became a choice of making your own, using unreliable household types, or purchasing "military spec" connectors. The only real answer was the "military spec" types, and you can imagine the cost when that handle is attached to them! It was nothing to spend from 5 to 10 times as much for connectors as you can buy them for today. Yes, that simple, taken-for-granted connector had a lot of development behind it, which has much to do with the success of the modern R/C systems.


You look at the very widely used Noble switch which we have today, and see something quite simple, very small, and so reliable that we can forget it most of the time. Suffice to say that many a reed controlled plane would have enjoyed a much longer life if the Noble switch had been available. The forerunner of the Noble switch was from the military also, and it too added many dollars to the cost of your R/C system. I hope that this short review of the past has made an impression, especially the amount of progress and value that is represented by these micro-miniature systems which we now enjoy. We have to thank Uncle Sam and the space program for a lot of it, but it took some imaginative R/C people to put the hardware together FOR US.

As our chart indicates, the major portion of the size and weight of ANY system is created by the servos. The servos are also the heart of the control system; they produce the results which we ask for. In addition, it should be noted that as progress has been made, the basis for it, each time, has been something new in servos.

This same pattern has continued with the micro-miniature systems. There is an old axiom which says that if something is superior, it will never be replaced. The FIRST proportional systems which we had, became possible because of the development of a revolutionary miniature motor. The trade name for this

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motor was "Micro-Mo", and it was developed in Germany. You must understand the arrangement of a motor to see the advantage which this development gained. A D.C. motor is composed of brushes, an armature with its windings, and a magnet. The usual motor has a circular magnet, like a piece of tubing in shape. The armature is mounted so that it revolves WITHIN the magnet, on the inside of the tubing, so to speak. The power and efficiency of a motor is controlled by the DIAMETER of the ARMATURE and how closely the armature is fitted to the magnet. The magnet produces an electronic field and the

more times that the windings of the armature can cut through this field, the greater will be the power generated. Obviously, the larger the DIAMETER of a motor, the greater its efficiency. The limitation for R/C is servo size and weight; to a major extent this is controlled by the size of the motor. R/C requires a motor to be MINIMUM in diameter.

The design of the "Micro-Mo" motor is DIFFERENT. This motor places the armature on the OUTSIDE of the magnet; the magnet is inside the armature. Just the opposite of a normal motor. What this does immediately is to increase the DIAMETER of the armature without

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increasing the overall size of the motor. A magnet's greatest field concentration is on its outside, so an "outside armature" also has the advantage of working in a more powerful magnetic field.

The micro-miniature servos use a "Micro-Mo" type motor, which has been developed in Japan. This motor is **LESS THAN HALF** the size of the smallest **NORMAL** servo motor. Even so, the performance of this fantastic motor is **BETTER** than the normal motor. Power output is about the same as the small normal motor, yet the battery drain is **LESS** than **HALF**. That is efficiency in capital letters!

With such a saving in motor size, the next logical step would be to produce a servo to take advantage of its size. The micro-miniature servos are the answer; less than half the size and weight of the smallest servo using normal motors.

These micro-miniature servos do not have the output power of some of the super-servos available today, but they do come close to matching many of the average servos commonly used in all sorts of planes. If we consider the actual power required to operate our plane's control surfaces, the past could again be revealing. Planes **HAVE BEEN** controlled by rubber band escapements

with success. Many of the early servos had far less power than we have today, in fact, it is only with the I/C servos that we have gained any appreciable power. It **DOES NOT** require a great deal of power to operate the average model's control surface. A new example is the Mammoth scale models being flown with average type servos, very successfully.

If you would be concerned, what can be of help, is a bit more attention to the design of control surfaces. Part of the servo's power is used simply to overcome the **WEIGHT** of the control surface and possibly hinge friction. Simply using well hinged, lightweight controls can do wonders, even when ample power is available. Then too, how many times have we been advised to have only freely moving pushrods? Putting this all together, only a fraction of today's average servo power is actually necessary.

Going back to the beginning again, designers were more cautious. They often took advantage of the attributes of balanced controls, just as full scale **ALWAYS** uses. Such aerodynamic and static balancing of control surfaces can do wonders in reducing required control pressures. This could possibly be of help even when excessive servo power is

available. Control action would be more positive and faster. And less power required means less battery drain.

In thinking of these things, we should also bear in mind that the **AMOUNT OF CONTROL MOVEMENT** used in guiding and steering the model is relatively very small. Remember, a couple of turns on a clevis will bring a drastic change in direction when trimming a model.

The same amount, or even several times that, when applied by a servo instead of a clevis adjustment, creates the same results, with very little power required. Naturally, if your model requires drastic control movements to perform aerobatic maneuvers, power is required to do this. However, the actual amount may be far less than one would expect.

It does appear from the engineering viewpoint, that these micro-miniature servos do have sufficient power for use with average models and perhaps larger. What can be their shortcomings? Most obvious is the cost. (This was written before the introduction of Futaba's \$39.95 S20, and the recent announcement of Novak Electronics' "Bantam Midget", for \$31.95 and \$29.95. wcn)

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you simply cannot build a Rolls Royce for the price of a Ford ... Even with the average servo, the motor is a large portion of its cost; with the micro-miniature that portion is much larger. The second possible shortcoming is also the motor. The original "Micro-Mo" motor proved most successful as far as performance was concerned, but it was found to be vulnerable to vibration because of its fragile construction. While it is not yet proven, it is possible that the micro servo motor could be vibration prone also, but let me emphasize that this has yet to be proven. (Also, the manufacturers know more about the vibration problem now than when the Micro-Mo was first introduced. wcn) The test flying of a major brand micro-miniature system was all done in average size and power pattern planes, with no failures noted. The future looks bright. . .

The micro-miniature receivers are smaller and lighter also, to complement the servos and batteries. Happily, the reduction in size and weight appears to come from more efficient packaging than anything else. Such a reduction COULD come from the use of some exotic integrated circuits and/or reducing the capabilities of the circuitry. Ap-

parently this was not necessary, and we have the same old proven reliable receiver circuits in a smaller package, in many ways a "good show".

Today's receivers have been developed to the point where they require a very minimum of battery power. Voltage is about as low as it is safe to use with soldered connections, and operating current is only a fraction of what was formerly needed. When the servo requirements have also been drastically reduced, there is no longer a need for a substantial battery supply. With the original multi systems, battery capacity was considered in AH (ampere hours), and you can believe that it was needed. Today's average system gets along fine on less than 1/2 ampere hours, 450 MAH (milli-ampere hours). That is a reduction of about one-half in battery capacity. The micro-miniature systems take it one step further, and reduce the required capacity by one-half again. You get equal performance from a micro-miniature system with only one-half the battery capacity. That again, represents progress!

So, what practical use do these micro-miniature systems have? Before the obvious, there is one serious consideration any conscientious model designer will have. With ANY

aircraft design, the greatest NEGATIVE factor is "dead weight". Before any design can begin, the engineer must know what the "fixed weight" will be. From that is determined what is needed aerodynamically. The two major "negative" factors to flight and its performance are "fixed weight" and "drag". How does the song go, "eliminate the negative and accentuate the positive"? Nothing could be more true of aircraft design. The less negative and the more positive you have the greater will be the performance. Fixed weight obviously comes from the building materials, powerplant, and the control system. Reduce the weight of any of them in ANY TYPE of aircraft, and the performance will be improved. What a neat opportunity these micro-miniature systems offer. We can reduce the control system weight by one-half, a major saving in dead weight. Add to that the possibility of a smaller fuselage cross-section and a whack has been taken at the other negative factor, drag. What an interesting possibility for the imaginative designer to explore!

The obvious uses for the micro-miniature systems make many of our dreams come true immediately. Full-house 1/2A is a very real possibility. Flying weights should not be

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more than 1-1/2 lbs., well within the limits of .049 power. If you have had ideas for a schoolyard scale job, the time is here; enjoy it!

Glider designers believe that they just have to have mighty slim fuselages, and the average modeler needs a shoehorn to get the equipment into them. Now, with the trend to flaps and spoilers, room for the extra servos has become a premium. The micro-miniatures should fit that need neatly. Also, should it be of any concern, there is no vibration in a sailplane. The micro-miniatures will make many of the problems simpler.

Some modelers are builders; their thing is building and flying. Other modelers are fliers, building is only a necessity to get air time. To the R/C flyer, winter is a tragedy. The free flight "flyer type" often turns to indoor to extend his fun through the winter. Indoor R/C is not an impossibility with these new systems. Paramount would be a light wing loading and a slow flying speed. Immediately, a lightly constructed powered glider would seem to fit the bill in a usable manner. However, it would seem that a little imagination could do better than that!

To conclude, what should be the criterion for using these new micro-

miniature systems? In general, following normal good practice as used with our average size systems should suffice. Close attention to control surface installations would be advantageous, even as it is with larger systems. Perhaps, here is an opportunity to explore the advantages of "balanced" controls, they certainly would do no harm.

Vibration is a problem in some types of models, even when normal systems are used. Solutions have been found for it, mostly by means of good shock absorption. A little ingenuity when mounting the servos should go a long way towards successful operation of micro-miniatures under vibration con-

ditions.

If any advice is in order it would seem to be; spend your money, obtain an EXCELLENT VALUE for it, and have fun!

We had a very nice letter this month from Kenneth Lovelace, who lives down Philadelphia way. Ken has been around a while and operates with an active group in his locality. Modeling often gets sidetracked for various reasons throughout life. Girls, marriage, and illness are often common reasons. Ken seems to have added a new cause. He was kept busy for a year cleaning up after a flood! (Add model magazine publishing to the list! wcn)

Ken and his group have progressed, as many of us have, to rather fast and precise flying pattern type designs. Anyone who has reached this level will tell you: as flying speed increases, along with the desire for precise flying, aircraft alignment becomes more and more critical. You need to build "straight" to fly straight! Anyone who has been exposed to accurate structural assembly, as would be seen around a tool shop, will tell you that the basis of success in that business is a "surface plate". The accuracy of any assembly can only be as good as the foundation upon which it was assembled. Ken and his group have searched for a reasonable supply of "surface plates" for modeling use, and with success. Heavyweight glass is created by pouring and grinding. Gravity and the grinder do an excellent job of creating a true surface. Today, glass doors are often used in buildings. Being used constantly, they often need replacement. Fortunately, a used glass door has little value. The Philadelphia group has found that glaziers are quite willing to get rid of such cumbersome rejects.

What an excellent source for large enough "surface plates" to use for modeling! Before you go in search of a glass surface plate, there are some considerations. First, don't go alone; such a piece of glass is extremely strong, and as a result, very

#### COMPARATIVE WEIGHT, SIZE AND COST FOR ORIGINAL MULTI AND PROPORTIONAL SYSTEMS TO 1978 MODELS

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Servos (4)	9	9	4.8	2.3
"B" Batt. (45 v.)	7	0	0	0
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Servo Batt. (3 v.)	5.2	0	0	0
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Wiring and Connectors	4	0	0	0
TOTAL WEIGHT	35.8 oz.	23.5 oz.	10.2 oz.	5.5 oz.
Retail cost	\$495	\$695	\$300	\$448

Mounting space required for reed and analog systems: 3-1/2 x 4 x 8 inches.

heavy. Take another strong back with you. Prepare your shop for it in advance, a glass door is not something which you can horse around, it should be permanently placed; once and for all. One suggestion for mounting it, other than the logical bench top, is to use it cantilever style. It has ample strength so that one edge can be buried in masonry, leaving the other edges completely free from all obstructions. Once you have it, modelers' ingenuity will certainly find ways of using its precision to good advantage.

Because of magazine "lead time" and all that, as this is being written, I have yet to see the first issue of **MB** with the column in it. So, it was a surprise to receive the **FIRST** reader letter today, it is always good to know that **SOMEONE** appreciates the work that goes into these sort of things!

First in is Graham Ainslea, of Depoe Bay, Oregon. Graham is another example of the fact that old modelers just do not fade away. He built his first model in 1927, first gas job in 1936, later dropped out for a while and now has been in R/C for 7 years. First R/C was a L.W. "Champ" that is still going strong. Has not been flying for 2 years while he built a new house with a "super work shop", what else? Now, has a couple of questions to get started again. His equipment is not new, has been shelved for 2 years, what should he do? From this viewpoint the answer is simple. He wants to get started right, wants no R/C problems. Send the equipment to a first class service center for a "check-up". When he gets it back he will **KNOW** that it is in fine shape, including the batteries which concern him now.

Graham will be having a Mammoth Scale for his next project. Has some concern about being able to use "normal" servos with it. Wishes some manufacturer would produce ultra-powerful servos for use with these models (???). It seems reasonable to expect that if this big plane movement continues, some of the manufacturers will see the need and **WE WILL** have special servos available for such use. However, things like that are not developed overnight. It will take some time to do it.

In the meantime, I am happy to tell Graham that a column is already in the "pipe line" which discusses the use of "normal" servos with the big planes. I believe that he will get some good out of that column, and hopefully, some answers to tide him over until what he really wants, is available.

I hope that you will remember that we do want **YOU** to be part of these discussions, please feel free to

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**Sailing . . . . . Continued from page 59**

*secretary, they all tell me what a great job I'm doing and they wouldn't want to change that.*

*"So it goes. But I must remember that I started this thing; I wanted to create interest, and through a push and a shove, got this club going. So I must keep it going. . . We sail mostly Pea Pods (MB Plan 4733, \$3.25) and have all kinds of fun. Fast to build, cheap and easy. Fun is the name of the game. We race, follow rules, but try to keep the fun in the hobby. Maybe that is missing in other clubs. We always tell new members "have fun". Enjoy building, enjoy the fellowship of our club. Sail to win, but remember to have fun while doing it. Share your knowledge, share your tricks, but also discuss your mistakes so we can all learn together. . .*

*"I surely wish I could contribute something to your column in Model Builder. Maybe one day. . ."*

Well anyway, that is what I got in the mail. Two letters . . . Kind of reminded me of the meeting they called at Central University to discuss student apathy. Three people showed up!! (Wouldn't it be neat if two countries declared war on each other, and nobody showed up to fight! wcn)

The following outline was drawn up for members of the Noroton Junior Yacht Club in Connecticut, as an introduction to the racing rules. It may prove to be a handy introduction to new skippers who are immediately thrown into the water with the fleet. Merely reading the USYRU rulebook does not give the beginner what he needs. It is filled with too much detailed verbiage that is not immediately useful to the newcomer. You might make copies of these rules and hand them out at the lake to everybody.

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2. When booms are on the same side, windward boat keeps clear.
3. Overtaking boat keeps clear.
4. If right-of-way suddenly switches to you, give the other boat time to respond and room to keep clear. Don't hesitate to hail a warning.
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6. At the start, "Don't Barge" means don't try to squeeze between a boat close to leeward of you and any starting mark.

7. If recalled, keep clear of all boats that start properly. You have no rights while returning to start until you are on the "before starting" side of the starting line.

8. Don't tack or jib too close (And if a boat is close behind you, don't tack around a mark unless clear to tack if the mark were not there).

9. When you are two boat lengths from a turning mark or an obstruction or a finishing mark, give room to all boats that have inside overlaps on you.

10. When another boat tries to pass you to windward, you may luff him until his stern is abreast of your mast, at which point your right to luff ceases and you must resume a proper course.

11. If you are on a reach or a run when another boat attempts to pass you to leeward, don't bear off below your proper course; and if the other boat overlaps you to leeward, he will be unable to luff you until he has pulled clear ahead.

These 11 points will cover the better part of the situations you encounter on the course. The last one, No. 12 is often overlooked.

12. Even when you have the right-of-way, it is your duty to avoid a collision.

Though the month of April has come and gone as of this writing, I have yet to receive any reports of regatta activity. I am finding it hard to serve the sailing fraternity without any help from you out there. When you are sending in a report on your regatta to the AMYA Quarterly Newsletter, why not send me a copy? I can guarantee I'll get it into print just as fast. A lot of potential newcomers will learn of activity in their areas. You quiet sailors have a need for publicity.

Take this opportunity to send in your \$5.00 annual dues to AMYA, 2709 S. Federal Highway, Delray Beach, FL 33444. And if you will enclose a stamped, self-addressed envelope, I'll field questions at: 7608 Gresham St., Springfield, VA 22151.●

**Counter . . . . . Continued from page 10**

All kidding aside, the term means that it will not migrate, will stay exactly where you put it, instead of flowing off to leave a weak joint and to cause a problem somewhere else.

Designated as Formula 3, this latest Hobbyoxy product is formulated to a gel-like viscosity that you can

apply to vertical surfaces, thin edges, and anywhere that thinner glues might run off. It is recommended for planking fillets, filling cracks, and joining between poorly fitting parts. The more you use it, the more places you will find that need it.

Formula 3 is packaged in two four-ounce cans, is mixed in a one-to-one ratio, cures overnight, with a one-hour working time.

And for those show class finishes, a filler compound is also available, designated as P.F.C., Polyester Filler Compound. It is a two-part filler, in pure white only, that requires the addition of a catalyst to set. It is perfectly compatible and will set over and on most common model materials. It sands easily and smoothly, and will accept most primers and paints.

As with all products of these types, some care should be exercised during their use, as they may cause irritation to the skin and eyes. Use with good ventilation and don't leave them on your skin for any long periods.

Check your local shops for these new goodies from Hobbyoxy Products, 36 Pine St., Rockaway, NJ 07866.

\* \* \*

Fans of Joe Bridi and his excellent line of kits must be hard pressed when it comes to deciding which one of the many successful and appealing airplanes to build next. Sorry, we can't help you make that decision, but we do have some suggestions about some necessities for two of these kits, the "Shrike" and the Quarter Scale "Cosmic Wind".

For the former, the funny-looking plumbing in one of the photos is a scale muffler and exhaust system manufactured by Macs Mufflers, 8020 18th Ave., Sacramento, CA 95826. It is available for a variety of .40's, such as the K&B, Enya, H.P., Webra Speed, and others. The system comes complete with detailed instructions and all the hardware necessary to attach the assembly to the engine and in the nacelle. The model for the K&B is \$45, for the others it is \$50.

And if your choice of Joe's birds is the Quarter Scale "Cosmic Wind", and you are considering a powerplant, we recommend the Webra .91 for your consideration. We first introduced this beauty to you in our March/April issue, and now would like to show you an installation in the Cosmic Wind. As can be seen, it is a perfect fit in the available space, and the cheek cowl covers it without an opening being required for the head. In the air, the combination is perfect, and there are already a number of them in California skies.

The muffler used in this installation is a home made adaptation. A tuned pipe is available from the importer, as is a muffler from Macs Mufflers. Either should fit easily into this big airplane.

Webra engines and accessories, are available from Model Rectifier Corp. (MRC), 5200 Woodbridge Ave., Edison, NJ 08817, and its many dealers.

Bridi Kits are manufactured by Bridi Hobby Enterprises, 1611 E. Sandison St., Wilmington, CA 90744, and available from distributors and dealers throughout the U.S. and the world. Tell them all you read about these goodies in **MB**.

\* \* \*

It'll be news to most of the present generation of fliers, but there was a time when a dollar would buy a couple of gallons of model airplane fuel! White gas, and seventy-weight motor oil, that is. It's still only about a dollar per gallon.

And ignition engines run much longer on an ounce of fuel, which alone makes them attractive for some events. They can, however, pose a problem when installed in an R/C model, as not all radio systems will work reliably in the vicinity of the electrical system used to generate the hot spark at the plug.

77 Products, manufacturers of ignition conversions for most present-day glow engines, is also producing a transistorized, completely shielded ignition system that will effectively prevent all interference problems. The advantages are twofold; the points switch a very low current, therefore no sparking occurs which pits them, causing erratic running, and the radio interference disappears.

The 77 Products transistorized ignition system is complete, ready to install, and includes the coil assembly, switch assembly, shielded high-tension lead, battery pack and charger, and a special plug wrench. It is available with two types of airborne batteries, a 250 MAH pack that is good for 20 to 30 minutes flying time, and a 1.2AH that will last about 1-1/2 to 2 hours. You also have a choice of high tension lead assemblies, one for plugs with 1/4-32 threads, and a larger one for 3/8-24, and 10mm threads.

Airborne weight with the 250 MAH battery is 9 ounces, and 12 ounces with the larger battery. The complete system is priced at \$85, extra batteries are \$15.50, and extra chargers are \$6.25. All from 77 Products, 17119 S. Harvard Blvd., Gardena, CA 90247.

\* \* \*

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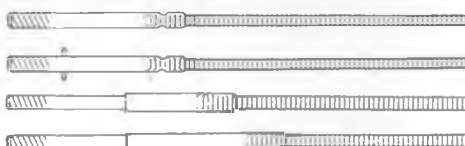


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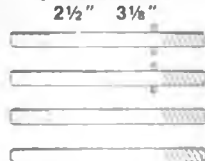
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of the YS.60SR R/C engines used by Mr. M. Kato of Japan, refers to this powerplant as "the COOL one". The design is such that it can withstand extremely high temperatures.

Along with which it also features an integral fuel pump and carburetor system, bolt-on muffler, and Schneurle porting. The engine is ruggedly built, with heavy mounting lugs as needed for proper support. Total weight, including muffler, is 22-3/4 ounces.

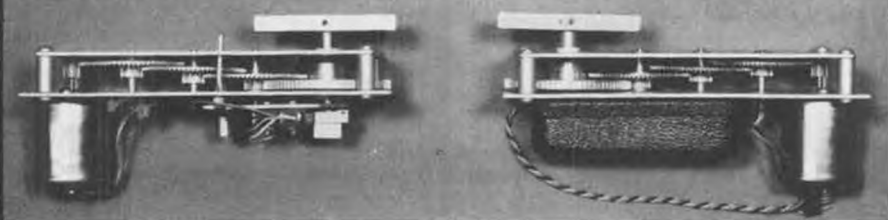
For further technical and availability information, please contact Reading Hobby Supply, Church Lane Rd., RD #3, Box 583AB, Reading, PA 19606.

\* \* \*

Thunder Road Automotive, a division of Tatone Products, has just announced its "Thunder Volt", a 1/12th scale electric racing car. It starts with a pressure-laminated fiberglass chassis, and features a one-piece aluminum front end, fully adjustable motor mount, and support for ny-liner bushings. It uses standard JoMac front spindles and rear axle.

Optional equipment can also be obtained from Thunder Road for use of this car in the new ROAR Modified Class. This equipment includes ball bearing rear axles, and

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W-2 . . . \$119.00

● Custom R/C design for all boat sizes ● Power - 40 in. lbs. ● Travel time - 5 seconds ● Voltage - 4.8-6 (W-1) ● Size - 2 x 2 x 5 inches.

The Probar W-1 is mechanically operated by a separate, neutralizing servo. The Probar Propo W-2 is designed to plug directly into the receiver, and requires no extra batteries. Specify Kraft, Futaba, or no connector. Both winches are fully assembled and tested, ready to install. All mounting hardware, switch pushrod (W-1 only), and winch arm blank are supplied.

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**MISCELLANEOUS ITEMS:**

Sheet exit guides, Bowsie, Rudder posts, Mast head fitting, Dacron sheet line.

*Dealer inquiries invited*

PROBAR DESIGN P.O. BOX 639 ESCONDIDO, CA. 92025

a mount to locate the motor in front of the rear axle. The car can be used with either four or six cells.

The chassis kit, less wheels is only \$29.97, available at all hobby shops featuring R/C cars, or directly from Thunder Road Automotive, 1209 Geneva Ave., San Francisco, CA 94112.

Dumas Products, Inc., "The Model Boat People", has announced its line of model boat kits for juniors and beginners. These all wood kits are available for a sailboat, and for 12 inch speedboat, cabin cruiser, and harbor patrol boats.

The powerboat kits are also available complete with electric motors and hardware, if desired.

For more information, write Dumas Products, Inc., 909 E. 17th St., Tucson, AZ 85719.

A completely different approach to a prop reduction unit has been taken by Florida's Robinaire Company. The results are a compact, engine mounted unit that does not add to the height or width of the original engine, and only adds slightly to the overall length. It is shown mounted on an HP-40; a .60 version is also under development.

These reduction units are to be custom made, and will be mated directly to a customer's rear rotor engine. A more conventional separately mounted and coupled unit will be made for use on a wider variety of engines.

We do not have information on recommended prop diameters or rpm figures at this time. The Robinaire prop drive will be available in October, with deposits against delivery positions to be taken in June. Write for information.

Another interesting new Robinaire goodie is a smaller shock link and overtravel device, companion to its SL-1. It is named the SL-2, and is designed for servo protection on 1/12th scale electric cars or glow plug engine cars. It is only 1-5/8th inches long, with 2-56 threads for connecting to threaded links or pushrods.

Look for Robinaire products in your local hobby store, or write directly. Robinaire, P.O. Box K, Boca Raton, FL 33432.

If you have an engine, and an airplane, helicopter, car, or boat, the chances are that Slim Line has a muffler to fit. It has many mufflers designed especially to fit certain engines, as well as universal models for unusual or recently introduced engines. And it has various styles of mufflers, tailored for competition, sport scale, helicopter, or standard purposes.

Our photos show the Sport Scale 1 Muffler, mounted on the K&B .35 R/C, which is designed for cowled installations. The extra length tubing can be cut off after it exits from the cowling, or it can be cut off short and copper tubing connected and formed as desired.

The Webra .61 is shown with a Slim Line Sport Scale II Muffler, designed for an absolute minimum of rpm loss, and just the ticket for in-line exhaust planes. It is available as shown, and also in a perfectly straight type that will exhaust straight away from the engine. Sounds perfect for helicopters, and those large cowling airplanes.

All Slim Line Mufflers are fabricated of top grade bar stock aluminum and tubing, and will fit with little or no mismatch between muffler and engine. They come complete with stainless steel attaching hardware, and pressure fittings are available on appropriate models.

You need a catalog to learn about all the possibilities . . . and to see which Slim Line fits your exact needs. Write and ask for yours: Slim Line Mufflers, 8631 E. Roanoke, Scottsdale, AZ 85257.

The 1930 Fleet! Isn't it beautiful? I think so, though I'll admit to some prejudice. It wasn't 1930, regardless of what some of my so-called friends might say, but the Fleet was the very first airplane I ever flew in. And now Concept Models has a kit for one in Quarter Scale! Where am I going to find the time. . . .

It is a big one, designed for the Quadra, Webra .91, or one of the .60/reduction unit combinations. It has an 86 inch wingspan, an area of

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2100 square inches, and an all-up weight of 18 to 20 pounds. Normally all it will require is a four-channel radio, unless you plan to do such things as crop dust with it, in which case you'll need a few more.

All dimensions, moments, rib spacing, fuselage and tail structures are scaled down from full-sized plans. It uses a semi-symmetrical airfoil, and lifting stab, for graceful, slow, and fully aerobatic performance.

Building this model should be a whole new experience in itself. It contains over 350 cut balsa, ply and spruce pieces, pre-formed landing gear and cabane wires, complete hardware, full-size plans, and a 16-page instruction book filled with 3-views, photos, and historical data. Even instructions and plans for the dummy cylinders are included.

This kit is a limited production item; available only through a few dealers, or direct from Concept Models, 2776 Syene Rd., Madison, WI 53711.

\* \* \*

"For That Competitive Edge", is the way that RM Enterprises describes its free flight and Nordic glider kits.

In 1/2A Free Flight, it is the 1/2A Maverick, 260 sq. in. of high per-

formance that is said to climb and glide with the best. This deluxe kit features specially selected balsa from Superior Aircraft Materials; all machine cut. Included also is all necessary stripwood, detailed plans, and complete building and flying instructions. The 1/2A Maverick kit is priced at \$15.50.

You say you like them bigger? Then how about a Zingo, for FAI or AMA Class A or B. This one is a partial kit, that includes all curved parts machine-cut from quality balsa and plywood, and detailed plans. Only stripwood and fuselage sides need be added. The Zingo partial kit is \$15.00.

And towliners can probably do no better than Tom Hutchison's Ultimate Dragmaster, an improved version of the Dragmaster, claimed to be successfully flown by more persons than any other Nordic glider in recent years. The improvements are good for 20 to 25 seconds better performance in still air, without the loss of any thermability or easy tow characteristics. This A/2 glider has been fully tested and is a cinch to build.

The Ultimate Dragmaster is available as a Deluxe Kit, at \$24.50; as a Deluxe Kit with fiberglass boom at \$29.50; as a partial kit less plans and stripwood at \$15.50; or as a double

kit, which includes everything for two airplanes, with only one set of plans all in one box, for only \$45.

All prices include shipping within the U.S., and can be ordered from RM Enterprises, 3255 NW Crocker Lane, Albany, OR 97321.

\* \* \*

Does that new Mammoth Scale project need something up front with 22 lbs. of measured thrust? If so, a Quadra engine, 24 x 10 prop, and "Super Drive" from Andy Sheber Inc. might be exactly what you are looking for.

This belt-driven reduction assembly is manufactured from steel brackets, and aluminum timing pulleys, and bolts on in 30 minutes or less. The weight is 1.7 pounds, plus the weight of the engine itself, and it will turn the prop at 4400 to 4600 rpm, depending on the engine. It is priced at \$149.95, from the manufacturer, or from dealers that cater to these larger craft. Andy Sheber, Inc., 18497 Brentwood, Livonia, MI 48154.

\* \* \*

It is mid-May, as this is being written, and it is definitely spring. According to the news media, one million people were at the Los Angeles area beaches last weekend. I wonder how many other millions

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tried to go but couldn't find a parking spot.

What does that have to do with "Over the Counter"? Well, we can't bring you a preview of this season's bikinis, but we can tell you about another spring event, the Spring 1978 edition of the Heath Company catalog.

The world's largest manufacturer of kit-form electronic products has hundreds of interesting and useful projects for you to choose, from model and hobby items, to home entertainment units, things for your car, plane or boat, and now, even personal computer systems.

The electronic bug, the radio amateur, the student, the modeler, the CB'er, and even the tinkerer... none should be without this free 104 page catalog. Available for the asking from Heath Co., Benton Harbor, MI 49022. Be sure to mention **MB** when you write for yours.

\* \* \*

The Japanese Army-Air Force Kawasaki Hien Type II (Flying Swallow), by any other name, is still a "Tony". And you Sport Scalers will be happy to know that a .60 size model of this WW II fighter is now being made available from Ikon Northwest, P.O. Box 566, Auburn, WA 98002.

It is the latest in the line, which also includes the Hawker Hurricane, and Italy's M.C. 202 Folgore. Like the previous two, the "Tony" kit includes a fiberglass fuselage and machine-cut foam wing cores. All necessary wood is also supplied, hand cut to shape where necessary. Landing gear is pre-bent, and hardware for the tailwheel is supplied. Material for air scoops, exhaust stacks, radiators, and other details is supplied, if you decide to go all the way on this one. Included also is a detailed construction manual, with step-by-step instructions and photos, including optional installation of flaps and retract gear. The canopy is molded especially for this model, and includes raised framing line.

Wingspan is 63 inches, area is 650. A flying weight of 7 to 8 pounds can be expected, depending on radio, paint, etc. Spares are available, if they should ever be needed. The "Tony" is priced at \$129.95, direct, or on order through your dealer.

\* \* \*

Foam Wings Cores... there are groups of modelers who will use nothing but, and there are others who won't use them under any cir-

cumstances. Some of the latter have probably never tried one, or else got scared off by someone else's horror stories about them. My experience has been that a major problem is the adhesive used to stick on the covering. It takes some experience to be able to get the proper amount on, without overdoing it and winding up with the heaviest wings in town. And then too, some of the adhesives in use tend to dry, get brittle, and allow the covering to come loose in time.

Looks like some of these problems are about to disappear, with the introduction of "Supertape", from Super Wings, 11015 Glenoaks Blvd., Pacoima, CA 91331.

Supertape is a double-sided adhesive tape, weighing only one gram per square foot of area, and leaving only .0005 inches of gluing material once the backing is removed. It sets instantly upon application, thus saves the usual overnight blocking and drying required with other glues.

It can be rubbed off, if mistakenly applied to a surface, but once both parts are stuck together, the peel strength is such that it will pull up pieces of foam without the glue joint itself coming loose. It bonds at 50%, or about 8 pounds per square inch upon application, and grows stronger with time.

"Supertape" comes in 3/8th and 1 inch wide rolls, 2160 inches long. A roll of 1-inch tape is therefore enough to sheet a 1000 square inch wing on both sides, with a bit left over for practice. The introductory price is \$6.95 for the wide, and \$3.95 for the narrow tape; with probably a small price increase some time in the very near future. So don't wait to try "Supertape".

\* \* \*

This year's Toledo show saw the debut of the exciting new Kendel Twin, a very realistic looking, rear flange firewall mounted 1.2 cu. in. opposed twin cylinder R/C engine. It differs somewhat from other twins, in that it uses "separate" crankcases, each with its own Perry carburetor, for each cylinder. This practically eliminates wrong settings, or different settings for each cylinder under flying conditions. For best operation, a fuel pump is recommended.

The Kendel Twin weighs 30 ounces, has a compression ratio of 9 to 1, and operates with an rpm range of 2500 to 13,000. It is claimed to swing a 14-6 prop at 11,000, and a 16-5 at 10,000 rpm.

The pistons are single-ringed, operating in a steel, chromed liner. The rods are forged aluminum, using bronze bushings at both ends.



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Plus! New NAMBA Oval Record  
of 1 min., 13.4 sec.

and the crankshaft is Stressproof steel, running in twin ball bearings. The heads, crankcase, and cylinders are also aluminum.

Operation is said to be simple, and complete instructions are included.

The Kendel Twin is priced at \$325, and is available from Kendel Model Engines, 43443 Telegraph Rd., Elyria, OH 44035.

The sharp looking "Mr. Mulligan" is not a Mammoth Scaler, not even a smaller sport scale. It is an eight-inch wingspan model, made up from a printed cardboard sheet, with a little color added here and there.

It all comes on two 8 x 10 sheets of light cardboard, that you cut, bend and glue, and comes complete with instructions in a decorated envelope, ready to address and mail to some modeling friend.

It is not meant to fly, though in addition to the esthetics of it, should also have some value to the new modeler and youngster as it will teach phraseology and other modeling skills.

And it will be welcome by any ill friend to whom you'd like to send a get well card. \$2.00, postpaid, from Olde Time Hobbies, P.O. Box 331, Bellerose, NY 11426.

The everlasting problem of "what color to paint it and what to paint it with" has all of a sudden been eased somewhat with the introduction of Pactra "Aero-poxy". It is a new line of specially formulated, two-part finishes designed for gas powered models of all types.

Aero-poxy dries to a totally fuel-proof, mar resistant finish. It uses a non-irritating and non-sensitizing curing agent that eliminates dermatitic or respiratory problems, is free of lead hazards, and is non-toxic when dry.

This new finish is available in four or eight-ounce cans, and in Phantom Black, Radar White, Rocket Blue, Solar Orange, Fighter Green,

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65" WING SPAN  
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Trainer Yellow, Marauder Red, Sabre Aluminum, and Clear Gloss. Primer is available in eight-ounce sizes only. Catalyst, in either of the two sizes mentioned, can be purchased in your choice of Super Hi-Gloss or Flat, for brush or spray application, to give you more versatility in your choice of finish. Thinners, either for brush or spray, are available in sixteen and thirty-two ounce sizes.

Look for the display rack of these paints, including color strips, at your favorite hobby store. From Pactra Industries, 7060 Hollywood Blvd., Los Angeles, CA 90028.

TAB's Book No. 907 won't help you break 1:12 at the next Formula One race, but our boat fans will no doubt find it extremely interesting.

It is entitled "Building Model Ships From Scratch", and contains 378 pages, with 217 illustrations. It tells you everything you need to know to convert \$50 to \$75 worth of materials into a ship model that is worth from \$400 to \$500 on the market, and much more in satisfaction and personal pride.

The book starts you with a brief history of sailing, and explains the different sailing ships. It tells you about plans, and about the language of the shipwright. Actual construction steps for every part of the ship,

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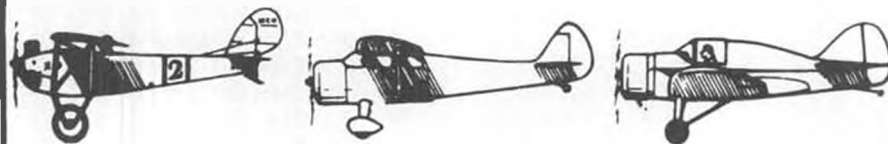
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from the hull to decks and furniture are included, as is complete information on the rigging of your project. And to show it off and protect it... how to build a variety of display cases and name plates, etc.

Highly recommended reading for all experienced and would-be sailboat builders and enthusiasts. Available from TAB Books, Blue Ridge Summit, PA 17214, in either paperback, at \$7.95, or hardbound at \$12.95.



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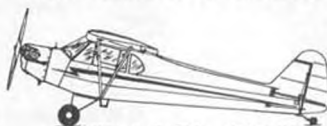
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## VINTAGE R-C PLANS



PIPER J-3 CUB - 1/4 SCALE  
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maximums. This, however, would only control models for Mammoth Scale. Someone could duplicate, or even exceed . . . urk! . . . the 1/2 scale Champion seen at Toledo, and unless AMA has an overall weight and wing loading rule, you might see war surplus target drones at the local flying field!

Though all areas of modeling should be concerned, it is fairly obvious that the limit breakers are going to be R/C type aircraft, and it therefore falls pretty dead center on the R/C Contest Board to develop the parameters needed. We invite your suggestions on this matter. It is both logical and a demonstration of our capability that the modeling fraternity solve the problem before the FAA has to ask us to do it. •

Workbench . . . Continued from page 6 of the G.E. battery booth at Toledo. His solution to the matter turned out to be both simple and satisfying . . . The abbreviation for nickel and cadmium are "Ni" and "Cd" respectively. Put them together with a hyphen and you have "Ni-Cd", which is used by industry, and is close enough to be recognized, yet clean as a whistle.

Now if we could just get everyone to say, "Pick up your trusty Uber Sciver and . . ."

### PRODUCT LIABILITY

Get into a discussion with model manufacturers about product liability and you'll notice a sudden seriousness and tension come into the air, accompanied by a few white knuckles. The "ambulance-chasers" have discovered a ludicrous, yet lucrative method of making money off of hobby manufacturers, on the basis of product liability. If a modeler quite innocently, or otherwise, clobbers another human being with his aircraft, be it R/C, F/F, or C/L, not only is he subject to a lawsuit, but also the dealer who sold the individual products that made up the model (kits included, no matter how much the builder may have modified it), the distributors who sold to the dealer, and the manufacturers who made the products! Case histories are on record to prove just how ludicrous it can get.

Perhaps the model hobby, which like auto racing, only gets national publicity when a juicy accident occurs, is in line to get a little relief from this ridiculousness. In the latest Gold Coast Flyer's (Florida) newsletter, edited by Col. Art (P-38, June '78 MB) Johnson and his wife Charlotte, he points out that a recent study shows that in a 12-month period, 24 deaths and 106,000 injuries were attributed to skateboards. That certainly seems like a much greener back yard for the money-suckers. And though we haven't seen any statistics as yet, the Moped should create an even more profitable field of endeavor for the unscrupulous members of that otherwise honorable profession. These extremely popular and economical transporta-

R/C World . . . Continued from page 17

on HOW we fly our models, not WHAT models we fly.

However, it appears that we are rapidly approaching the need for overall limiting specifications for models, beyond which they become full-sized aircraft (if only in manner of description) under jurisdiction of FAA.

By the time you read this, we plan to make an official proposal for Mammoth Scale, with the main feature being the specification

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.020 Replica Kits: **PLAYBOY SR., STRATO-STREAK, BROOKLYN DODGER, SO-LONG**. FREE PRICE LIST, J & R Models; 5021 W. Sheridan St., Phoenix, AZ 85035.

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tion devices are flitting all over the public streets and highways, with little or no regulation to protect the innocent motorist from taking the blame in a collision.

**WHEN IN MANHATTAN...?**

Being chairman of an AMA contest board, we are fully appreciative of anyone's efforts to establish firm, final, and official rules for modeling, no matter what the category, AMA oriented, or otherwise. For that reason, when we found that after due consideration, Ed Whitten,

editor of that fine newsletter, "Star Skippers", had taken the bull by the horns and published THE OFFICIAL MANHATTAN FORMULA RULES, we were immediately compelled to add our weight ... for what it's worth ... to Ed's action, by publishing those rules herewith:

1. The minimum airframe weight, less rubber, shall be 4 grams.
2. The maximum overall length, measured from front of prop bearing aft, shall be 20 inches.
3. The fuselage must...

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a) support and enclose a single rubber motor. No motor sticks.

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(A square is still a square, even if rotated 45°! wcn)

c) have a windshield of 2 sq. in. minimum area, plus a window on each side of 1 sq. in. minimum area, covered with cellophane or similar transparent material.

4. The prop shall be all wood, direct drive, and fixed pitch.

5. The wing shall be a monoplane with a maximum projected span of 20 inches and a maximum chord of 4 inches. Wood bracing allowed.

6. The stabilizer shall be a monostab with a maximum projected span

of 8 inches, and a maximum chord of 3-1/2 inches. Wood bracing allowed.

7. Landing gear shall be rigid and fixed, with at least 2 wheels of 1 inch diameter. Gear must be able to support airplane.

8. Covering, except for windshield and windows, shall be paper only (condenser paper is allowed). No film or microlite.

9. All flights shall be at least two-point R.O.G. Best single flight counts, of unlimited number of official flights (or of limited number of flights, if desired).

There you have it. Stick to these rules, and you'll be doing the same thing all other "Manhattaners" are

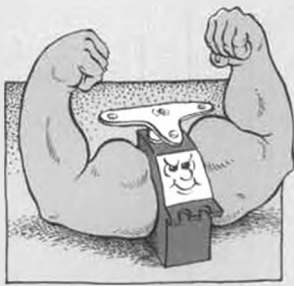
doing, and as the old saying goes, "When in Manhattan. . ."

BIPE CHAMPS

Rather short notice, but we call your attention to the Sixth Annual National Multiwing R/C Championships, to be held on July 8 and 9, at Hawk Field, Omaha, Nebraska. This contest is strictly for aircraft with two or more wings (and that doesn't allow for one wing on each side of the fuselage!), and this year, prizes and trophies amount to more than \$2,000 in value.

For complete info, contact Olie Olson, Jr., 6111 Maple St., Omaha, Nebraska 68104.



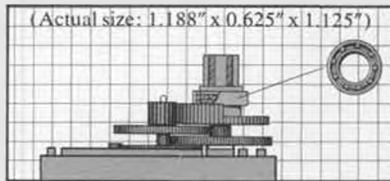


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