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## On the cover

A modern replica from another era, the Kloud King XL from Beehive R/C Model Aircraft Co. is a fine R/C sport/trainer that was originally designed as a freeflight in 1938. Photo: Dr. D.B. Mathews. American R/C Helicopters' new Atlas Van Lines Unlimited awaits action. Photo: Vic Macaluso.

## Aircraft features

- 24 **Faser/(Al Trapanese**  
Contemporary pattern aesthetics in a 25 size machine
- 28 **Freeflight at the 1983 Nats/(C.A. Shaw**  
Great indoor facilities and fierce outdoor competition
- 32 **Beehive's Kloud King XL/(Dr. D.B. Mathews**  
An FM Product Review: This 1930's replica comes already framed-up
- 36 **MRC's Cessna Skyhawk/Bob Aberle**  
An FM Product Review: A rugged and realistic ready-to-fly design
- 40 **Lifting Body Bostonian/(David Aronstein**  
Twin pusher props and a lifting fuselage add up to an unusual freeflight
- 43 **Airtronics' FM Receiver/Bob Aberle**  
An FM Product Review: The newest entry into the FM, 72 MHz R/C market
- 46 **Analysis of Model Aircraft Structures/Paul Bell**  
Some insights on improving your model's strength
- 50 **C/L Stunt at the 1983 Nats/Windy Urtnowski**  
Jim Casale tops a very talented field of aerobats
- 52 **Frequency Facts/Bob Aberle**  
The new frequencies perform flawlessly at the 1983 Nats
- 54 **Executive Design's Rockwell Commander 112/Tony Lombardo**  
An FM Product Review: Outstanding fiberglass components highlight this kit
- 56 **Rubber Winding Techniques/Don Ross**  
Back to . . . Square one: More about rubber motors
- 58 **Flyin' Things for Fledglings/Earl VanGorder**  
More news from the gang
- 62 **R/C Giant Scale/Frank Costello**  
A visit to the Somers Giant Scale Fly-in
- 65 **R/C Pattern/Dean Pappas**  
Use of differential throws in trimming
- 66 **R/C Soaring/Bob Crane**  
What's new in RTF sailplane kits
- 67 **F/F Sport/Gene Sellers**  
Taming of the wild beast, or, trim, trim and more trim
- 68 **C/L Combat/Phil Cartier**  
The 1983 Fast Champ reviews the Nats Combat events
- 69 **C/L Stunt/Windy Urtnowski**  
ST 60: The gentle giant of stunt

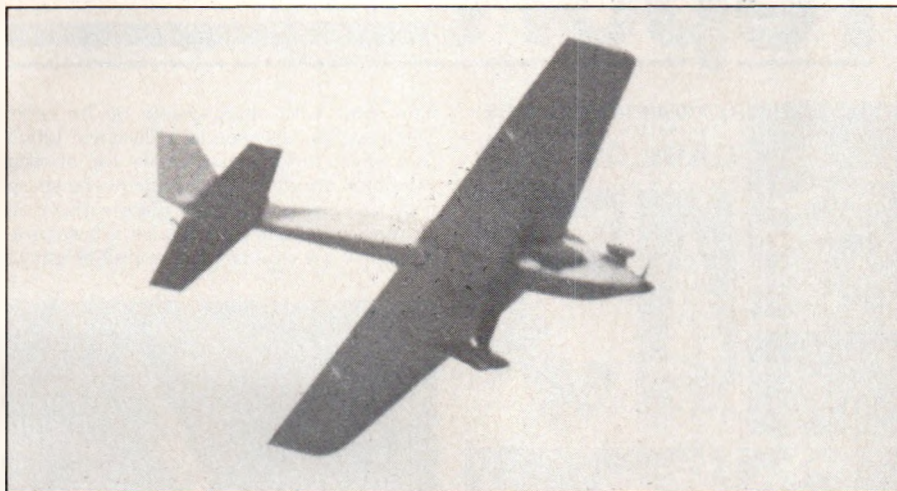
## R/C model boating

- 72 **Atlas Van Lines Unlimited/Vic Macaluso**  
An FM Product Review: American R/C Helicopters, Inc. makes a big splash!
- 78 **R/C Scale Boats/Eric Goldschrafe**  
Englishtown, Huntington, and a voice from the past
- 80 **1983 Mini-America's Cup/Rich Palmer**  
A bon voyage to the '83 series

## Departments

- |                        |                            |
|------------------------|----------------------------|
| 5 <b>Editorial</b>     | 81 <b>Letter Rip</b>       |
| 6 <b>Flying Report</b> | 86 <b>Timetable</b>        |
| 22 <b>Air Mail</b>     | 88 <b>Classified</b>       |
| 64 <b>3-View</b>       | 89 <b>Dealer Directory</b> |
| 70 <b>Pit Report</b>   | 90 <b>Ad Index</b>         |

# editorial



FLYING MODELS takes off into another year with another feature construction article on a Small Model Category plane, the *Faser*. Designed by Al Trapanese for .25 size engines, it's a sleek sportster.

It's "ring out the old, ring in the new" time again, and may I be among the first to wish you a healthy, happy, and prosperous new year.

Let's take a moment and reflect a bit on the past year, as it was a most momentous one for our hobby.

Although the new R/C frequencies were officially obtained in late 1982, it was the flying season of '83 that proved them out. If contest reports and club feedback are any indication, then the new frequencies have scored a resounding success in their first full year of operation. If I'm not mistaken, there were no reports of interference on them at the Nats, where they were in heavy use.

Speaking of the Nats, I must say that it was among the highlights of the year for me. It has been a long dry spell for the east coast without them and after fourteen years the modelers who have been lamenting the absence of the championships in this area proved their sincerity by showing up in near record numbers to compete, help out, and spectate.

Another first was the inclusion of a National Convention into the scheme of the Nats. A veritable smorgasbord of modeling delights greeted those who attended.

I was personally glad to see a return to a more traditional or "old style" Nats, where all (or at least most) of the events were gathered together on one field. If you remember the Navy sponsored events of the 1950's 60's and early 70's then you'll know exactly what I mean.

Our national organization, the A.M.A., had a good year too, as they made the move from Washington D.C. rented offices to their new permanent home in Reston, Virginia. This new facility is officially titled the National Center for Aero Modeling. In addition to housing the offices of the AMA, this facility also serves as the home for *Model Aviation* magazine and the National Aeromodeling Museum. It's open to the modeling public and would make a great addition to an eastern vacation.

On a more local level, FLYING MODELS

sponsored the return of the Old Timer Fly-in. This event was originally held in 1977 to commemorate 50 years of continuous publication of FLYING ACES/FLYING MODELS magazine. Plans are now being made for this popular event to return in 1984.

Yes, it was a very good year indeed, and here's hoping that coming 1984 will hold just as many good things for this great hobby.

## Inside story

A few moments back I expounded on the virtues of smaller size models. This month we are presenting another original design that fits right into that class. The *Faser* by Al Trapanese combines the characteristic looks of a .60 size pattern design with the economical and easy to handle qualities of a .25 size sport model.

Bob Aberle has been attempting to inform serious R/C buffs about the new frequencies and how to best put them to use through his monthly column, Frequency Facts. This month that series will end, as Bob feels he has covered the subject completely. However, if there are still questions about their use, Bob has agreed to follow up with answers and new information as the need arises.

We are pleased to introduce the first in a series of articles by Paul Bell on stress analysis of model structures. Paul is a Structures Analyst for Grumman Aerospace and knows whereof he speaks. He offers some simple facts and suggestions for strengthening our models.

Concluding our look at the 1983 Nats, C.A. Shaw gives us the story of the freeflight happenings while Windy Urtnowski reports on the ever popular control line Stunt event.

With us for the first time this month is David Aronstein with his novel *Lifting Body Bostonian*. Disguised in a rather modern and rakish design is the age old twin pusher concept. Just goes to prove that the more things change, the more they remain the same.

—BOB HUNT

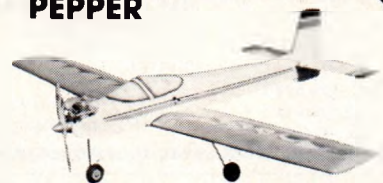
*Bob*

## STAMPE SV4 STAND OFF SCALE



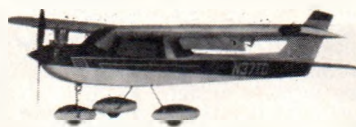
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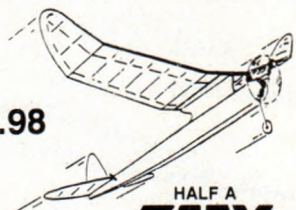
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## TOWER HOBBIES RADIO CONTROL MODELS CATALOG 1984

TWO DOLLARS

TOWER HOBBIES, PO Box 778, Champaign, IL 61820, has just released its new 1984 R/C Catalog. Its 228 pages include a special, 36 page, full color section illustrating all the Tower Hobbies private label products. The rest of the catalog features a Table of Contents, dictionary style tab system, a comprehensive Accessory Completion Guide, and information on over 5,000 items related to the field of radio control planes, cars, and boats. The 1984 catalog is free with a first order from Tower or to active customers. For everyone else, Tower will send its new catalog for \$2.00. Contact Tower at their address above or call 800-637-6050 (Cont. US only).

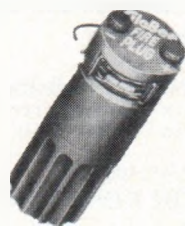
TOWER HOBBIES, PO Box 778, Champaign, IL 61820, has recently introduced their new BJ Prop Balancer designed to easily and precisely balance props or spinners for planes or boats. Capable of handling any size, the prop mounts on a machined, threaded alumi-

num shaft with sharp points on its ends. These rest against specially designed teflon pads which are mounted at the top of each aluminum upright. The tension of the sharp points holds everything in place with virtually no friction. The molded plastic base measures 4 x 4 inches and the overall height of



the BJ Prop Balancer is 7 inches. Introductory price for the Balancer is \$14.98 and is available only from Tower. For more information about it or Tower's other products contact them at their address above or call (Cont. US) 800-637-6050.

FUTABA CORPORATION OF AMERICA, 555 West Victoria St., Compton, CA 90220, has announced the introduction of a new eight channel helicopter radio system with the latest state of the art technology. Their new FP-SSGH-P helicopter system utilizes the T8SGH-P Pulse Code Modulation (PCM) transmitter with pitch to rudder/throttle to pitch control mixing, throttle hold control, acceleration mixing, pitch trim, hovering



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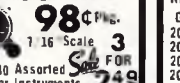
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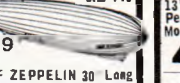
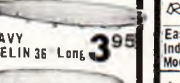
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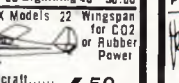


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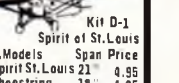
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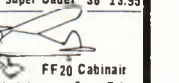
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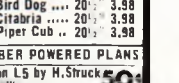
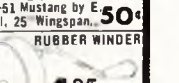
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## NEW! THE M.E.N. "BIG JOHN"

BY BILL NORTHRUP

"Big John," a big easy building biplane from the "workbench" of Bill Northrup. Designed back in 1963 Big John is a proven design and proven performer with over 2 thousand sets of plans having been sold since its introduction. M.E.N.'s kit simply updates this classic, with modern building and construction techniques, designed to create a stronger, lighter, easier to build model. Weighing in at only 8 1/2 to 9 lbs. complete... this is one big model that really can perform on only a 60! Quoting Bill Northrup, "This biplane will do just about any maneuver...if you don't mind waiting a little while for them to get completed!!!! A great exhibition airplane."

M.E.N.'s kit engineering was specifically planned for fast, easy building. Our "THRU-CUT" die cutting combined with "TRI-SQUARE-LOC" construction of lite plywood and balsa makes construction fast and simple. The inherent strength of lite plywood construction provides durability and lasting performance. 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.

BIG JOHN is designed for four channel radio control operation with .60 to .90 model engines. The 76 3/4" wing span combined with 8 1/2 lbs. flying weight gives a wing loading of 13 ounces per square foot.

The kit features THRU-CUT die cutting, quality materials, rolled plans, building instructions, wing jig building fixtures, complete hardware package, pre-bent landing gear and cabane strut wires. Building time for the BIG JOHN is 25 to 45 hours.

The following items are needed to finish the model: 2-4 1/2" wheels, 1-1 1/2" wheel, 1/2" wheel collars, 1/2" wheel collars, a 12-16 oz. fuel tank, fuel line, throttle cable, elevator and rudder pushrods, glue and covering material.

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

LENGTH  
56"

WING SPAN  
76 3/4"

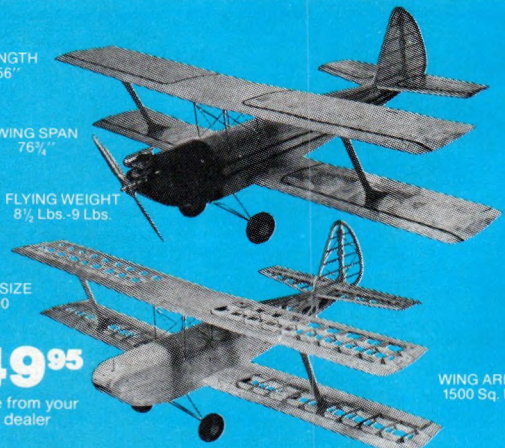
FLYING WEIGHT  
8 1/2 Lbs.-9 Lbs.

ENGINE SIZE  
.60-.90

**\$149.95**

Available from your local dealer

WING AREA  
1500 Sq. In.

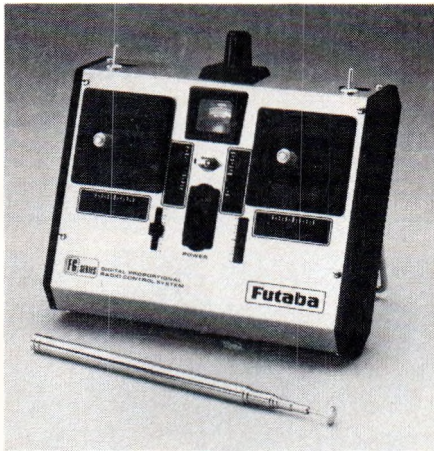




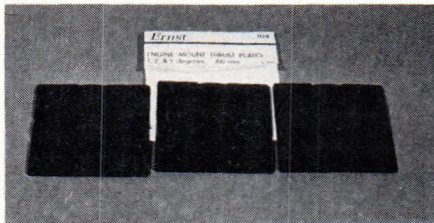
memory and throttle to pitch mixing. Beside these distinct helicopter functions, the T8SGH-P has three linear dual rates, or non-linear VTR rates, servo reverse switching, ATV, rudder button, 3-way adjustable open gimbals, Direct Servo Control (DSC), Fail Safe, idle up and built-in Tachometer micro-processor. Companion to the transmitter is the new R118GP eight channel PCM receiver with four precision, water tight, ball bearing S130 high performance servos. Accessories include a nickel-cadmium receiver battery pack, dual charger, remote tachometer sensor, servo tray, switch harness, control panel screwdriver, neck strap, frequency flag, and a detailed operation manual. The new FP-8SGH-P system is now available from local dealers. For more information, contact Futaba at their address above.

**FUTABA CORPORATION OF AMERICA,**  
555 West Victoria St., Compton, CA 90220,  
has recently released a new six channel sport system, the FP-6FG. Control inputs are afforded by the FP-T6FG transmitter which features "G" series electronics, adjustable open gimbal control sticks, servo reverse switching on all channels, and built-in trainer

circuitry. Another convenient feature is the new modular frequency section for extra versatility. The R6L six channel receiver accompanying the transmitter incorporates an eight bit CMOS IC minimizing power consumption and is stabilized against voltage fluctuation. Four S-28 servos, nickel cadmium battery packs, dual charger, switch harness, servo tray, neck strap, and fre-



quency flag complete the FP-6FG sport system radio. Check with your local dealer for price and availability. For additional information, contact Futaba at their address above.



**ERNST MANUFACTURING INC.,** PO Box 248, Brightwood, OR 97011, offers the modeler an easier installation of engine down- or side-thrust with their new Thrust Plates.

## Tornado PROPELLERS

Made of polyester, do not boil or color.

Go to **GRISH**... the No. 1 propeller.  
True helical pitch and airfoil for more "win-power"

2 Blade Tractor			
5 3/4	5 3/8	5 3/4	each
6 3	6 4		50c
7 4	7 6	7 8	80c
8 4	8 6	8 8	70c
9 4	9 6	9 7	
9 8	10 4	10 6	85c
11 4	11 6	11 8	91
12 4	12 5	12 6	1.150

AT YOUR DEALER

2 Blade Pusher			
5 3/4	6 3	6 4	50c
		8 6	85c
		9 6	91
		10 6	
3 Blade Tractor			
5 3	6 3	6 4	50c
3 Blade Pusher			
6 3			50c

Metallic Aluminum Color

Tractor			
7 6	7 8		91
8 6	8 8		1.25
9 6	10 6	10 4	1.50
Pusher			
10 6			1.50

3 Blade

## GRISH

### LARGE WOOD PROPELLERS

**HARDWOOD**... but not too hard, minimizes chance of costly plane and engine damage. True pitch and airfoil fully finished and balanced, ready for coating.

3/8" BORE	ALL SIZES IN		
	6, 8 & 10 PITCH	18"	\$7
		20"	8
RIGHT HAND TRACTOR		22"	10
		24"	13
	IN 8 & 10 PITCH	26"	\$16

**GRISH BROS.**  
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A specially formulated and chemically balanced fuel for top performance and minimum engine wear in any weather condition!

#### THIS FUEL FEATURES:

- RUST PREVENTION AGENTS
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- WETTING AGENTS FOR MORE EFFICIENT AND DEPENDABLE FUEL FLOW
- ANTI-FOAMING AGENTS TO PREVENT LEAN RUNS. KEEPS YOUR ENGINE RUNNING COOL
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- CHILDPROOF LIDS Available in F.A.I. 5, 10, 15, 25, & 40% Nitro-Methane Contents. Formulated with synthetic lubricants. Also available with castor.

## DEALER'S WANTED DOMESTIC & OVERSEAS WE EXPORT.

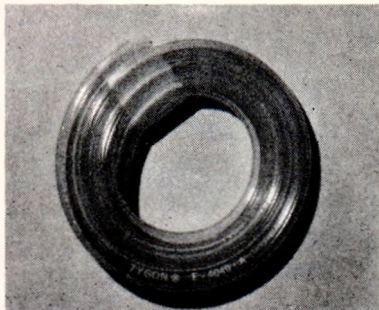
This competition fuel is fast becoming THE CHOICE with top professionals. Be one of the first to cash in on this product.

Contact us for price structures and ordering information. We are Manufacturers and Major Brand Distributors of Model Engines, Kits, Radios and Accessories.

SUPER K Fuels, are a brand of:  
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# SUPER-K COMPETITION FUEL

# TYGON



## FUEL TUBING

Tygon is excellent for the large gasoline and glow fuel motors.

Formulation F-4040-A designed specifically to handle all gasoline, diesel, or glow fuels. As such, it finds application in all areas of modeling from fuel pumps to water jackets. It comes with a translucent yellow color in one size: 1/8" I.D., 1/4 O.D., and 1/16" wall. It's Cat. No. S-181, a three foot package with four cable ties which lists for \$2.95. It's also available in 50 foot rolls, price upon request.

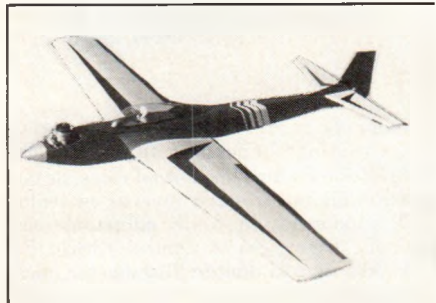
**Paul Clements'**

**KITTY HAWK  
MODELS**

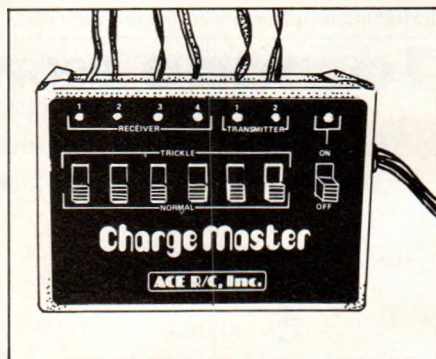
R.R. 2 Paoli, Ind. 47454  
Phone (812) 723-3601

See your dealer or distributor. If not available, send check, money order, VISA or MasterCard

These plates allow instant alignment of the engine to provide correct thrust angle which helps the flying characteristics of the aircraft. The *Thrust Plates* will fit either the round or square type of aluminum or glass-filled engine mounts. A cutting line has also been added to allow for trimming to fuselage shape if necessary, and each plate has a reference line and angle identification molded into it. Three sizes are available: #102 for .20 size engines which lists for \$1.69; #103 for .40 size engines and lists for \$1.79; and #104 for .60 size engines and lists for \$1.89. Each package contains three plates in 1°, 2°, and 3° sizes for that displacement. Contact your local hobby dealer for more information.



**HOBBY BARN**, PO Box 17856, Tucson, AZ 85731, has released their newest kit, the *Total Chaos*, a low cost pattern/sport plane designed by Joe Bridi. This new plane uses the same airfoil as the famous *Curare* pattern ship. Specifications: wing span - 65 1/2 inches; wing area - 699 square inches; and, engine - .60. This deluxe kit is all balsa and plywood, includes a complete hardware package, and comes with a full set of plans. The *Total Chaos* is available for an introductory price of \$56.99 plus \$4.60 in postage and handling. C.O.D. orders require an additional \$2.00 fee. For more information or to place an order, contact Hobby Barn at their address above or call (602) 747-3633.



**ACE R/C, INC.**, Box 511, 116 West 19th St., Higginsville, MO 64037, has introduced a new multiple output charger, the *ChargeMaster*. This charger offers the versatility of charging up to four receiver flight packs and two transmitter packs from the same device. The charge rate is programmable up to 120 mAh. After the overnight charge is complete, the *ChargeMaster* can be switched to a trickle charge, leaving the battery packs on charge indefinitely. ACE R/C offers the *ChargeMaster* in kit form (Ace #34K55) for \$36.95 or in an assembled version (Ace #34K55C) for \$46.95. For more information, contact ACE at their address above.

**MICROX** Box 1063 Lorain, Ohio 44055  
Phone (216) 282-8354

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Piper Vagabond  
Piper Cub  
Stinson 125  
Outdoor kits each . . . \$4.95  
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PC-6 Porter  
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Rubber or CO<sub>2</sub> Power  
Kits each . . . \$6.95

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Microlite — \$3.75 Glue — \$1.60 Solvent — \$1.25  
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Rubber Strip .020 thru .085 . . . . . each \$1.75  
3/32 thru 5/32 . . . . . each \$1.95  
Winder 6:1 . . . . . \$3.95 Mark I 16:1 . . . \$11.95

Complete Line of Brown CO<sub>2</sub> Motors  
Balsa Wood Outdoor & Indoor Sheets & Strips  
Add 10% Postage — Minimum Postage \$1.50  
COMPLETE CATALOG \$1.50

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*Fly* VL-102  
ELECTRIC  
PROPULSION  
SYSTEM

Send 50c for complete illustrated CATALOG

FAST CHARGE  
CONSISTENT PERFORMANCE

QUIET OPERATION — permits flying most anywhere-city parks, front yards, etc.  
LIGHT WEIGHT — 2 1/2 Oz. - but powerful enough for models weighing up to 10 oz.  
INSTANT STARTING — no priming, no continuous flipping of prop to start.  
MORE EFFICIENT — lower rpm - lower running cost.  
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**VL PRODUCTS**  
7871 ALABAMA AVENUE • #16  
CANOGA PARK • CALIF • 91304

# RPM Inc.

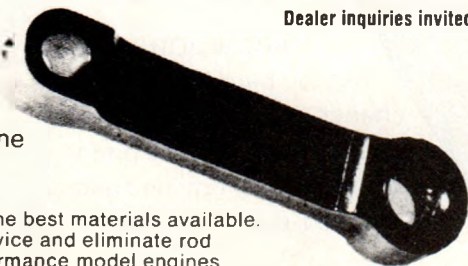
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- Our connecting rods are made of the best materials available. They are designed to give long service and eliminate rod breakage in the modern high-performance model engines.
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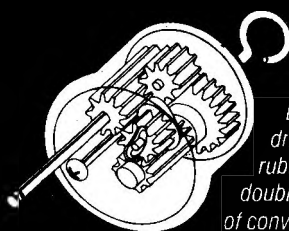


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Bentom's new rubber-powered kits fly and perform like painstakingly built balsa.

But these Bentom flyers are polystyrene foam, using the latest molding techniques for simple, quick construction.

And Bentom foam is as durable as it is light.



*Bentom's Bi-Matic drive is like a turbo for rubber-power, virtually doubling the thrust of conventional systems.*

Best of all, Bentom kits are powered by our exclusive Bi-Matic drive. This compact and ingenious 1:2 gearbox doubles prop speed for additional thrust and extended flying.

Everything you need to build one of Bentom's beautiful sport or scale airplanes is included, too, right down to the special, clear contact cement, spare rubber and prop. Even lightweight decals.

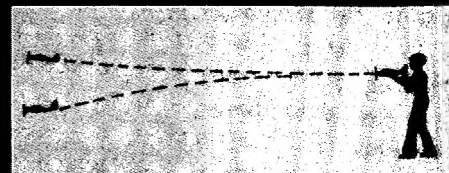
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No.	Model	Wing Span	Price
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Please add \$1.50 for post. handling. Calif. residents include 6% sales tax.



There are 7 great flying Bentom foam kits available, including the sporty Skykid (shown) and WWII scale models.



Flying skills and use of thermals can keep the Bentom Skyboy aloft for over 30 minutes!

**Bentom**

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## 1/4 - 20 x 2"

### 50 pcs. for \$7.50

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### "INLAND SPORT"

37 1/2" Wing / .049 R/C, .020 or Electric

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# ALPHA

An ideal trainer or sport plane for .049 to .09 engines and a two or three channel radio. Features interlocked plywood fuselage and foam wing construction for ruggedness and quick building. Photo illustrated plans and complete hardware included.

DESIGNED BY TOM RUNGE

Span: 40"  
 Area: 240 sq. in.  
 Engine: .049 - .09  
 Weight: Approx. 25 oz.  
 Functions: Two or Three Channels

Send \$2.00 for our complete catalog, add \$1.00 handling on all direct orders.

50 L212 - Ace Alpha, Kit \$23.95

**ACE R/C, Inc.**

Box 511 H, Higginsville, Mo. 64037 (816-684-7121)

ACE R/C, INC., Box 511, 116 West 19th St., Higginsville, MO 64037, has just released the DMVC, a dual metered vari-charger. This new unit is capable of producing a variable rate of charge up to 250 mA allowing the charge of one to ten cell packs from 100 mA to 2500 mA capacity. A wide range of battery packs can be re-charged using the DMVC as well as a 12 volt starting battery. Featured are two variable outputs (up to 250 mA on either), an accurate meter output, and a LED monitor. The kit for the DMVC (Ace #34K32) lists for \$39.95 while the assembled version (Ace #34K32C) lists for \$44.95. For more information, contact ACE R/C at their address above.

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World's Largest Gas Plans Assortment  
 INTERNATIONALLY FAMOUS C-D QUALITY

MASTER MODELS PLANS:

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82 Lockheed Vega	\$34	99 N. Bk Widow P61	\$65
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74 Doolittle G B 11	\$39.95	95 Doug DC 3 Train	\$45
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122 Douglas O-38 Obs	\$49.95	68 Bristol Bulldog Fr	\$30
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94 How Mr Mulligan	\$45	100 Waco Taper Wing	\$49
63 Boeing P 26A Fr	\$36	75 Westl'd Lysander	\$32
84 Boeing P 26A Fr	\$48	100 Westl'd Lysander	\$49
69 Waco C 6 Cabin	\$36	57 Ford Trimtr 4 AT	\$28
64 Beech C17 B Slag	\$38	76 Ford Trimtr 4 AT	\$45
96 Beech C17 B Slag	\$49.95	114 Ford Trimtr 4 AT	\$59
55 Lock 11 Electro	\$24	84 Berl Joyce XFJ 2	\$56
82 Lock 11 Electro	\$32	93 N. Bk Wing C 2 Amph	\$69
63 Stinson T-W SR7	\$16	38 Grum J2 F Duck	\$39
81 Stinson T-W SR7	\$24	78 Grum J2 F Duck	\$56
122 Stinson T-W SR7	\$32.95	59 Gatho G-1V Bom	\$22
59 Bristol Fr F2 B	\$70	117 Gatho G-1V Bom	\$39
78 Bristol Fr F2 B	\$32	68 Doug O 46A Obs	\$32
118 Bristol Fr F2 B	\$45	108 Sikor 5-38 Amph	\$49
74 L. "Paco Spa"	\$45	108 Sikor 5-38 Amph	\$36
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74 Rap Sea-B Amph	\$39	100 H Page O400 Bom	\$49
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63 Grum F6F Hellcat	\$28	54 Curt Swift XP934	\$48
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103 Boe B-17G Fr	\$49	66 BU133 BU Jungm	\$39.95
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68 Ryan Navion	\$39	63 Lindberg L Sirius	\$24
68 B Bonanza V Tail	\$39	55 Hwkr Hind LrBom	\$32

(NO KITS AVAILABLE) Prices subject to change without notice.

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 All Complete With Patterns From 25c  
 Add 10% to all orders for shipping & ins., etc., to USA, Can & Mex. Elsewhere add 15% (20% if by air).  
 Pictorial catalog \$1.50. Price list section alone 55c (by air, foreign add \$1.00).

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## INTRODUCING THE NEW FOX 29 BB

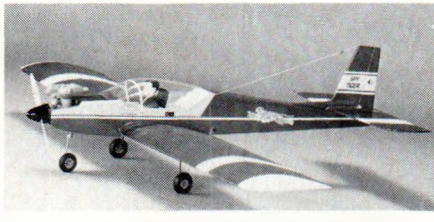


Bore	.....	.732
Stroke	.....	.715
Displacement	.....	.289
RPM with 9-6 prop	.....	14,000
Weight	.....	9 1/2 oz.
Fuel Consumption	.....	.5 oz. min.

The Fox Schneurle 29 is the brand new replacement for our popular Baffle 29. With today's modern technology, our latest model Fox 29 produces half again more power than our older 29, and does it on little or no nitro. The new 29 is interchangeable with the earlier model Fox 29's. Isn't it time to trust your model to a powerful new Fox engine?

23000 Fox 29BBRC Schneurle	.....	\$59.95
13000 Fox 29BBCL Schneurle	.....	\$44.95
90236 Tilt-Up Muffler	.....	\$14.95
90237 Tilt-Down Muffler	.....	\$14.95

**FOX MFG. CO.**  
 5305 TOWSON AVE FORT SMITH, ARK. 72901  
 Our Hot Line: (501) 646-1656



CARL GOLDBERG MODELS, 4734 West Chicago Ave., Chicago, IL 60651, has released their newest kit, the Sky Tiger. Previewed at the Toledo and WRAM shows, the Sky Tiger features many of the same characteristics as the popular Goldberg Eaglet 50 and 63; easy construction, complete step-by-step photo instructions and flying hints, well detailed, full size plans, and complete hardware package. Specifications: wing span - 63 inches; engine requirement - .40 to .61; and, radio - four channel. One exceptionally nice feature of the kit is the choice of building it with the "greenhouse" canopy or as the "executive" version reminiscent of contemporary single engine light planes. Novice or experienced sport flyers alike will find the plane suits their abilities. For more information about the Sky Tiger, contact Carl Goldberg Models at their address above.

MGA ENTERPRISES, PO Box 864, Forest Hills, NY 11375, has announced the availability of their new 1/4 scale U.S. pilot figures. These are 12 inches high and fully dressed in removable flight gear of their time. Weighing under six ounces each, they can be fully posed since all joints are movable, and can be dressed, painted, and assembled according to scale requirements. Three figures are available. A World War I pilot comes with fixed helmet and goggles, dressed in a removable leather-like flying coat, breeches, and knee-

**PEANUT SCALE FLYING MODELS**  
MINIATURE REPLICAS

RUBBER POWERED 12"—13" WINGSPAN

Gee Bee (shown),  
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**HÄFELE AMERICA CO., PO Box 1590, High Point, NC 27261**, has recently introduced their *Flexible Shaft Tool* in their *Mini-tool* line of miniature hand tools. The *Flexible*

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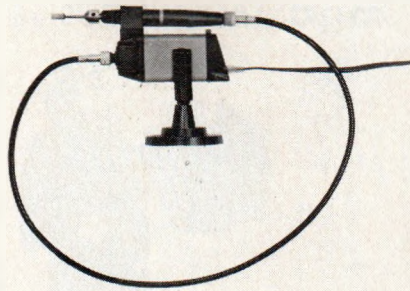


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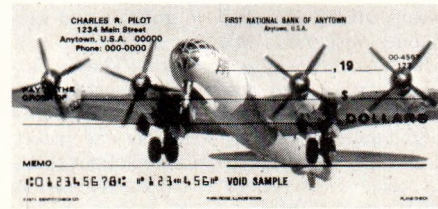
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**IDENTITY CHECK PRINTERS, Box 149-D, Park Ridge, IL 60068**, have recently added two new aircraft to the list of popular planes depicted on their Warbirds personal sized check assortment. Now available are

the *B-29 Super Fortress* and the *P-38 Lightning*. Along with these two, new additions, there are the *P-51*, the *F4U Corsair*, the *Avenger*, the *Wildcat*, the *AT-6*, and *B-25*. For more information about the aviation personalized checks, contact George Johnson of Identity at their address above or call (312) 992-0882.

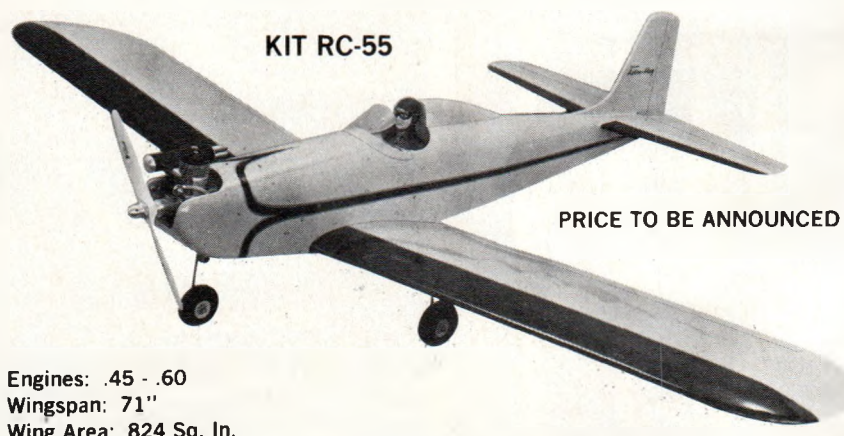


**COVERITE, 420 Babylon Rd., Horsham, PA 19044**, has released their latest kit, Art Chester's *Jeep*. One of the more famous Golden Era racers of the Thirties. The kit, designed by Henry Haffke of Gee Bee fame, qualifies as true quarter scale because of the small size of the original, full size airplane. Specifications: wing span - 52 inches and engine - .40. Included in the kit are die cut and machined balsa and ply parts, molded cowl and wheel pants, pre-formed landing gear, rolled plans, and construction book. List price is \$99.95.

**INDOOR MODEL SUPPLY, Box C, Garberville, CA 95440**, has released its peanut kit of the *Zippy Sport*, a recently designed experimental homebuilt sport airplane. This Pea-

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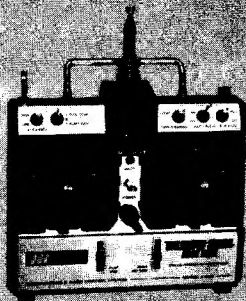
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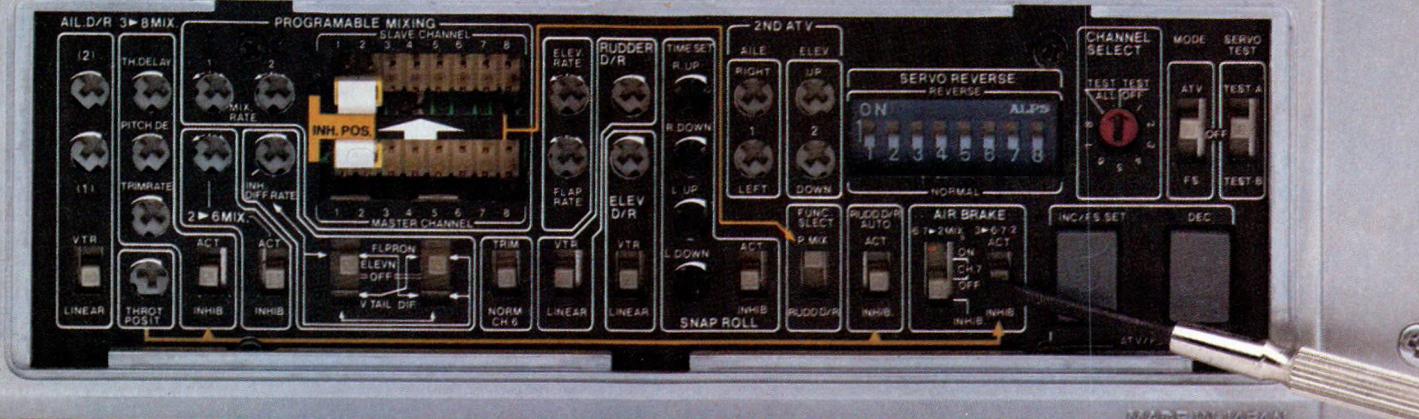
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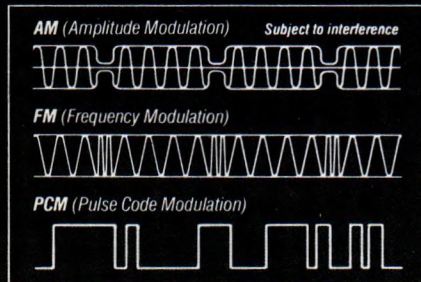
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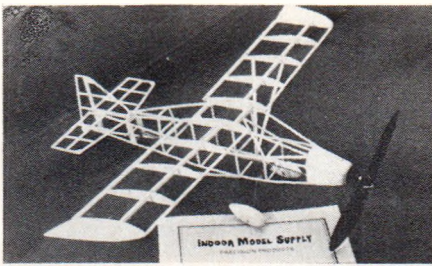
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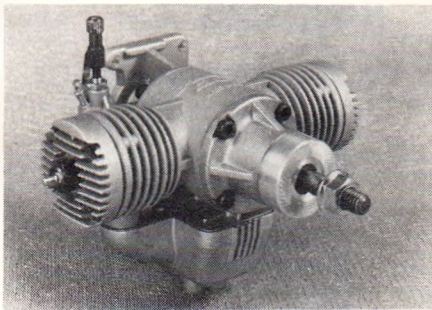
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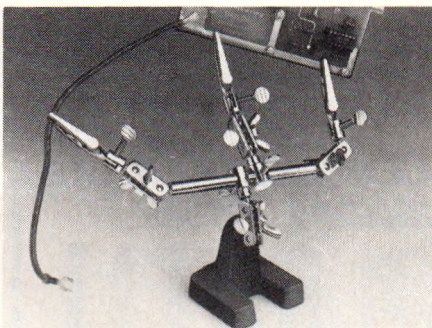




nut is one of the Miniature Scale Aircraft Series by Indoor Model Supply and lists for \$6.95 at local dealers. It is available from the Indoor for \$6.95 plus \$1.00 postage and handling. A special offer, the *Zippy Special*, gives you the *Zippy* kit along with the new 16 page Indoor catalog with instructions and illustrations for \$8.00. For more information about the *Zippy Sport* or the *Special*, contact Indoor Model Supply at their address above.

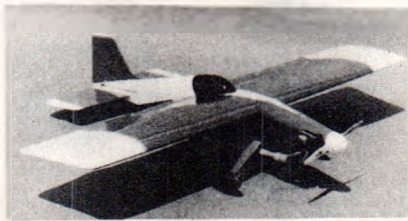


CANNON R/C SYSTEMS, 13400-26 Saticoy St., North Hollywood, CA 91605, has announced the introduction of a new twin engine in their G-Mark line, the .30 R/C Twin (opposed). A front rotary valve, schnuerle porting, dual ball bearings, slide valve carburetor, and an integral muffler are features of the .30 Twin. Specifications: bore (each) - 0.591 inches; stroke (each) - .551 inches; displacement - .305 cu. inches; weight - 11.15 ounces; speed range - 2500/15,000 RPM; prop 9X5. The .30 Twin uses a rotary type mount and is available for an introductory price of \$174.95. For any additional information, contact Cannon R/C at their address above.



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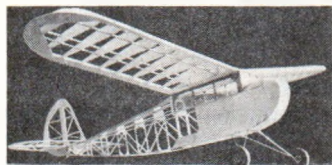
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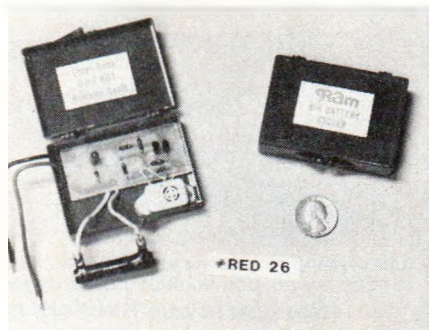
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**AIRCRAFT PHOTO PACKS**, 369 *Moorgate St., Winnipeg, Manitoba, Canada R3J 2L6*, has announced the publication of their *1984 Catalog*. It lists the color photos available from them of over 125 different aircraft to assist the scale modeler in preparation of his model and use as scale documentation. Three different size formats are available. To obtain your catalog, send 50¢ to Aircraft Photo.



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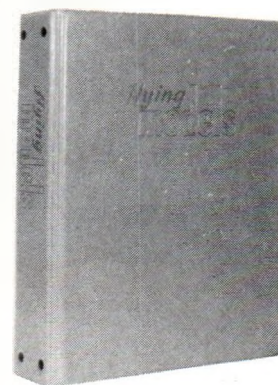
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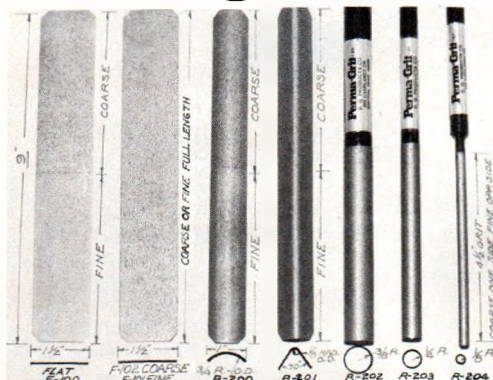
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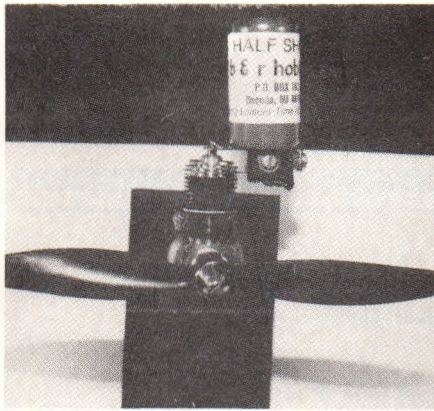
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**ROBART**, 310 North 5th St., St. Charles, IL 60174, has introduced a new accessory to complement the Dremel #407 *Mandrel*. Their new *Carbide Drum Cutter* is designed to far outlast any paper sanding drum and make work much easier. This *Carbide Drum Cutter* is made of virtually indestructible tungsten carbide on a steel drum. There are two grades to choose from, #459 *Coarse* or #459 *Fine*, which list for \$5.95 each. See your local dealer for more information.

**REPLA-TECH INTERNATIONAL**, 48500 McKenzie Hwy., Vida OR 97488, has announced that they will be distributing the internationally recognized Koku-Fan scale, three view and cross sectional drawings of aircraft. These plans from Japan are re-printed in the U.S. by Scale Model Research and document over 60 aircraft from all periods and countries. Scales represented range from 1:100 to 1:32. A list of the aircraft drawings available can be obtained from Repla-Tech at their address above.

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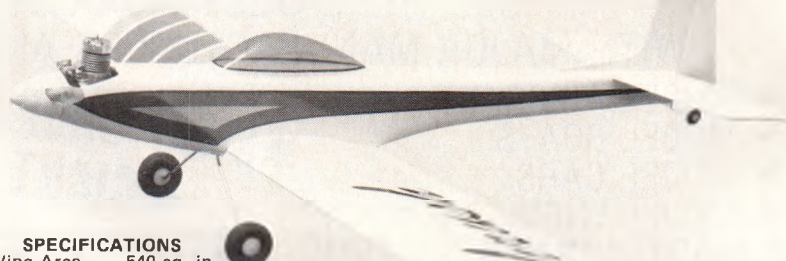
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## One last remark

Enclosed is the Reader's Survey, better late than not. Now for my comments. I recently read and received the November '83 issue and read a letter signed P.M. after reading his letter, it sort of galled me, especially his comments about the Ryan and Peanut Scale Stik. I recently built the Peanut Stik. What an enjoyable project. My gripe about the article is *no scale* for enlarging the plan (1" scale). It took as long to enlarge plans as it did to build it. As to technical articles. Bob Aberle does an excellent job; as to beginners, Earl Van Gorder can't be beat for information. As to full scale, I see many technical books on the newstands—FLYING MODELS should remain a fun/hobby book. The only real grips against FLYING MODELS is lack of articles on Old Timers (models, not guys like me).

Please put on the plans the *necessary scale bar* (example; none shown on the Sagitta plans, like the Peanut Stik). . .

RJF

## Just look around

I thought Tom Winter's column on *Making a Spring-loaded Free Wheeler*, Back to Square One, September '83, was a very good and needed article. One suggestion for the spring would also be the springs that come out of the locks you find around the home (old ones of course; don't want the front door flying open). You might go to the locksmith close by and ask to see some of his springs from some locks. These springs are inexpensive and come in different sizes.

Thanks for the idea, Tom.

JIM COCKRELL  
Pearl, MS

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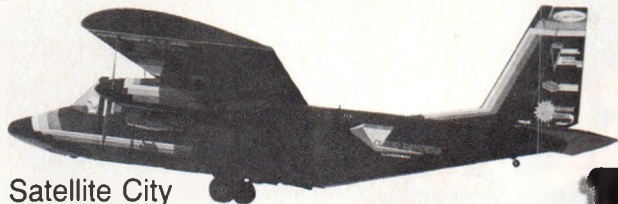
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Sincerely,  
Cloud Dancer R/C Show Team, Kissimmge, FLA.



Left to right: Tom Veloskey, Johnny Davis, Jay Ward, Don Muddiman, and Tom Veloskey, Jr.

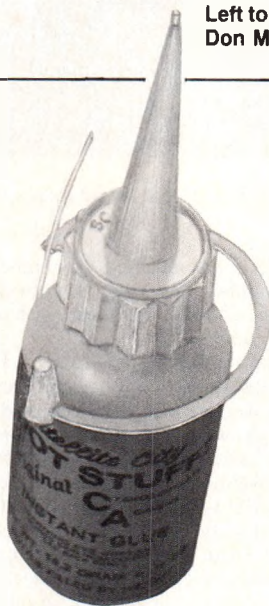


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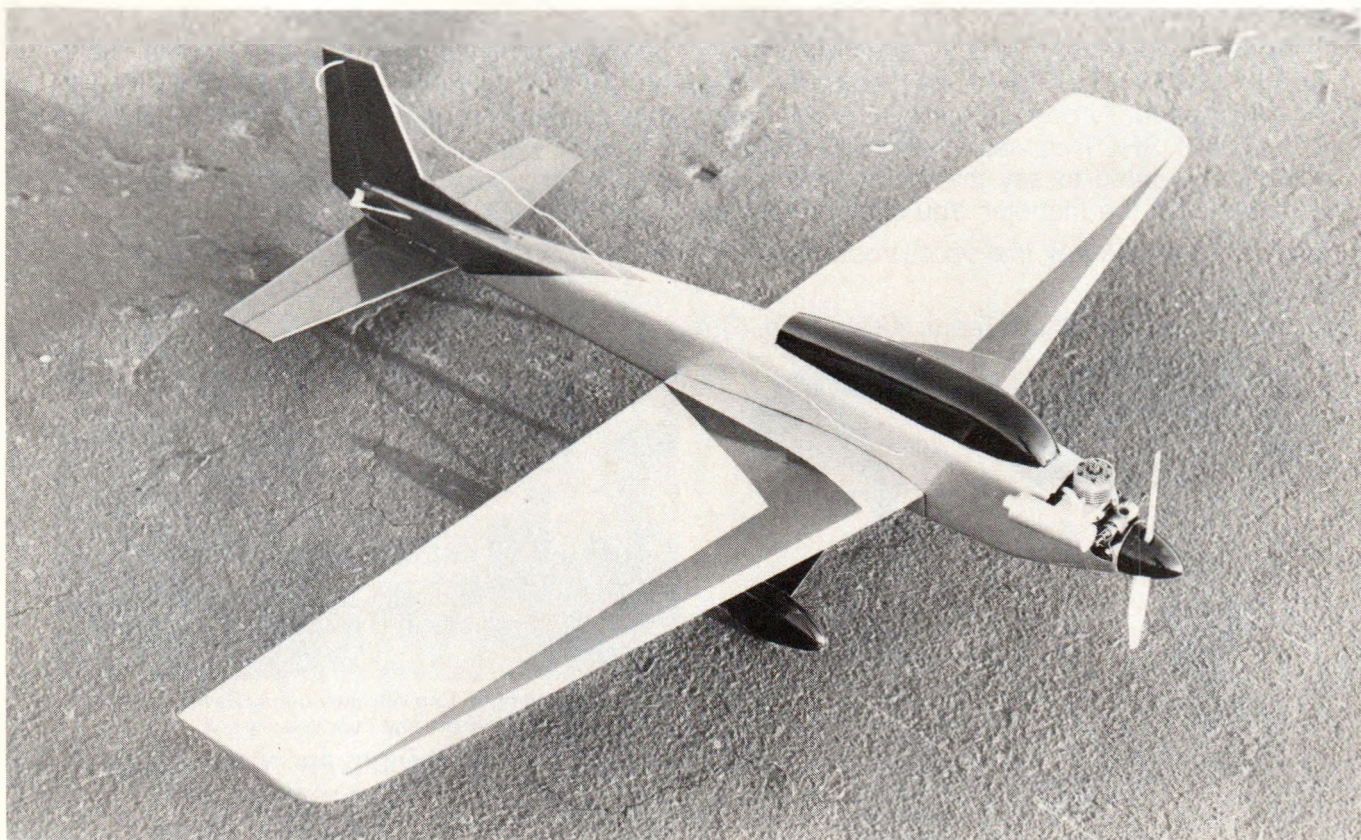
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# Faser

By Al Trapanese



PHOTOGRAPHY AL TRAPANESE

Al Trapanese seems to have met his design criteria of something sleek but simple with a mid-wing and conventional gear in his .25 size Faser.

About 10 years ago I picked up a brand new Fox 25 at one of our club swap meets. At this time, I didn't have a particular project in mind for this size motor so I stuffed it in a drawer along with a variety of other motors that I didn't have an immediate use for.

Much has happened in the intervening years. My modeling interests have changed direction from small sport aircraft to 1/5th scale military aircraft, sporting liquid cooled motors, landing flights, flaps, retracts, etc. I have always found this type aircraft challenging and exciting when everything works as designed but terribly frustrating when everything doesn't work such as the gear not retracting, or worse, not extending due to a faulty control valve or the radiator popping a coolant hose and motor overheating, etc. Anyway, after 10 years of aggravation I decided to get back to the basics and find a home for my "brand new" 10 year old Fox!

I originally planned to purchase an off-the-shelf sport type aircraft but when a couple of fellow club members bought a garage full (literally!) of balsa from a now defunct kit manufacturer, I decided to purchase some of the balsa and scratch build my own design.

What I had in mind was something sleek but simple: midwing, conventional gear, set up for a side exhaust motor with or without a tuned pipe.

As with most of my aircraft, I first started with a pleasing wing design. The remainder of the aircraft was then designed to complement the wing. I have always been partial to swept back wings. Just looking at an aircraft with swept back wings makes it look as if it's going 100 MPH! The only difficulty with this type of wing is that its construction is non-trivial. In an effort not to violate my original intent of sleek but simple, I elected to utilize a symmetrical airfoil built in one piece, top-side down. Because of the wing taper, chord dihedral is automatically established. Rib feet were incorporated to ensure proper alignment.

The empennage was designed using solid 3/16 medium grade balsa and for the sake of consistency, swept back. A built-up empennage would of course have been lighter but more difficult to construct. Hence, the reason for solid sheet.

The fuselage required considerably more design work than the empennage! I had to ensure that all the moments were correct and

that there was sufficient room for the "worst case" 25 schnuerle type motor, a four ounce tank, a 500 mA pack, an average size receiver, and four mini (not micro) servos. The first design didn't quite make it. Too tight! The second go-around looked good. I increased the height of the canopy section 1/2 inch over the original design and lengthened the tail one inch. I also moved the wing back 1/2 inch to ensure proper clearance for a four ounce tank. Presto! All my hardware now fit without using a shoe horn!

Conventional gear was a must; less drag plus it looked better. Wheel pants helped dress up the model so I added them. Almost any commercially available glass or plastic wheel pants could be used. Many methods are available to attach the pants to the gear. I chose the simplest approach I could think of, by gluing a piece of 1/16 inch ply to the inside of the pants, drilling two holes through the pants and gear and bolting the pants on using 4-40 hardware. Crude maybe, but effective!

The part I hate the most, the wing, was constructed first with the help of two fellow modelers, Craig Brooks and Kevin Robertson. Many other modelers use the same ap-

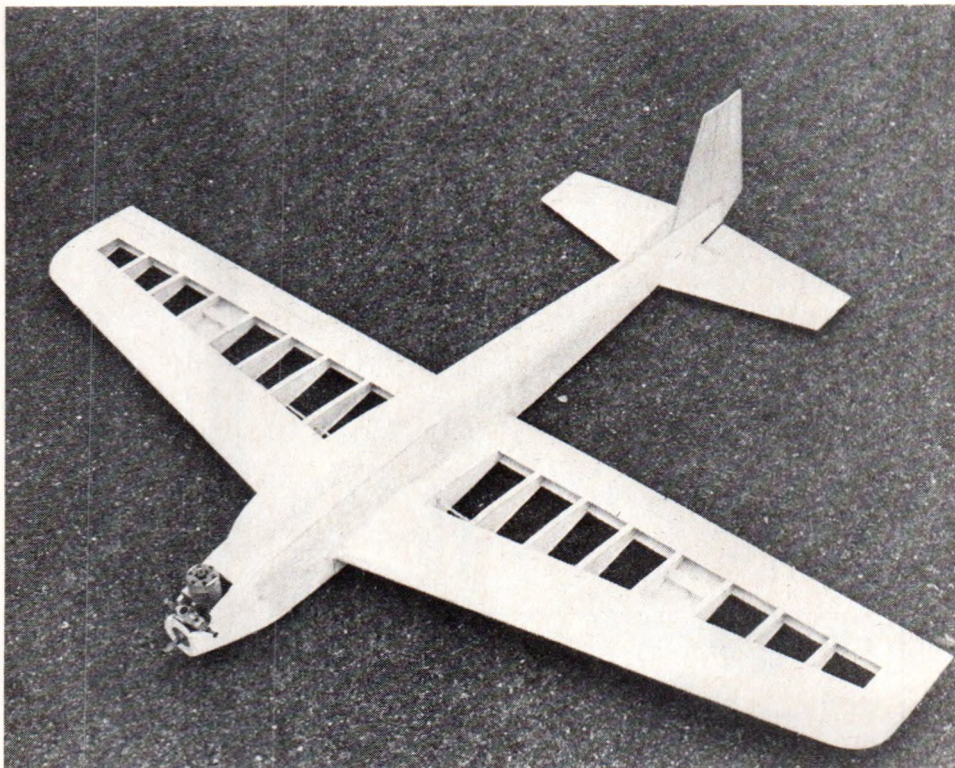


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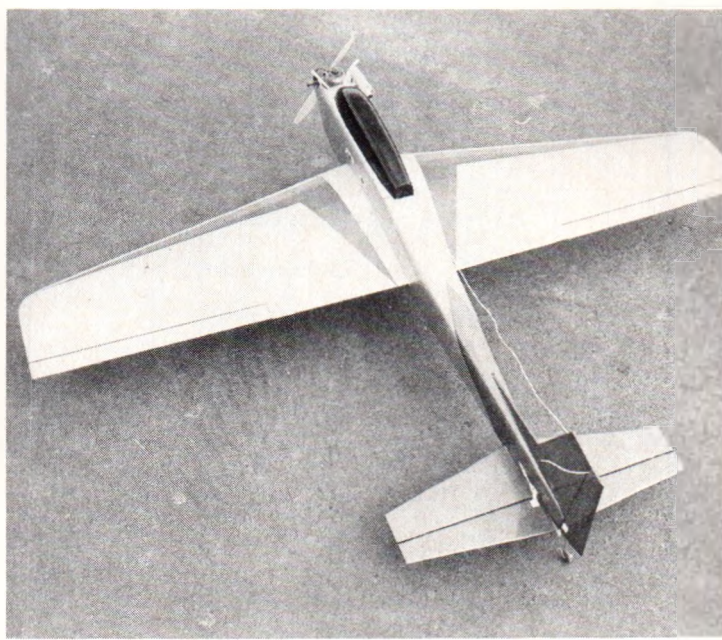
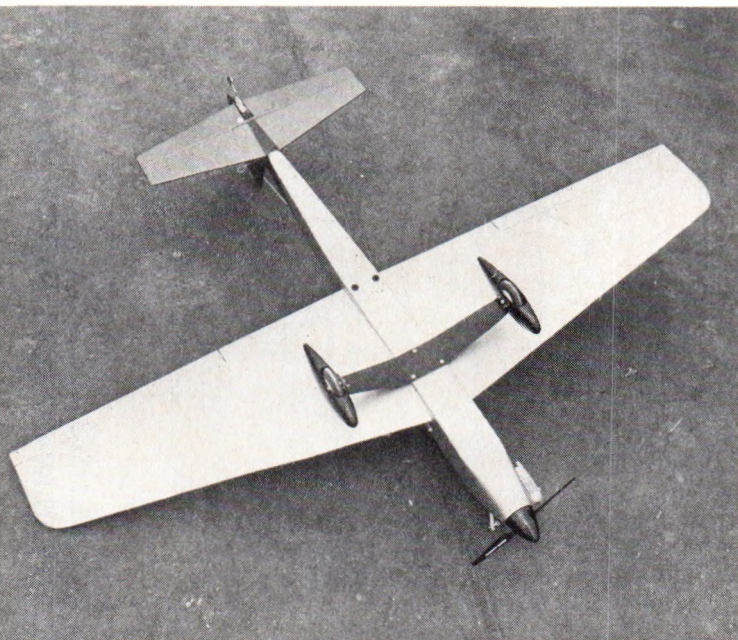
Bogged down in a sophisticated project? The author gets back back to basics with this spirited .25 size fun machine.

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proach. I guess the philosophy is to get the worst part done quickly to make it as painless as possible. Initially, I drew the outline of the ribs on templates with the help of a french curve. The ribs are cut using the templates as a guide and the ribs with the feet were pinned over the top view of the plans. The rest of the assembly is conventional so I'm not going to go into any great detail. The top spar is added using one of the superglues, then the leading and trailing edges. The leading and trailing edges are then carved to shape, the remainder of the ribs added, and the structure is sheeted and capstriped. Note that the leading and trailing edge sheeting is glued over the respective leading and trailing edges. When completely dry, the panel is flipped over and the bottom spar, sheeting and capstrips added. It is important in this procedure to ensure that the panel does not warp by constantly checking it everytime something is added. The other panel is built similarly. The wing tip blocks, trailing edge extensions (from trailing edge stock), and aileron bellcrank hardware is installed at this time. The wing tips and leading edges are carved to shape and the entire structure sanded. Dihedral angles are sanded on the center ribs of each panel and, finally, the panels are joined together topside down as previously mentioned. Two  $\frac{3}{16}$  dowels are added to the leading edge as part of the wing hold-down hardware and braced inside using  $\frac{1}{16}$  ply. Hardware is added to the trailing edge section and drilled to receive two 10-32 nylon



In keeping with the simplicity factor, construction of the fuselage consists of slab sides with triangular supports and few bulkheads. Wings are simple as well, using feet on ribs for alignment.



Conventional gear was chosen as a drag reduction factor (above left). Wheel pants were attached using a  $\frac{1}{16}$  ply plate and some 4-40 hardware. The lines

remind one of a sleek pattern ship (above right). In keeping with that theme, the wing's airfoil is symmetrical.

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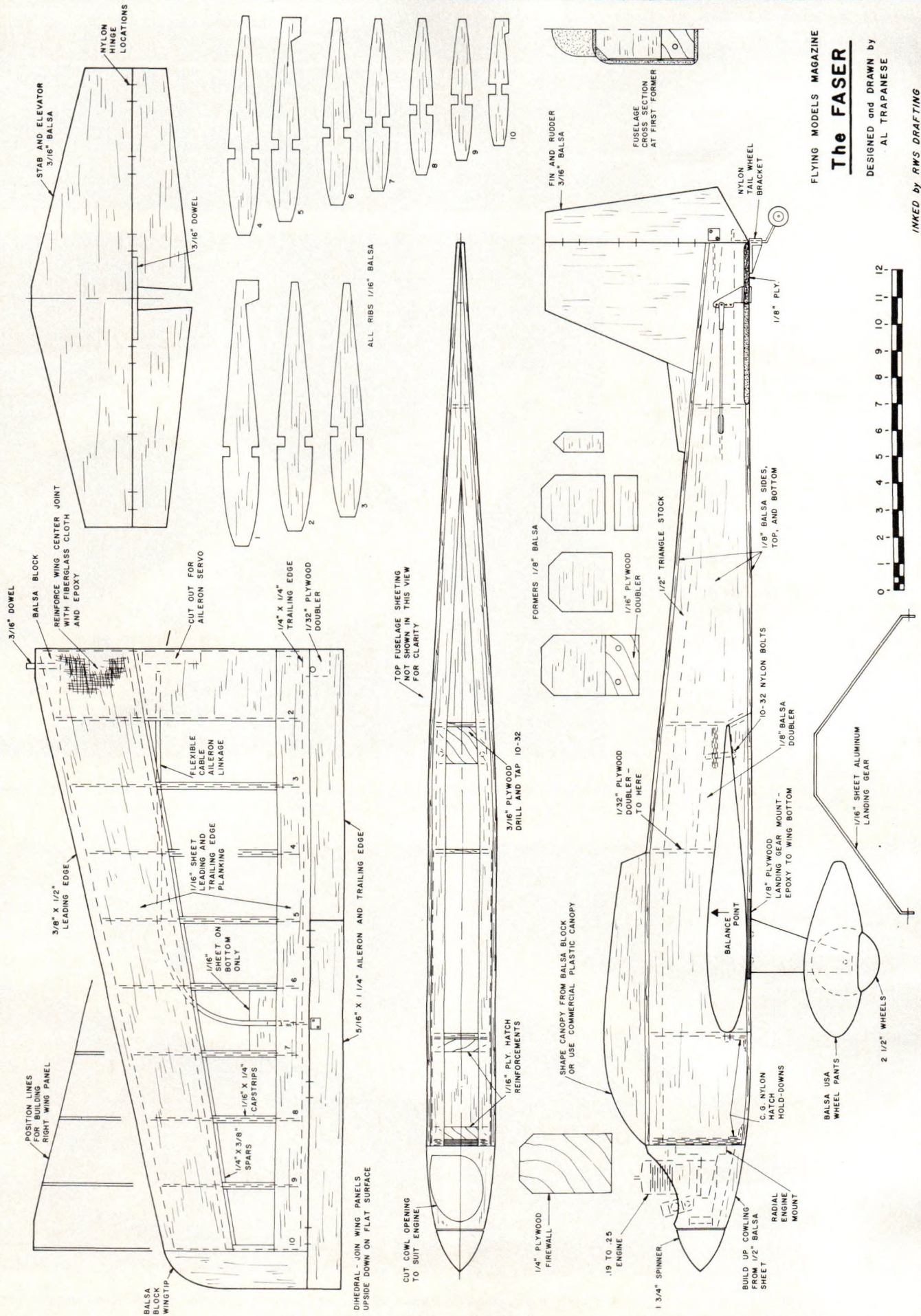
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# Faser

bolts to complete the wing hold-down hardware. The center section is then sheeted and wrapped with medium weight glass cloth and glued in place using polyester resin. The ailerons are simply trailing edge stock with the proper angles sanded on their leading edges to allow for up and down movement. The belly pan is added after the fuselage is constructed.

At this point I needed a break from thinking, so I constructed the empennage. The outline is traced on a slab of  $\frac{3}{16}$  planking and cut using a jigsaw. The components are sanded as per drawing, hinge slots cut, accommodations made for the elevator horn/dowel coupler, and assembly temporarily put aside.

The last remaining assembly was the fuselage. I tried to keep it simple by reverting to slab sides, straight lines and as few bulkheads as possible. I think I succeeded. The  $\frac{1}{8}$  medium grade sides are cut to shape and soft triangular stock added for support. With one side laying flat, bulkheads 1, 2, and 3 are glued in place assuring that they were square with the side. When dry, the second side is added making sure everything is straight and even. The assembly is then turned over on its bottom, and pinned to the workbench. The rear section of the fuse was drawn together, at the same time bulkhead 4 was added. Here again, ensure that each of the fuse sides bend evenly and are square with the fuse bottom.

Next, the bottom planking is added, the rudder and elevator control rods are then installed. Holes are drilled in the firewall for the engine mount and 4-40 blind nuts added. Next the throttle cable is installed. Finally, the tank rails and tank are installed. In actuality the above procedure can be performed in any order except for the tank installation; it must be last. The planking under the tank is held in place using C.G. hatch fasteners.

The belly pan is made and tack glued to the fuse. The objective of tack gluing is to facilitate the shaping of the pan and fuse and also guarantee that everything fits correctly.

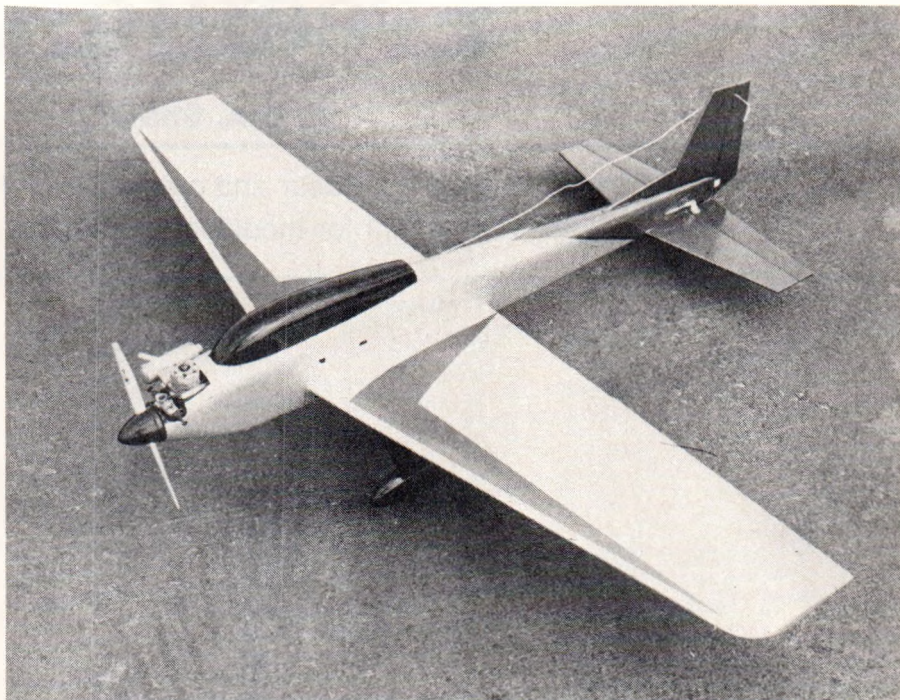
The top planking and nose section is added and everything rounded in accordance with the drawing. The canopy structure is made from balsa as shown in the drawing. The tail wheel bracket must be trimmed to fit in the space provided.

The final assembly consists of gluing in the servo rails, installing the radio, pushrods, etc., permanently gluing the belly pan to the wing, and finish sanding the entire structure. I chose gold and green Solarfilm for my covering material. No particular reason, just happened to have some on hand.

Over the years, I have found it best to cover as many parts as possible before gluing them to the main structure. It's so much easier and, for me, results in a neater job.

The plane was slightly nose heavy so  $\frac{1}{2}$  ounce of lead was added to the tail section. The all-up weight came out to be  $3\frac{1}{4}$  pounds resulting in a fairly respectable wing loading of 19 ounces/square foot.

The plane was test flown at our club field. The field has a 250 by 50 foot paved runway which is recommended over grass when your aircraft has wheel pants and relatively small



**Fast but predictable** performance. Stalls are not vicious since the nose only pitches gently down. Inverted flight requires some down elevator. On landing, the glide path is steady with a gradual sink rate.

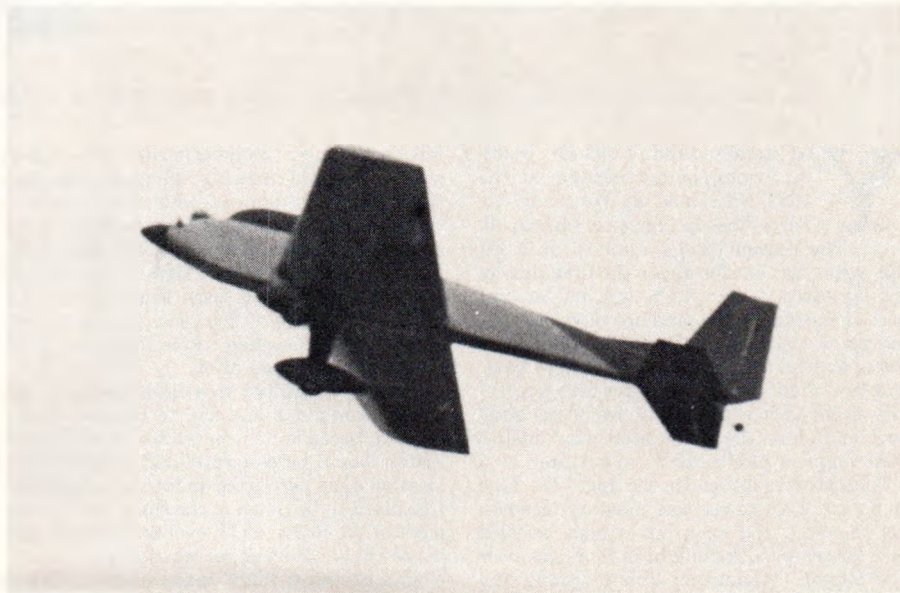
wheels as the Faser does. I'm always a bit nervous when I test fly one of my own designs. You're never 100% certain that everything was designed correctly, incidences and moments correct, etc. Therefore, I did what most cowards do - gave it to someone else to test fly! Actually it's not a bad idea to have a more experienced pilot test fly any aircraft just from a safety standpoint.

My nervousness melted away when my test pilot, Craig, lined the plane up on the runway, applied throttle and accelerated down the runway. The plane was up on its mains in 75 feet and airborne in 100!

The plane performed very well and was very fast. I can picture what it would be like with a hot schnuerle 25 and tuned pipe! Too much for me to handle! Inverted flight requires some down elevator to keep the nose up. Slow speed stalls cause the nose to gently pitch down, with no tendency to fall off at either wing.

On landing, the glide path was predictable although the first landing was a bit bouncy. Pure nervousness on the part of its test pilot.

Presently, I am thinking of expanding this model to accommodate a hot 40 and really bore holes in the sky! C



# 1983 Nats Freeflight

By C.A. Shaw

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Westover brings indoor and outdoor events to a single site. A delight for modelers and spectators alike.

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PHOTOGRAPHY C.A. SHAW

A Fox Combat Special powered Gerald Donahue's *Satellite* in "C" Gas. Due to initial trim problems, the ship acquired a taste for the woods.


**Y**ou literally couldn't tell the spectators from the participants at the 1983 Nats held at Westover Air Force Base in Chicopee, Massachusetts. The reason things were so different this year was that for about the first time in the last decade, free flight was an integral part of the Nats scene and not physically removed to some remote location. Spectators were plentiful throughout the entire air base, and free flight contestants got an opportunity to interact with their share of the audience and show the uninitiated what makes their segment of the hobby so exciting.

Spectator reaction to the big "D" Gas ships and FAI power was most interesting to watch and hear, but it also revealed how far removed free flight is from the average citizen. Wandering about among the

folks who lined the launch sites, one could hear all sorts of amazing spectator explanations of how motors were shut off, planes returned to earth, and even how the ships were constructed in the first place. I'm sure that some of the FAI power fliers would be as startled as I was to learn that their ships were made totally of fiberglass and manufactured in West Germany. Free flight just has to get to town more often.

While the outdoor free flight launch site was only minimal and had to be moved frequently because of wind shifts, overall, the AMA should be congratulated on finding a location that permitted indoor and outdoor free flight to be flown in the same vicinity as most of the R/C and C/L events. To be as fair as possible, the hangar chosen for indoor events exceeded flight requirements by the

same proportions that the outdoor location barely met them. The base hangar location was great, with a very large floor area, minimal ceiling obstructions, and once again, accommodations for spectators. People, in fact, seemed eager to line the hangar sides at both upper and lower levels in order to watch the beautifully crafted ships circle the inside perimeter. On scale day, in particular, between two and three hundred people lined the sides of hangar and applauded flight after flight. It was a terrific exposure for the sport and a real thrill for contestants to get a round of applause for their achievement.

In all, freeflight had one of its best Nationals in recent memory with no small thanks going to the AMA's site selection committee and to those officials who worked so diligently to make it all happen. 



**A double threat**, Dave Rees' *Zippy Sport* competed in both Indoor and Outdoor Rubber Scale. Long gear for prop clearance (**above**). George Perryman (**below**) shows us his outdoor autogyro entry with its own directions.



**Coupe was a** very popular event. Here (**above**), John Rice launches his *Champion B*. This Miles *Sparrowhawk* is the work of FM columnist Larry Kruse. It came in third in Outdoor Rubber Scale (**below**). Future FM feature.



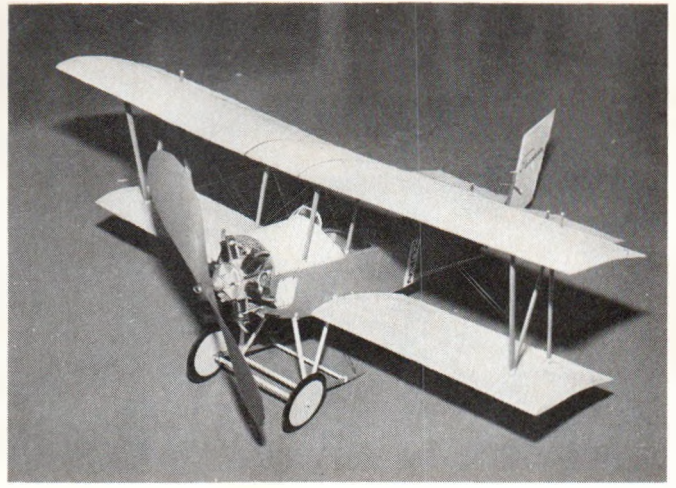
**Fred Anderson** aims his *Starduster* skyward during 1/2A Gas competition. This event was the most popular of all F/F categories.



**All indoor was** held at the extremely spacious Base Hangar in which Walter Eggert flew Hand Launch Glider. Note the interesting tip "feathers".



**This young lady** flew in both Paper Stick and Easy B in the Junior category. She's Amanda Henry of Melrose, MA launching her Paper Stick.



**Another entry** saw dual competition in both Indoor and Outdoor, Walt Eggert's Farman Sport. Model represents a ship at the Silver Hill museum.



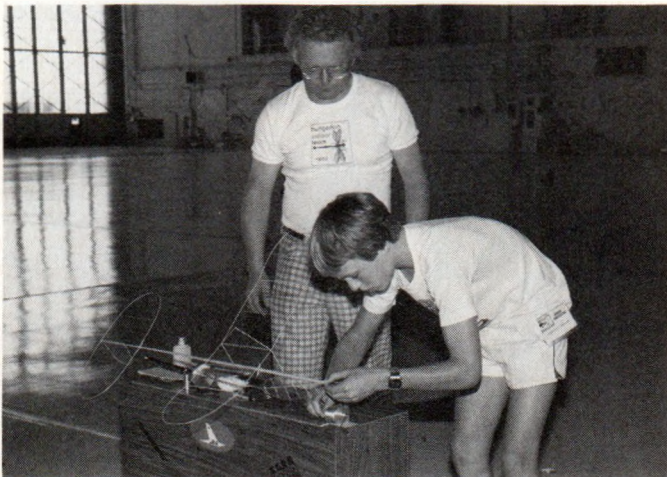
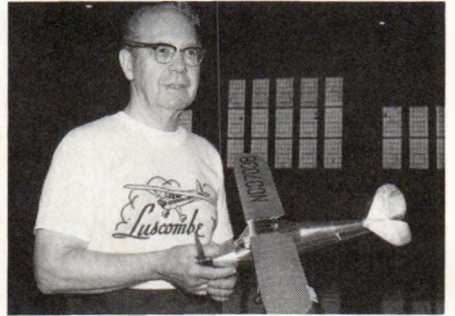
**Shades of earlier days.** Steve Landy flew this ancient Denny Davis design (**above**) in Payload. Bill Hunter (l) confers with Bob Gutai (r) (**below**) concerning Bob's FAI ship.



**Winner of the NASA Flight Achievement Award** was Leon Bennett's huge, rubber powered Moth Minor (**above**). Stephanie Anderson (**below**) holds her dad's winning Payload entry, the *Midnight Oil*.



**A participant** in many F/F events, Dave Brown launches his Coupe (**above**) as his brother and his dad watch. This Luscombe *Silvaire*'s metallic finish done by Rolfe Gregory (**below**).



**Junior participant** John Harlan winds his FAI Stick under the watchful eye of his dad, Ray. Jon placed high in several Indoor events.




**We may be wrong**, but this looks like Ray Pelatowski launching a Bob White designed *Vol Libre Coupe d'Hiver* at the Outdoor site.

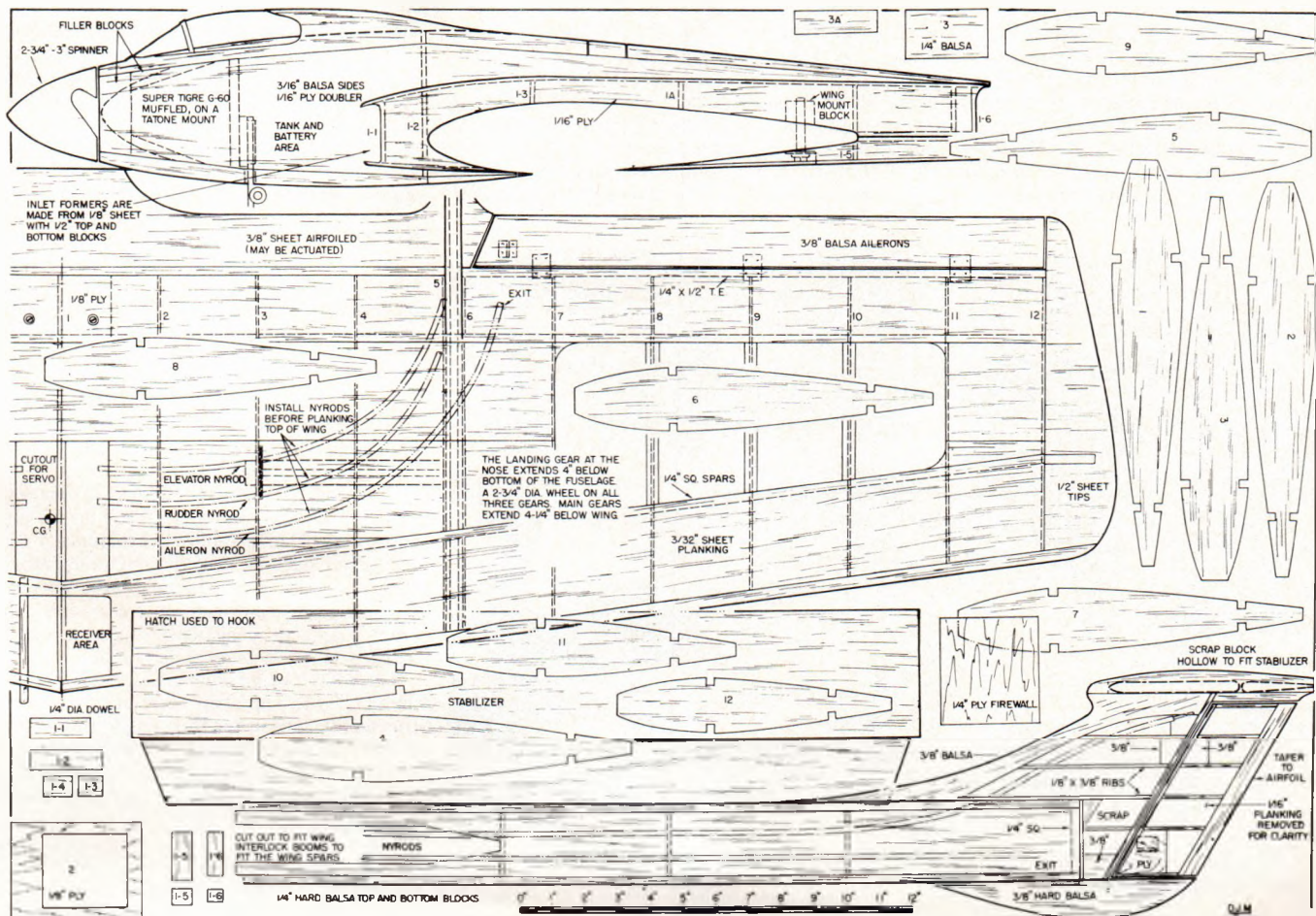
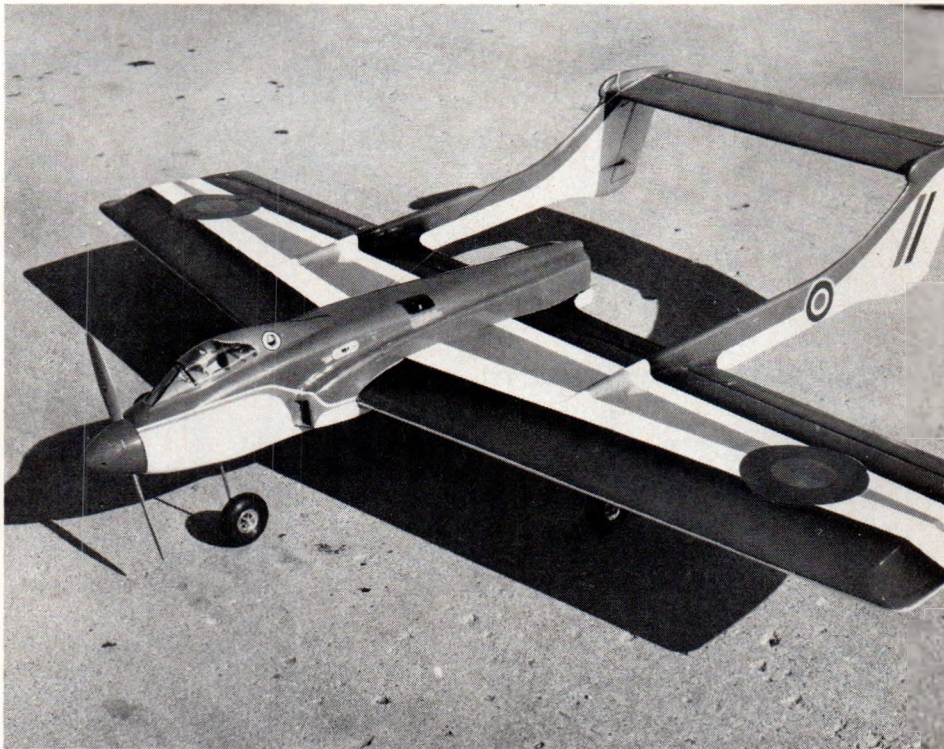
# CF-281 Sea Vixen

**E**ver hear of "Run-off" scale? That's the term Jack Sheeks invented to describe his unique pattern design the *Sea Vixen* published in the November 1972 FM. It's loosely (that's very loosely) based on the British deHavilland *D.H. 110 Sea Vixen*, the first two seat, all weather fighter to exceed Mach 1.0

What Jack had in mind with this design was to avoid the seeming monotony of pattern design at the time by adding some eye appeal. The *Sea Vixen* had an ST G.60 pulling it around quite handily. Wing span was 84 inches with an area of 800 square inches. Weight came out at 7 1/2 pounds with an all paint finish.

Construction is also a little unique. In this plane, the fuselage bolts to the rest of the plane. The twin tail booms, while adding a little extra effort, are easily fabricated from sheet balsa.

The plan for the *Sea Vixen* is available from Carstens Flying Plans Service. You can order it, as well as any of the other plans listed in the plan directory published in the April 1982 FLYING MODELS. Back issues of magazines, for the current cover price, are available from this service as well. Order from: Carstens Publications, PO Box 700, Newton, NJ 07860. For your convenience, Visa and Mastercard are accepted. 



# Beehive R/C Model Aircraft Co.'s



An FM Product Review:

## Kloud King XL

By Dr. D.B. Mathews

This replica of a 1930's Freeflight classic is now a pre-fab R/C sport kit.

PHOTOGRAPHY DR. D.B. MATHEWS

**B**eehive Models *Kloud King XL* is a pre-built, nearly ready to cover, modified version of a design published in *FLYING MODELS*, July 1980. (Plan CF-543) For those fliers with inadequate time or skills to scratch build, this concept may be a viable alternative in trying their hands at Old Timer R/C assist.

Certainly, the open framework, "stick and pieces" models can be attractive alternatives to the more conventional sport models. The undeniable beauty of these nostalgic throwbacks combined with their docile flying characteristics have made them remarkably popular with a large number of fliers.

The published design on which Beehive Models based this product was developed by this writer. I hasten to add I have no financial interest, nor am I receiving any compensation from the manufacturer. However, having originally designed and developed the model certainly places us in a rather odd position when evaluating the product.

Although I enlarged the *XL* from Mickey De Angelis' original 1937 drawings, an error crept in between my pencils and the draftsman's inks. The *Kloud King* nose outline is not accurate, nor is that of the rudder. Therefore, the *Kloud King XL* is not SAM legal! It really should not be allowed to compete in

SAM events.

Otherwise, it is a splendid sport trainer. Frankly, the design would be hard pressed to compete effectively with the floaters such as the *Dallaire* or the *Cabin Playboy* anyway.

That the *Kloud King XL* is an excellent choice for those seeking a slow and gentle flier with thermalling capability is testified to by the large number of plan-built versions flying. I have received correspondence from builders from such diverse locations as New Zealand, Mexico, Canada, England and even Israel! The plan has been a very popular one for *FLYING MODELS*, and with what, I think, is good reason.

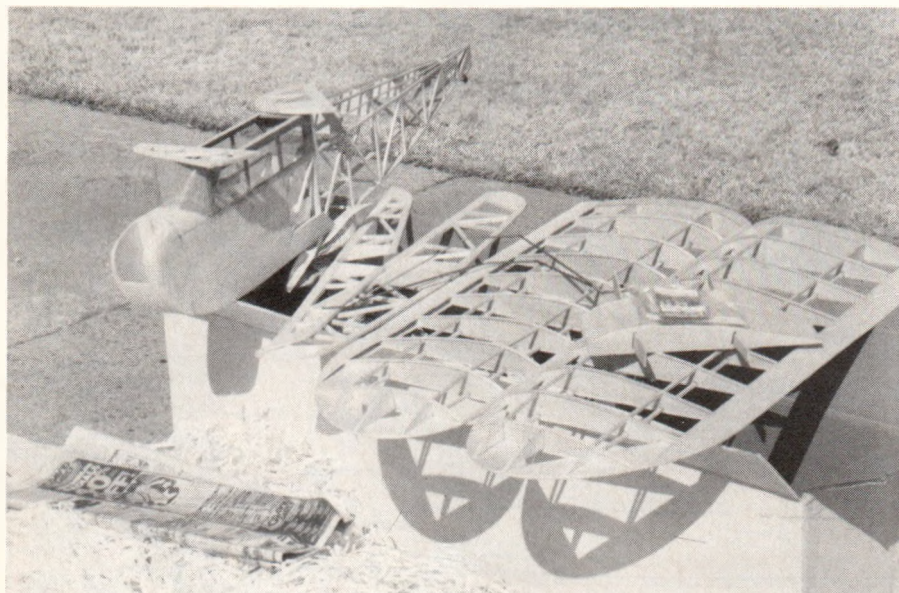
### Kit details

Beehive has altered the original construction to facilitate assembly on jigs using cyanoacrylate adhesives. The sub-assemblies are produced by ladies in the community, on a piece work basis in their homes. That is: one lady builds all the right wing panels with the jig and pre-cut parts in her kitchen, and so forth. Certainly a novel and well proven approach which produces excellent workmanship and quality.

The fuselage is nearly all balsa as opposed to the original design's extensive use of ply and spruce. Double laminated sections of  $\frac{3}{16}$  X  $\frac{3}{16}$  inch balsa are used for longerons rather than the original  $\frac{3}{16}$  square spruce. My particular sample contained several vertical and cross pieces of very light and soft balsa which I found to be awfully fragile.

The wing leading edge is square stock, set on edge, with cap strips running from it to the double sheet trailing edge. Spars are spruce. As shipped, the completed right and left panels are to be joined to a sheeted center section via a plywood brace which slides into a set of boxes which are joined with epoxy. All and all, this is a strong and light wing well suited to covering with MonoKote™.

The empennage is manufactured of  $\frac{1}{4}$  inch



All that lovely framework is the way you receive Beehive Models' version of the *Kloud King XL*, a modified version of the author's design published in the July 1980 issue of *FLYING MODELS*



strip and sheet balsa. Robart hinge points (large) are supplied to fit into pre-drilled holes. A hardwood insert is used for the rudder horn and tail wheel steering tiller.

Landing gear is pre-bent and soldered 1/8 diameter music wire, and need only be screwed onto the ply fuselage bottom. Wheels (3 1/2 inches) and collars are not supplied.

Wing hold down is via 1/4 inch diameter dowels running through ply reinforced holes in the cabin. Nose blocks are pre-shaped, sanded, and installed. A drain hole is even pre-cut in the bottom block! No motor mount is supplied as the engine chosen will dictate what size nylon motor mount is needed.

A removable hatch windshield unit with clear plastic already installed is used for access to the battery and tank compartment.

### Specifications

*Kloud King XL* spans 74 inches, chord is 13 inches and total wing area is approximately 900 square inches. A flat bottomed modified Clark "Y" airfoil is used. Fuselage length is 53 inches overall. With a radio compartment 12 inches long, 3 inches wide and 9 inches deep, needless to say it is roomy! The nose compartment is 3 1/2 inches long, 3 inches wide and 5 inches deep, a tank notch in the rear bulkhead does allow use of a six ounce tank with the battery under it.

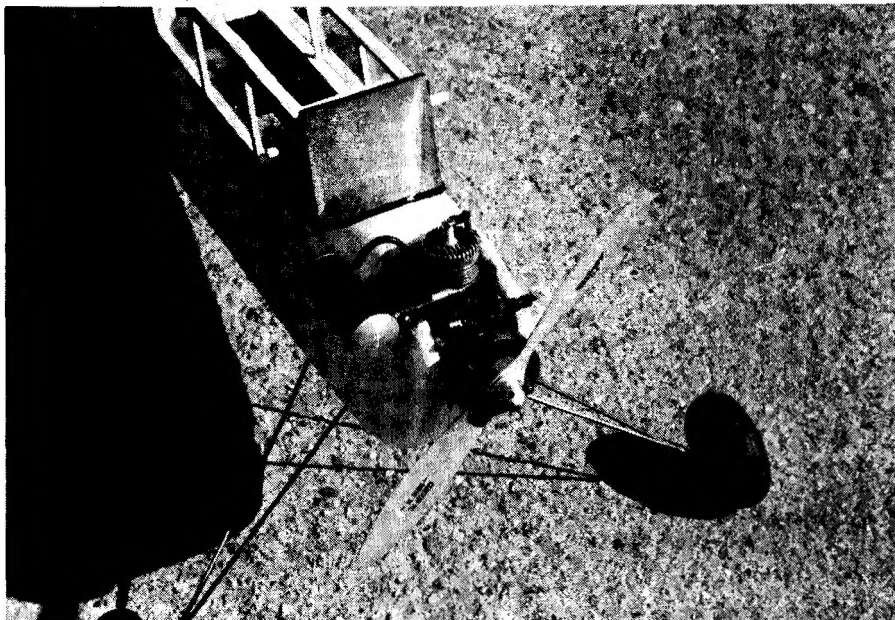
Total weight should range from 4 to 5 1/2 pounds for a spectacularly low wing loading of 10 to 14 ounces per square foot. Recommended power plants are .25 to .40 cubic inches.

### The product

All parts of our sample were band sawn, well sanded, nicely fitted and well glued. All one need do to be ready to fly the *Kloud King XL* is join the wings, install the motor and radio, screw on the landing gear, and cover. Only a few hours of relatively simple work will produce an attractive and "out of the rut" model.

### Finishing

Although the entire model possesses sufficient rigidity to be safely covered with a heat shrink plastic, I chose to cover the fuselage on mine with World Tex. This heat



Initial power for the XL was a K&B .40 converted to gas and oil operation with a C.H. electronic ignition system. The plane was vastly overpowered and the author had to switch to an OS .30. Details in text.

shrink fabric is rapidly becoming my favorite material. The adhesion to both the framework and to itself is vastly superior to previous products of this type. Seams are tightly stuck, the ability to cover compound curvatures is amazing, and the durability "splendiferous."

The wing and empennage were covered with crystal green MonoKote™, while the fuselage was sprayed with white Poly-U. The edges of the MonoKote™ were striped with Sig Stripe-rite for a rather attractive overall look.

Of course the tank compartment needed fuel proofing which I did with clear Poly-U. Window edges were dressed with Stripe-rite. I removed the factory installed side windows to facilitate covering and painting. They were replaced with clear Sig plastic adhered with Wilhold R/C 56.

Strangely, the rather sparse two sheet instruction booklet contains absolutely no information or recommendations for installing

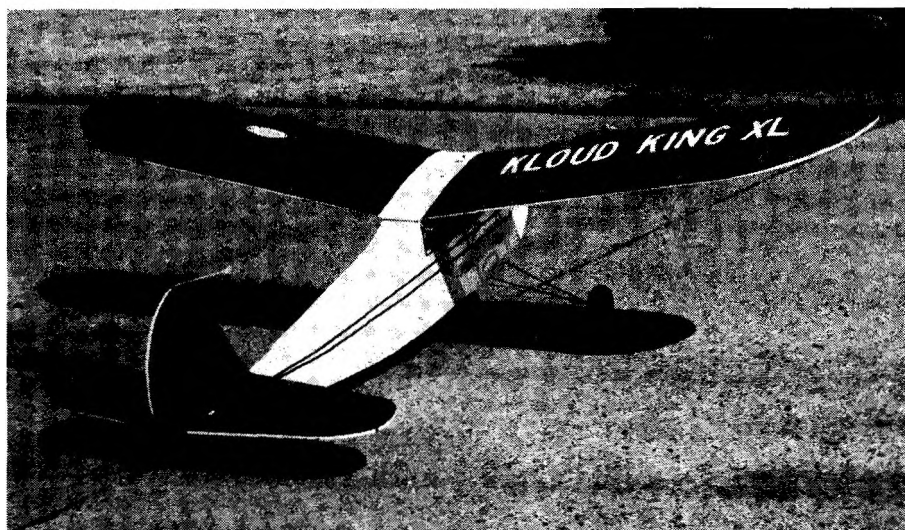
the servo pushrod system. The fuselage does have slots for Nyrod exits built in so we presumed they were the recommended method and installed Sullivan heavy duty (blue) rods. Anti-flex was provided with scraps of balsa drilled to accept the outer tube, then glued with cyanoacrylate to the vertical fuselage members.

Assembly of the R/C system is much more easily accomplished prior to covering the fuselage. I found the model tended toward tail heaviness and placed the receiver under the servos all just immediately behind the bulkhead. Even then, ballast was required.

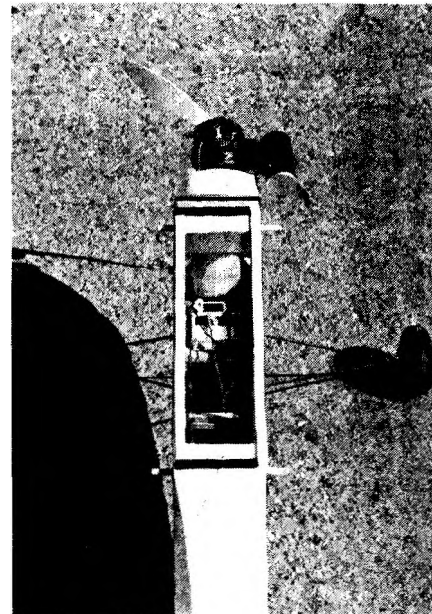
Extra length bits for the drill would certainly simplify drilling the holes for the Kraft motor mount. The nose blocks put the firewall a long way in for a conventional drill, but they can be used by carefully chucking to their maximum length.

### Flying

Using a K&B 40 (8011) converted to gas and



The open framework lends itself to the transparent heat shrink mylars (above). A mix of World Tex, MonoKote™, and Poly-U finished the author's. Don't worry about room for the radio (right), there's plenty.



oil operation with one of C.H. Electronics ignition systems, the model was nearly unmanageable even though I had the C.G. as marked on the drawings, the clevises in the outer holes of the factory supplied Goldberg short horns, and used the recommended thrust settings.

Surface movements were extremely sensitive and excessive, the model was nearly totally unstable in the pitch axis at full throttle; I saved it only with one of those "maximum efforts".

The *Kloud King XL* was designed originally to be the required 900 square inches to utilize a .40 engine in SAM events. As set up, it was incredibly overpowered with a .40. I immediately re-engined with a very tired and old OS Max 30, retro-fitted long Sig control horns to reduce the throws, and moved the C.G. forward  $\frac{3}{4}$  of an inch by sticking lead ballast on the firewall.

The second flight was much more docile and better behaved, but still short of the original's. As the throttle was advanced, the model ballooned nose up very badly, requiring full down elevator. Obviously, we needed a ton of down thrust, which we added by securing two  $\frac{1}{8}$  inch thick washers on the left top motor mount bolt.

This fix finally corrected the major problems and we were able to relocate the C.G.  $\frac{3}{8}$  inch farther back to help the glide.

Measured at the widest portion of the surface, our deflections were:  $\frac{1}{2}$  inch up,  $\frac{1}{2}$  inch down, and a total of one inch rudder throw. We also used a total of  $\frac{3}{16}$  inches of down, right shim. Our recommendation would be to shim the leading edge of the wing about  $\frac{3}{16}$  inches to reduce the awkward looking down thrust.

The *Kloud King XL* was developed primarily as a powered glider and, in that role, it is a delight. It will ride lift well and is very "thermal ready". The super slow gliding speed completely obviates any squirrelness in power. Slow speed characteristics are so very



Slow speed characteristics, as befit an Old Timer design, are excellent. Landings are a study in relaxation; dead stick is very docile. At low throttle, touch and goes become a dream.

docile we prefer to land ours dead stick, although in very low throttle, touch and goes are lovely.

### Summary

Beehive Models *Kloud King XL* is certainly an easy entry into the wonderful world of Old Timers for those with limited time or building skill. The workmanship is excellent. (with a few exceptions), the materials are acceptable if some of the super soft strip is replaced, and with the above detailed alterations the model can be tamed into a fun model to fly.

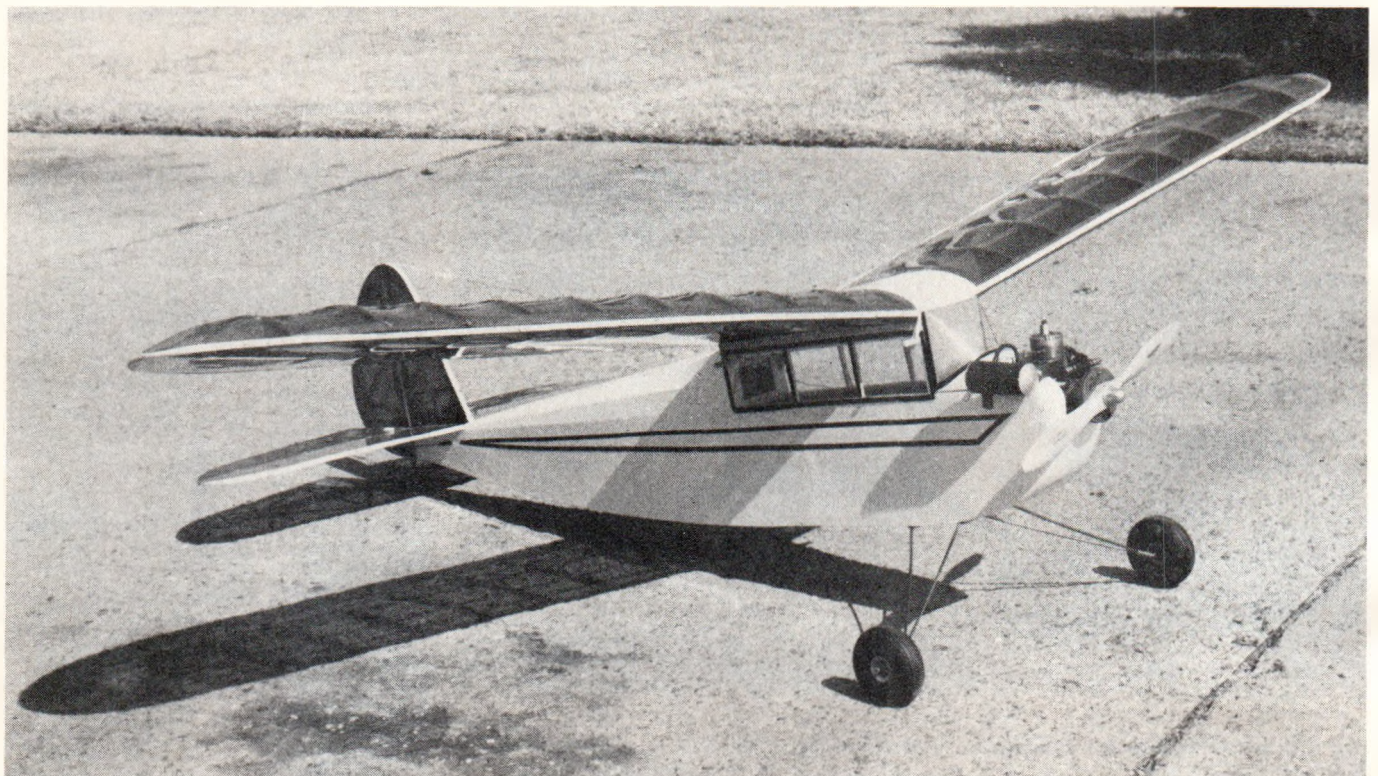
Even though the *XL* in the model's name refers to the Roman numeral for forty, we cannot recommend that this model be so powered! Perhaps if  $\frac{3}{32}$  inch vertical shear webs were added to the front and rear spars, and the model were covered in silk or Sig

Koverall, enough structural strength could be added. Frankly, why bother? Just hang a good .25 on the nose, ballast the thing for a proper C.G., add down and right thrust and have a ball!

The new generation of 25's such as those from H.B., O.S., Supertigre, etc. are such solid workers with small fuel appetites they are just plain delightful in a model like this.

Beehive is to be congratulated for introducing an almost assembled and ready to cover model of the classic "sticks and pieces" approach. It is certainly novel when compared with the contemporary foam and plastic approach and proves the continuing viability of Old Timers as sport models.

With a bit of "tweaking" a *Kloud King XL* is a model to enjoy. Beehive R/C Models of Box 744, Layton, UT 84041 sells it for \$149.95 direct to you.







PHOTOGRAPHY: BOB ABERLE

Jill Aberle holds her dad's, Bob, vintage but trusty MRC 776 six meter transmitter. In front of her is the new MRC Cessna Skyhawk.

## An FM Product Review:

# MRC's Cessna Skyhawk

By Bob Aberle

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Latest in a line of foam ARTF airplanes comes complete with engine and all hardware.

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The people at MRC (Model Rectifier Corp.) are certainly well known for their molded foam construction, ready-to-fly R/C model airplanes. Their .15 powered *Trainer Hawk* has been on the market for years. Several years ago I had the opportunity to review the then new, MRC *Eagle*, which was another molded foam model. The *Eagle* was quite large (372 square inches — 48 inch span) but was powered with only a .049 size engine. I remember stating at the time that it couldn't possibly get off the ground with that small engine. Well, if you read my review of the MRC *Eagle* in the January 1981 FLYING MODELS you know this "big" 1/2A R/C model turned out to be an excellent performer. I guess the main point of this story is that you have to try something

first before commenting on it's performance.

Recently, my favorite UPS driver delivered a truly large shipping box to my house. It contained the long awaited MRC, stand-off-scale, ready-to-fly, Cessna *Skyhawk II*. When I first opened the box and noted the size of the model (large) and then the size of the engine (comparatively small), once again I assumed that it would never get off the ground. Well, the fact of the matter is that it does fly and fly quite well at that — but I must admit I had to try it first before I actually believed it.

The new Cessna *Skyhawk* is available from the Model Rectifier Corp., 2500 Woodbridge Ave., Edison, New Jersey 08817. List price of the complete kit (not really a kit when you get right down to it) is \$224.95. For this price

you receive a complete molded foam (expanded bead variety) model aircraft. The foam is reasonably dense and the exterior (white colored) surface is relatively smooth. For added realism, the metal ribbing effect found on the full size Cessna ailerons, wing trailing edge, and elevators are duplicated in the foam molding process. The molded wing halves must be permanently joined by the modeler. Already molded into the wing halves are the nylon aileron control rod sleeves and a pair of plywood spars (in the center section). The fuselage comes fully assembled with the engine, fuel tank, and steerable nose gear already installed. Stabilizer and vertical fin are separate, molded assemblies. All control surfaces, aileron, elevator, and rudder are pre-hinged and installed in place. They include the appropriate control horns already installed as well. MRC supplied the popular Enya .35 TV engine, along with the matching muffler and muffler extension stack, a propeller, and a spinner. Additionally supplied is the aluminum main landing gear, all the wheels (2 1/4 inch diameter), pre-formed control rods for the rudder, elevator, throttle, and steerable nose gear hook-ups and all the necessary mounting hardware. The finishing touch is a set of vinyl decals which add a great deal of realism to the finished Cessna. This is almost as complete as you can get and obviously an excellent choice for the "first time" R/C beginner.

Let's talk about the plane itself and discuss some of the design details. The Cessna *Skyhawk* is claimed to be 1/6 scale of the original aircraft. Wing span of this model is 71 inches. Root chord (width of the wing at the center section) is 11 1/2 inches, while the tip chord (width) is 8 1/4 inches. I calculated the

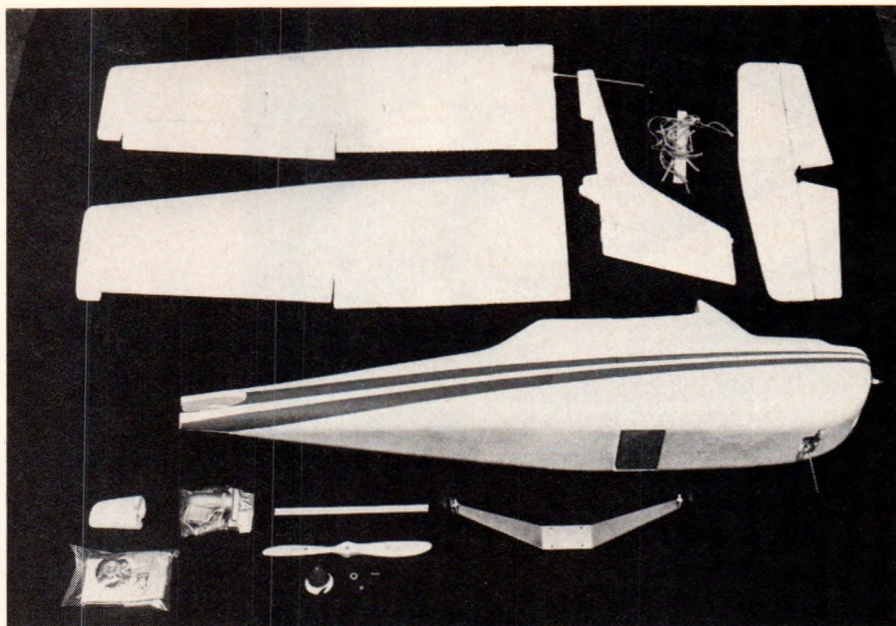
wing area at 754 square inches. The airfoil is a semi-symmetrical section (rounded top and partially rounded bottom) of approximately 14-15% maximum thickness. I would guess the actual airfoil is close to an NACA 2414 or 2415 section. Overall fuselage length is 49 inches. Out of the box weight of the model (everything less the radio system which you must supply) is 76 ounces. I installed my old, faithful MRC six meter FM R/C system (which was reviewed in the April 1979 FLYING MODELS). This particular MRC system is no longer available. For reference purposes, the weight of this R/C system (with heavy duty MR-80 servos) is 14 ounces. In the process of assembling and finishing the Cessna I picked up an additional 6 ounces, so the all-up weight, ready to fly (less fuel) ended up at 96 ounces (76 + 14 + 6 ounces) or six pounds even. At that weight the wing loading turned out to be a very light 18.3 ounces/square foot, which again is excellent for the beginner R/C pilot.

Total assembly time from the box to the flying field took about three nights or approximately 6-8 hours total effort. MRC supplies a three page instruction sheet, plus an additional page of diagrams. A separate set of Enya model engine instructions are also included. The Cessna assembly notes consisted basically of written text. A few detailed photos, supplementing the text, would have been a helpful addition in my opinion. I had no particular problems during the assembly steps, but I wondered in a few cases how a beginner might have interpreted some of the instructions.

Rather than take you through the entire assembly procedure, let me give you a few highlights and some helpful hints. You must establish your aileron servo mount before joining the wing halves. Once joined, it is practically impossible to make any adjustments to the aileron linkage later on. It is most important that you use the longest output arm available on your servo for the aileron linkage attachment point. This will give you the maximum aileron surface deflection which is definitely needed on this model. Let the aileron servo output arm extend beyond the edge of the plywood servo support. Get this all set up and operating with the wing halves temporarily taped together before permanently joining the panels with epoxy glue. It didn't say in the instruction notes, but the wing dihedral angle (the "V" shape angle of the wing) amounts to approximately two inches under each wing tip, with the center section resting on a flat surface. Before adding the center wing section red decal, I epoxied some strips of  $\frac{1}{32}$  inch plywood on the top of the wing by the leading and trailing edges. Without this reinforcement the wing rubber bands can easily cut into the foam material. Don't forget this extra point which is not covered in the instruction sheet. I expressly assembled the wing first and then mounted it in place on the fuselage with the help of a few rubber bands. This allowed me to more accurately align the stab and fin in relation to the wing before cementing these surfaces permanently in position.

The foam surfaces are naturally fuel resistant. Some of the residual engine oil will tend to soak into the foam, but that shouldn't prove any great problem. I personally prefer fuel proofing around the engine compartment area. So in my case I did remove the engine and apply a light spray coating of Pactra Formula-U clear urethane varnish. If you use any other paint products, it is advis-

FLYING MODELS



The basic MRC Cessna Skyhawk "kit". The fuselage comes already assembled with engine, fuel tank, and steerable nose gear already installed. Join wing panels, add fin and stab, and you're just about flying.

able to test compatibility on a piece of scrap foam. Many paints and model finishes will melt the foam surface, so please be advised. Admittedly the clear varnish does tend to "yellow" the white foam somewhat, but not really that badly. I did experience problems with my engine coming loose on the first couple of flights. I beefed up the engine mounting tray area with  $\frac{3}{8}$  inch square hardwood and a liberal coating of an epoxy filler type material (Sig Epoxolite). I also switched over to hardened steel hex head machine screws with appropriate lock washers. It is my understanding that these several suggestions will find their way into future MRC Cessna kits.

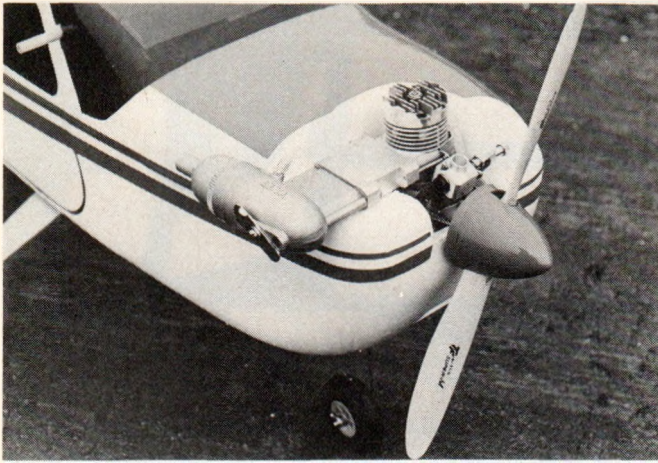
Let me caution you on the application of the vinyl decals. These decals are first quality, with excellent "sticking" ability. It wasn't clear to me as to how to install the front, wrap-around windshield (black color). After I did it completely wrong I found an

assembly diagram (specifically for the windshield) printed oddly enough on the red decal sheet. Look for this helpful diagram before you start on it; it will save you a lot of time. I had to resort to repairing the windshield with some regular MonoKote™ black trim sheet material to complete the job.

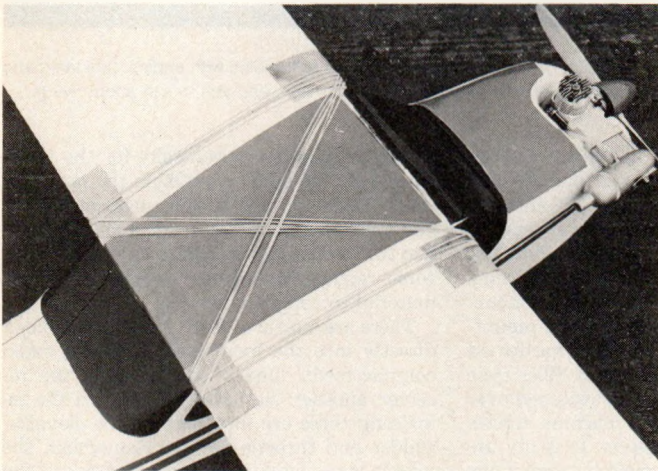
There are a total of five receptacles molded directly into the foam interior of the radio compartment. One of these holds the receiver, another the battery pack and the remaining three are intended for the elevator, rudder and throttle servos. Remember, the aileron servo mounts on the under side of the wing center section. Unfortunately, my MRC MR-80 coreless motor servos were too big for these molded receptacles and required a lot of extra cutting away of the foam material to make them fit. As such I had to resort to some hardwood inserts (epoxied in place) with the servos being attached to these bearers with small wood screws. If your particu-



In flight, the Skyhawk certainly looks realistic and actually prompted some residents' concerns about a full size emergency landing! Two plywood spars in each wing, 13 inches long, add extra strength.



Close-up of the Enya .35 TV engine which comes with the kit (above). Muffer, muffer extension, spinner, prop, and fuel tank are also included. For added protection against crushing the foam wing (below), Bob added 1/32 ply strips for reinforcement with the rubber band hold-down.



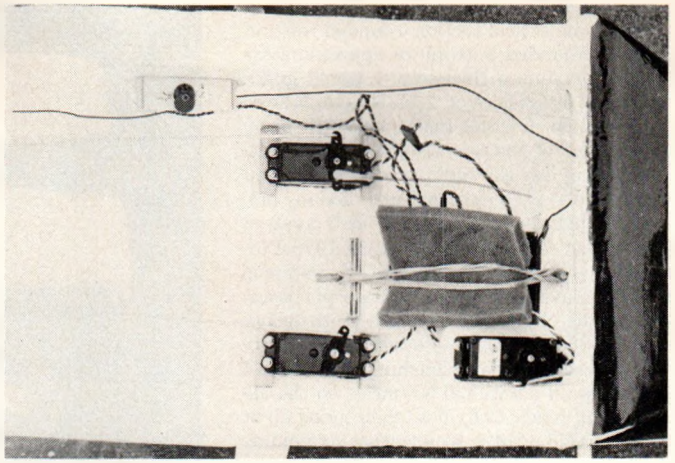
lar servos are a snug fit in these molded "holes" you could probably get away with just a piece of double sided servo tape on the bottom of each servo.

Interesting to note that, when finished, my Cessna balanced perfectly. This surprised me because all throughout the assembly process I thought it would just have to end up tail heavy. Since the R/C equipment is roughly evenly distributed around the C.G., the weight of a particular radio system would have little effect on the final C.G. Having a well balanced model is most important, especially for a beginner. I'm glad MRC took the trouble to work this out properly — good planning and design!

Some special attention must be given the Enya .35 TV engine before you attempt your first flight. A note glued to the cylinder head cautions that one hour of break-in is recommended before flying. I ran about 1/2 quart of Fox Super Fuel, which contains about 29% oil, through the engine and then went out to fly (still on the same fuel). As you will hear shortly, that wasn't enough. My muffer came loose after each of my initial flights. As a result I decided to tap out the muffer extension stack for a 4-40 screw and substitute hardened, long, hex head bolts with lock washers. MRC has indicated that they will also take this suggestion into consideration for future Cessna kits. The fuel tank supplied has a seven ounce capacity which will give you a good 8-10 minute engine run on the .35 engine (even more if you stay at lower throt-

tle settings). The tank is actually built directly into the molded foam fuselage. It can't be removed for maintenance without cutting away a lot of the molded foam. They tell me that the fuel line will last the life of the model. An 11-5 propeller is supplied with the kit. I used it on some of the initial flights and found that the engine overheated too easily with it, so I switched to a 10-6 prop which provided better overall performance. The spinner that came with the model was useless. As soon as the electric starter hit it the nose cone would fall off. I substituted a Goldberg 2 1/4 inch diameter variety. One thing for sure with regard to the Enya .35 engine; once broken in and adjusted properly, it will provide endless hours of reliable performance which is exactly what a beginner needs. You must be able to concentrate on flying, not engine maintenance.

Now let's get to the details of flying this large sport model. I decided to use a paved street in an industrial park area near my home. On the weekends there is practically no traffic. I also wanted a clear, smooth surface, for my first attempts with the Cessna because I wasn't really convinced that the engine would have enough power. On the first take-off the engine quickly began to overheat and sag at about 30 feet altitude. Take off run was a little over 100 feet on the smooth black top surface. With the overheat condition I had to reduce power somewhat, which made the Cessna a "hedge-hopper" to say the least as I attempted to avoid contact



The MRC MR-80 servos used are lost in the cavernous R/C compartment (above). Receiver and battery are under the foam. The aileron servo, an MR-80 also, is located in a small compartment (below) on the under side of the wing center section. Dark splotches are filler material.




with the various construction debris and equipment scattered around the industrial site. After a minute or so I was able to climb up to an altitude of approximately 150 feet. The Cessna needed considerable down elevator trim to maintain level flight (both at high and low engine speeds). Aileron response was excellent and there was no need to coordinate rudder control during turn maneuvers. Being able to simply use aileron and elevator control on one stick (Mode II configuration) is much better for a beginner pilot. When setting up for the first landing approach, I still needed the down elevator trim (mentioned earlier), so the problem must be with the incidence angle of either the wing or stab (engine downthrust is definitely not called for). Turning on to final approach, I thought it was a real Cessna coming in for a landing. I didn't realize it until later, but after landing I had attracted a big crowd. It seems the local neighbors thought a full sized Cessna was attempting an emergency landing in the industrial park. You have to see this model in flight to believe it. Control surface movements ended up as follows: ailerons 1/2 inch either side of neutral; elevator 3/4 inch either side of neutral and rudder one inch on either side. Keep the nose wheel steering to a minimum (hole closest to the center hub of the servo output arm).

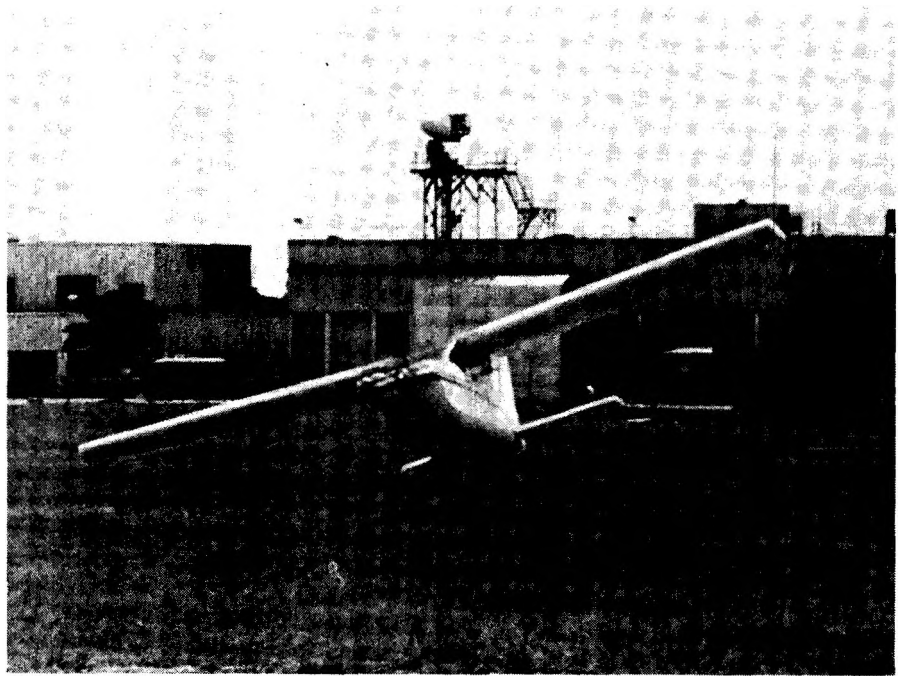
As the engine acquired more running time, the take-off distance decreased to about 75 feet or so, on the black top surface, and, of course, I had no further trouble attaining al-

titude. I also noted a marked increase in performance when I switched to a higher nitro content fuel. The Enya ran better on 15% nitro than it did with break-in fuel. The muffler was used throughout all the flying, along with muffler pressure (a tap is provided with the muffler).

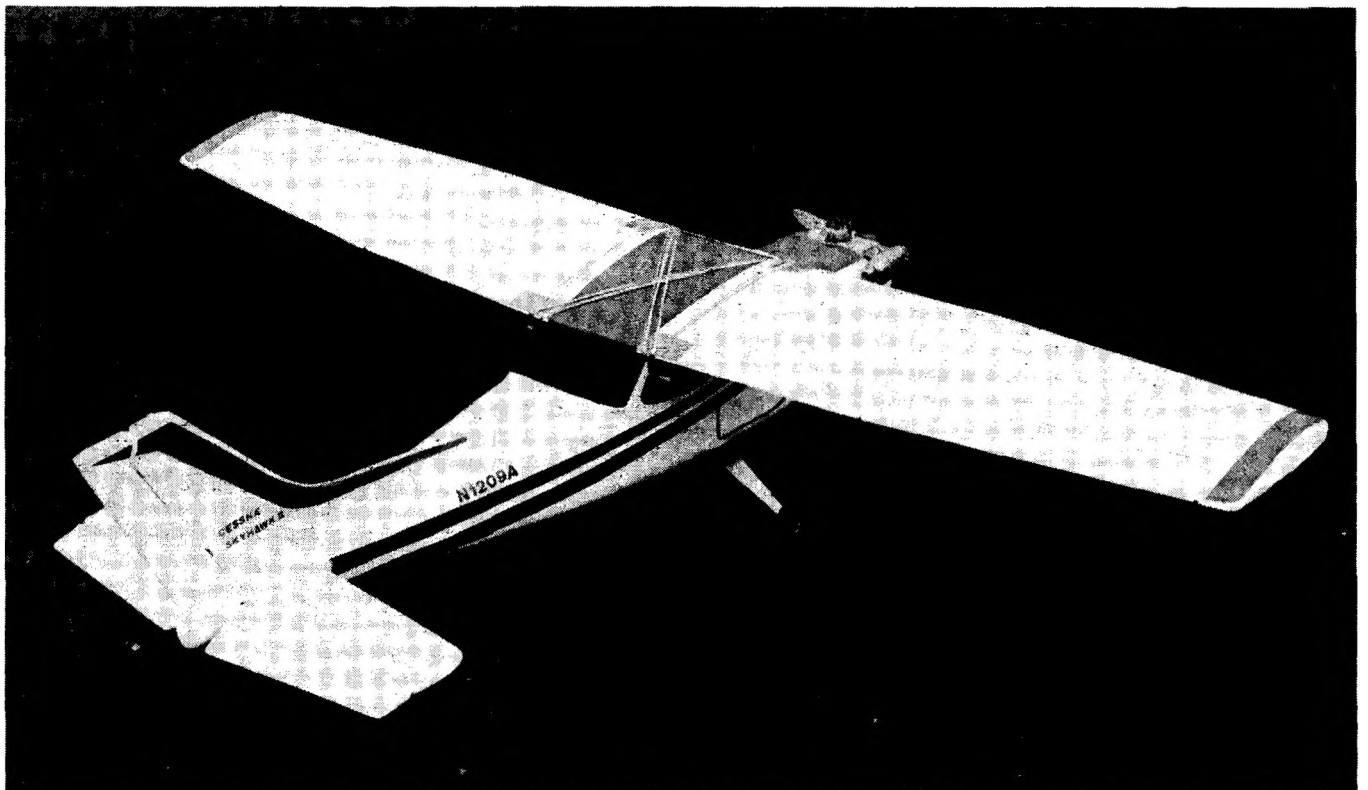
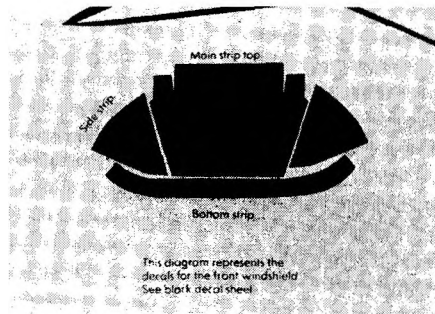
On a part grass, part old black top surface at our Grumman flying field, it took a lot longer to get the Cessna in the air. Longer still if the wind was up around 20 MPH. But once in the air the Cessna is a responsive and surprisingly maneuverable model. There is no tendency to tip stall. When landing keep the speed up much longer than you would normally be used to doing. With all that bulk and drag, the Cessna slows down in a hurry without power.

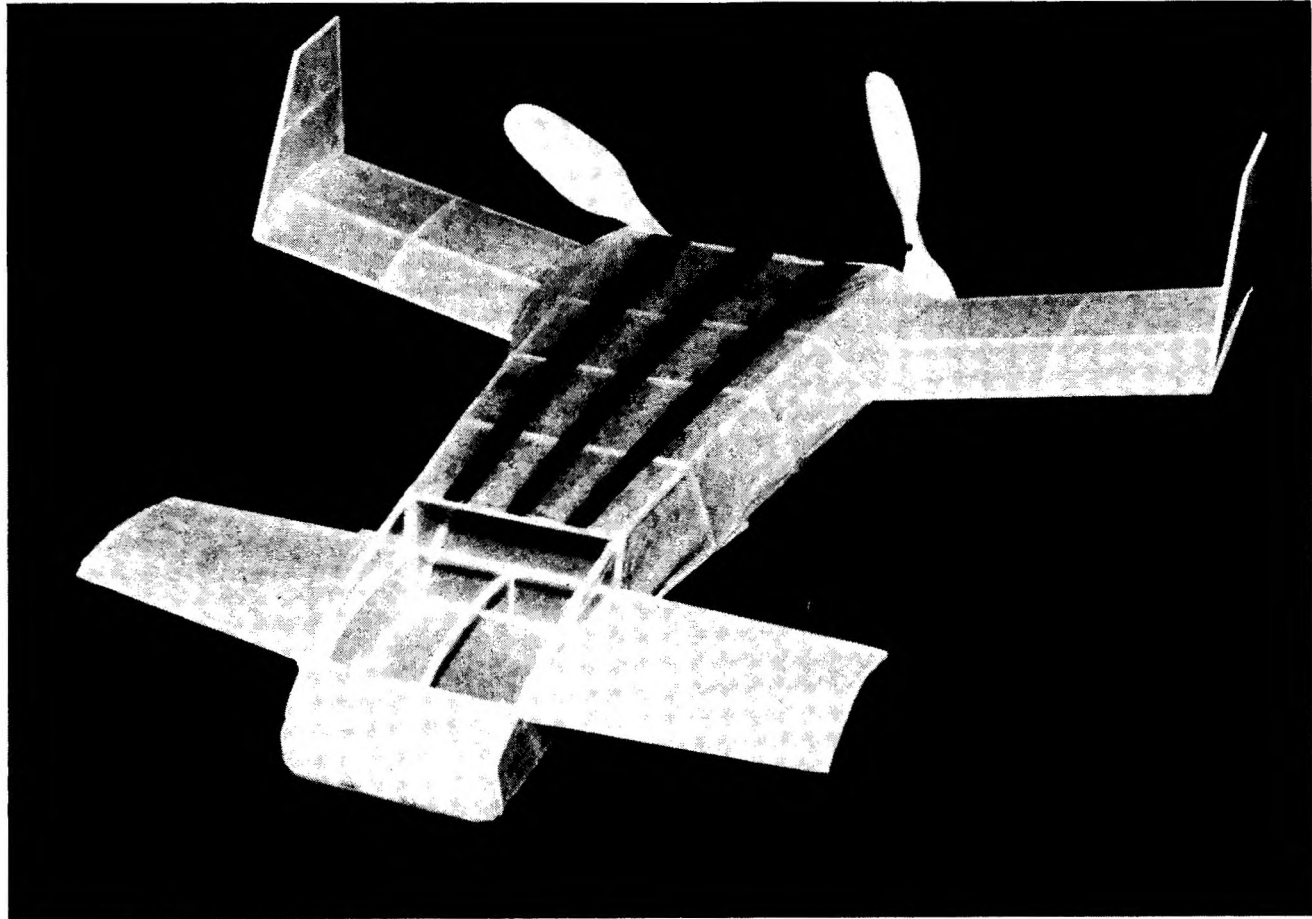
To summarize, the new MRC Cessna *Skyhawk* appears to be a good beginner's R/C subject. One of the key points to consider is the fact that this model is so durable. Rugged would be a better choice! The total foam construction can easily absorb a lot of energy. Should repairs become necessary they are accomplished easily with the help of epoxy cement. Replacement parts are also available from MRC. The Cessna would also be a good sport model for the average R/C "Sunday flyer". It is very realistic in flight, handles well in the air with plenty of control available. Engine power initially can be somewhat marginal until it becomes more broken in. At least an hour of running time is necessary, per MRC recommendations, before making that first flight.

In the next few months I expect to add a Kodak Disc camera (4000) to the inside cabin of my Cessna with the express intention of taking some aerial photographs. There is plenty of room for this purpose. I always wanted to try this; now I have the perfect opportunity with this new MRC Cessna *Skyhawk*. Should the results prove worthwhile I will follow up with another article. Until then good luck with your Cessna. 



Take-offs need some room on grass (above) and the engine should be well broken-in as MRC recommends. These are the application instructions (below left) for the vinyl windshield decals. Apply carefully, since they stick permanently. No trouble landing on the runway (below right) with the Skyhawk.





PHOTOGRAPHY: DAVID ARONSTEIN

Canards come to Bostonian with David Aronstein's *Lifting Body Bostonian*. This unique design has twin pusher props and a 18 inch wing span.

# Lifting Body Bostonian

By David Aronstein

A venerable modeling tradition, the twin pusher, up dated with a lifting fuselage section.

**T**he twin pusher is by far the longest lived configuration in aero-modeling history. It goes back more than seventy years, when rubber powered freeflight was all there was, and tractors were rare, even among full-size aircraft. They are still popular; more than twenty showed up at a contest in Westover, Massachusetts in mid-1982. Twin pushers are good flyers in any size; I have built little ones that get flights of more than two minutes, far better than a comparable R.O.G. Most amazing of all, however, is the fact that after seventy years, it is still possible to design one that is totally different.

The *Lifting Body* was not, however, originally meant to be a twin pusher. I had recently had surprising success with a flat

body *Bostonian* similar to the *Park Street*, but with a more airfoil-shaped fuselage, and with my peanut scale *Goldwing* canard. So, I decided to design a combination: a flat-body *Bostonian* with the stall resistance of a canard. Then my friend Jim Davis told me to make the in-seg at least twice as wide. I realized how ridiculous and impractical it would be, but there's no harm in drawing it. . . . When Jim saw what that looked like, he suggested tapering the fuselage to a three inch width at the nose. It occurred to me that with such a wide rear end, two props could fit side by side improving performance, stability (no prop torque), and wash-outs. Then Jim Davis did something which deserves even more credit than helping design the *Lifting Body*; he convinced me to build it! The results

have been well worth it.

## Construction

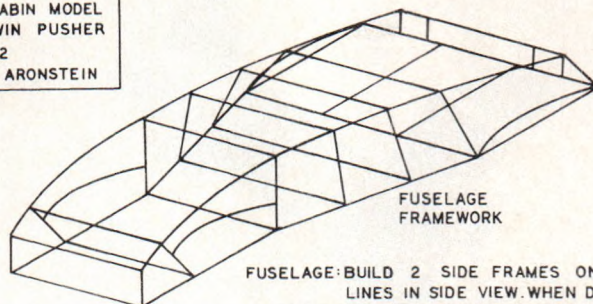
Construction of the lifting body begins with the wing. Wood weight depends on whether you are building a fourteen gram or a seven gram *Bostonian*. Whichever your choice, use lighter wood than you normally would because there is a lot of it, as well as two propellers and some noseweight. For the wing, I used  $\frac{1}{16}$  inch square, with  $\frac{1}{32}$  inch sheet for the six ribs. Because the center section is enclosed by the fuselage, airfoil ribs are not necessary in that section. Just  $\frac{1}{16}$  inch square. After adding  $\frac{1}{4}$  inch dihedral in the outer panels, cover those panels, but not the center section, with Japanese tissue or condenser paper.

Start the fuselage by building two side frames, each consisting of a bottom longeron, three forward uprights, and an overlength stabilizer rib. When these are dry, they are pinned over the top view, uprights sticking up perpendicular to the plan, and the bottom crossbraces are added. The completed wing is now glued to the ends of the bottom longerons with the trailing edge raised  $\frac{3}{32}$  inch for slight negative incidence. Cut two pieces of  $\frac{1}{16}$  inch square,  $\frac{3}{16}$  inch long, and glue them - pointing straight up - to the trailing edge of the wing,  $\frac{3}{4}$  inch in from each end of the center section. The ends of the top longerons will be glued to the tops of these. Now soak two pieces of  $\frac{1}{16}$  inch square, and bend to shape over the side view; they will be the top longerons. Glue them to the three forward uprights on each side. When dry, crack



# LIFTING BODY

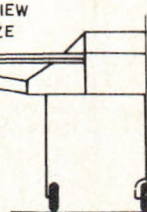
BOSTONIAN CABIN MODEL  
SINGLE OR TWIN PUSHER  
SHEET 1 OF 2  
DAVID ARONSTEIN



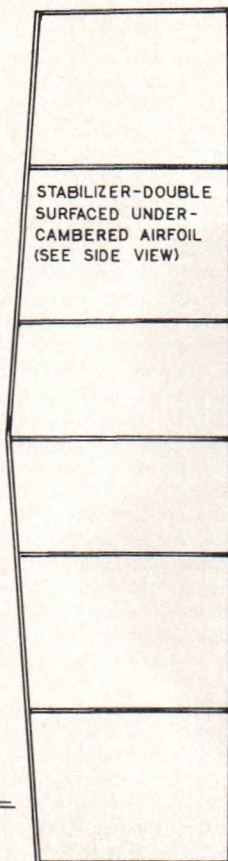
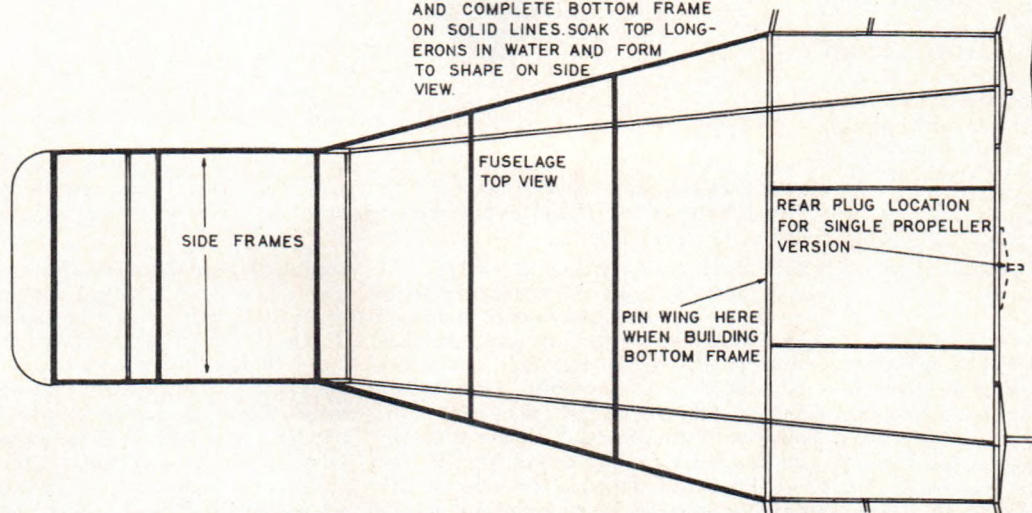
FUSELAGE FRAMEWORK

FUSELAGE: BUILD 2 SIDE FRAMES ON SOLID LINES IN SIDE VIEW. WHEN DRY, PIN SIDES AND WING TO TOP VIEW AND COMPLETE BOTTOM FRAME ON SOLID LINES. SOAK TOP LONGERONS IN WATER AND FORM TO SHAPE ON SIDE VIEW.

FRONT VIEW  
1/2 SIZE



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FULL SIZE PLAN AVAILABLE THROUGH CARSTENS FLYING PLANS

ORDER PLAN CF-654

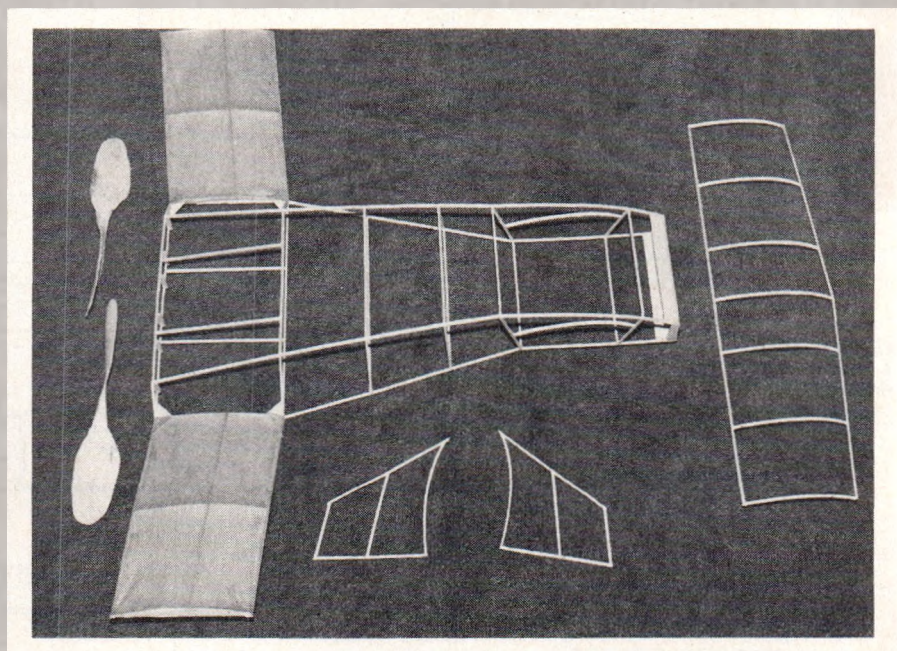
slightly just behind the third upright, bend outward, and glue the rear ends to the two uprights on the trailing edge. Let dry.

Now put in the crossbraces between the top longerons, and the four remaining uprights (which are actually not upright, but slanted) between the top and bottom longerons. The last of these goes from the dihedral joint in the trailing edge of the wing to the end of the top longeron. Add whatever reinforcements you consider necessary at each end to hold the rubber band, depending on intended weight. If you are building the single prop version, add two uprights, one inch apart, between the rear top and bottom crossbraces to hold the tail plug. If you are building a twin, put the uprights one inch from each end of the rear opening. If your model will be interchangeable, put in all four of the uprights. Main landing gear wire is .015 inch or .025 inch, again depending on intended weight. The 90 degree bend in the top end is stuck into the upright; if you are building a heavy model, you might want to reinforce the upright. Nose and tail plugs are made in the usual way and, as usual, require a snug fit.

Rudders and stabilizers are of conventional construction. Stabilizer ribs are made by the typical indoor method, using a curved edge as a template. Cut three sides of a  $2\frac{7}{8} \times 1$  inch rectangle of  $\frac{1}{16}$  sheet. Use the template for the top  $2\frac{7}{8}$  inch edge. Move the template down, and slice again. Repeat until you have nine ribs (two for the fuselage). The bottom edges of the rudder are made in a similar manner, to match the wing airfoil. The stabilizer is double surfaced, with the tissue on the bottom matching the curve of the ribs. I

cover such surfaces bottom first, gluing along the trailing edge, then ribs, and finally leading edge. The tissue can be pulled tight spanwise, but not chordwise, as that will prevent it from being smoothly undercambered. Don't shrink the tissue on the stabilizer or the rudders unless they are very strong. The

center section, which will be inside the fuselage, does not need to be covered. Now cover the fuselage, but leave the section of the sides through which the stabilizer passes, as well as the top of the fuselage above that section, open. These areas will be covered with clear windshield material. The fuselage sides



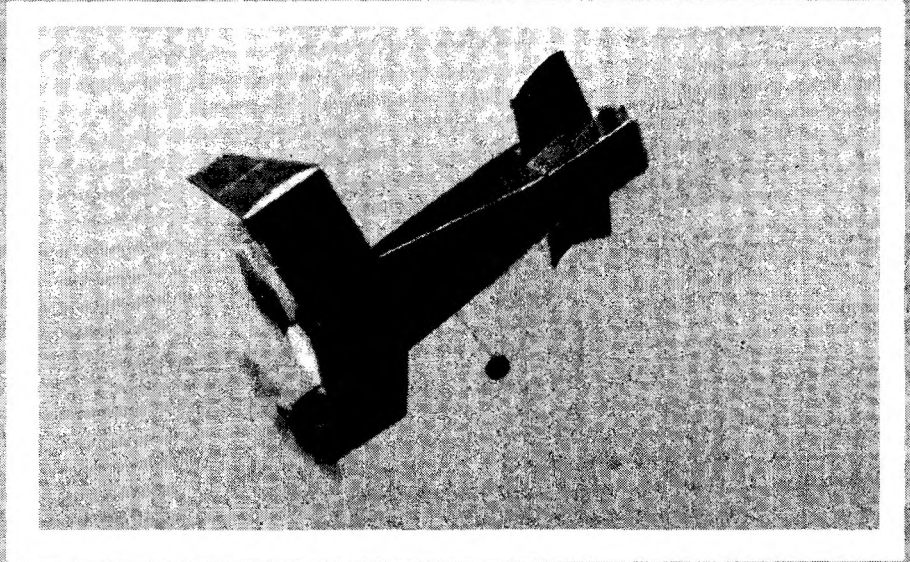
Wing and canard surfaces are conventional construction. The fuselage requires some care but is not very difficult. Note also that there is a right and a left hand prop to counteract torque.

will need to be shrunken because of the compound curve, but be careful with the top and bottom; those long crossbraces could bow severely. Don't dope any of the covering. After covering, put in the stabilizer and glue the rudders to the wingtips.

Now its time for all the other little odds and ends, starting with the nose gear wire. This goes up through the bottom of the fuselage to the stabilizer, where it is bent 90 degrees and glued to the trailing edge. As usual, the trailing edge should be reinforced if you are building a heavy model. Wheels are cut from 1/4 inch Polystyrene foam (the kind that meat comes packaged in) and are sanded round, with 1/32 inch O.D. Hot Stuff tubing through the center as a bearing. Willhold R/C-56 glue is good for that, as well as clear windshield material. Thrust bearings are 1/16 inch O.D. brass or aluminum tubing held in the tail plugs with epoxy. One must be about one inch longer than the other to prevent the overlapping props from hitting each other. The propellers are carved from lightweight balsa, one left-handed and one right-handed. Because the *Lifting Body* is a pusher, the props do not need to be strong, just light. If you build the single prop version, you need to anchor the other end of the rubber off to one side to avoid the nose gear wire.

### Flying

Rubber thickness is dependent on weight and intended climb. A seven gram model intended for low ceiling flying should have two loops of 1/8 inch rubber (one for each prop), while an outdoor fourteen gram model would have two loops of 1/8 inch rubber. Regardless of thickness, the loops should be at least twice as long as the fuselage for maximum duration, and should take 1500 - 3000 winds.

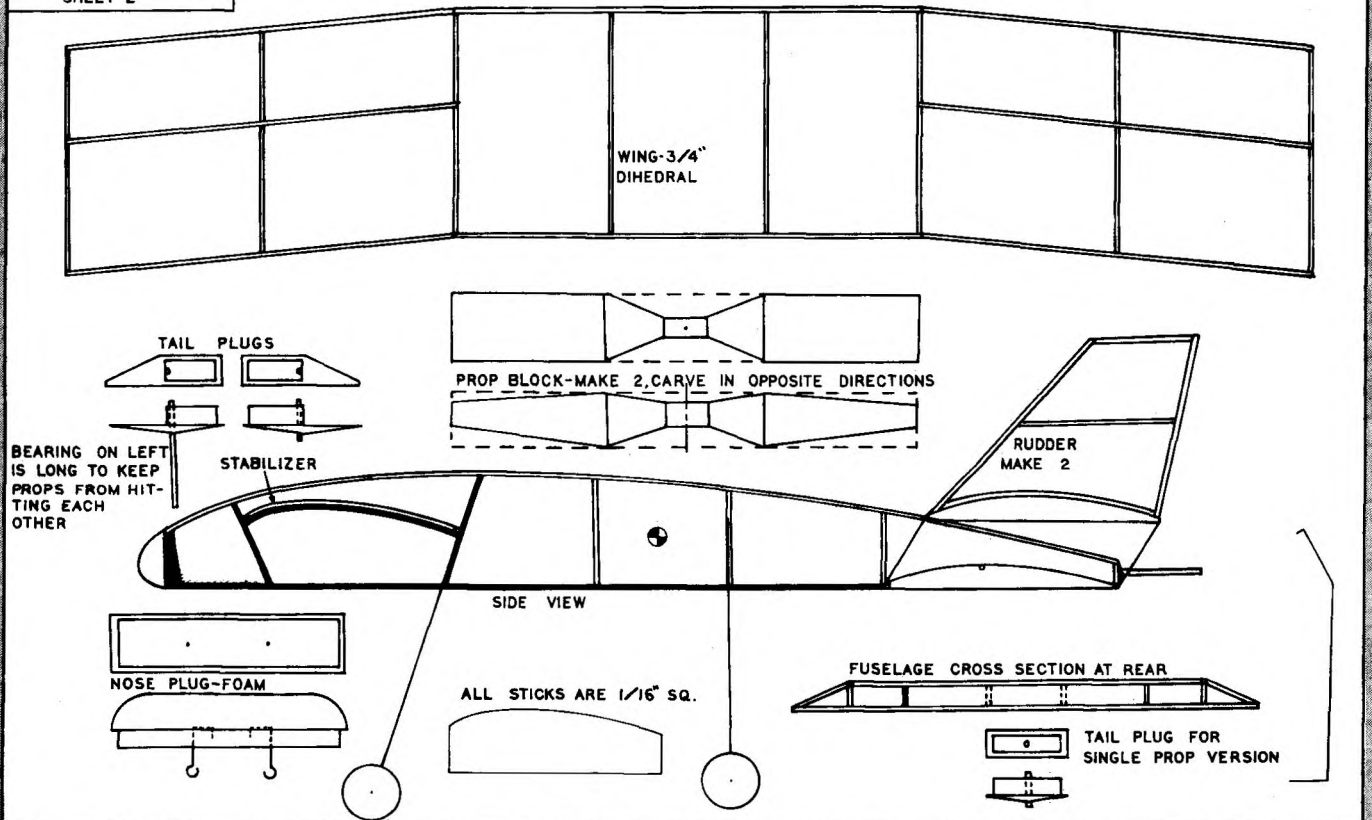


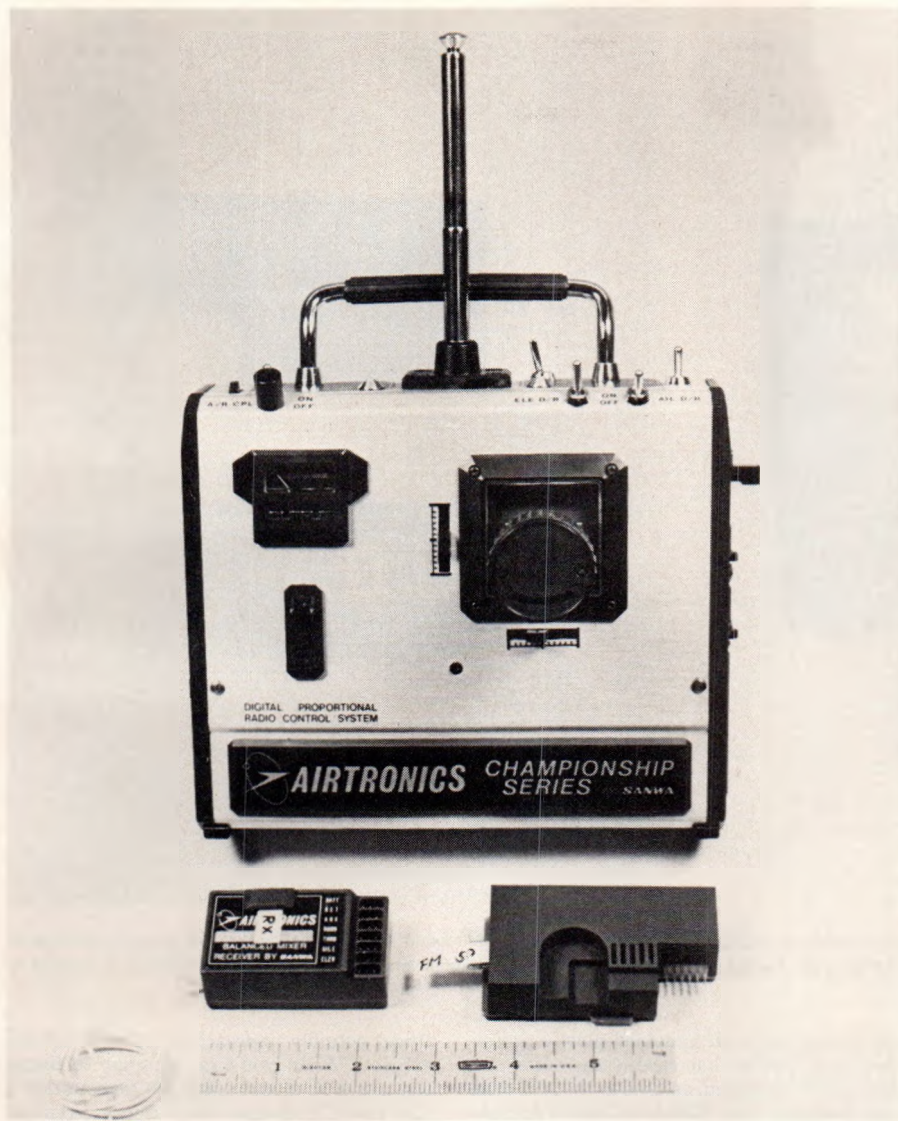
Under full power, the *Lifting Body* can climb rather steeply. Your choice of rubber depends on its role - indoor or outdoor. Don't reduce the required noseweight in order to save weight, it's necessary for good flight.

The *Lifting Body* requires noseweight, but don't reduce the angle of incidence in order to reduce the required noseweight. In fact, if your model does not have adequate incidence, it will dive violently under power. The only way to solve this problem, I have found, is to put trim tabs on the trailing edge of the wingtips, bent upwards. Stabilizer trim tabs and thrustline changes do not help. If your model is a twin, put equal size tabs on each tip; if it's the single prop version, put on only one tab, on the right wing to counteract prop torque. That was the only adjustment mine

needed. To wind the model, I hold it by the nose plug with my left hand, hold the winder in my right, put the end around in circles. This is not good for putting maximum winds into a 30 inch rubber band, but at a contest you will probably have access to a stooge or helper. When one rubber band is wound, I put that plug back into the fuselage, and stick a pin into the plug from the back so it sticks out enough to keep the prop from turning while I wind the other one. I have found that twin pushers can be made to turn by winding more on one side.

## LIFTING BODY SHEET 2





PHOTOGRAPHY BOB ABERLE

The two new items featured in this product review, the new Airtronics FM receiver (at left) and the companion FM transmitter module (at right) in front of the Airtronics Championship single stick transmitter.

## An FM Product Review:

# Airtronic's FM Receiver & Transmitter Module

By Bob Aberle

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New FM receiver exhibits excellent narrow-band performance, and the price is right.

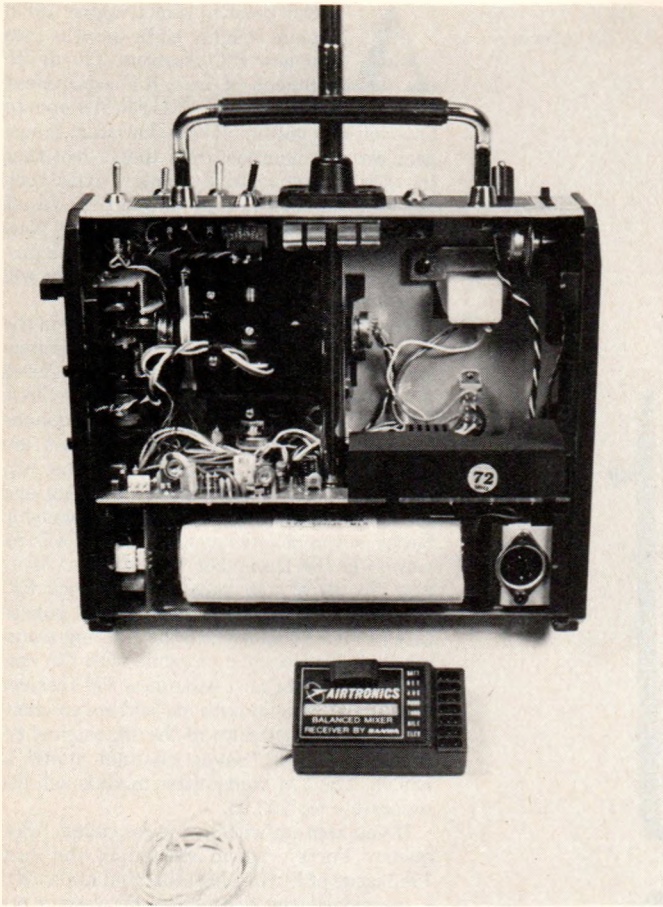
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At this point in time (August 1983) we are roughly eight months into our new R/C channels. The development of new R/C equipment (better suited to the new FCC rules) seems to have initially gotten off to a slow start. I suspect certain manufacturers didn't feel that the AMA could actually obtain what they did. But, the fact is they did and the result has been a "catch up" game ever since. New equipment is now finally coming off the production lines. As it becomes available we will be writing about it in these pages.

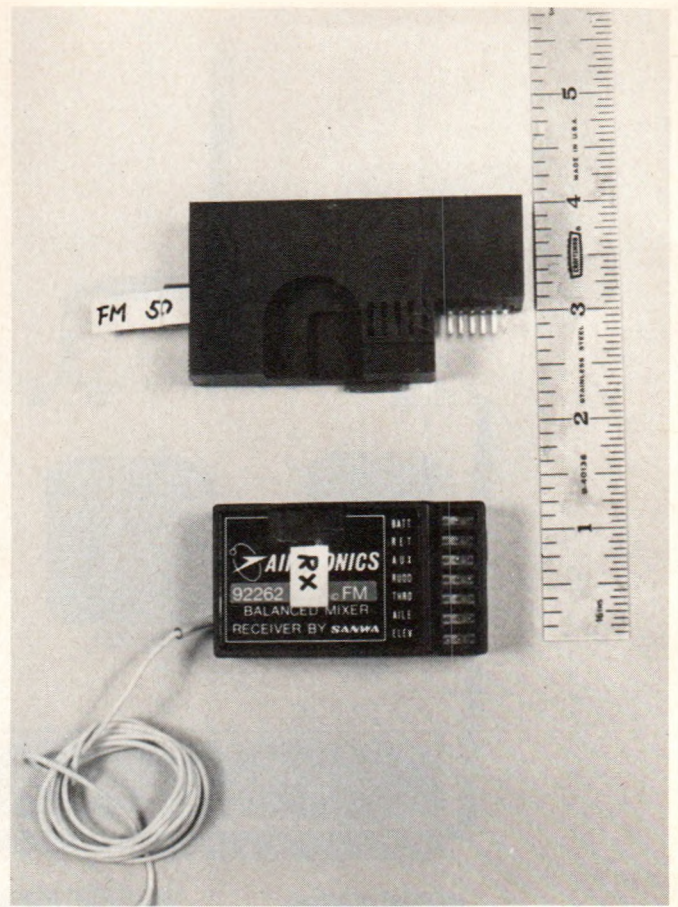
The subject of this particular review is the new FM narrow-band receiver and companion FM transmitter r.f. module being offered by Airtronics Inc. (16191 Construction Circle West, Irvine, California 92714 - telephone 714-551-0180). These new components are primarily intended for owners of the Airtronics XL series (six channel system) and the newer, more sophisticated Championship Series (seven channel system), which was reviewed in the December 1982 FLYING MODELS. To place your present Airtronics R/C system on 72 MHz FM you simply substitute receivers and replace the existing transmitter (AM) frequency module with the new FM module. The new Airtronics FM receiver will be available in both six and seven channel versions. List price of the six channel receiver is \$79.95. Seven channel model is \$89.95. The FM transmitter module will list separately for \$39.95.

If you kept up with my series called, "Frequency Facts", which started in the July 1983 issue of FLYING MODELS, you know that I mentioned the distinction between a (1)-narrow-band receiver and a (2)-"1991" receiver. This particular new Airtronics FM receiver falls into the first category, namely *narrow-band*. It can effectively reject adjacent channel interference which is most important. It will provide excellent service until January 1991. However, at that time all the remaining 50 aircraft channels go into effect. When that happens, image problems resulting from the use of standard 455 kHz single conversion i.f. (intermediate frequency) circuitry, will likely cause some problems. It is hard to say at this point how extensive these potential problems might be. The "1991" receiver, or one that will operate *after* January 1991, will likely have dual conversion circuitry or an "odd" i.f. (other than 455 kHz) which would tend to eliminate potential image frequency problems. So be advised that this new Airtronics FM receiver is quite a remarkable performer, it is definitely not that expensive, but will have a certain useful life span (January 1991) after which it might have to be replaced.

Let me first describe the two new components. The new Airtronics 72 MHz FM receiver is designated as their Model No. 92262. It is available in both six and seven channel versions. Obviously the six channel receiver is intended for Airtronics XL system owners and the seven channel for Championship series owners. The only difference between the two models is the single cable that exits from the case of the seven channel receiver. These new FM receivers are identical in size to the Championship AM receiver (Model 92370) and measure 2<sup>3</sup>/<sub>16</sub> inches long × 1<sup>5</sup>/<sub>16</sub> inches wide × 1<sup>3</sup>/<sub>16</sub> inch thick. Weight is about 1.5 ounces. Idle current was measured at 17 mA (the AM version idle was 10 mA). When you open up the receiver case you will find some notable circuit differences. Two Siemens I.C. chips are employed, both



The new FM module in place inside the transmitter. Bob's particular module was not stamped in any way with an FM designation. In his opinion, it ought to be to avoid possible confusion in the future.



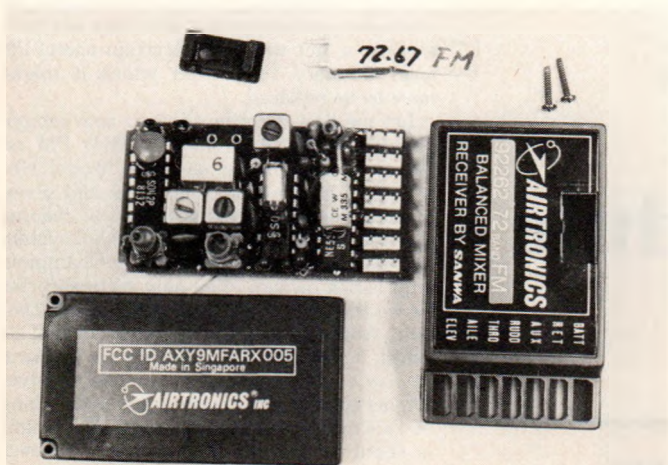
A closer view of the FM module and the FM receiver. This particular one was a six channel; a seven channel version is also available. See Bob's comments in the text about the use of transmitter plug-in crystals.

the SO42P and the SO41P, along with a sharp filter. The same Signetics NE-5045 chip is used in the decoder circuit. To my knowledge the only other receiver I have seen using both Siemens chips is the Kraft KPR-7F (six meter FM receiver in the black case). For information, Jim Oddino told me last week that Siemens has just come out with a new, single I.C. chip that essentially combines the functions of the SO41P and SO42P devices. There is always constant progress in this field.

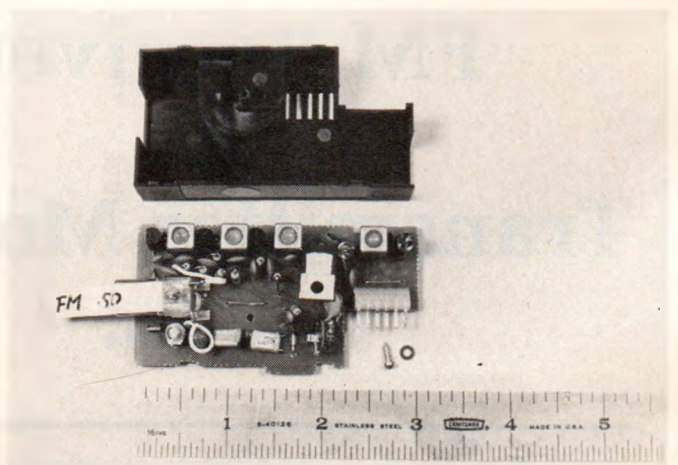
The new Airtronics FM transmitter mod-

ule is supplied with a molded plastic protective case. Inside that case is the same size printed circuit board, as used in the AM module. Actually the AM transmitter r.f. circuitry is contained on an exposed (no case) P/C board. The new FM module case is the better way to go. The crystal contained in this FM module, although seemingly accessible from the outside of the transmitter case, will unfortunately have to be permanently covered. Airtronics' official request to the FCC for approval of plug-in crystals was denied. I wonder how many other R/C manufac-

turers actually approached the FCC on this subject? When you first attempt to install the new FM module into the transmitter it may take a little care and patience. I remember telling Dave Shadel of Airtronics, that the module wouldn't fit into my single stick Championship transmitter. He said impossible — try again! I did and it fit, so remember I said so. The measured power output was in the order of 700 milliwatts which is close to the 750 milliwatts noted when using the AM transmitter module. I didn't measure the total transmitter current drain with



Inside the new FM receiver, No. 92262. Note the use of two Siemens' I.C. chips and a special sharp filter (number 6 above the two i.f. cans).



Inside the new FM transmitter module. This is the first time Airtronics has enclosed a transmitter frequency module in a molded plastic case.

the FM module. When using the AM module the drain was noted as 175 mA at 9.6 volts.

Now we get down to the most important area — how well did this new FM receiver perform? The new R/C frequencies have prompted some changes in my product review format. I'd like to be able to provide quantitative data on the selectivity of each receiver tested, but the fact of the matter is that the cost of the necessary test equipment would be prohibitive. The next best thing to do was to come up with a test plan that is still meaningful for the modeler and yet practical for me to perform. What I have been doing is requesting that all new equipment for product reviews be provided to me on Channel 50 (72.790 MHz). I did this primarily because we have a paging system in the New York City area (Empire Paging) which operates on 72.800 MHz at 75 watts output, from the top of the World Trade Center (a height of 1400 feet). The signal produced by this transmitter comes in loud and clear at our flying field, some 40 miles east of New York City. Many existing R/C receivers converted to the new Channel 50, have proved useless in our area because this paging service signal is only 10 kHz away. What could be a better test of performance than to ask for Channel 50 for my evaluation units. I might also add that I have my Kraft Signature transmitter specially set up to operate at normal power level (650 milliwatts) on 72.800 MHz (the same as Empire Paging, just 10 kHz off R/C Channel-50). This same Signature transmitter can also be operated on R/C Channels 48 and 52 which are adjacent channels spaced 40 kHz on either side of Channel 50. Remember, when we go to the full 50 aircraft channels in January 1991, the spacing between channels will be only 20 kHz. The test criteria is simple; try to get either the Empire Paging Service or my Signature transmitter (both operating on 72.800 MHz or 10 kHz away) to interfere with the R/C system under evaluation.

Airtronics was good enough to supply their new FM receiver and FM transmitter module on Channel 50. This new equipment passed my test procedure with flying colors. Let me describe it in detail. First I started with a ground check by placing the Airtronics transmitter exactly 30 feet from the model aircraft containing the new FM receiver. The second transmitter (the Kraft Signature), operating on 72.800 MHz, was held by a helper standing directly next to the Airtronics transmitter. Both transmitters were turned on and both antennas were fully extended. At that point the Airtronics transmitter had total control over the FM receiver in the model. The 10 kHz off-frequency signal did not cause any interruption of the controls. My helper then walked towards the model. The idea was to see at which point the "interference" source transmitter might "cut in" on the operation. By "cut in" I mean obvious glitching of the controls (going crazy!). That point turned out to be 12 feet. This compared favorably with the results obtained with the Kraft KPR-8FD receiver (see September 1983 FLYING MODELS, page 30).

Next came the actual flight testing. You can tell from the photo that I used my Top Flite Hot Canary biplane as the test vehicle. During several flights I had the Kraft Signature transmitter operating continuously right next to me (only 10 kHz off my operating frequency). Flying in as close as 20-30 feet, no glitches of any kind were noted. That's about the same results I obtained



**Running the all** important ground interference check. In the background, Ralph Fisch holds the Airtronics transmitter exactly 30 feet away from the model. George Myers holds the interfering transmitter at just 12 feet away. Only at that distance did the 10 kHz away signal begin to cause a problem.

with the Kraft KPR-8FD receiver. Finally I loaned this new FM receiver and FM transmitter module to my flying buddy, George M. Myers who installed it in one of his gliders. George was able to get the glider up extremely high (I won't say what I think the altitude was!). At that point, he collapsed the transmitter antenna down to just one section and was still able to maintain control of the glider. All the while he did this Empire Paging Service was broadcasting its 75 watt signal just 10 kHz away. Again this nearby source of potential interference did not affect the Airtronics FM receiver. So from my standpoint this new receiver is extremely selective and obviously quite sensitive as well.

One other observation I might make with regard to this new FM receiver. If you have the model sitting on the ground with the receiver turned on, but the transmitter off, you will notice that the servos tend to get jittery. This has always been an indication that outside interference was getting into a receiver. After experiencing this situation, I actually returned my first Airtronics receiver to the

factory. The folks out there confirmed my observations, but on receivers that were being successfully flown. They returned a second, new FM receiver to me. It was as jumpy as the first, until the transmitter is turned on, at which point the controls become rock steady. As already mentioned, in-flight performance was excellent. Why does this happen? I'm not really sure at this point, but be advised that the receiver still performs normally.

Just to summarize my findings. This new Airtronics FM receiver employs a standard, single conversion, 455 kHz i.f. It is not dual conversion, and therefore, its performance beyond January 1991, when all the remaining new R/C channels come fully into service, is somewhat questionable. But that is still more than seven years away. Considering the demonstrated narrow-band performance (selectivity), the excellent sensitivity and the reasonable price tag, the Airtronics new FM receiver and companion FM transmitter module should be a good choice at the present time.

# Analysis of Model Aircraft Structures

By Paul Bell

Avoid things that go "crack" in the air. Build stronger models with an understanding of the stresses involved.



ARTWORK: DON SHULTZ

"Bending moment? Yea, this should bend in a moment!"

It struck me, while talking to many Sunday fliers, that there are a great number of modelers who regularly fly R/C airplanes, but don't have a comprehensive understanding of a variety of the different technologies that go into making an R/C airplane work. I, for example, don't know any more than the most basic rudiments of electronics, but take for granted that my radios will continue to operate with a minimal amount of maintenance. The same thing is generally true with respect to the aircraft structure. In the event of damage, or deterioration, we all know enough to patch and repair, or otherwise maintain it. There are even a significant number of scratch builders and original designers who don't know too much about structural analysis, but have a feel for how much material, of what strength level, to put where. We kind of know that if we are going to build a hot airplane, it must have more structural strength than, say, a .15 sized trainer. The object of this

series of occasional articles is to make the design of model aircraft structures a little less qualitative and much more quantitative for scratch builders, original designers, and kit builders.

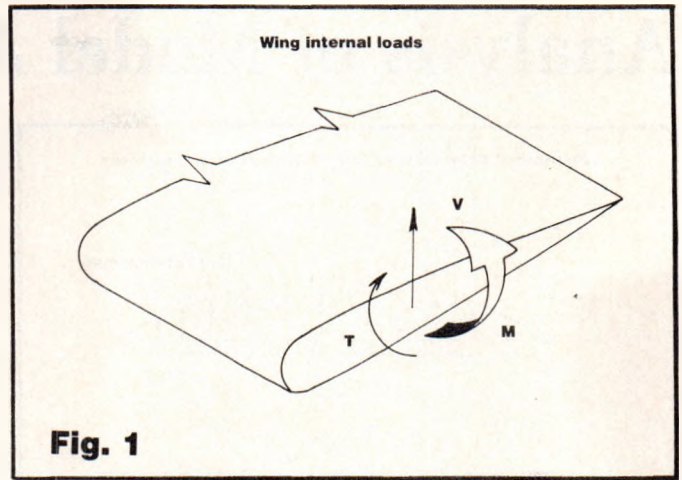
Let's take a look at wings first. Although the wing of a conventionally configured airplane usually constitutes about twenty to twenty-five percent of the total airframe weight, no one can dispute its importance. Anyone who has folded a wing during a severe maneuver, or going up on a hi-start or winch will attest to the sinking feeling that accompanies that failure (Not to mention the extreme sink exhibited by the rest of the airframe). My goal here is not to try to tell you what loads to design to, since aerodynamics isn't my strong suit. But, given a design load, I hope to help you figure out what your wing structure should look like, and how much wood (or other stuff) to put where. Also, I'll try not to load you up with any more than a few rudimentary equations.

Wings break because they are inadvertently overstressed while flying or launching and landing, or while "carefully" removing them from our basements and cars. In later articles, I hope to discuss some things which can be done to improve structural resistance to accidents. For now, I'll talk about what happens to the wing structure due to the application of aerodynamic pressures and, to a lesser extent, the inertia (or weight) of the wing. These, when applied to the wing, produce the loads of primary interest here. Referring to Figure 1, these internal loads are **shear (V)**, **bending moment (M)**, and **tor-sion (T)**. Any other internal loads are negligible for our purposes.

The shear is developed because of the distributed airload acting along the wingspan. Although the wing loading is distributed all over the wing we can sort of gather up the chordwise pressure and think of it as a distributed load along the span. This would make the wing look like a beam from head on with a distributed load along it (see Figure 2). Our average wing loading values are usually given in ounces per square foot so that we get some reasonable sized terms like ten or twenty. In the structural analysis business it is a lot easier to use pounds and inches, so that a typical wing loading of 23 ounces per square foot converts to 0.01 pounds per square inch (psi). If we then multiply this value by the chord of the wing, we get the distributed load as shown in Figure 2. If the wing chord is, say, 10 inches and we multiply that value by the 0.01 psi we got earlier, then the value of the distributed loading would be 0.1 pounds per inch (of span). The aerodynamic pressure is hardly ever uniformly distributed evenly along the span, even for a constant chord wing. A good approximation for the distribution is a parabola as shown in Figure 3a.

The accumulation of the distributed load as we move from the wing tip to the wing root is called the **shear**. I'll show later how this shear can, indirectly, cause a failure for certain types of construction.

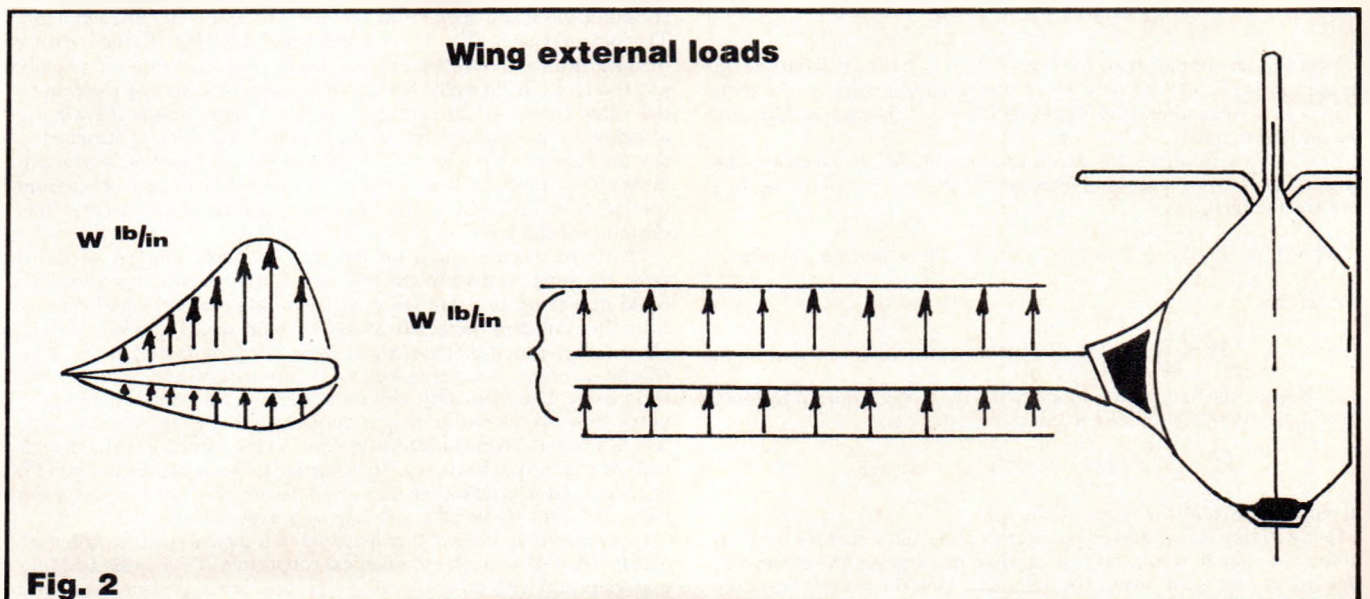
Just as the accumulation of the distributed load produced the shear, the accumulation of the shear produces a **bending moment**. In an attempt to visualize these terms, take a ruler (straight edge) and clamp it to the edge of your work bench. Now, take some small weights and distribute them along the straight edge (span). These weights are like the airload, except that they act downward while the airloads act upward. The straight edge will also bend. You can see that if you make the straight edge longer, it bends more and, at the same time, the more weight you add, the more it bends. Most of the failures we get in models are caused by bending, but in some cases this results because we don't have enough material in the right place to carry the shear. If we have a ten pound airplane and each wing is assumed to carry half of the total weight of the airplane during straight and level flight, then each wing must have a total of five pounds of shear near the root of the wing. If all we had to carry the shear load in this wing were two  $\frac{1}{8}$  x  $\frac{1}{4}$  inch balsa spars, then we could have a shear failure. You can experiment with this by taking a thin square balsa stick in both fists, with your fists close together. Push one fist away from you while trying to minimize the bending of the stick. The failure you produce is a shear failure. I'll bet that before you got a real shear failure, you broke some sticks by bending them. This is what happens in your wing between ribs if you don't



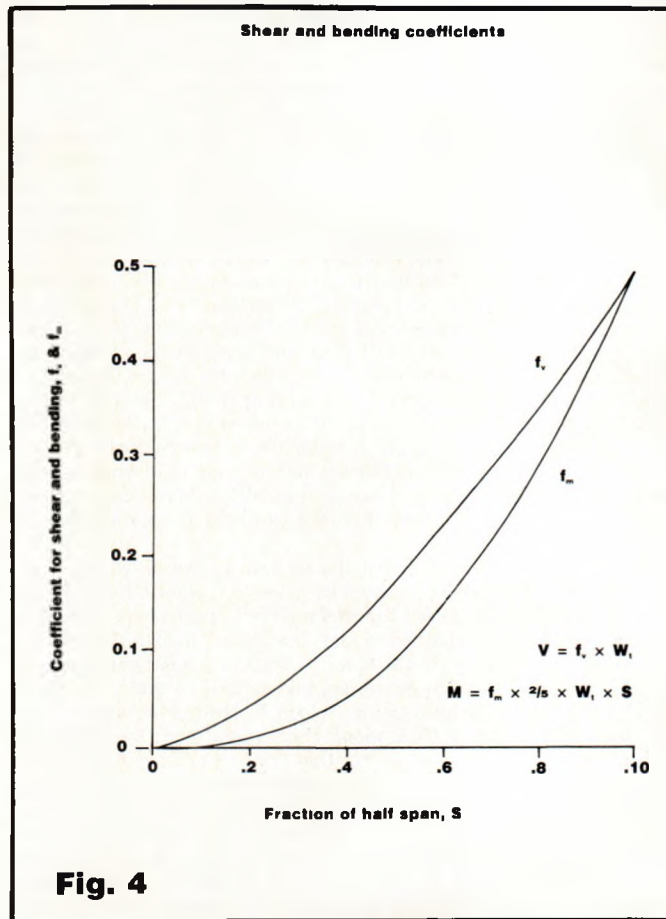
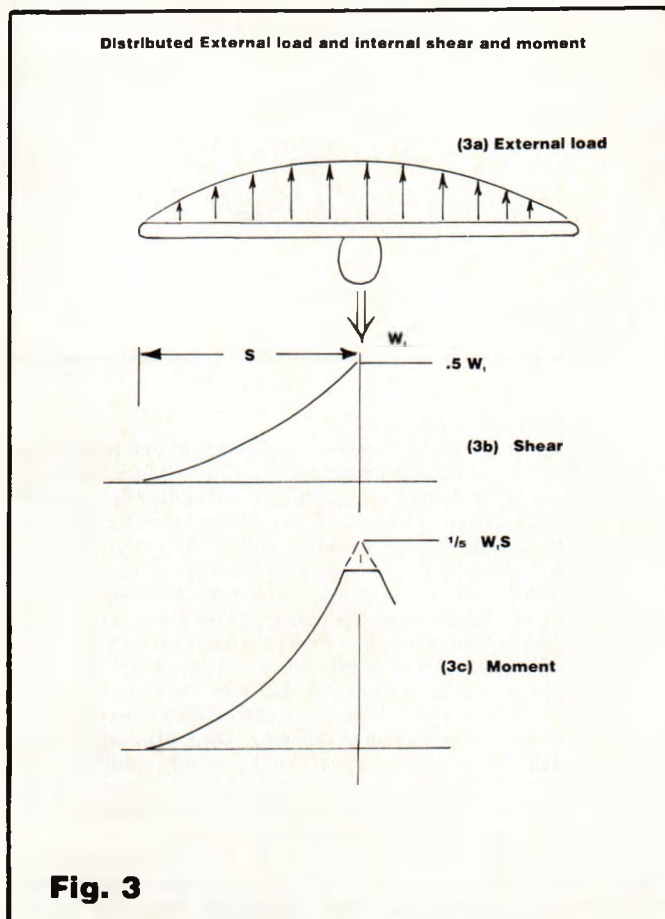
have enough shear material.

Earlier I used a ten pound airplane flying straight and level as an example. Well, we hardly ever fly straight and level. Imagine getting a little disoriented, or flying through the sun and ending up in a high speed dive. The instinctive thing to do is pull "up" elevator and pull out of the dive. In doing so, you put a load in the wings which is several times the weight of the airplane. This is referred to as pulling "g's." If the load we put on the wings was ten times the weight of the airplane, then we would have applied ten g's or ten times the force of gravity. In the previous example, where the total load on each wing was five pounds, it would now be fifty pounds! To get a little perspective on this, take your wing from this fictitious ten pound airplane and support it off a couple of blocks placed half-way between the wing tips and the center section of the wing. Then, place any handy 100 pound child on the center section. No, I was only kidding, don't do that, but you can see the magnitude of the loads we impose on the structure. Ten g's is a fairly reasonable value to use for design, but in some cases we could use twice that value.

Figure 3 shows the three loads applied to the head-on view of an airplane. Figure 3a shows the **distributed load**, assuming a parabolic distribution and Figure 3b the **shear distribution**. Note that for the one g case shown here, the shear for each wing at the root is one-half the weight of the airplane. In Figure 3c the **bending moment** is shown to peak to one fifth the product of the weight and the half span. The spanwise center of pressure of the parabolic distribution is 40% of the way from the centerline to the tip. Figure 4 shows calculated values for the variation in shear and moment, referenced to the weight and half span of the airplane. The horizontal axis is the fraction of the half span. Zero is the tip and 1.0 is the root. The vertical axis is a non-dimensional value, to be used as described below. As an example, assume we have a five pound airplane with a half span of 30



# Analysis of Model Aircraft Structures



inches. Referring to Figure 4 and using the  $f_v$  curve, the value at a half span fraction of 1.0 is 0.5. So, the shear,  $V$ , on one wing at the root is:

$$V = f_v \times Wt = 0.5 \times 5.0 = 2.5 \text{ lbs.}$$

or half the aircraft weight, as expected. If we want to design for ten g's:

$$V = 10 \times 2.5 = 25 \text{ lbs.}$$

Note that at the half span fraction of 0.5 (i.e., half way from the tip to the root)  $f_v$  is 0.18, or only about one third the value at the root. This is why some aircraft designs can leave out the spar webbing in the outboard panels.

Now, let's talk about the bending moment,  $M$ . To calculate the moment at the root (half span fraction = 1.0),  $f_m = 0.5$  from Figure 4 and the moment is:

$$M = f_m \times \frac{2}{5} \times Wt \times S = 0.5 \times \frac{2}{5} \times 5 \times 30 = 30 \text{ inch pounds}$$

For ten g's:

$$M = 10 \times 30 = 300 \text{ inch pounds (in-lb)}$$

Note that at the half span fraction of 0.5 (half way from tip to root),  $f_m = 0.09$ . At this point the moment for 10 g's is:

$$M = 10 \times 0.09 \times \frac{2}{5} \times 5 \times 30 = 54 \text{ in-lb.}$$

or only one fifth of the value at the root.

Using Figure 4, it would be possible to tailor the structure from tip to root so that it would be just capable of carrying the shear and bending at each point along the half span. One thing that should be apparent is that the center of the wing, where we usually have all

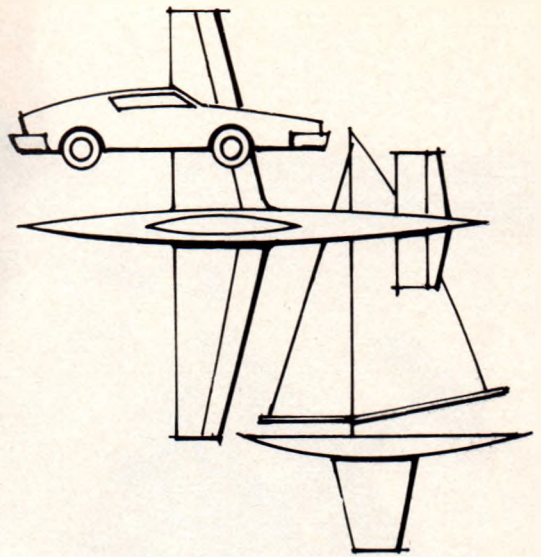
kinds of splices and cutouts for servos, is where all the heavy loads occur. It would pay to work carefully in this region to make sure the glue joints are all as well made as possible and that we don't do anything careless like cutting a notch in the spars just to clear some linkages. As a matter of interest, whenever I build a wing with no dihedral or sweep, I don't build any joints at the centerline, regardless of what the plans call for. For example, if the wing has a 48 inch wing span and the kit provides 24 inch spar and leading and trailing edge stock, I use one piece of wood centered on the wing and then cut the other piece and splice it at the ends, or half way out each wing. The logic of this is that at the point where the joint is, the bending moment is only about 23% of the value at the root where you usually put the joint. Technically, the bending moment does not peak up to the value shown at the center of the wing span, unless the wing is attached to the fuselage at that point only. If the wing is attached to the fuselage at the sides (which is usually the case), let's say two inches from the centerline, then do this. Measure out two inches from the center on the bending moment curve and draw a horizontal line, clipping off the peak, as shown in Figure 3c.

The third internal load, *torsion*, like its name implies, tends to twist the wing relative to the fuselage. Earlier, we assumed that we could gather up the chordwise aerodynamic pressures and concentrate them at some point, say along the main spar. If the effect of the shear-carrying material (i.e., shear webs) is concentrated at the same chordwise point, then there will not be any torsion and, therefore, no wing twist. Unfortunately, this is hardly ever the case. In addition, every time an aileron or flap is deflected, or a wing-mounted gear touches down, a torsion load is applied to the structure. The magnitude of the torque loads is a little harder to get a handle on, but I'll show in a later article that most well-designed wing structures will have sufficient torsional capability to prevent a failure.

In an effort to present this material in a logical manner, the next article will deal with the mechanical properties of our basic building materials and with different wing structure configurations and their relative strengths. I'll get back to torsion sometime after that.



# WRAM SHOW '84



Don't miss the greatest Radio Control Show in the East at the Westchester County Center, White Plains, N.Y. It's our 16th annual show and it's sure to be the biggest and best ever!

This year's WRAM Show is going to be the largest yet. Well over 150 manufacturers and other exhibitors have already signed up to bring you everything that's new in the hobby ... kits, engines, radios, accessories and everything in between. And, our famous Swap Shop will be in full operation with thousands of items, including built-up planes, almost new radios, engines and on and on and on with something for just about everyone.

### ADVANCED TICKET SALES

Save time ... avoid long ticket lines — contact Ed Alexis, 1587 Central Park Ave., Yonkers, N.Y. 10710. 914-337-6632.

### STATIC COMPETITION

Make sure your latest creation is finished up and polished so you'll have a chance to take home one of the dozens of trophies to be offered in these events:

- WWI
- POST WWI (Military)
- POST WWI (Non-Military)
- PATTERN
- GIANT SCALE\*
- OLD TIMERS
- SPORT
- GLIDERS
- HELICOPTERS
- SCALE RC BOATS. (Military)
- SCALE RC BOATS. (Non-Military)
- RACING R/C BOATS
- STAND-OFF SCALE
- JUNIOR EVENTS
- RC CARS up to 1/8" scale
- RC CARS over 1/8" scale
- BEST-IN-SHOW\*\*

\*Entries may be limited due to space availability  
\*\*Best in show will be awarded a VCR.

Judging takes place Sunday afternoon. Entries accepted until 12 Noon Sunday.

Special admission area will be provided on both days for static display contestants with built-up models.

Registration of models will start at 8:30 a.m. each morning.

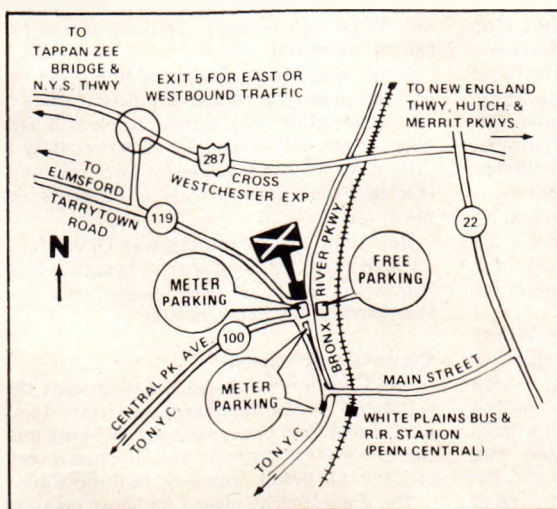
### SWAP SHOP

The WRAM's Swap Shop has become one of the major show attractions with thousands of individual items changing hands. To help eliminate "registration crush," the Swap Shop will provide for preregistration forms. To receive these forms send a self-addressed stamped envelope to: John Isbister, 4 Devon Rd., Larchmont, N.Y. 10538.

### SPECIAL NOTE

This year there will be no restrictions in the number of built-up models a registrant may place in the Swap Shop.

For further information, write or call: Ron Faanes, Route 4, Box 204, Poundridge, N.Y. 10576, 914-763-3986.



WESTCHESTER RADIO AEROMODELERS, INC.



# February 25/26

The Westchester County Center is centrally located in the city of White Plains, N.Y., at the intersection of Rt. 119, Central Park Ave., and the Bronx River Parkway. White Plains is just 22 miles north of N.Y.C.

10 A.M. to 6 P.M.



PHOTOGRAPHY BOB HUNT

The Walker Cup's new owner for a year, Jim Casale (center), poses with the four other finalists. Standing, left to right: Dennis Adamisin (4th) and Windy

Urtnowski (5th). Kneeling, left to right: Bob Gieseke (3rd), Jim Casale (the winner!), and Paul Walker (2nd).

## C/L Stunt at the 1983 Nats

By Windy Urtnowski

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Casale, in peak form, wins Walker Cup. Coveted  
Concours award goes to Joe Reinhard.

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The big winner this year in Stunt was Jim Casale who lost the luggage off the roof of his car on the way to the Nats but came home with the Walker Cup on the roof of his car.

Jimmy was unquestionably in peak form flying his *Spectrum*, which uses an *Avanti* wing and stab. This was a convincing win for him and the S.T.60. His first flight set the pace for the Walker Cup fly-off and nobody was able to catch him.

Second place was awarded to Paul Walker flying his original and colorful *Bad News*. Paul had jaws, much like a P40, painted on his plane, and he ate up everyone except Jimmy. Paul has arrived for sure, and right after the Walker Cup let about ten flyers try out *Bad News*. This plane had a very crisp corner with a Max. 45 for power. Everyone seemed able to put in an excellent pattern right away, so this ship must be quite friendly. Love that paint job Paul, Chiang-Kai-Shek could have used you.

Third place went to the master, Bob Gieseke, with a beautifully finished version of his Gieseke *Nobler*. This ship featured beautiful wheel pants, an immaculate finish, a foam wing, and of course the reliable Fox .35. Bob had the very slow, smooth patterns that put him and the red *Nobler* in the Walker Cup fly-off countless times before.

Fourth place was Dennis Adamisin and his 7:1 aspect ratio *Eclipse* powered by a .35 Max. This very original design won the Sheeks Trophy last year and still is one of the most impressive designs around.

Rounding out the top five was Windy Urtnowski with the *Sweeper*. This ship featured carbon fiber wing re-inforcing, a trick muffler and nosewheel, D-tube flaps, and empennage, and aero-dynamic formulas from Jim Greenaway. Powered by a custom "Big Jim" S.T. 60. and using a Taffinder tank, the Imron monster finally made it to the Walker Cup fly-off. This ship will be featured in an upcoming issue of FLYING MODELS as a con-

struction article.

Sixth place went to Lou Dudka flying his *Matrix*. Lou is a master builder and has helped many east coast flyers in the past with some excellent foam wings and unique technology. Lou uses an S.T. 60 and dope finishes, heavy duty controls, breakaway landing gear and custom machined spinners. His design is flown by many of the east coasters and he's helped many of them upgrade their building and flying.

Ted Fancher was seventh with his new *Celebration*. This is a beautiful ship powered by an S.T.46. Ted broke pattern, and lost points, or he would have been in the Walker Cup fly-off this year again, and certainly nobody discounts his talent as one of the best. Ted's wife Shareen was the tabulator again this year and thanks to her for her dedication to the event.

Eighth was Stan Powell with the timeless *Dove* still looking like the day it was buffed out. What can be said about Stan's ships; they're awesome.

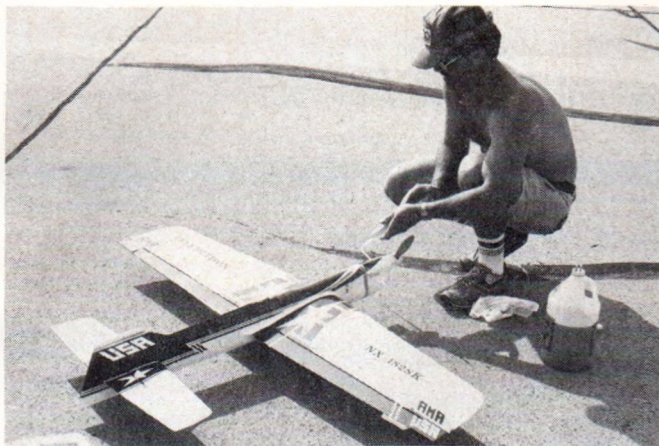
Ninth was Marty Cwiakala flying his totally original twin rudder *Vindicator*. He's a real competitor and earned Rookie of the Year honors. His ship is S.T.60 powered by a "Big Jim" motor I loaned to him, and now that he's done so well with it, I'll probably never see it again!

Rounding out the top ten was Dave Hemstrought with his *Sojourner*. A beautiful blue ship with the *Classic* trim scheme, only this year in varying shades of blue.

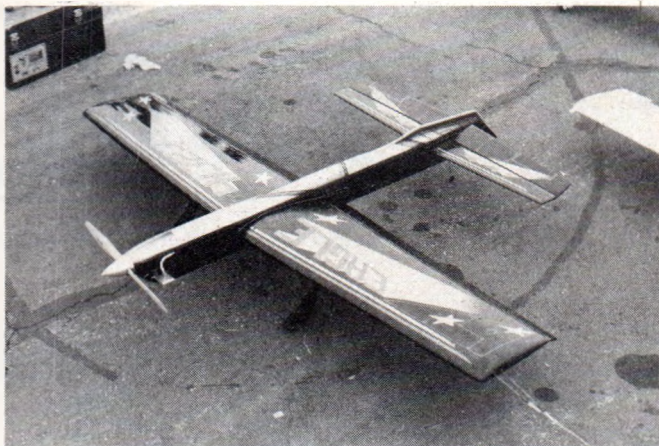
### Coveted awards

The Concours D'elegance award went deservedly to Joe Reinhard this year. Joe's workmanship is always among the best and this one was exceptional. The ship had a very nice cockpit detail, trim, and built-up wing.

The Jack Sheeks award for most creative and original award went to Windy Urtnowski for his *Sweeper U.S.S.R. 1*. Jack



Last year's Nats Champ, Ted Fancher (above) took seventh place after a pattern error took him out of contention. The Concours D'elegance, an award given the plane with the best finish, went to Joe Reinhard (below).



Glen Meador's Eagle sported an ST .60 and a really nice finish (above). A whole host of dedicated officials gave their time unselfishly (below) under the able direction of George Higgins and Lanny Shorts.



A very familiar plane, Bob Gieseke's Nobler, starts its take-off roll after being launched by his son Max. As usual, it used a Fox .35.



Gene Martine poses with his Mariner. It used a three blade prop driven by an OS 45 FSR. This was Gene's first competition after a brief lay-off.

has presented this plaque yearly now to stimulate interest in developing new technology we can all benefit from.

### Summary

The 1983 Nats was the ultimate success with beautiful stunt weather, an unbeatable location, fierce competition, and the best FLYING MODELS

judging in my memory. Even the traditional PAMPA awards banquet was better than ever. I think we should apply whatever pressure we can to have the Nats back here in the future. Each Nats is special in a different way, and it's hard to imagine anyone not remembering this one pleasantly.

George Higgins and Lanny Shorts ran a

very organized event and all the judges gave their time unselfishly so that many could enjoy their hobby. Stunt is a very competitive event, that absorbs a huge chunk of your life before you can ever hope to be recognized as a winner. Many new faces appeared in the winner's circle this year, and it isn't by accident . . . they paid the price.



# Frequency Facts

New frequencies perform at Nats. **By Bob Aberle**



PHOTOGRAPHY: GEORGE MYERS

Six rounds in three days for each of the 280 sailplane contestants at the '83 Nats (above) helped prove the success of the new frequencies.

This will be the sixth and last column in this series. The basic idea of "Frequency Facts" was to explain in detail the new R/C frequencies which were awarded to us by the FCC last December (1982). The previous columns have been summarized in Table I as a reference guide. Very shortly a special article will appear concerning the new R/C frequency flags. Keep an eye out for that presentation, it is important to the full understanding of our new R/C channels.

I didn't receive many reader letters in response to this column. At first, that disappointed me. However, after hearing some of the results of the AMA National Model Airplane competition (Nats as we call it!), which

took place this past July in Massachusetts, I am certain that the new R/C channels have become a total success. AMA R/C Frequency Committee Chairman, George M. Myers, attended the Nats and was good enough to share some of his data and observations with me. Approximately 600 R/C transmitters were processed at the Nats by George Myers and Dan Kahn, a Hewlett Packard Corp. engineer, who willingly volunteered his personal services and the use of close to a quarter million dollars worth of his company's most modern frequency spectrum analysis equipment. Some R/C transmitters missed this detailed processing, but those involved with R/C pattern, helicopters, and sailplanes were included. The equipment was only avail-

able for three days, while entry processing went on for six days, which permitted transmitters for some events to get through with only a cursory scanning monitor check. Interestingly, of the 600 transmitters just referenced, 100 were on the six meter band (53 MHz) and the balance of 500 were roughly divided equally between old and new R/C channels. So, in just six months time it would seem that the new R/C channels have been accepted by a significant group of active modelers (those who fly in major competitions). There were no reports of interference on the new channels. On the other hand, a local cement mix trucking company mobile communications system was suspected of being responsible for several crashes on 75.64

MHz, the causes of which could not be conclusively determined (again an old frequency!).

The best demonstration of the value of the new R/C frequencies came from the sailplane competition. Gene Shelkey, the CD, was able to keep up to 15 gliders in the air simultaneously for three days of competition. Except for a few interferences on old channels (72.160 MHz as previously noted) there were no problems. There were no interference reports from users of the new R/C channels, whatsoever. Thus, our original concerns for certain types of interference that one modeler might cause another have been eliminated. After learning of these results, I hope the club in California which banned the use of all new R/C channels might reconsider their unwise decision.

Of the 600 transmitters checked out (from "brand new" to "after 10 years of hard knocks"), 18% failed to meet FCC type acceptance criteria for new equipment. The AMA, using data from actual equipment that had proven, in service, to be able to fly together without mutual interference, permitted nearly all of these transmitters to pass anyway. The results of the week long Nats experience appears to have proven the decision correct. 4,000 flights, 1700 of them with simultaneous flying on 40 kHz channel spacing, and no interference reports from users of the new R/C channels. Pretty convincing results wouldn't you say?

One modeler wrote recently about his concerns that his equipment would require frequent and possibly costly re-tuning to maintain the tight bandwidth performance. Our Nats sample showed that *all transmitters* indicated a sufficiently narrow band-width, and 99% showed sufficiently precise center channel frequencies. I might add that some transmitters were of the very inexpensive variety and some were in excess of seven years old, with nothing but original factory tuning. We don't have similar data for old receivers, but we know that R/C manufacturers are already producing receivers capable of 10 kHz selectivity. We have seen them for three of four months now (more being made available each day!). Only time will tell how well their tuning will hold up. My initial experience makes me feel that it won't prove as much a problem as some originally feared.

One of the possibly disturbing things noted in recent months is the news that some R/C manufacturers have gone "public" on the use of plug-in crystals for both R/C receivers and *transmitters*. The FCC rules clearly say you can't change the frequency determining element of a transmitter unless it has been properly certified by the FCC for that specific purpose. Some of the tests performed by George Myers recently have indicated clearly that one plug-in crystal transmitter operates just as well on Channel-12 as it does on Channel-56 (which is almost a full

megahertz separation). From this we can conclude that the plug-in crystal concept can technically be made to work and work quite well at that. But, R/C manufacturers are not really pressing for approval of crystal swapping by the FCC. So what you have is a situation that is technically feasible and very practical, but by the letter of the law — illegal!

I have a feeling that in the next year or so we will see the introduction of synthesizers for both R/C receivers and transmitters. This technique will permit frequency selection at the turn of a dial (just like a radio or CB set). Hopefully, the transmitter dial will be inside the case somewhere, to avoid "dial-a-crash" type accidents. Synthesized transmitters will, of course, have to be certified by the FCC (and hopefully they will be!). With this equipment, the modeler will be able to change frequencies easily (and many modelers want that type of capability). R/C manufacturers are hopeful that they will be able to implement this concept in the near future to reduce their inventory costs. The cost of stocking eventually 160 crystals (80 receiver and 80 transmitter) is frightening, and would prove a great burden which would (naturally) be passed on to the modeler.

Competition flyers, especially those involved in group activities like pylon racing

and sailplanes, want to be able to change frequencies rapidly to be able to participate in the maximum number of heats or flight rounds. At a local flying club field, frequency agility (being able to change frequency quickly and easily) might also prompt modelers to get careless and, in turn, cause accidents. The pros and cons of this subject will be debated for a long time to come, but synthesized R/C systems are inevitable. How do you feel about this situation and the prospects in the future?

That about concludes my discussion of the new R/C channels. Remember, a full color chart containing a listing of all the new R/C aircraft and non-aircraft channels was reproduced in the March 1983 issue of *FLYING MODELS*. A copy can also be obtained by writing to the Academy of Model Aeronautics at 1810 Samuel Morse Drive, Reston, Virginia 22090 (include 10 cents and one stamped, addressed envelope size 9" X 12" with your request). If you have any questions concerning the new frequencies, by all means continue to send them in to us. Even if not published I do try to answer most reasonable questions personally as time permits. And please keep watching *FLYING MODELS* for upcoming product reviews of new narrow-band R/C equipment. C

**TABLE-I**

Frequency Fact Column	FLYING MODELS issue	Subject and Topics
Part-I	July 1983	—Introduction to the new 72/75 MHz R/C channels —New receiver terminology —Converting existing R/C equipment —Our new channels are they exclusive?
Part-II	August 1983	—Dealing with outside interference as caused by commercial radio operations —Discussion of new AMA R/C Frequency Coordinator job functions —References to frequency monitors and scanning receivers
Part-III	September 1983	—Dealing with modeler to modeler interference —Adjacent channel problems —2nd and 3rd order IM problems —Image problems
Part-IV	October 1983	—An introduction to our new six meter R/C channels for use by licensed Amateur Radio Service Operators
Part-V	December 1983	—A look towards the future and the possibility of 900 MHz R/C flying
Part-VI	January 1984 (this issue)	—A summary of the past columns —Results of using new R/C channels at 1983 AMA NATS competition —Some prospect for the near future

**Additional References:**

- (1) - "Explaining the New R/C Frequencies" (in depth)—*FLYING MODELS* March 1983
- (2) - The Elimination of FCC R/C Licenses—*FLYING MODELS* September 1983 (page 14)

Please note that back issues of *FLYING MODELS* magazines are available for the newsstand price by writing to: Carstens Publications, P.O. Box 700, Newton, New Jersey 07860.

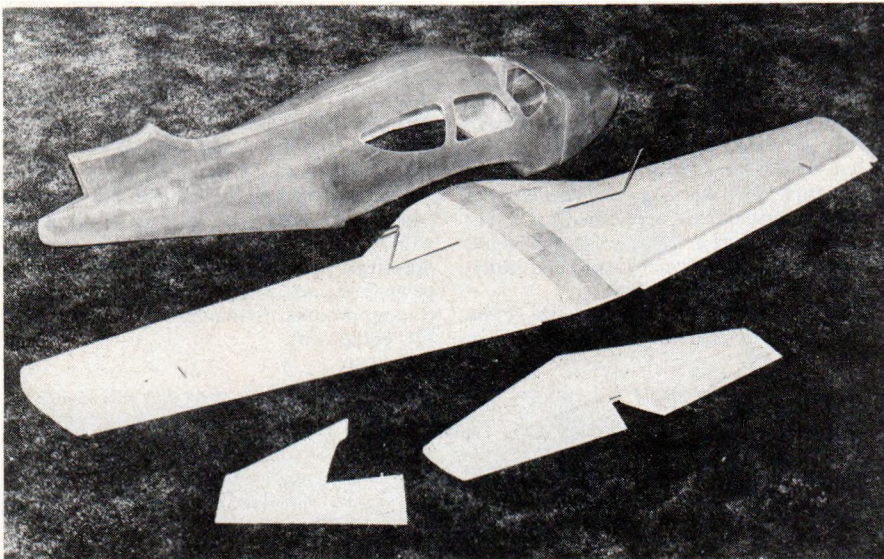
An FM Product Review:  
Executive Design's  
Rockwell  
Aero Commander  
112

By Tony Lombardo

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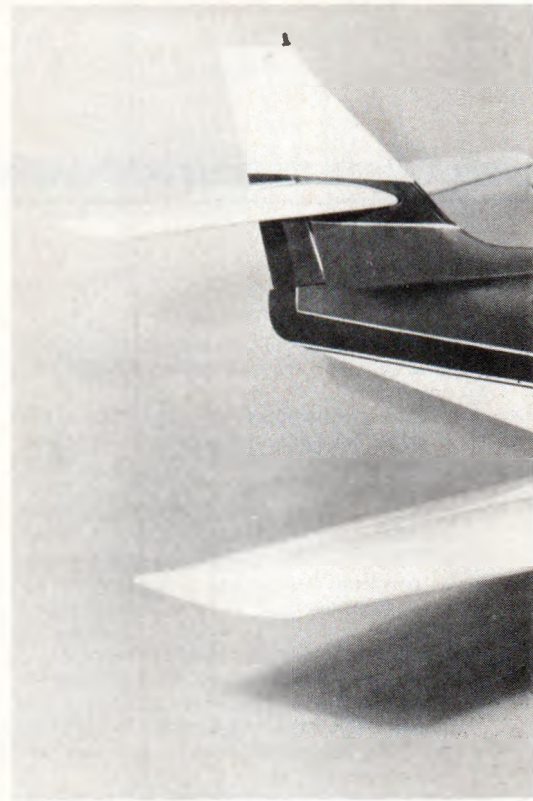
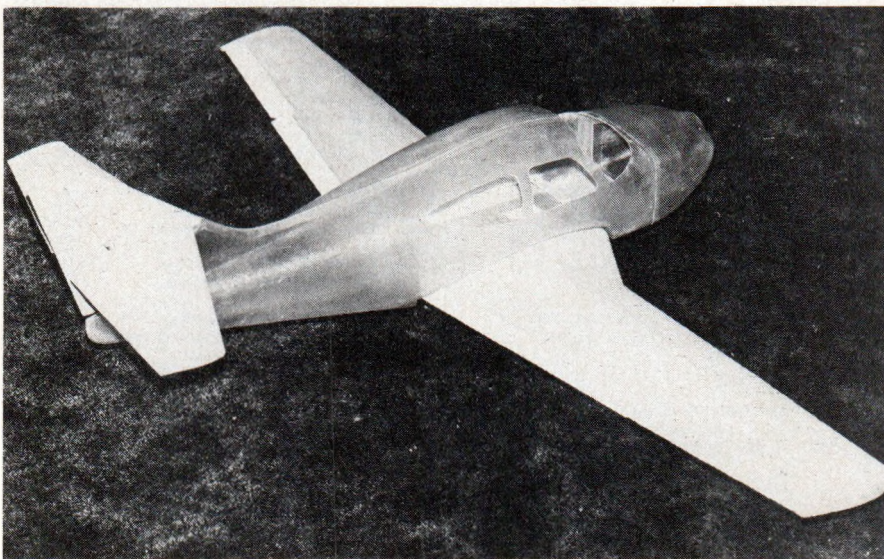
Good flying qualities complement an excellent fiberglass and foam kit with full interior.

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PHOTOGRAPHY TONY LOMBARDO

The various, primary structures of the Rockwell Commander shown (above) before assembly. Good instructions and isometric drawings ease the final assembly (below) as well as the entire construction procedure.



**E**xecutive Design has done it again! In the true tradition of excellence, Al Wolter and company have produced yet another masterful kit, the Rockwell *Aero Commander 112*. Everything about this honey of a package has been superbly engineered and exquisitely executed. The result is an airplane which is a pleasure to build and fly.

When you take the lid off the large box this kit is packaged in, be prepared to gasp, ooh! and ah! a few times. First, the fiberglass fuselage is bound to impress even the most finicky modeler. The workmanship is flawless, requiring only the slightest amount of touching up with fine emery around the seam. The lower portion of the vertical stab and wing fillet are molded right into the fuselage. The fiberglass cowl exhibits the same impeccable workmanship and requires absolutely *no* touch-up prior to finishing. The windows are formed to the proper curvature and fit precisely into the cut-outs in the fuselage. They are also *incredibly* clear. The kit comes complete with a specially machined aluminum motor mount with integral nose gear bearing and all hardware required to complete the control installations. As if this were not enough, the entire cabin interior, including instrument panel, center console, seats and false bulkheads are supplied in the form of ingenious, pre-formed ABS plastic components. These parts have all of the realistic detail molded right into them. The interior snaps into grooved rails which you epoxy to the inside walls of the fuselage, making installation of the truly scale cabin interior literally child's play.

The wing, horizontal stab, and upper vertical stab and rudder are high quality, beaded foam cores which you cover with  $\frac{1}{16}$  balsa sheets (supplied) and solid balsa leading edges. Ailerons and flaps are cut out after the wing has been completely sheeted and are then endcapped with balsa prior to hing-



of a lot of time finishing. A couple of coats of white epoxy paint on the fuselage and white MonoKote™ on the wing and tail feathers yielded a fairly credible scale metal finish. Red and gold MonoKote™ trim were added and then a coat of Glaskote over the entire fuselage sealed everything up nicely. I had lots of fun painting the interior details using the Pactra line of plastic scale paints. Since virtually all of the details are molded into the interior components very little artistic skill is necessary to produce a "realistic" effect and there is no need to mask.

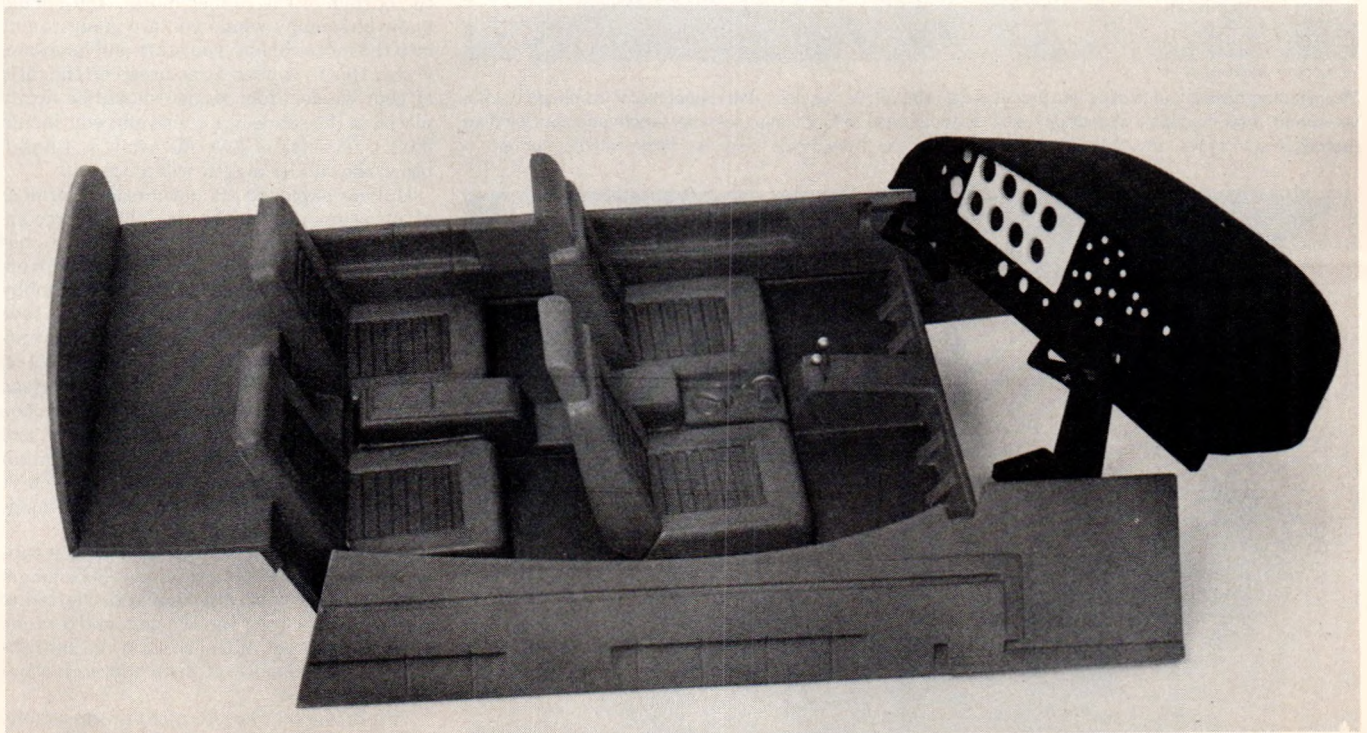
I installed my trusty Enya 45 and Futaba 5LK and found that proper balance was achieved with no ballast. All up dry weight was 5½ pounds. This translates to a wing loading of 18.4 oz/sq. ft, which is in the pattern and semi-scale category. Pilots having experience with at least one low winger in this loading range should have no problem flying the *Aero Commander*. Flight performance was smooth, ultra stable, and slightly more responsive to control input than I anticipated. The airplane has good aerobatic capability and very realistic appearances in the air. At full throttle she really moves out, while true-to-scale flight appearance is best achieved at about ½ throttle. Landings, are a bit on the hot side on calm days if you don't use the flaps which are included in the design. With flaps down about 25 degrees, however, you can bring her in at jogging speed. One piece of advice: if you have never used flaps before, make some practice passes at normal flying altitude to get a feel for their effectiveness and any re-trim required once the flaps are deployed. Also, don't forget that while flaps increase lifting capability they also increase drag once deployed so don't try to make your normal approach with the engine idling. You have got to keep the power up to maintain airspeed during the approach or you will fall short everytime. Happy Flying!

ing. I have always found the highest quality micro-cut balsa in Executive's kits and this one is no exception.

There is a full size plan, complete with isometrics, illustrating radio and cabin interior installations, but just to make sure you do everything right there's also a complete construction booklet with step-by-step instructions so clearly written that even an inexperienced builder will have no difficulty with the

assembly. Those of you who have built a squadron or two of R/C aircraft in your day will also appreciate the instruction booklet because the well-thought-out fabrication sequence makes things go very smoothly and speeds assembly. There are also some pretty neat tips thrown in which are relevant to general construction techniques.

I was anxious to get the *Aero Commander* into the air so I didn't spend a heck



All the realism of the full sized plane are incorporated in the ABS plastic interior which is supplied with the kit. Installation easy.

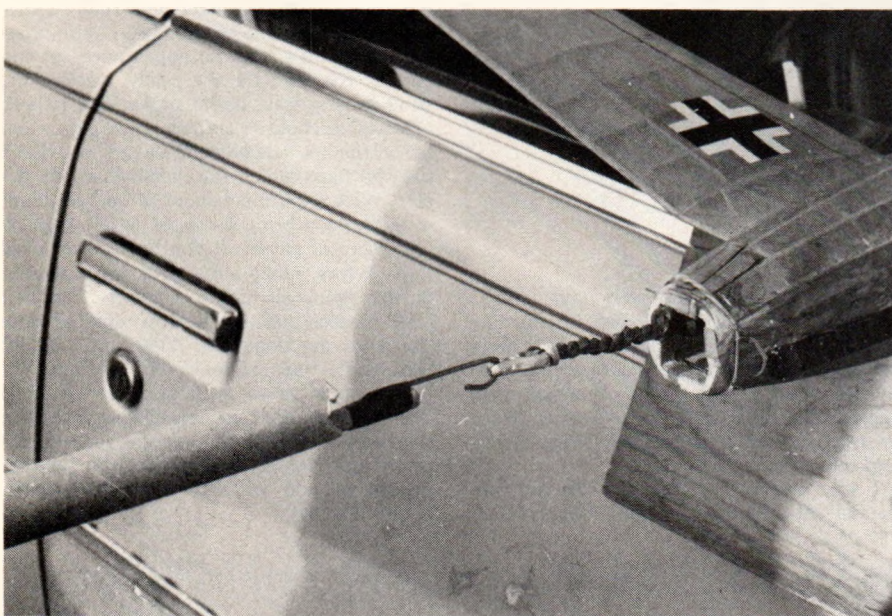
# Back to . . . Square One

## Rubber Motors - Part 2

# Winding

By Don Ross

Winding up our discussion of rubber motors, the author shows us how to "pack in the turns".



PHOTOGRAPHY SID BERNSTEIN

The winding tube about to slide into the fuselage (above). At this point, the rubber motor is braided but not yet wound. After the tube's in position, back up about three to four times the motor length and start winding (below). Put in about 10% of the intended turns and see if the motor "relaxes" before winding further.



Before starting this month's article on winding, there are two other items to consider. The first is your winder. Small, efficient winders are available from Sig and Peck and are very useful for indoor models and Peanuts. However, for the larger motors you will need something stronger. A converted hand drill will make a good winder if you make the following modification. Take off the chuck, drill the shaft for at least a  $1/16$  wire, and bend a hook that has a shank passing through the drill shaft and is bound and soldered to it. A cup hook clamped in a drill chuck is an invitation to disaster. When buying a hand drill, look for one with two sets of gears on the shaft. Simplex Miniatures makes a fine, professional winder that will handle everything up to a Wakefield.

The other item to consider before winding is the number of turns that you are going for. The two charts shown are intended as guides to turns per inch. Each batch of rubber has its own characteristics of torque and burst strength so the only way to get a closer idea would be to make up a short (six inch), two or four strand motor and wind it to destruction. This would give you an accurate winding factor for that particular batch, however I have been using these charts for several years and found them quite efficient. I usually wind to only 85% of the max turns for sport flying and have broken very few motors. In Fig. 1 you can interpolate for  $3/16$  rubber as half way between  $1/8$  and  $1/4$ . For  $3/32$  I have been using 10% more than  $1/8$ . These charts were created by Charly Sotich for another model mag back in 1976 and are still quite valid today.

Now that you have made up a few rubber motors, lubricated them, broken them in and braided them if necessary, we can proceed to the actual process of converting your work with a winder into useful torque the motor can deliver to fly your model. I prefer to describe this as a conversion of your effort into useful work in order to point out that the quality of the work you do will be reflected in the output of the rubber motor. You should know how many winds you are going to put into the motor before you start and have converted this to winder turns based on the ratio of your winder. Your stooze should be firmly placed in the shade if possible and you should have a fair idea of how far away 3, 4 and 5 times the rubber length will place you.

Having exploded an uncountable number of fuselages in past years, I highly recommend a winding tube system. It's easy to use and all the parts are readily obtainable from camping supply stores, pet shops, or hobby shops. A winding tube will not only save more than 90% of your fuselages when motors break, it will allow you to concentrate on the really important parts of the job instead of worrying about the motor exploding. You will find yourself winding more slowly and getting smoother knots and smoother motor runs. Once in a while, you will find you've launched the model with the tube still inside but it won't fly far that way.

Following the pictures, first slide the tube on to your wire holder which should be longer than the tube. The tube should be slotted to slip over the rear motor peg and extend about  $1/2$  inch out of the nose. Make sure the tube is very smooth at each end so it can't nick the rubber.

This is a good place to mention that many scale kits have a hole in the nose only large enough to admit the hook and the nylon bushing. Rework the nose to make at least a



**Fig. 1 For outdoor models**

No. of strands	Pirelli and Sig			
	6MM	4MM	1/4	1/8
2	59.3	72.6	68.8	97.4
4	41.9	51.3	48.7	68.8
6	34.2	41.9	39.8	56.2
8	29.6	36.3	34.4	48.7
10	26.5	32.5	30.8	43.5
12	24.2	29.6	28.1	39.8
14	22.4	27.4	26.0	36.8
16	21.0	25.7	24.3	34.4
18	19.8	24.2	22.9	32.5
20	18.8	23.0	21.8	30.8
22	17.9	21.9	20.8	29.4
24	17.1	21.0	19.9	28.1
26	16.4	20.1	19.1	27.0
28	15.8	19.4	18.4	26.0
30	15.3	18.8	17.8	25.1
32	14.8	18.2	17.2	24.3
34	14.4	17.6	16.7	23.6
36	14.0	17.1	16.2	22.9
38	13.6	16.7	15.8	22.3
40	13.3	16.2	15.4	21.8

**Fig. 2. For indoor models (two strand motors)**

Size	Weight	Turns	Torque
0.020	0.00092	210.0	0.150
0.030	0.00138	171.5	0.276
0.040	0.00184	148.5	0.424
0.050	0.00230	132.8	0.593
0.060	0.00276	121.2	0.779
0.070	0.00322	112.2	0.982
0.080	0.00368	105.0	1.200
0.090	0.00414	99.0	1.432
0.100	0.00460	93.9	1.677
0.110	0.00506	89.5	1.935
0.120	0.00552	85.7	2.205
0.130	0.00598	82.4	2.486
0.140	0.00644	79.4	2.778
0.150	0.00690	76.7	3.081
0.160	0.00736	74.2	3.394
0.170	0.00782	72.0	3.717
0.180	0.00828	70.0	4.050
0.190	0.00874	68.1	4.392
0.200	0.00920	66.4	4.743
0.210	0.00966	64.8	5.104
0.220	0.01012	63.3	5.472
0.230	0.01058	61.9	5.850
0.240	0.01104	60.6	6.235
0.250	0.01150	59.4	6.629
0.260	0.01196	58.2	7.031
0.270	0.01242	57.2	7.440
0.280	0.01288	56.1	7.857
0.290	0.01334	55.1	8.282
0.300	0.01380	54.2	8.714

3/4 inch opening and add some balsa bracing around it- you'll need the strength.

Now catch the motor front hook on the wire hook and slide the tube over the motor and down the fuselage all the way to the rear peg while holding the motor taut with the wire. Stuff foam around the tube in the nose to keep it in place and slip the front hook off the wire holder and on to the winder.

Now check once more to make sure your model is firmly anchored to the stooage and that the stooage is just as firmly anchored to the ground. Is your retaining wire cleanly slotted through the fuselage rear tube and through the stooage? You are about to begin pulling with anything up to 40 pounds so your set-up had better be solid.

Back up to about three to four times the motor length and start winding. Do not try to wind very quickly. This will heat up the rubber and weaken it. Feel the heat of a partially wound rubber to get an idea of the temperature it can reach.

Put in about 10% of the turns you intend and feel the pull on the winder. A properly broken in motor should "relax" a little at this point and you can now back up another 8 inches or a foot. Continue to put in more winds until you reach 50-60% of your total. You will feel the rubber during this time and it should continue to have some "give". If it starts to feel stiff then begin to walk in towards the nose while winding. Try to time your walking and winding so you reach the

nose as the last few turns are put on. Watch the knots in the rubber during winding. They should line up smoothly along the length. Massage the rubber with your free hand or pull back and forth a few inches so the knots will slide over each other and not bunch up. The smoother your winding technique, the smoother the rubber will twist and the smoother and more powerful will be your motor run.

When you reach the noseblock, you can slip your retaining wire through the front hook (it has two holes) while you remove the winder. With the retaining wire holding the motor, take your time attaching the long wire hook to the front hook and taking up the rubber pressure while removing the retaining wire. Slide out the tube, re-hook the retaining wire, remove the long wire and tube and attach the prop hook. Now you can easily hold the motor with the prop, remove the retaining wire and place the noseblock in position. Add a small rubber band to hold the noseblock in position and you're all set.

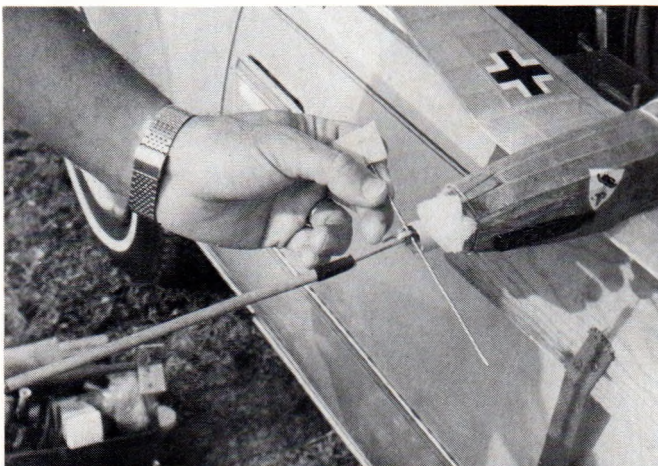
I hope the pictures make the explanation as simple to understand as it is to do. You will be surprised at how quickly you begin to feel confident. With the worry of an exploding motor gone and a model firmly anchored so you don't have to do all kinds of adjustments "in the air", your flying will improve and your models will last a lot longer.

Once wound don't be afraid to hold the model in that condition for a few minutes.

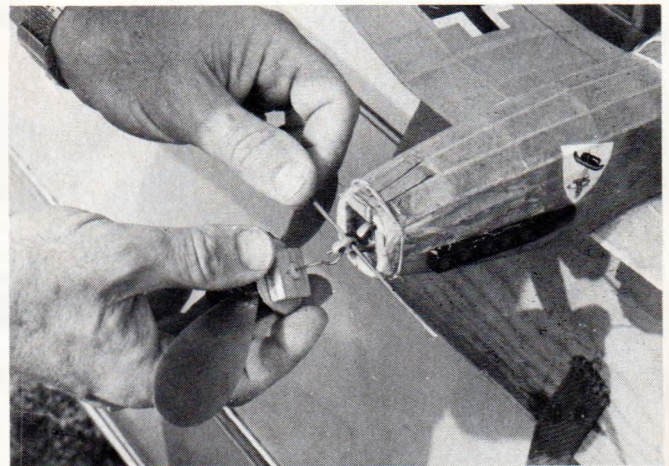
Certainly some power will be lost as the rubber "sets" but not much and you can afford to walk to the launch area or wait for a favorable thermal. Take your time and check that all adjustments are in place and that all parts are firmly attached. Light the dethermalizer fuse and check the wind again before launching.

By the way, lubing a motor in the field can be messy so here are a couple of neat ways to avoid goeey hands. Put a few drops of lube in a plastic sandwich bag, drop in the motor and knead the bag. Or, get hold of a pair of plastic photographers tongs with foam rubber at the ends. Photogs use them to squeegee film dry. Put some lube on the foam pads and run the rubber between them. Don't forget to wipe off excess lube. It can splash all over the inside of your fuselage and soften the glue joints.

For the beginning flyer or for the RC'er who wants to relax for a while and fly something quiet, this article should carry you from hand wound test flights through controlled, full power. For those who want to go on to win contests, as Bob Hatchek once told me, "You have to know a lot about rubber; then you need thermals and luck".



After the complete number of turns have been put in (left), the retaining wire (with placard) is inserted while the winder is removed and the long wire at-



tached. Remove the retaining wire, slide the winding tube over the long wire, (right) insert the retaining wire, and then the prop hook.



# Flyin' things for fledglings

More news from the gang. **By Earl VanGorder**

**W**ell, here we go gang, the first issue of another year. Yep, it's January of 1984 and that always makes me want to reflect on the past year. All years have their good points and bad points; their highs and lows, as it were. I guess 1983 was really no different than most years, but we did get some great letters and it appears that all of the gang enjoy our monthly get-togethers. Since we now have so many experienced modelers joining us every month, one of the gang wrote to say that we should change our heading to "Flyin' Things for Fledglings and Aces!" Well, heck, gang, a fledgling is someone who is learning, and, as far as I'm concerned, if we ever quit learning, this great hobby could get boring and we sure don't want that to happen! An awful lot of those guys we refer to as "experts" tell me that they learn something new with every model they build no matter how long they've been at it, so, you see, we're all really "fledglings" — Right?

Speaking of "experts" reminds me to tell

you about some of the great photos I've got to share with you this month. First of all, we have another of the scratch-built efforts of (Iron) Mike Midkiff. This time, it's Mike's 30 inch, rubber-powered Curtiss SB2C *Helldiver*. A really beautiful model.

Lin Reichel of the Flying Aces Club also sent us a shot of Ted Russell with his 54 inch *Taylorcraft* from the Comet kit. This one will show you what can be done with a kit model and a little of that "extra effort". Now that is *really* jumbo rubber — look at the size of that prop! We also have a "bare bones" shot of a fantastic Fokker *D-23* push-pull fighter by Jim Kaman of Hurley, N.Y. This Fokker was finished up in authentic camouflage coloring and entered by Jim in the Nationals. It's  $\frac{3}{4}$ " : 1' scale and has a 28 inch span. Ready for flight, it weighed slightly over four ounces and used two independent direct drive rubber motors. The canopy opens and has a full instrument panel and scale pilot. It uses a plug-in scale landing gear and all components come apart for storage. All control surfaces are operable.

Incidentally, gang, the full scale ship was the only one built and it was destroyed in World War II before flight tests were complete. Now, I know you're thinking that this is a pretty fantastic model, so I guess I better tell you that Jim is one of the "volunteer" designers for Ed Packard at Cleveland Model Supply Co.

To get away from scale for a minute, we've also got something that will warm the hearts of the oldtimer ukie crowd. Old friend, Lou Roberts, has designed another one. This is his own design of a U-control stunt ship along the lines of the type used in the 1950's. It's not a re-hash of any given design of that era — just a sort of composite. Lou has kept the old time flavor by installing an OK Cub 19 engine for power.

Well, gang, I guess that about covers this month's pictures, so let's get to the mailbag

... We got a real great letter from Capt. Lloyd Furthmyer, a former B-24 pilot with the 8th Air Force in WWII. You may remember that a few months back, he asked if anyone possi-

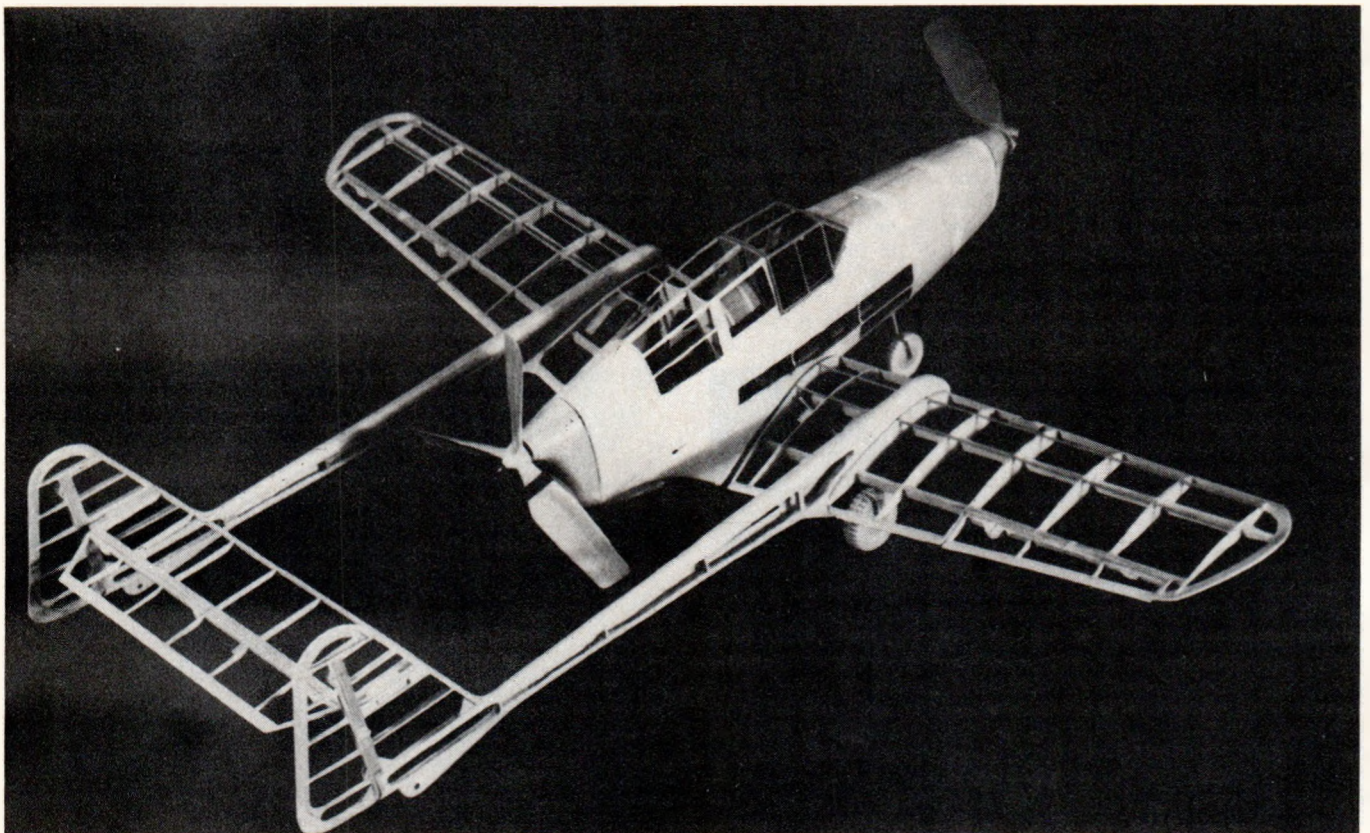


PHOTO JIM KAMAN

This is a Fokker *D-23* done by Jim Kaman of Hurley, NY. It spans 28 inches weighs slightly over four ounces and uses two direct drive motors.

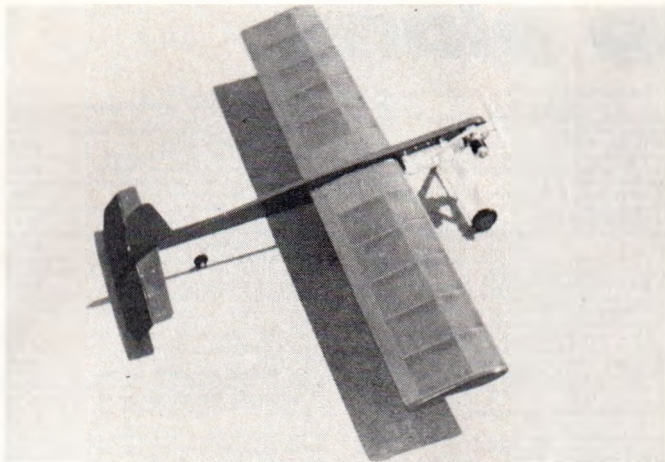


PHOTO LOU ROBERTS

**Lou Roberts** returns the old days of U/C stunt with his design of the *Blue Boy* based on the ships of the '50s. An OK Cub 19 completes the picture.



PHOTO MIKE MIDKIFF

**Mike Midkiff** keeps 'em comin'. This time it's a scratch built Curtiss SB2C *Helldiver*, with a 30 inch span, for rubber power.

bly had a plan of the old Jimmy Allen *Bluebird* from the 1930's. Listen to what he says in his letter: "I had a faint hope that there might be a few doddering old buzzards who would remember it. Now, it appears that the old U.S.A. is lousy with old buzzards with plans for *Bluebirds!* I received many long and delightful letters and now have two complete sets of plans."

I'll tell ya, gang, it makes this old balsa basher's day, when he hears something like that. You're a really great gang — every last one of you! I'm guessin' that Lloyd not only found his plans, but a lot of great new friends in the bargain.

We also heard from Mrs. Myrtle Coad, executive secretary of Western Associated Modelers. She wrote to tell us about a local California hero, Bill Osborne. And, let me tell ya, gang - for my money, he's an authentic hero in all respects. Bill is 69 years old . . . is he retired? Heck, no! He works regularly in the real estate business. Well, almost regularly . . . he takes six weeks off every summer to teach a group of fledgling modelers. How about that! Not only that, but he's been doing it for the past nine years! He's been running the course for the city of Alameda, CA and - are you ready for this? - he receives a salary of \$1.00 for his efforts! Not only that, but he buys all the material for his class which costs him hundreds of dollars! I've said it before, gang, and I'll say it again - don't ever let anyone tell you that modelers aren't the greatest bunch of folks in this whole world. Bill Osborne, our entire Fledgling gang salutes you!

There must be more "Bill Osbornes" around this vast country of ours. Be sure to let your old modelin' buddy know, when you spot one - Okay? Now, I wanted to save some space to tell you about the neatest new deal I've heard about in a long time. A guy, by the name of Joe Wagner, down in New Wilmington, PA has been working for over a year to put together a whole new model airplane society called *The Fun Flyers*. It will promote non-competitive flying - purely "fun stuff" and will be aimed at getting young people involved in the hobby. Of course, experienced modelers will also be needed to act as "squadron leaders" and distribute the special kits, etc. Arrangements have already been made with a well-known American manufacturer to produce the kits. There will be a complete insurance program, a quarterly maga-

zine, and a complete book for every new member. The whole emphasis of the program is aimed at "Fun" with models. Here's where you can write to get more details: Fun Flyers, PO Box 95, Volant, PA 16156. Well, gang, I guess that's it for this session - but, you

gotta admit, we're starting off the New Year with a "bang". Don't forget to keep in touch with your old modelin' buddy here at 10 Brothers Rd. in Wappingers Falls, NY 12590. I'll be watchin' my mail for that note from you!



PHOTO LIN REICHEL

**There's a lot** of rubber behind that prop! Ted Russell displays his *Taylorcraft* from the old Comet kit. It goes 54 inches and shows what can be accomplished when using a kit and some extra effort.



CF-76 SEA HORSE. RC seaplane. 67" span, twin float amphib for 45. Don McGovern FM 5-77 \$5.00.  
 CF-88 MAKO MONSTER. RC seaplane. 45 ml. Don McGovern original. FM 7-87 \$6.00.  
 CF-94 UNSINKABLES. Foam floats convert big models to ROW. Gene Rogers FM 9-87 \$3.00.  
 CF-123 KOOKABURA. 72" seaplane for 45 RC. Wilm Arts FM 6-88 \$6.00.  
 CF-132 GRUMMAN WIGEON. RC scale flying boat for twin 45 Oscar Weingart FM 9-88 \$8.50.  
 CF-150 MORAY MONSTER. 72" RC flying boat with retracting floats for 45. Don McGovern. FM 1-89 \$9.50.  
 CF-168 SCAMP. 63" span RC flying boat for 56 RC. Holland. Willam Arts FM 7-89 \$6.00.  
 CF-171 ENSIGN. 60" span RC flat plane uses Enya. 45. Gene Rogers FM 8-89 \$5.00.  
 CF-199 SAVOIA-MARCHETTI. Twin Hull CL semi-scale of 1933 flying boat. Make it RC. Sarpulus & Shubel. FM 15-19 pusher. Dave Ramsey. FM 12-71 \$6.00.  
 CF-283 MADGE FLYING BOAT. 3 channel RC for 29.45 ml with 57" span. Brent Reusch. FM 5-72 \$6.00.  
 CF-290 PALFONCER TAIL. RC semi scale amphibian. 71" span. 45-80 eng. Don Prentice. FM 3-73 \$8.50.  
 CF-361 SEAWING. RC seaplane with 65" span. 60" wings. Bob Aberle. FM 3-76 \$12.00.  
 CF-393 VIKING. Remote setting RC seaplane for 35-60 engine. 77" span. Bryce Petersen. FM 1-76 \$6.00.  
 CF-450 THE SEE BEE. "A" camera plane for RC with 42" wingspan. Dave Kopp. FM 1-77 \$4.00.  
 CF-539 ELECTRIC TRIM. Electric powered RC seaplane for use with Astro Flight 020 motor. Mitch Poling. FM 5-80 \$4.00.  
 CF-592 ASTRO SPORT FLOATS. Easy to build pair of floats for use on electric powered or "A" models. Mitch Poling. 3-82 \$3.00.

**CONTROL LINE SCALE**

CF-10 FOKKER D17. 33" span WW1 fighter. Brian. CL 049.09 Paul Del Gallo. Two sheets. FM 6-64 \$8.00.  
 CF-23 SPIRIT OF ST. LOUIS. 46" scale UG Lindbergh's plane. Paul Palanek. FM 12-86 \$3.00.  
 CF-33 SEAWING. 18" span Navy jet fighter. 35 ml with 56" span. CL scale. Jack Sheeks. FM 4-66 \$3.00.  
 CF-40 EXTENDED GEE BEE. CL semiscale lengthened for better flying. 35" sport. B. Miller. FM 6-66 \$3.00.  
 CF-71 LOCKHEED HUDSON. 41" span twin wing 19 powered scale CL WW2 bomber. Paul Palanek. FM 4-62 \$2.00.  
 CF-84 CURTISS HAWK 75. CL scale 36" span. 35 ml. French radial engine. P-40. Paul Palanek. FM 4-62 \$5.00.  
 CF-87 RYAN SC. Semi scale CL 51" wing. 35 ml. Jack Sheeks. FM 7-87 \$3.00.  
 CF-106 FOCKE-WULF FV-190. 50" span. CL profile. 35 ml. fighter. 35-45 eng. Jack Sheeks. FM 1-68 \$3.00.  
 CF-130 BELL P-39 AIRCORP. 56" CL twin W. Simmons. for 35 ml. FM 8-68 \$6.00.  
 CF-167 MESSERSCHMIDT ME-109. Near scale 44" span combat CL design for 35 ml. Vince Micchia. FM 6-69 \$5.00.  
 CF-186 RYAN PT-20. CL stunt with 55" wing. 35 eng. Famed 2-place trainer. By A. DiMezza. FM 3-70 \$5.00.  
 CF-195 MUSTANG P-51. Control line for 35, semi scale. Joe Barry. FM 9-70 \$7.00.  
 CF-197 F-86D. Sabre jet. CL stunt 54" span with 35 ml. Bob Lampron. FM 6-70 \$6.00.  
 CF-210 MESSERSCHMIDT ME-262. Semi scale CL 55" span. Single inverted & throttle 35. Vormitt. FM 3-67 \$3.00.  
 CF-212 STUKA JU 87. Famous German WW2 dive bomber. CL for 40 ml. Jack Sheeks. Semi-scale. FM 7-70 \$6.00.  
 CF-226 HAWKER TYphoon. British WW2 fighter in neat CL version 1/12th size. 29.40 power. Paul Palanek. \$5.00.  
 CF-228 CHANGE VOUGHT V45 CORSAIR. 62" CL scale. 50-60 eng. 1 1/2" scale. FM 4-77 \$4.00.  
 CF-241 SKY FLY. 2" scale replica of Anton Cvyetkovic's popular homebuilt for CL. Takes 40 ml. Roberts flight control system. Bob Adair. FM 10-71 \$6.00.  
 CF-246 F-14 TOMCAT. CL stunt Navy fighter. 56" span. 35 ml. 1 1/2" scale. Macintosh. FM 1-72 \$4.00.  
 CF-267 F-105 THUNDERCHIEF. 57" span stunt CL semi scale for OS 40 engine. Bob Hunt. FM 5-73 \$6.00.  
 CF-365 TYphoon. Semi scale CL stunt. 56" span. 37-46 engine. Steve Ashby. FM 1-76 \$6.00.  
 CF-414 AT-9 JEEP. Profile CL for twin 30" span. Jack Sheeks. FM 8-76 \$4.00.  
 CF-428 GRUMMAN S-2G TRACKER. 63" span. CL scale for twin 35's or 45's. Steven A. Hull. FM 1-77 \$6.00.  
 CF-433 HANRIOU-BICHE H-110 PURSUIT. CL sport scale for 35 eng. 48" span. Dick Sarpulus. FM 3-77 \$8.00.  
 CF-473 P-61 BLACK WIDOW. Twin CL stand off scale for 049. 34" span. Michael Beaulieu. FM 5-78 \$5.00.  
 CF-489 F4V CORSAIR STUNTER. Stunt CL with 58" span. 35-46 engines. Jack Sheeks. FM 11-78 \$6.00.  
 CF-516 CESSNA ACWON. Profile CL stunt ship. 40" span. 35 ml. Larry Kruse. FM 10-79 \$5.00.  
 CF-630 OS2U-1 KINGFISHER. Something a bit different for CL. Carrier events. Features include a sliding leadout placement and a span of 30 1/2". For 40-60 size motors. By Tom Schaeffer. FM 4-83 \$5.00.  
 CF-639 P-39 AIRCORA. A control line scale version of the famous WWII bi fighter used by the Russians. A 23-35 ml powers this 34 1/2" inch model just fine. By Walter Musciano. FM 7-83 \$6.50

**CONTROL LINE**

CF-59 CHIZLER. CL slow stunt pattern flyer uses Fox 35 engine with shaft extension. 50" span. Dick Mathis. FM 5-66 \$3.00.  
 CF-62 TALON. CL stunt with inverted. 35.56" span. J. Kostecy. FM 12-66 \$6.00.  
 CF-67 SWINGER. Swept wing CL stunt. 51" span. 35 ml. Jack Sheeks. FM 1-77 \$3.00.  
 CF-68 STARLIGHT. CL stunt. 56" wing for hot 35. Charles Mackey. FM 8-67 \$3.00.  
 CF-III NOVI III. 51" span. CL. 1st at 87 NATS. Dave Gierke. FM 2-68 \$5.00.  
 CF-12 FREEDOM 45. CL stunt with 45" span. 40 eng. 40 wing. 45 ml. sheet covered. Jack Sheeks. FM 5-68 \$4.00.  
 CF-134 SPITFIRE STUNTER. Semi-scale CL 49 1/2" span. 35 engine. Jack Sheeks. FM 9-68 \$3.00.  
 CF-141 FURY. Stunt CL trike gear. Fox 35 engine. full span. 54" wing. Don Bamberg. FM 2-67 \$5.00.  
 CF-144 WINDER. CL combat 42" span high speed. Terry Prather. FM 1-68 \$2.50.  
 CF-147 FORMULA S. 55" stunt CL. 2nd at Olathe NATS. J. Kostecy. FM 12-68 \$5.00.  
 CF-149 TORING B. 53" span. CL stunt with 35 ml. Modern Jack Sheeks. FM 1-69 \$4.00.  
 CF-153 SCOTTSMAN. 53" span. CL stunt swept wing design with full faps for 35. Jack Sheeks. FM 2-69 \$3.00.  
 CF-162 PEGASUS. CL stunt 630 eng. in. 57" span. 40 engine. Bob Howard. FM 1-69 \$5.00.  
 CF-164 KNIGHT. T tailed. CL stunt. 52" span. 35 ml. Jack Sheeks. FM 6-69 \$4.00.  
 CF-172 HI-LO. CL stunt trainer. 51" span. uses 35 ml. Paul Palanek. FM 9-69 \$3.00.  
 CF-181 TEAR-ALONG. Combat CL. small and compact. Cox 15. Fast Richard. FM 12-69 \$3.00.  
 CF-185 MESSERSCHMIDT ME-109. Semi scale CL 52" span. for 35 engines. Jack Sheeks. FM 4-70 \$5.00.  
 CF-192 NOVI IV. 55" span. Control line stunt for 35 ml. 5-70. Dave Gierke. FM 5-70 \$5.00.  
 CF-203 OLD GLORY. Stunt control line 53" span. 35-40 Jack Sheeks. FM 2-71 \$3.00.  
 CF-213 MYSTERE II. CL stunt with 55" span. 29.40 ml. Sensitive. Jim Van Lou. FM 10-70 \$6.00.

**CONTROL LINE PROFILE**

CF-316 SPIDER. Slow control profile CL 42" span uses Fox 36. Lou Woolard and Mike Tallman. FM 11-73 \$4.00.  
 CF-332 HEINKEL HE-21B. Profile twin control line for two 15 40 engine. 38" span. Joe DeMarco. FM 5-74 \$4.00.  
 CF-335 EROUPE. Profile CL for 19 to 40 engines. 53" span. Dick Mathis. FM 6-74 \$4.00.  
 CF-342 CLIPPER. CL profile slow combat. 35 1/2" span for 35 engine. Wm. Wiley. FM 8-74 \$4.00.  
 CF-352 FRODOING FAB-3 PROFILE. CL biplane with 34" span for 29-36 engines. Joe DeMarco. FM 12-74 \$4.00.  
 CF-355 METAPHOR I. Stunt profile CL for 35 ml with 47" span. Bill Bradford. FM 1-75 \$4.00.  
 CF-363 SKYFIRE. "A" stunt profile for Cox line wing. 28" span. Larry Reger. FM 5-75 \$4.00.  
 CF-392 MISS JILL. Profile CL stunter with 52" span. Fox 35 ml. Jack Sheeks. FM 12-75 \$4.00.  
 CF-398 BEARCAT & ZERO. Two profile CL with 29" span for 09-15 power. Joe DeMarco. FM 3-76 \$4.00.

CF-409 METAPHOR II. CL profile stunter with 52" span and 35 engine. Bill Bradford. FM 6-76 \$4.00.  
 CF-411 TRAGER. CL Navy profile carrier. 32" span. 15 engine. Russ Brown. FM 7-76 \$4.00.  
 CF-444 THE WILD GOOSE. Canard profile control line stunter with 48" span for 35 engines. Dick Sarpulus. FM 7-77 \$6.00.  
 CF-480 DRUINE TURBULENT. CL profile stunt trainer. 48" span. cheap and easy. for 35 ml. Larry Kruse. FM 7-78 \$4.00.  
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 CF-555 FRUGAL PHANTOM. CL profile sport scale for air show demonstrations. Designed for 35-40 engines and throttle control. Hal Redner. FM 12-80 \$6.00.  
 CF-563 "A" SPITFIRE. Profile control line ship with 29" wingspan for "A" engines. Dick Sarpulus. FM 3-81 \$3.00.  
 CF-567 BEECHRAFT STAGGERED. Sport scale profile model of a biplane classic. 29 1/2" \$4.00.  
 CF-572 YARDBRID. 36 1/4" span profile CL stunt trainer designed for the NCRPA program. Mark Romanowicz. FM 6-81 \$4.00.  
 CF-586 NORTHRUP GAMMA. Sport scale profile version of a racing classic, with wheel pants and 29 1/2" wingspan. W.D. Musciano. FM 1-82 \$6.00.  
 CF-598 SC-2. A Top CL Slow Combat design for use with 36 size motors. Phil Carter. FM 5-82 \$5.00.  
 CF-625 ROOKIE. This CL stunter features an upright mounted 35 motor in a profile fuselage design. The ship features a 50 inch span. By Don Winfree. FM 3-83 \$8.00.  
 CF-633 PROFILE MISS DARRA. The popular Goodyear racer is rendered in profile form for CL sport and stunt flying. Features include a span of 51 inches, adjustable leadouts and speed mounting for 35-46 size motors. By Allen Brockhaus. FM 5-83 \$6.00.  
 CF-643 ZLIN 50-L. Unique foam wing and fuselage construction highlight this 52 inch span CL profile design for 35-40 size engines. By Phil Carter. FM 9-83 \$5.00.  
 CF-646 CAP 21. CL. Features will enjoy this spirited profile stunter which spans 29 inches and has a hot 049 for power. By Dick Sarpulus. FM 10-83 \$4.00

**FREE FLIGHT SAILPLANES**

CF-314 THERMUS. Catapult glider. 36" span. Bob Adair. FM 11-73 \$2.50.  
 CF-343 FACE SAVER. Handlaunch glider for rough wind. 16" span. Larry Kruse. FM 7-74 \$3.00.  
 CF-378 OCHRONIA. NYRMAIDALE. Nordic A/2 with 70" span. Dave Linstrom. FM 8-75 \$3.00.  
 CF-401 BACKLASH. Catapult glider with 24 1/2" span. Larry Kruse. FM 3-76 \$3.00.  
 CF-408 DESPERATION. A/1 Nordic glider. 48" span. Bruce D. B. Mandard. FM 6-76 \$3.00.  
 CF-424 BOOMER BUM. 78" span. Nordic A/2 competition glider. Joe Slovacek. FM 12-76 \$4.00.  
 CF-443 MOJAVE A/2 NORDIC. A/2 Nordic free flighter with 85" span. Dick Mathis. FM 6-77 \$6.00.

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CF-318 MAXPEARL. FF power for classes BCD for 29 to 40 engines. 86" span. Bill Chenault. FM 12-73 \$6.00.  
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 CF-349 MANDARD. Scale biplane for rubber. FF or 020 and lightweight RC. 36" span. Hurst Bowers. FM 10-74 \$3.00.  
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 CF-362 BAD MEDICINE. "A-A" FF 43" span. 045-051 engine. Mike Rawley. FM 5-76 \$3.00.  
 CF-381 PARFAI. FF. FAI power 15 engine. 61" span. Chuck Markos. FM 9-75 \$6.00.  
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 CF-387 ETRICH TAUBE. FF scale antique with 32" span. Wm. Stroman. FM 11-75 \$3.00.  
 CF-399 SCORCHER. Competition Jetex 50 FF with 30" span. FM 3-76 \$3.00.  
 CF-402 DEHAVALD DH-10. FF scale 49 1/2" span. two Astro Flight 020 electric motors. W.R. Stroman. FM 4-76 \$4.00.  
 CF-416 1910 FABRE HYDRAVION. FF scale seaplane for Cox 020 engine. 35" span. W.R. Stroman. FM 9-76 \$3.00.  
 CF-419 HELLA-PENO. "A-A" competition FF with 47" span for 049-051 engines. Joe Slovacek. FM 10-76 \$4.00.  
 CF-449 VALKYRIE MODEL A NO. 1. Free flight electric scale for the Astro Flite 02 motor. 37" span. W.R. Stroman. FM 9-77 \$4.00.  
 CF-451 COUNTRY BOY 650. Competition FF for Class B. Engines from 20. 41. Jim Clem. FM 10-77 \$4.00.  
 CF-465 CHICAGOGLANDER. Class A power FF for 15 ml 52" span. Dave Linstrom. FM 3-78 \$5.00.  
 CF-470 EVIL WYVERS. Class A-B contest FF ship for 15-23 engines. 60" span. Mike Hallam. Grady Turner. \$6.00.  
 CF-472 HOLY SMOKER. 15 competition FF 59" span. Joe Slovacek. FM 5-78 \$6.00.  
 CF-499 THE SKY BRID. "A" competition FF for 049-051 engines. 46" span. Larry Kruse. FM 3-79 \$5.00.

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 CF-573 SUDDEN SAAM. Competition FF B/C for 29-35 75" span. Jim O'Reilly. FM 8-79 \$6.00.  
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 CF-594 LONING LO-9. Designed by Fulton Hungerford, this rubber scale amphibian features exact scale construction and optional retractable landing gear. Can also be built as two channel RC. 34" span. Ed Toner. FM 3-82 \$6.00.  
 CF-599 EMBRY ON. Designed to compete in the FIF Rubber Embryo class, this design includes many scale-like features. Al Lidberg. FM 5-82 \$4.00.  
 CF-601 B-25 MITCHELL. A 36" span super-scale rubber powered version of a famous WW2 bomber. Mike Mickiff. FM 6-82 \$4.00.  
 CF-607 MCRAE SUPER DART. A 27 1/2" span rubber scale beauty. By Florent Baeck. FM 8-82 \$4.00.  
 CF-610 BOSTONIAN "T" CRAFT. Designed for the popular rubber competition class, this scale-like ship features a 16" span. Larry Kruse. FM 9-82 \$4.00.  
 CF-612 LOW-CAL. P-39. profile FIF rubber version of a WWII fighter in air race colors. Features a 16 1/4" span. B. Al Lidberg. FM 10-82 \$3.50.  
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 CF-620 POLISH RWD 6. Winner of the 1930's Berlin race, this design is faithfully reproduced for Rubber Scale competition. Features include a 32 1/2" wing with 150 sq. inches of area. By Hurst Bowers. FM 1-83 \$5.00.  
 CF-622 GLOSTER GANNET. This rubber powered freight scale biplane has plenty of charm. It has a 21 1/2 inch wingspan. By Don Snell. FM 3-83 \$4.00.  
 CF-626 NEGABIE. Designed to conform to the Bostonian competition FIF rules, this unique biplane features a negative stagger planform. By John Tudor. FM 3-83 \$4.00.  
 CF-628 OS2U-1 KINGFISHER. This rubber scale version of the famous Navy scout/rescue plane features either wheel type gear or optional floats. The Curtiss replica features a 27" span. By Mike Mickiff. FM 4-83 \$5.00.  
 CF-632 GADFLY. Winner of the 1962 FAC Nats. This Jambo Scale FIF rendition of the Glenn Henderson design features a span of 36 inches. By Dave Rees. FM 5-83 \$5.00.  
 CF-635 FIESELER Fi-157. This unusual WWII German biplane is designed for FIF Rubber Scale competition and features a span of 30". By Col. Hurst Bowers. FM 6-83 \$5.00.  
 CF-638 PEANUT STICK. A just-for-fun "Peanut Scale" version of the popular RC Ugly Stick design. This freight rubber version spans 13 inches. By Jim Kostecy. FM 7-83 \$3.50.  
 CF-641 RYANPT-22. A classic from the 1930's becomes the subject of a rubber scaled masterpiece. Features include a shock mounted landing and a span of 30 inches. By Tom Sandor. FM 8-83 \$6.00.  
 CF-647 BOMBABRIA. Scale-like lines set this Bostonian class freight design apart from the norm. The 14 gram machine features a span of 16 inches. By Jim Kostecy. FM 10-83 \$4.00.  
 CF-650 LEARN FAN. Try this profile scale version of Bill Lear's last fan. The fun machine spans 17 inches and features a pusher prop. By Larry Kruse. FM 11-83 \$4.00.  
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 CF-654 LIFTING BODY BOSTONIAN. A truly unique approach to the popular FIF event is this twin pusher design with a lifting fuselage section. The original canard spans 16 inches. Plans to two sheets. By David Aronstein. FM 1-84 \$5.00

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# R/C giant scale

By Frank Costello



PHOTOGRAPHY BOB BLANEY

The largest plane in attendance at the Somers Mammoth Scale Fly-in was Hank Likes' *Spirit of St. Louis*. Wing span was 12 feet. Power was a Quadra and at 19 pounds, it flew quite realistically.

One of the nicest parts of giant scale modeling (in fact, one of the nicest parts of modeling in general) is meeting other people with a common interest on an informal basis. The concept of *non-competitive meets*, though, is a new one in model aviation and I think is one long overdue.

The jumbo airplane movement has begun a tradition of non-competitive and sport-type fun flies. A very informal atmosphere unencumbered by strict adherence to competitive rules. When modelers get together like this, all sorts of wonderful things happen, not the least of which is that everyone has a good time! No tension in the air, no sitting on pins and needles waiting for your turn to fly, no big letdown when you found out you lost. Just easy, calm, fly-when-you-want-or-not-at-all-type flying. Some of you die hard competitors out there may find this a little boring, especially you competition pattern types, but we love it. There is finally a special interest part of the hobby that the sport flyer can get involved in on his own level and at his own speed.

Nowhere was this concept more evident than at the recent Somers (NY) Mammoth Scale Fly-In. A perfect weekend of relaxed flying enjoyed by all. This group is really dedicated to the enjoyment of flying jumbo-sized planes and the whole club pitched in so that all the pilots would have a maximum amount of flight time and a minimum amount of problems.

This was their fifth attempt at this sort of fun gathering and they really have it down pat. A well-controlled parking area with super crowd control and tons of pit area all marked out on the ground so you knew where you were, and one of the finest grass fields I have ever had the pleasure of flying from. (Unfortunately they lost the field two weeks later but that's another story.)

The flight line was set up so that four planes could fly at one time with about 20 feet between flyers. No frequency overrides here! The announcers (Carl Risk, Rich Conti and Bob Stubbs) all did a super job by keeping up a pleasant line of humorous chatter mixed with facts about each plane as it came up to the flight line to fly. They were on an elevated platform and could see the entire field from where they were. They also used an interesting method of identification. Polaroid pictures had been taken of each plane to fly and attached to an info sheet of that plane. When a flyer stepped up to fly all the announcer had to do was take out the picture of the plane for all the announcing info he needed!

Another interesting feature of the meet

was that each flight line director (and there were four of them, one for each flyer) was in constant communication with the announcers by way of short range walkie-talkie headphone sets. Not only was this great from a safety point of view but also the announcers could get first hand info from the flyer about his flight. The flyer would tell the flight line director (who stood with him during the whole flight) what maneuvers he would be performing and where and how he would fly and the flight line directors would pass this info on to the announcers on the P A system. It worked well in the other direction too with the announcers (at their excellent vantage point) telling the flight line directors of possible dangers on the field or of airplanes straying over the crowd. Such safety control!

Spectators were well contained with a snow fence separating them from the flight line and pit area. However, twice each day all flying was stopped for a half hour while spectators were allowed access to the pits and the flight line for picture taking and perusing. A nice break for everyone, flyers and lookers!

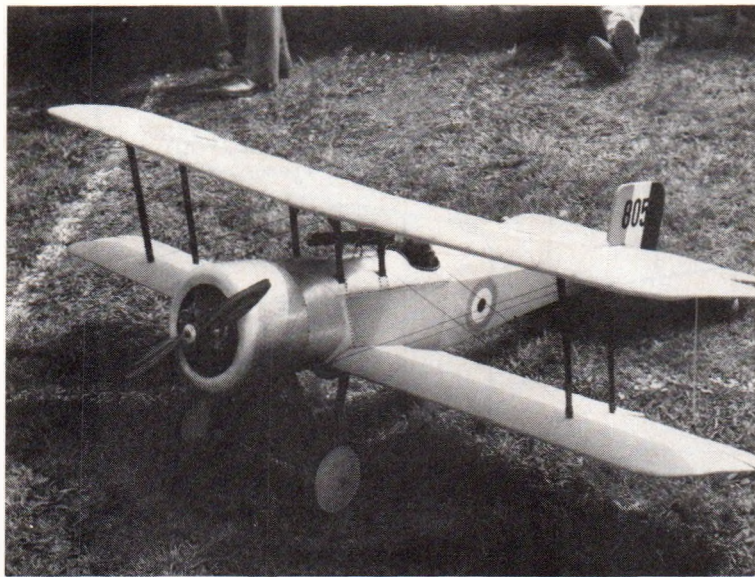
And such planes they had to look at! Hank Likes' *Spirit of St. Louis* at 12 feet was the largest plane there, all the way from Toms River, NJ. Hank had a Quadra in it and, at 19 pounds, it flew most realistically.

Hank also brought along his 10 foot *Miss Vintage*. An unusual airplane to begin with, he scaled it up from RCM plans. At 22 pounds, a little heavy for its Quadra but still a fine flyer.

William McCartney won the pilots choice of Best Craftsmanship Award with his Waco *Taperwing*. Bill, who hails from West Milford, CT, scratch built his Waco and a 2.4 Kioritz pulls its 26 pounds around with au-



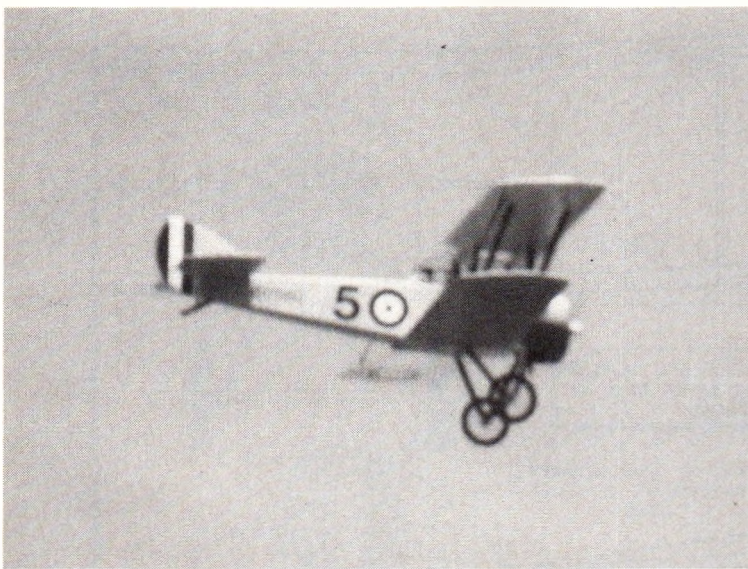
As ever popular, there were plenty of Cubs. This one, by John Kovarik, was remarkable. Its 28 pounds were pulled along with the Kavan Continental while its fuel tank mimicked its full size brother down to a "cork".



Excellent planes were all over. Here's another (above), George Bjorkland's Bristol Scout. Richard Feroldi's Sopwith Pup flew very realistically with its Kawasaki 3.15 pulling it (below). Weighed 33 pounds.



The setting isn't right but Hank's Spirit (above) sure achieves an air of realism when it lifts off. Would you believe an OS .61 pulls this nine foot Aeronca C3 (below) of Bob Griswold? Sure didn't fly like a bathtub.



thority.

There were many Cubs to be seen but John Kovarik's 12 foot Cub overshadowed them all. Built from Bob Nelitz's plans, John put in a Kavan Continental to pull its 28 pounds through the air. With that much at stake up front, I'd be afraid to fly it but John put on an amazingly realistic performance. Even the sound was scale! John mounted the fuel tank as per the full scale plane and even put in a cork float to indicated fuel level as per full size practice. Such realism!

Richard Feroldi of New Hyde Park, NY, FLYING MODELS

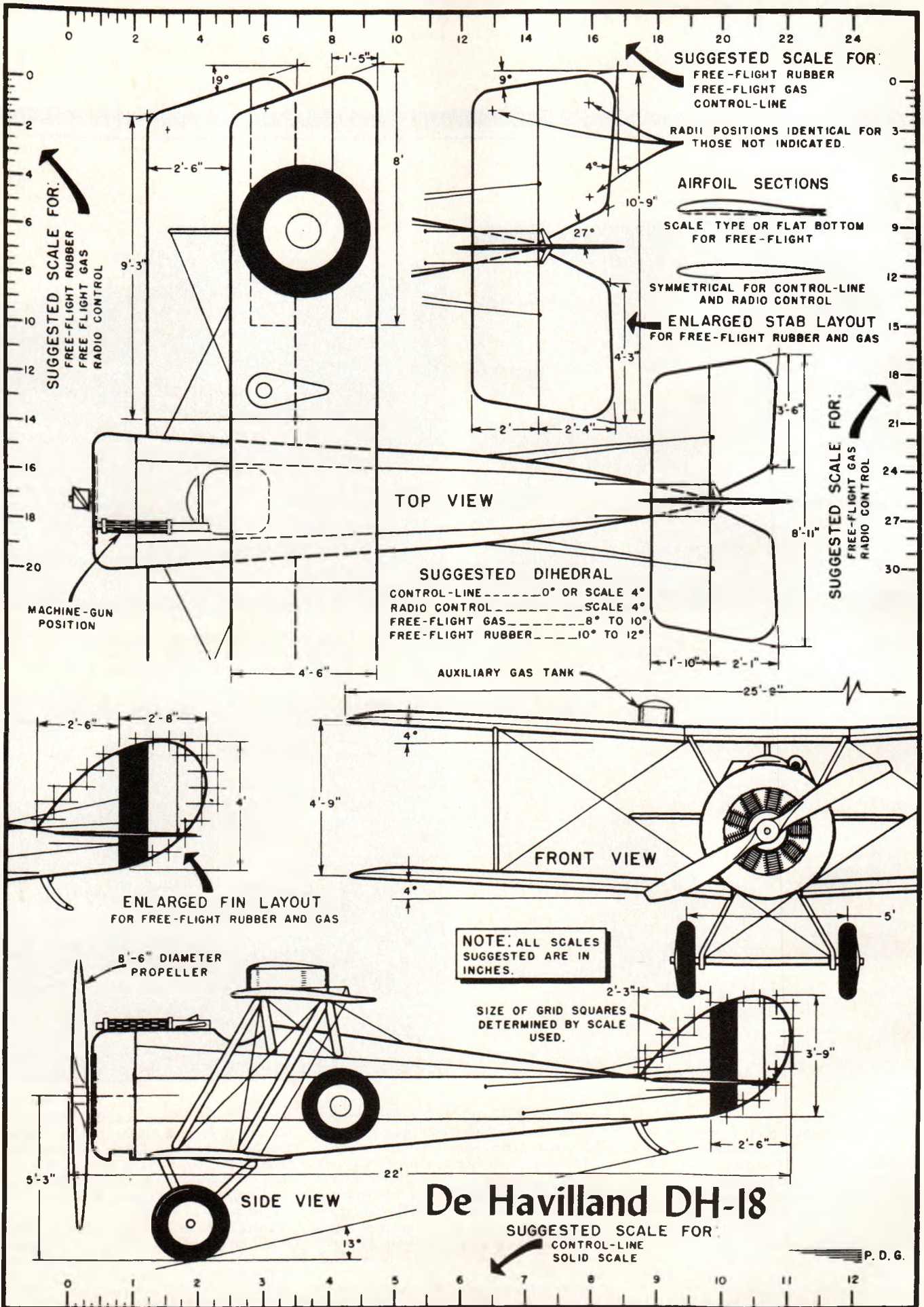
brought his Balsa U.S.A. Sopwith Pup and also did a thoroughly realistic job of flying it. This plane is personally one of my favorites and I was glad to see that Richard had done a fine job in building. His pilot was even servo controlled! A Kawasaki 3.15 is really the only engine for this plane and Richard made the right choice. At 33 pounds, you might think he would need even more but 29 square feet of wing is a lot of life and the combination is perfect.

Another favorite of mine is the Aeronca C3 (the flying bathtub). Bob Griswold of Strat-

ford, CT, had one there from the Balsa U.S.A. kit. Bob took careful pains to make this pioneer lightweight even lighter. At 25 pounds I think he succeeded! An OS 61 pulls this nine foot beauty around at such a slow speed you'd think it would fall out of the sky but it stayed stable as a rock.

There were many other excellent planes there, but I think I've run out of superlatives. There's just one left and that's a "good job well done" to Somers President Don Kilgus and Vice President Frank Gorham and their fine crew.







# R/C pattern

By Dean Pappas

Just got back from the flying field where I've been conducting some tests on an OPS 29. I don't have any results to give regarding pipe length, props, and carburetors yet, but I should by next month. Why is a dyed-in-the-wool pattern nut playing with 29's? It's because two of them, if tied together in a Cass 2+2 drive, are a pattern (and Turnaround) legal 9.7cc! Depending upon the tuned pipes that I end up with, the all-up weight of this powerplant should be between 3 and 3 $\frac{1}{4}$  pounds. Belt reduction off these high revving engines should allow me to harness their high output while keeping the prop below nine thousand RPM. Any bets on three horsepower?

By now you're probably wondering what sort of monster this is going into. It is going into a very light 1300 square inch example of the Ulery *Laser*. The MonoKoted airframe, ready for engine, wheels, radio, and pushrods weighs an incredible six pounds, 1 ounce! This plane was framed up by a modeller by the name of Howard Cowdrick (hope I got that right). Howard is presently making arrangements to frame up these airplanes to order. I'll get some information on this for next month.

If it comes in at under 11 pounds it will make a nice, calm weather turnaround airplane. I may even fly it in standard Pattern. That's just what Sal Battaglia did last week at the Romano Garabello Memorial Pattern Meet hosted by the Pennsylvania Avenue Club at Floyd Bennet Field in Brooklyn, NY. Sal's plane was a 10 $\frac{3}{4}$  pound version of the Spinks *Akromaster* designed by Ed Keck. It is powered by a 1.9:1 O.S. gear engine with a 16-10 prop. It did not lack for power, and probably flew better than Sal's pattern plane this year. My only criticism is aimed at the sound of the gear drive unit. During one of my flights, I mistook the sound of the Spinks taking off and thought that my ailerons were fluttering.

Despite all this fun that I have experimenting, the majority of my efforts are still aimed at a light *Tipo 750* since the designs and trimming techniques for present day pattern designs are our biggest asset. I would like to continue last month's discussion of differential and of control linkages that provide adjustable differential.

The *Tipo* that I flew two seasons ago (sob, sob) would roll more cleanly during the last half of a slow roll than during the first. The first half looked like a Barrel Roll, until the differential was properly adjusted. The linkage used was a Goldberg Strip Aileron Linkage using  $\frac{1}{8}$  inch wire. Don't use anything less than  $\frac{1}{8}$  inch wire as this is asking for aileron flutter to pay you an unwelcome visit. The differential was adjusted as shown in Figure 1. Notice that by moving the linkage in on the servo arm while moving the threaded connector closer to the aileron by the same proportion will not change the aileron

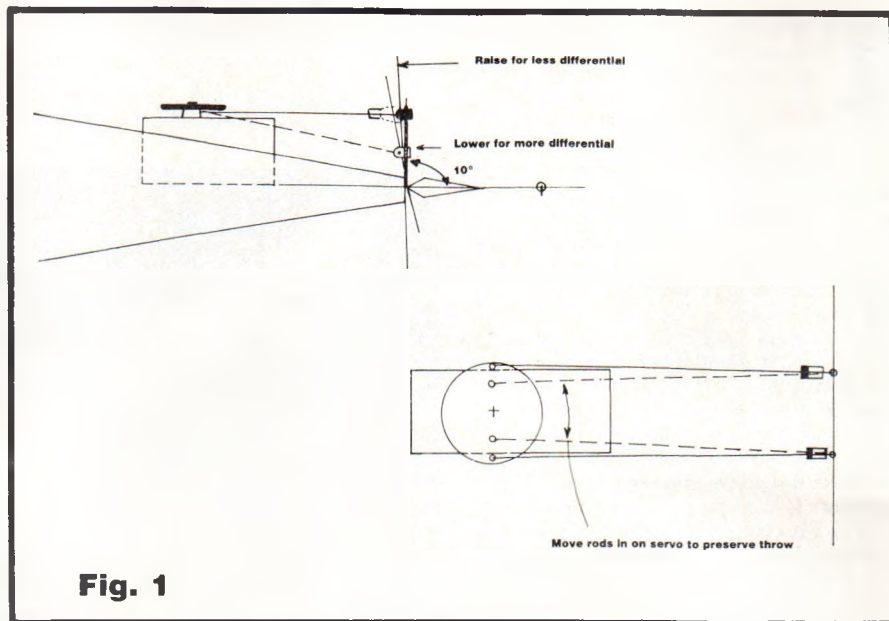


Fig. 1

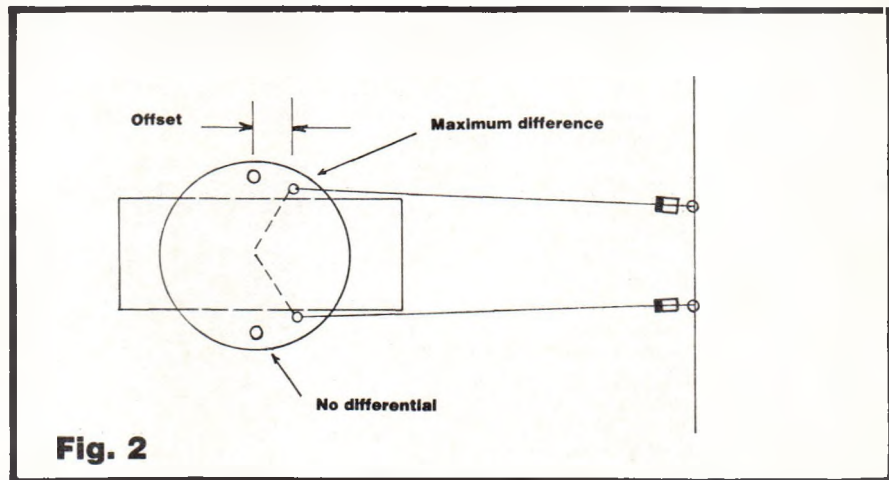


Fig. 2

ron centering while increasing the differential. Moving the linkage up, while moving it out on the servo, will decrease differential.

Another method is to move the connections on the servo arm back toward the ailerons (on a low wing model). This is shown in Figure 2. While not normally adjustable, some people have been known to make up sets of wheels with offsets calibrated in turns of a KwikLink. In this way the linkages can be adjusted so that the aileron centering does not change. I believe that this has been credited to Ivan Kristensen. Of course, if all your equipment has servo output shafts of the same size, then it becomes easy to keep a stock of wheels with an offset of a turn or two between each. It is harder if all three rods you own have different output shafts.

An airplane with the differential properly adjusted looks good in the three rolls, as the fuselage does not seem to wriggle or move up and down when the maneuver is correctly flown with no altitude changes. If the plane appears to "barrel" or jump when upright, and roll cleanly when inverted, increase the differential; if the jumpiness occurs while inverted, reduce the differential. The *Tipo* that I mentioned earlier needed about 25% more throw on the raised aileron than on the lowered one. The *X.L.T.* that I am now flying has virtually none.

This weekend saw the end of the contest season in the northeast, and signals to me that the next couple of articles would be well spent on building and lining up that perfect plane for next season.

# R/C Soaring

By Bob Crane

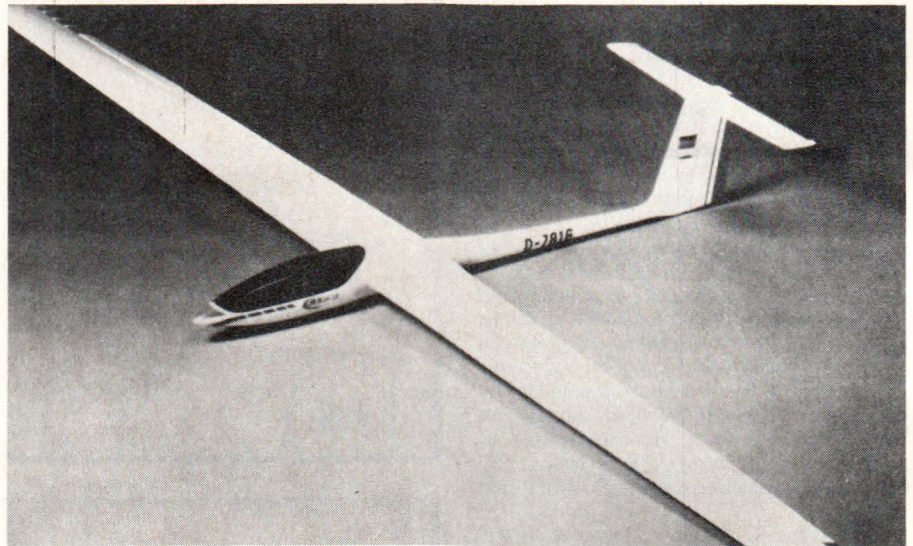
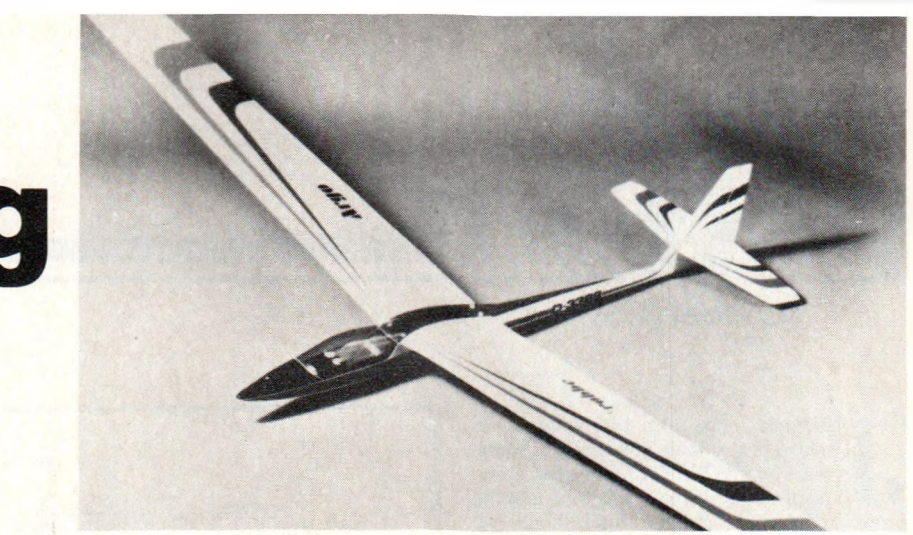
This time of the year, your thoughts are geared towards the winter building season. I usually look through the magazines to see what all the winners of various contests are flying, evaluate my own performance criteria, and make the final selection. This year, time is very critical for me so I decided to take a very close look at ARTF (Almost Ready To Fly) aircraft. Those beautiful ads of Robbe enticed me to send for their catalog. The three dollars spent is well worth every penny of it. The 98 page catalog is done in full color. With this column and the next I would like to explore not only the Robbe line but also other manufacturers of ARTF sailplanes.

Robbe offers six sailplanes, from trainer types to high performance. What I will attempt to do is give a brief description of each and their respective specifications. All their sailplanes feature their Plura, ready-made fuselages, with the exception of the *ASW 15B*, which is all balsa construction. In conjunction with the Plura fuselages, the other five sailplanes feature Siros aircraft wing panels. The Plura fuselages are manufactured in one piece, of white pigmented thermo-plastic material. The semi-matt surface can be glued with many standard types of adhesives. They can also be given a permanent finish with all common types of paint. The Siros wings are foam filled in negative molds to guarantee high airfoil fidelity. The wings are covered with a sanded obechi veneer, with the multi-function root ribs pre-set at the correct dihedral angle. Plug-in wings, joiner system, spars, webbing, push rods guide tubes, aileron and flap linkages and just about anything else that you can think of are incorporated into the wings. Each wing is also finish sanded. Now onto the sailplanes.

*Finikofi* is an all around trainer with the novice in mind. The *Finikofi* is at home in thermals as well as on the slope. The model is very strong and simple aerobatics such as loops, stall turns, and spins are within its scope. The broad wing chord contributes to the model's docile stalling characteristics. A two channel radio is all that is needed for this plane. The wing panels are the Siros type and the fuse pod is in two halves and just needs to be screwed together. The tow hook, socket for the tail boom, grooves for the main former, cabin flange etc. are all in place.

*ASW 15B* is also an easy to build, easy to fly sailplane with the novice in mind. This is the only model that features all balsa, built-up construction. The *ASW 15B* can also be outfitted with an external engine pylon which attaches to the top of the wing. All accessories are included in the kit.

*Argo* is a high performance sailplane in the intermediate class. The model's wide speed range, excellent glide angle and docile stalling behavior, combined with a high degree of maneuverability, make it easy to exploit small areas of thermal or ridge lift. *Argo* fea-



Robbe Modellsport have imported their varied line of ARF kits which include some beautiful sailplanes. The *Argo* (above) is a high performance sailplane while the *ASW 19* (below) is a stand-off scale, multi-task plane.

Specifications:	Finikofi	ASW 15B	ARGO	ASW-19	VERSO	SF 36
Wingspan (in.)	63	85.04	101.18	123.23	82.67	118.11
Fuse. length (in.)	39.37	44.49	49.42	53.15	50.59	53.15
Wing area (sq. in.)	446.37	635.46	796.65	976.44	683.51	1038.44
Tail area (sq. in.)	81.37	85.24	92.99	92.99		201.49
Total area (sq. in.)	527.74	720.70	889.64	1069.43	776.50	1239.93
All up weight (oz.)	35.27	31.75	59.96	70.54	63.49	123.45
Wing loading (oz./sq. ft.)	9.6	6.3	9.6	9.45	11.78	14.33
Airfoil			E193	E193	E178 Mod	FX 126

tures the Plura prefabricated fuselage, with all holes drilled and the Siros wing panels and tailplanes. All accessories are included in the kit.

*ASW-19* is a stand-off scale version of the sailplane manufactured by the firm of Alexander Schleicher. This versatile model can be used for all types of flying from gentle thermal soaring to F3B work. The *ASW-19* features gapless ailerons and elevators, a new type of airbrake, which is located on the top surface of the fuselage between the wings, and a newly developed type of wing retention system. The Plura fuselage is very resistant to damage from impact and extremes of temperature. All holes and slots are done at the factory. The Siros wings feature pre-cut ailerons and all linkage and hardware. The canopy is pre-cut and trimmed to size.

*Verso* looks like it will fly right off the page of the catalog. This sleek and racy looking

sailplane is their aerobatic slope soarer. The Plura fuselage and Siros wings and tailfeathers are used.

*SF-36* is a semi-scale R/C motor glider. The clean design line coupled with the Wortmann FX 126 laminar flow airfoil provide excellent handling and performance. The *SF 36* features the Plura fuselage and Siros wings. This motor glider can also be fitted with an on-board starter so that you can re-start your engine in flight, while thermal hunting. The starter will only work with the Enya .40 4-cycle. Wheel pants enhance the beauty of this sailplane.

For your fantastic catalog send \$3.00 to Robbe, Suite 2D, The Office Center, Princeton Meadows, Plainsboro, NJ 08536. Tele: (609) 799-4712. And tell them you heard about Robbe in FLYING MODELS.

That's about all for this month. Green Air!

# FF sport

By Gene Sellers

**A**t the Galeville One-Design Contest and other events, I've noticed that modelers with little experience have trouble with power adjustments on rubber sport and scale models. This is one of the most poorly understood parts of the adjusting process. The objective is to develop a safe, efficient climb without destroying the model in high speed power dives or uncontrolled stalls. The standard procedure is to first adjust the model's glide and then the powered portion of the flight.

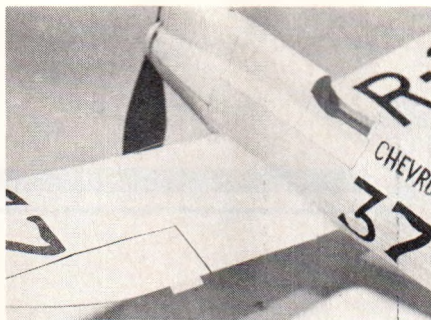
The first problem occurs in trying to test glide a model with the free wheeling propeller used on sport and scale models. A free-wheeler has a lot of air resistance. It is very difficult to launch the model with just the right amount of speed to simulate the glide. Consequently, hand gliding without power to turn the propeller doesn't help diagnose the trim because most of what you observe is caused by the way the model was launched.

To overcome this problem, a short motor should be installed and used for the trimming process. Make this temporary motor of the same size rubber as will be used for full power, but only long enough to reach from the motor peg to the propeller hook. This is not good practice for later flights, but while testing you will not be using a winder and when hand wound it will simulate the power pattern of the longer motor. Assuming that the model is balanced and the most serious warps have been removed, you are ready for the first flights. Wind the propeller backwards by hand about 25 to 50 turns. Use just enough turns to keep the propeller turning till the model glides to a landing. Ideally, the model will be released at the correct flying speed and with the nose at the correct attitude for a smooth steady descent to a gentle landing. If it didn't nose down into a dive or pull up into a stall, you're doing all right. Repeat the process several times. This will give you a chance to reassure yourself that you can launch the model correctly and let you look for any turning tendencies. Try several flights after each adjustment, if the results are not dangerous, to be sure you understand what is happening.

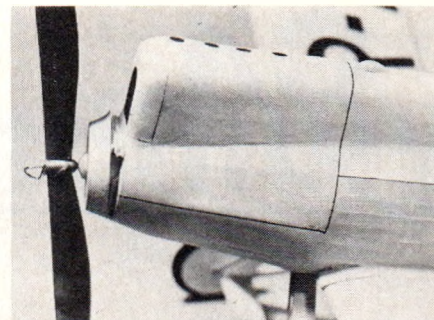
I like to see a model show definite signs of buoyancy in the air at this time. It should be clearly floating on the wing's lift. If it is not, remove some nose weight or add a little weight to the tail - a very small amount at a time.

If the model nosed up into a stall, add weight to the nose. Modelers differ on this point. Some advocate adjusting the incidence of the stabilizer, but for kits and plans that someone has already worked out, I adjust incidence only after everything else fails. Or, on a thoroughly tested model, I may change incidence to try for more performance from it.

Spend enough time at this stage. If your first flight succeeded you probably added another 10 to 25 turns the next time; and as



PHOTOGRAPHY GENE SELLERS



This Howard Pete required trim tabs, side thrust, and down thrust to fly successfully (above left). Close-up (above right) shows the balsa shims added to achieve the successful thrust angles. Bruce Burroughs' twin engine A-26 (below) takes to the air. Careful consideration of thrust effect allows such success.



things progressed you may now be hand winding the propeller 100 turns or more. That's OK as long as each flight was better than the last. At 100 turns or more, you should get level flight or even a modest climb before gliding to a landing. A short motor, wound even a few turns without stretching has a lot of torque. It just exhausts its energy more quickly. This lets you use the short motor to adjust the model with minimum risk.

At this stage, close attention should be paid to the turn in the glide - unless you enjoy long downwind chases. Tilting the stabilizer to raise the tip on the inside of the intended turn is the best way, since it has about the same effect under power and glide. In the power pattern, there are two things to watch for - too much turn and the re-appearance of a stall. You know that the glide is about right, so these new problems must be due to the added power.

Too much power in a turn can be countered by side thrust - putting a shim behind the nose block to offset the turn. Nosing up into a stall can be countered by downthrust - putting a shim behind the top of the noseblock to point the propeller slightly downward. If the model executes a violent left turn for the

first few seconds of flight, but had an acceptable climb under lower power, the problem can be corrected by using a lowered aileron-like tab on the low wing. This will level the wings and convert the high speed turn into a steep climb. As power falls off the climb will lessen and the model will make a smooth transition to glide. This is the ideal you are trying for.

As this step in trimming progresses (adding power, adjusting, adding more power, etc.) you will find it necessary to begin using the winder and stretching the motor (see Back to Square One this month-Ed.) The climb will improve and you will see the glide in greater detail. Any problems you missed earlier will become apparent now and the glide can be fine tuned.

When performance is beginning to look respectable, change to a longer motor and develop the final adjustments. Adjusting is a never ending process. Changing humidity may cause small warps. Handling and flying can crack spars and repairs may not be exactly aligned with the original. So keep your eyes open and at the slightest sign of change in the flying characteristics go back and track the trim, using the same principles all over again.

# CA combat

By Phil Cartier

Lots and lots happened in the combat world in the last couple of months. The Nats came in July; we had a record turn out at our August Slow contest; the Bladder Grabber contest kept them busy out on the West Coast; and the Team Trials filled out September. To top it off, I spent the night before leaving for the Team Trials shovelling dirt back onto our septic tank. The flying season is too short. We need twelve months of summer. I don't have space for a detailed, blow by blow description of each and my notes aren't that good anyway. Besides, I was flying so I missed a lot of what went on.

The Nats were great. Westover AFB is a beautiful site. Combat had plenty of grass. Freeflight accommodations were adequate except for a fairly stiff breeze at times. The R/C areas were good too, with a separate sight for sailplanes accommodating a record turn out - 260+ entries. Westover will go on the list as a prime candidate for future Nats.

Maybe a few highlights can give you a feel for the action. Don Cranfill, from Texas, gave an outstanding demonstration of slow combat flying on his way to first place in Open Slow. In every match he seemed to be in command. I distinctly remember one impressive pass he made in an early match. He chased his opponent through a long, low inverted half lap. The whole way the nose of his plane was weaving up and down about a foot, hunting for a couple of cuts. A superb example of

control and skill. Don's planes were typical Texas style with a low aspect wing and immaculate construction. He usually seemed to have a small edge in speed or turning.

Meanwhile, Jim Gall from Garfield, NJ was working his way up the other side of the pyramid. Jim was hot too, with everything going his way until the finals. Jim's planes were quite distinctive and the last match generated a lot of interest. He uses a high aspect ratio of about six. I believe it's a stretched *Matador* wing. He also used a balloon tank with good results. Cranfill used a Triangle Hobbies hopper tank equally effectively. It's been a long time since we've seen two such different airplane styles in a high stakes match. Both pilots were flying well and I think it ended up two cuts to one and a midair. By that time I was so pooped, I'm lucky I got back to the right motel, so correct me if I'm wrong.

In Fast Combat, good old Pennsylvania blew everyone away. That's twice now. The *Gotcha 500* is a hell of a plane (FM plan #CF-570). Get the plans now and start learning how to build it. Gil Reedy came within a sixteenth of an inch of winning it using a *Gotcha 400*. The *400* is an older, slightly smaller design. It will still fly with almost any design around. In a first that I've never seen before, Gil got a string cut in his leading edge that didn't snag off the streamer. We evidently turned away from each other before my knot jammed up against the spars on his

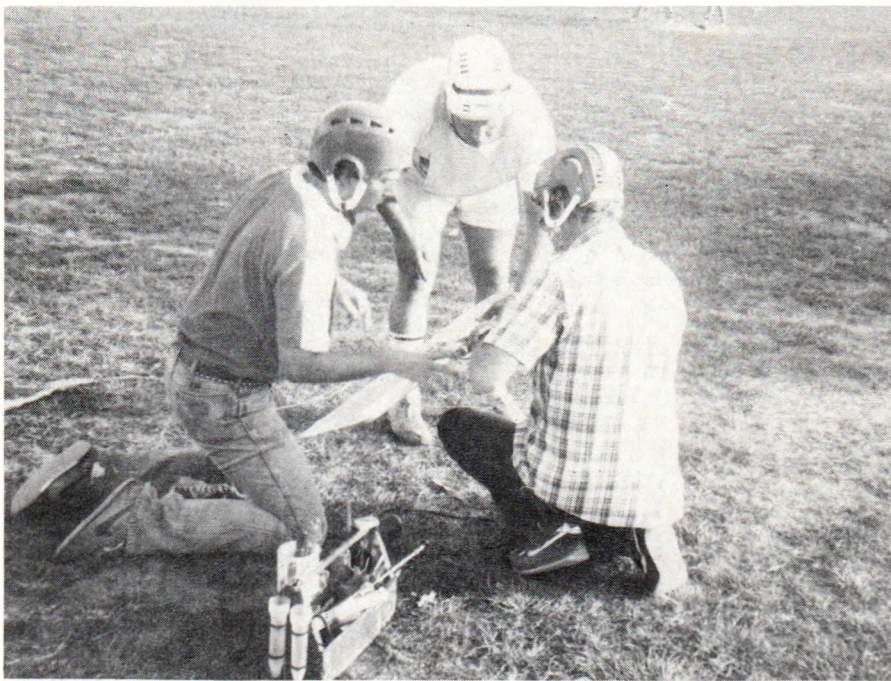
plane. The final score was two cuts to one with even air time and a spectacular mid-air collision.

The 1984 Team Trials was another biggie. George Cleveland, Ron Columbo, and Howard Rush are the new combat team. All three compiled 8-2 records with a lot of super flying. I won't even try to give all the details. There was just too much: 37 flyers, 120 plus matches. On Saturday, two circles were in constant use from 9 am to 7 pm. Often two matches were going off simultaneously. Mack Henry and Paul Hartlaub Jr. did a great job organizing and running all the activity. A special thanks also goes to all the judges too. I don't have a complete list so I won't name any names, but all the contestants really appreciated their efforts.

I saw some interesting and impressive developments in equipment. A lot of flyers used Nelson engines in several flavors-front valve, rear valve, AAC, ABC, and a couple of superlight Team race specials converted to glow. The best ones, flown by Max Mearns, Chuck Rudner, and Howard Rush consistently went over 105 MPH (17 seconds/8 laps). Average Nelsons easily turned 95 MPH which appeared to be about the upper limit for all the other motors.

Airplanes were scattered around in great variety and numbers. The venerable *Force* design by George Cleveland seems to have reached its peak development. They've lightened and pared until almost nothing is left. I counted at least six of them that simply broke in the air. The effort to cut weight finally went too far, particularly since speeds have increased too. Rush was the only man on the team using exclusively foam planes. They were real works of art. Howard also makes extensive use of carbon fiber for reinforcing. He uses it to laminate the boom, around the motor mount and actually as the motor mount itself. It is extremely strong and stiff while still being relatively light. Now that it is being manufactured fairly extensively, the price is becoming more reasonable.

I think the award for best flying has to go to Ron Columbo. Ron broke his right, flying, arm about three weeks before the contest and still managed to turn in an exceptional performance. He even had the high scoring match, racking up six or seven cuts to one against Al Jorgenson of Fargo, NC. It seemed like every time Al made a maneuver Ron was there to take a cut. I hope Al doesn't take it too seriously and comes back again. He used a very interesting, all foam design he calls the *Amok*. It has a straight leading edge, a curved trailing edge, with the elevator mounted on an extension of the wing. It looks very much like the French *Boomerang* design. Al used Fox 15's and was kind of down on power. It will be interesting to see what the plane can do with more power.



PHOTOGRAPHY PHIL CARTIER

Tom Fluker, Dick Stubblefield, and George Cleveland pit Dick's plane during the last match against Howard Rush. The action took place during FAI Team Selections and would determine the last team position.

# CA stunt

By Windy Urtnowski

## S.T. 60 Engine tips

Due to the tremendous surge in interest in the S.T. 60, I felt some ink should get spent to familiarize you with the pluses and minuses of this motor. A clear majority of experts on the east coast have converted over to this gentle giant.

The S.T. 60 has been around for many, many moons. I used one in 1967 very successfully, and since then have owned seven others. You have to put them in your will, as they seem to last forever.

As you may know, many variants of this motor, also known as a Lite-case, exist in the .51, .56, .60, and .65 displacement range. The motor is a mild animal, but makes exactly the type of power we can use in stunt. High torque at relatively low RPM's, and the ability to spin a large prop.

With many schnuerle fans now converting over to this pussycat powerplant, let's look at some pluses this beast can put in your pattern.

First and most obvious choice is that 70 ounce Saint Bernard stunter you gave up on, because it was too heavy. Well, shoe-horning in one of these spaghetti-benders will surely pump new life into the old dinosaur. Maybe it'll still be a dog, but now it'll be a flyable dog. George Higgins had a T-shirt made up with the phrase: "If it don't fly, put an S.T. 60 in it." He should know, as well as any of the east coast crowd, just how good that old bird will go, on full seventy feet solids, with the sixty purring along swinging a big piece of lumber. Alleluia.

The second choice is to build a new ship strictly for this motor. Wing areas of 600 to 700 squares seem to work well, while hardly putting a strain on working parts. I prefer a larger airframe, but it doesn't seem very critical at all, as we've all managed to win contests in various shapes and sizes. Stuntships, like women, seem appealing in a variety of shapes and sizes.

One thing you'll soon discover is the variety of props that will work on *Mr. Italy*. He likes 13-6 Rev-Ups, Top Flites, Zingers, and just loves 14-6's with various diameters trimmed to make them 13 and a fraction. Some pilots are even going under thirteen inch diameter on the smaller lighter ships, and of course the smaller diameter puts more corner on the square maneuvers. There is so much to learn in the art of prop selection, and so few people are willing to spend the time to squeeze out the last few percent of improvement that's there for the taking. I have a pile of three blades that Bob McDonald made for me and I can't wait to start experimenting with them. My initial reaction after trying one is that a lot of potential is there, and it's just a question of fooling enough to find the performance gains available.

Venturi sizes go from .285 to .360 with very good results. The average 650 square inch pumpkin will need a .300 to .315 for starters.

Flying Models



PHOTOGRAPHY BOB HUNT

The scourge of the eastern Senior division during the 1960s, Bill Suarez, is back. The plane he's holding, the F-4 Phantom, was his own design and appeared as a construction article in the old *American Modeler* magazine. Powered by a Fox .35, it had been totally destroyed and then completely re-built.

O.S. Max venturi's are adaptable and available; however the case must be drilled to mount the spraybar. I highly suggest disassembling the motor, bearings and all, to drill this accurately. Now as long as you have the sleeve in you hand, measure the ring gap. The ring fit in stock motors leaves something to be desired. A five thousandths fit seems ballpark. Also you can radius the port edges on all ports except the exhaust port. The outside edges need very little work with the Dremel tool to get the transfers and Perry Ports flowing more smoothly. Remember the old engines were *not* perry ported and slightly less potent, but still very usable. Lou Wolgast still swears by his old "Bear".

Stock bearings seem to hold up well with decent fuel, and a nice tip is to put a shield from a shielded bearing on the outside front bearing. This helps fuel economy somewhat and keeps the oil inside the cowling to a minimum.

We are using R.P.M. rods now, but I think it's overkill. Glen Meador has had a rod fail, mine just plain wore out after 15 years of service, so take your pick. The newer motors come thru with bushed rods just like the R.P.M. rods.

Lou Wolgast, 40 Castlewood Trail, Sparta, N.J. makes the best muffler I've ever seen for this motor. You'll have to Heli-Coil the muffler hold down holes or have access holes in the cowl for removal. A nice Heli-Coil kit for 4-40 threads with ten inserts will set you back 15-20 bucks. You can do this while the motor case is bare and insure no metal chips work their way into the finished motor.

The head is huge and I've machined quite a bit of it away to reduce engine weight up front on nose heavy ships. Needless to say this is unnecessary if you require noseweight for trim.

Another tip is to use head gaskets from the blue head schnuerle S.T. 60 to shim the head for your final tuning. Big Jim Greenaway machined the heads I'm using now and set up the compression at 8.5 to 1. The heads are full Hemi's with the squish bands machined away. Also for fine tuning compression, try using Rossi .60 gaskets which come .004" and .008".

This powerplant seems to run best on five to twelve percent nitro fuels. One word of caution about fuel; be sure it has at least 10 percent castor oil. Some of the synthetic mixtures don't work well in this motor. Lower end rod wear and short ring life can result from not having enough castor oil in the fuel mix. The reason for this is that the castor oil tends to flow *toward* heat or hot spots in a motor, synthetics flow *away* from heat. Ask anyone who road races motorcycles about how big, hot, two strokes like castor oil. The thermal load on motors goes up drastically when you increase nitro, or use an oversized prop. The phenomenon is like pulling up a steep hill in high gear and the by product is engine heat. Heat eats motors alive, castor oil soothes the "sunburn". I have had especially consistent runs from Taffinders fuel which is available by mail direct from: Carolina-Taffinder, 8345 Delhi Road, Charleston Hgts, SC 29405. Write for his catalog. Lastly, don't forget if you put a motor away for any length of time, or store your space shuttles in a damp cellar or garage, to oil the motor with a few drops of motor oil and work it in by cranking the prop thru several times. Neither castor nor synthetic protect from rust effectively and those few seconds you spend oiling will pay off at engine overhaul time. My fifteen year old original Sweeper engine still lives and it isn't because I don't run it hard or pull big planes around with it. ☐

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# Pit report



FUTABA CORPORATION OF AMERICA, 555 West Victoria St., Compton, CA 90220, has released the new FP-3PG/Magnum three channel pistol grip car racing radio. The new T3PG transmitter, part of the system, incorporates a swivel grip design which accommodates right or left handed drivers. Other features include adjustable throttle and steering throw, steering dual rate, ATV, brake fine trim, and a warm-up circuit for gas powered cars. The new R104H micro receiver and choice of the S-132H or S-131SH servos complete the Magnum system. For more information about it, contact Futaba at their address above.



and the 7.2 volt battery in the middle of the chassis. A three step, forward and reverse speed control is included. Hotter performance can be obtained by using the new RS-540 motor and ball bearings. For more information about the 1/10 Subaru Brat, contact Model Rectifier Corp. at their address above.



TOWER HOBBIES, PO Box 778, Champaign, IL 61820, has introduced the new Minitz .06 off-road car gas powered. The Minitz comes completely assembled which eliminates much of the time necessary to get the car on the road. Included features on this off-road car are: full, four-wheel independent suspension, large knobby tires for increased traction, centrifugal clutch, starting system, and powerful .06 engine. Introductory price for the Minitz is \$89.98 and it's available direct from Tower Hobbies. For more information, contact Tower at their address above or call (in the Cont. US) 800-637-6050.

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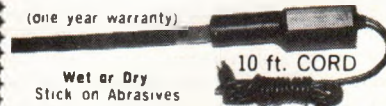
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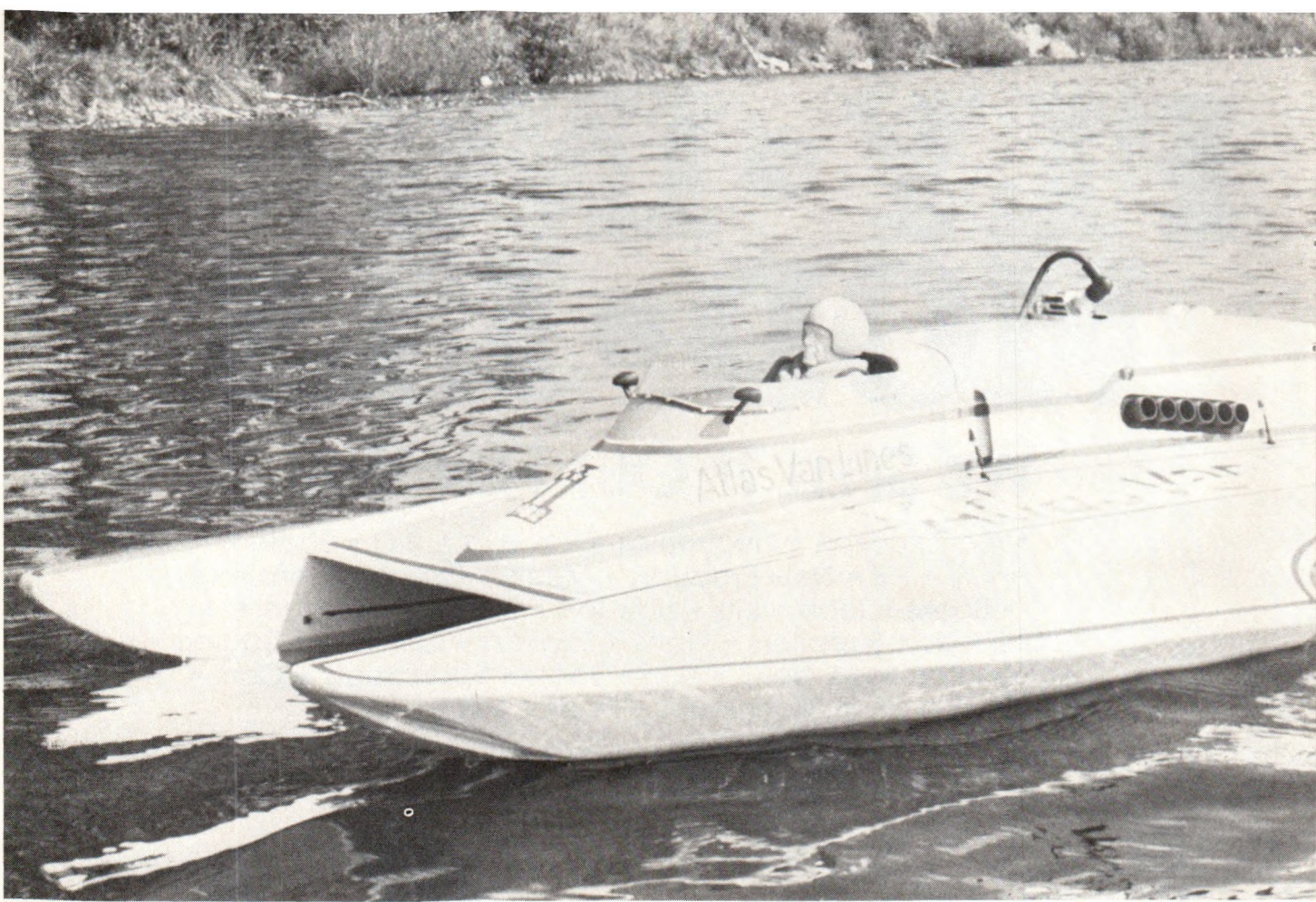
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PHOTOGRAPHY VIC MACALUSO

**An FM Product Review:**

# American R/C Helicopters' Atlas Van Lines Unlimited

**By Vic Macaluso**

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The word "impressive" takes on new meaning  
when applied to this model "thunderboat".

---

**W**ell people, it's finally happened! On these next few pages you are going to find out that there really *is* something that you can get the R/C boater who supposedly has everything or supposedly did it all! Not only that, it's just in time for Christmas!

It all started at the 1983 edition of the WRAM show in White Plains, New York. I got there a day early so I could get my show coverage photos without the usual problems created by crowds. Directly across from the

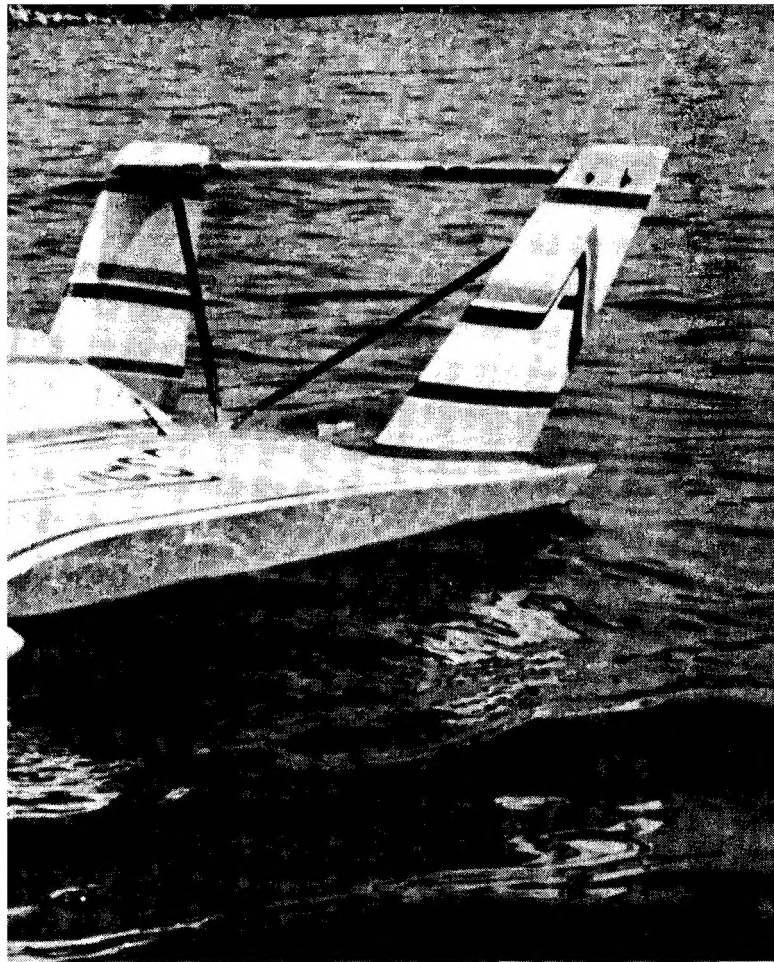
FM booth was the American R/C Helicopter display and, of course, being a boater I didn't pay much attention to it at that time. Suddenly, something caught my eye that certainly did *not* look like a helicopter. Perched on a tripod was this 1/8 scale model of the *Atlas Van Lines*. Now I've seen large model boats before and was duly impressed, but this was really something to see. At that time the only manufacturer producing R/C kits in that size range was J-5 Enterprises and I was quite familiar with their product

line so I knew it wasn't one of their kits. Besides, what was a boat doing in a helicopter display anyway!? I wandered over and introduced myself to Mr. John Simone, (yes, the same John Simone featured in the October 83 FM who did all of that fantastic model flying in the movie *Blue Thunder*), the owner of American R/C Helicopter Inc. and in no time at all found out quite a bit about this boat.

Out on the west coast things seem to happen in very big or unusual ways, sometimes both, and this boat is no exception. In talking to and working with the modelers in his area John saw an opportunity to develop a model boat that would appeal to not only power boat racers but the scale and sport boater as well. The *Atlas Van Lines* is the result of that vision. John Simone is not only a kit manufacturer and engineer but a superbly competent modeler as well. The final kit form that will be reviewed here is the result of many, many hours of engineering, testing, changing, and re-testing. There is nothing ordinary about this model or the kit. As you will see by the end of this review, this kit is a totally engineered and developed system. Everything in this kit was engineered for this boat alone and it's quite obvious that when John designed this boat, he took a whole new approach and was not bound by tradition.

One does not really realize what this kit is all about until the box arrives at your door delivered by a trucking company. (Much too big for UPS!) The actual length of the boat is 68 inches but with all of the components included, the box appears much larger and actually takes two people to carry it because of its bulk. This certainly isn't a review of the packing box but I felt that I should convey my first impression of this kit from the very beginning. By the way, this kit is very care-





fully packed using foam, tape, and paper packing where necessary to protect the epoxy glass moldings and the various components of this kit. I received mine in perfect condition with no nicks or cracks in any of the moldings.

Although the kit comes complete with all hardware, including complete drive train and clutch for the new 50 cc Quadra Marine, I'd like to discuss each component of this kit separately because each is a totally engineered concept unto itself, all brought together to form a model that is totally performance oriented. This  $\frac{1}{5}$  scale *Atlas Van Lines* model is what I consider a breakthrough in giant scale boats with not only true scale dimensions but astonishing speed and handling. More about that later, let's get on with the review.

### The hull

The main hull structure consists of two molded epoxy glass halves. The lower half is the entire hull including sponsons, steps, sponson ride surfaces and air dams all molded in and filleted in the mold. The upper half is the entire deck structure from the sponson gunwales (if you can find the gunwale on an unlimited hydro) to the tops of the rear clipped chines. Care must be taken when unpacking this kit and in handling these structures because at this point (no internal structures and unattached) they are very floppy (just upper deck) and could be cracked if you are not careful.

American R/C uses a unique process when laying up these structures in the mold. Be-

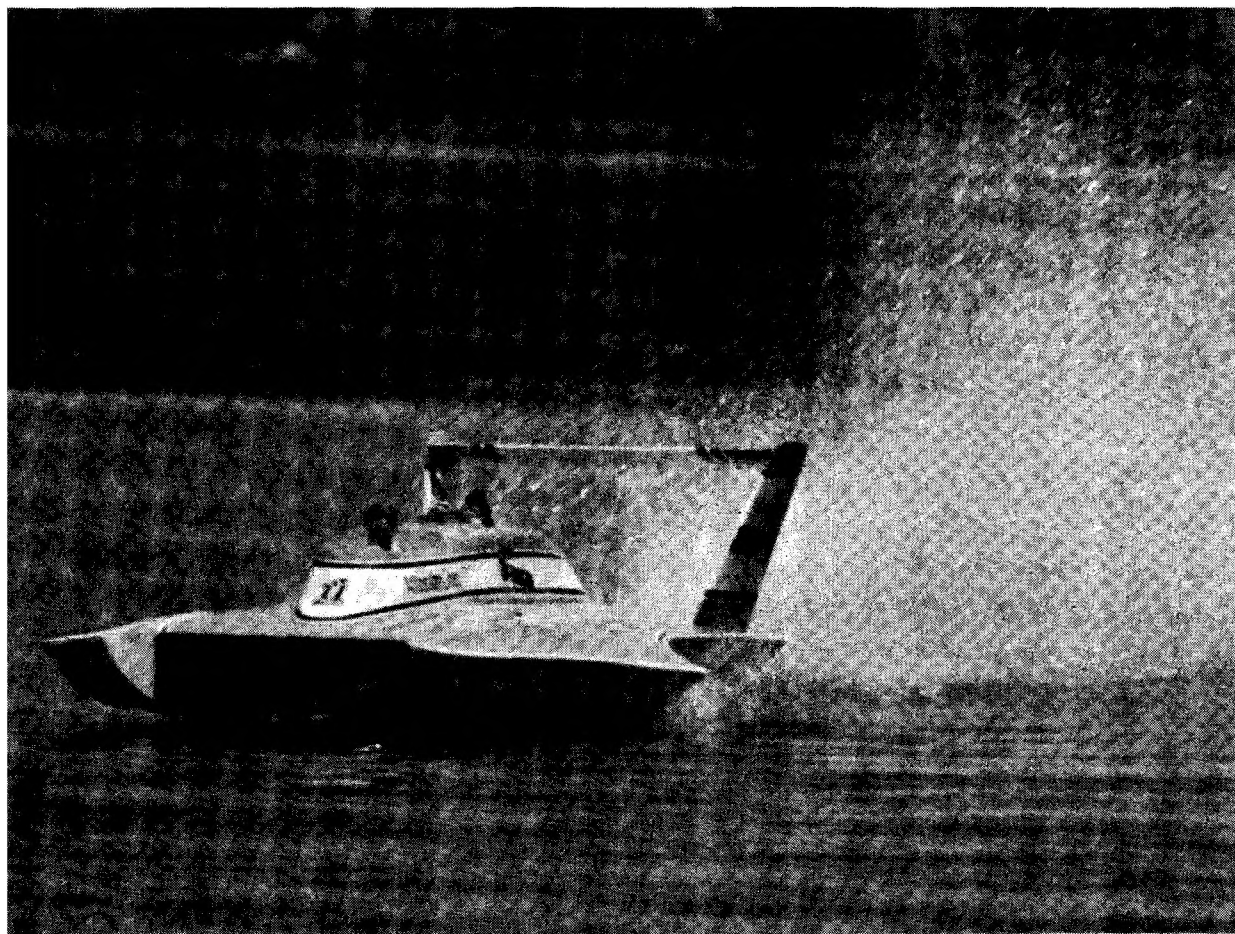
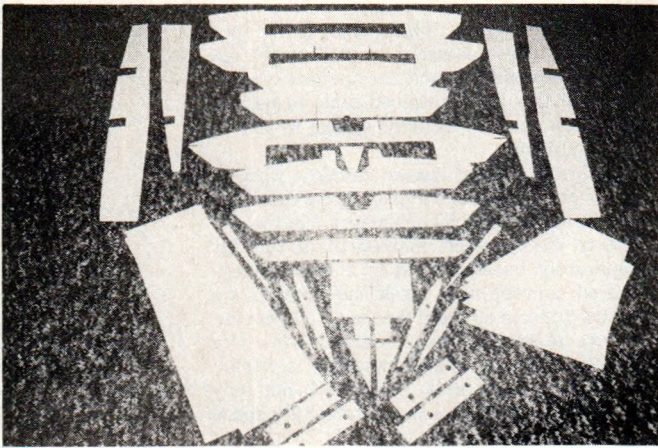
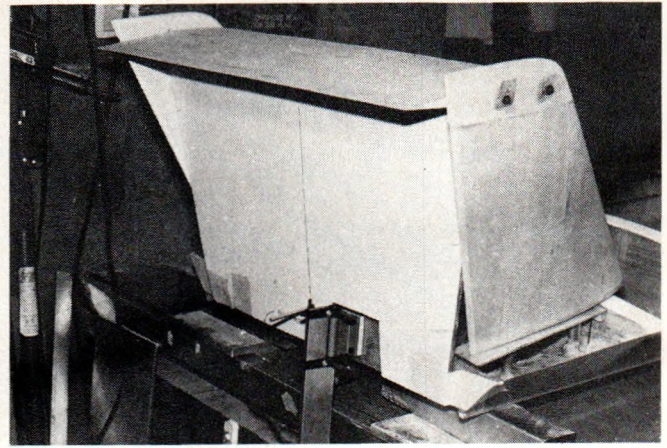


PHOTO COURTESY: AMERICAN R/C HELICOPTERS

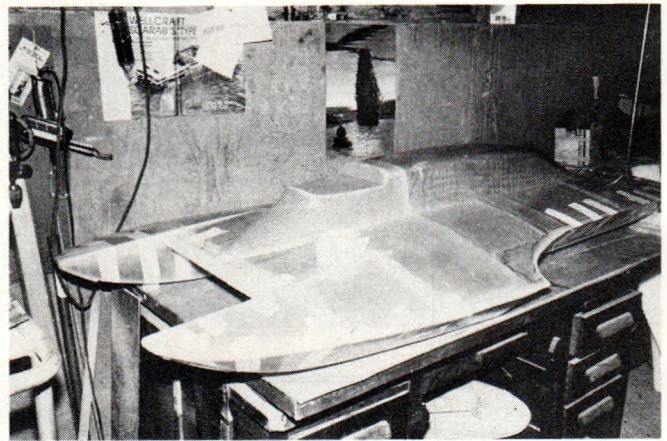
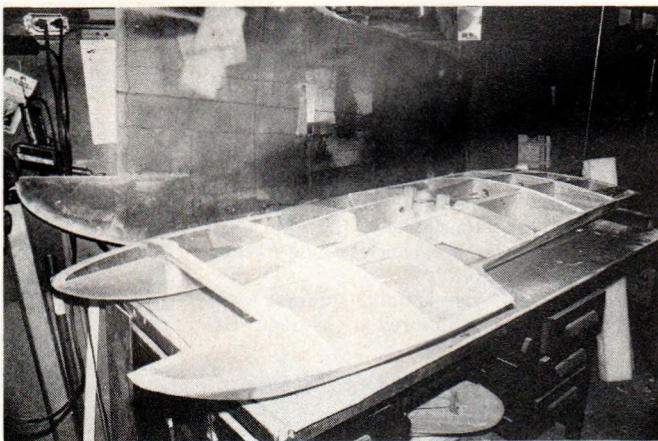
Every impression generated by American R/C's  $\frac{1}{5}$  scale kit of the *Atlas Van Lines* is one of awe.



Full size templates and high quality balsa and ply are provided with the kit so you can cut all wooden parts (above) for interior structure. Hull interior (below) utilizes an "egg crate" design for superior strength.



An alignment jig (template provided) is used when initially installing vertical fin mounting tubes (above). When deck is joined to the hull (below) use plenty of tape to clamp it. Deck actually serves as alignment jig.



fore any epoxy or cloth is put in the mold, a filler is squirted into all of the sharp mold edges and grooves. This is to ensure that all of the detail of the original plug is accurately reproduced without any voids or gaps. (I can personally vouch for this, my hull was almost perfect right out of the box!) Because of the extreme care given the molds at American R/C, each hull emerges with no ripples, voids, and very few pinholes in the surface of the molding, so common in this process. I was truly impressed with the quality of the surface finish. (Better finish here means less work later on for the final finish!)

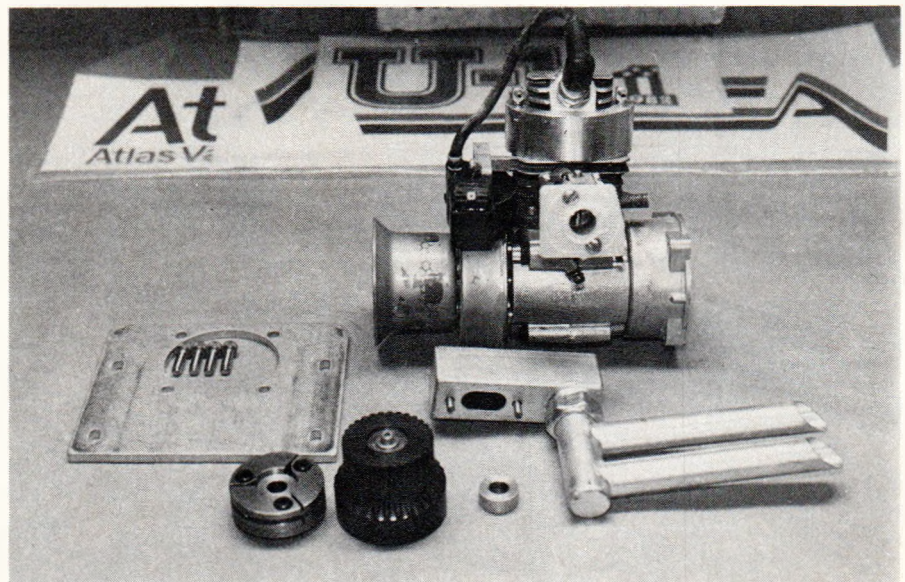
All of the moldings in this kit (6) which include the upper and lower hull structure, forward cockpit, engine cowling and two air-scoops consist of a three layer process. The first layer consists of two ounce glass cloth to accurately conform to the contour of the mold. The next two layers are six and ten ounce glass cloth respectively. The final result is a very light but very strong structure that when completed is quite accurate in configuration with an incredible strength to weight ratio.

When the layup is complete, American R/C oven cures the moldings to prevent any warpage that could occur with a "green" molding and trims the deck, hull, and cowling in the mold to insure a completely accurate and straight hull. These moldings are so accurate that the deck is actually used as an alignment jig when attaching the hull and deck together. If they fit right, the hull is straight. You can't miss!

Before I go any further, I'd like to remind

the reader that this is *not* a construction article and if some building techniques and procedures that I'll mention throughout this review seem vague, be absolutely assured that these are clearly and completely explained in the twenty page construction manual supplied with the kit. This manual is also supplemented with an eight page photo booklet

showing many, if not all, of the critical phases of construction. Although this kit requires quite a bit of "building" (more about that in my summary) you would really have to go some to find an easier kit to build. The construction manual and photos practically take you by the hand through all phases of construction and are appropriately noted at all



The manufacturer sells a specially modified 50 cc Quadra marine engine intended for use as the boat's powerplant. It fits the specially designed clutch/bell housing and engine mount which come with the kit.

critical points in construction. These two booklets are constantly being updated as American R/C receives feedback from builders of this hull so the one you receive might even be easier than the one I received!

By the way, the cockpit and engine cowlings come without any holes cut into them because of the various engine options available for this model. About the only thing I would like to see American R/C do is put a score line on either side of the engine cowling where the scale exhaust stacks would be. This would greatly facilitate the location of these stacks. I do not consider this a negative point but feel it would make it easier for the modeler with limited access to scale data.

That about covers the "skin" of this hull; now on to the internal structure. (This is what keeps those floppy moldings strong!)

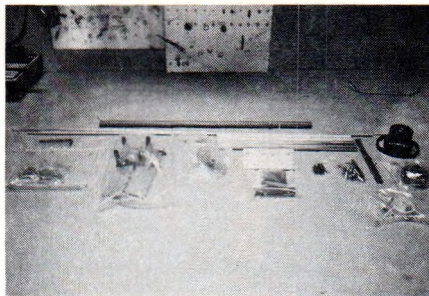
The internal structure is unique in its simplicity and strength. After all necessary hull reinforcements and doublers have been located and glued in the hull, the main reinforcing structure is a simple "egg crate" structure consisting of seven bulkheads and four engine well side rails.

As I previously mentioned, everything in this kit was engineered with accuracy, strength, and lightness and the composite structure formed by the "egg crate" design lends itself to just that. The engine well sides, two bulkheads, and the transom are cut from very high quality birch plywood. Four of the main structural bulkheads are a one inch styrofoam and  $\frac{3}{32}$  inch balsa sandwich. Sandwiching the one inch foam bulkheads between layers of  $\frac{3}{32}$  inch balsa makes a very light and incredibly strong structure. When all of these components are assembled and lowered into the lower hull, you can see how it will become very strong and rigid when the entire structure is glued together per the instructions.

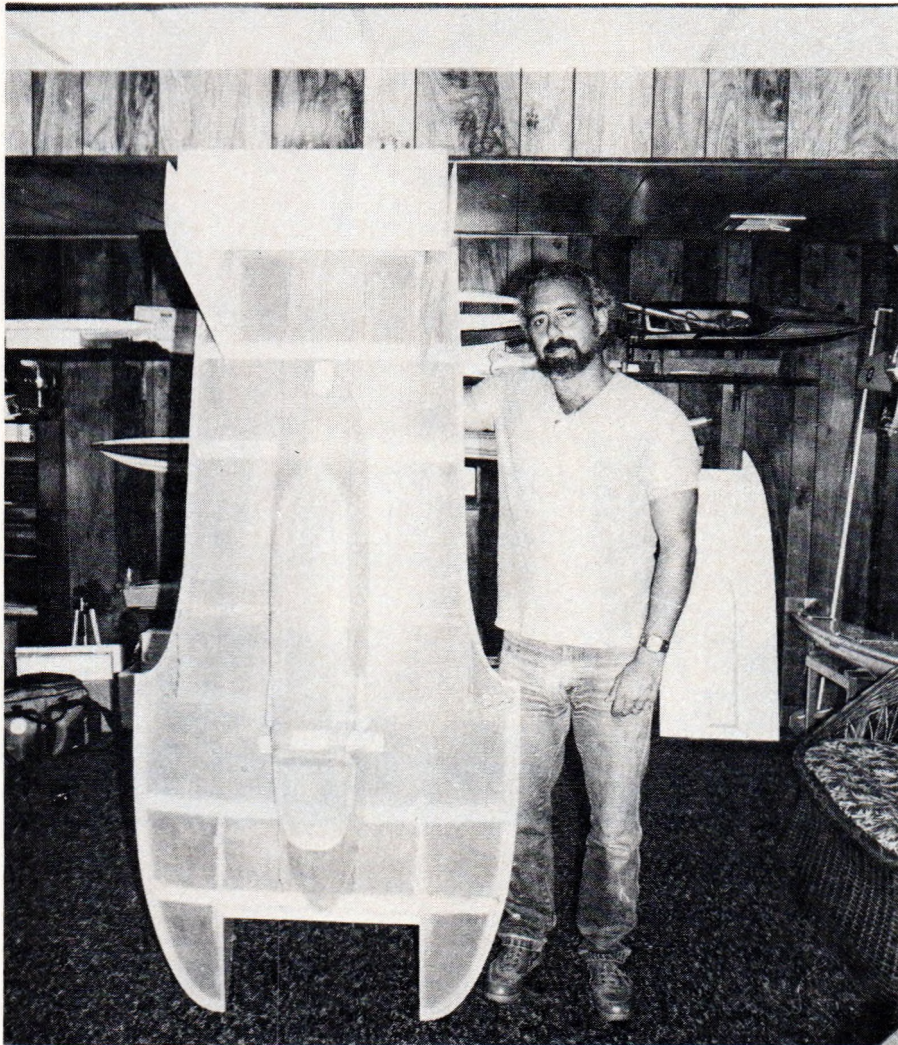
The above mentioned components (bulkheads, engine side rails, doublers etc.) are *not* die or machine cut by the manufacturer. Supplied with the kit are two large plan sheets with the necessary templates printed full sized on them. A very simple and quick method of transferring these templates to the appropriate material is explained in the construction manual and a full evening in your work shop should get the job done. The material supplied by American R/C for these internal structure components is by far some of the best I've seen. The  $\frac{1}{8}$  inch birch ply is easily "cabinet grade" and the balsa supplied for the bulkheads and "flying surface" sheeting (next to be discussed) is some of the best contest grade I've seen! I personally feel that American R/C went overboard on these items! It's really a shame to hide all of that beautiful wood once the hull is sealed! (I still can't figure out how they make money with this kit!)

The last three items that complete the main hull structure are the "flying surfaces" or two vertical and single horizontal stabilizers. The full sized unlimited hydros travel at such high speeds that these surfaces become essential in maintaining stability on the water. While this model does not do 200 MPH as the real one does, the surfaces are no less important and they are just as effective. (More about this later also.)

Because of the overall commitment to light weight and wanting to keep the C.G. as far forward as possible, these surfaces are also of balsa and foam core construction. The foam cores come accurately cut by American R/C and the  $\frac{1}{16}$  inch balsa skins are, again, of



Complete drive train is supplied with the kit (above left) and it's all quality machine work. The power train installed (above right) is easy to adjust and maintain. It's also quite robust and takes the power put out by the Quadra. This is what happens (below) to authors who build such big boats. They shrink.



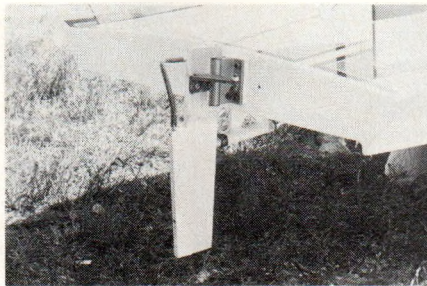
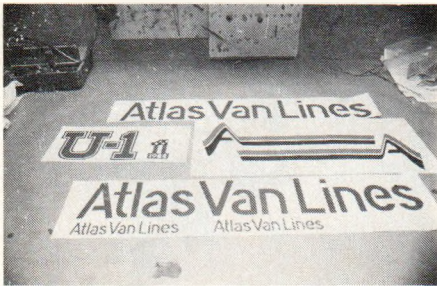
contest grade balsa. (At least, here it's not hidden!) The construction manual gives very clear and simple instructions on how to skin these foam cores for anyone who has never done this before.

That about sums up what you could expect while assembling this hull. Building this kit is by no means a weekend project but neither will it baffle a builder with average experience. Actually the most difficult part (not difficult at all, just time consuming), was cutting all of the necessary structural parts from the material supplied. At the very least, a good jig saw is necessary for this step. Those of us lucky enough to have a band saw will find this step takes about 3 to 3 1/2 hours. The rest is clear sailing.

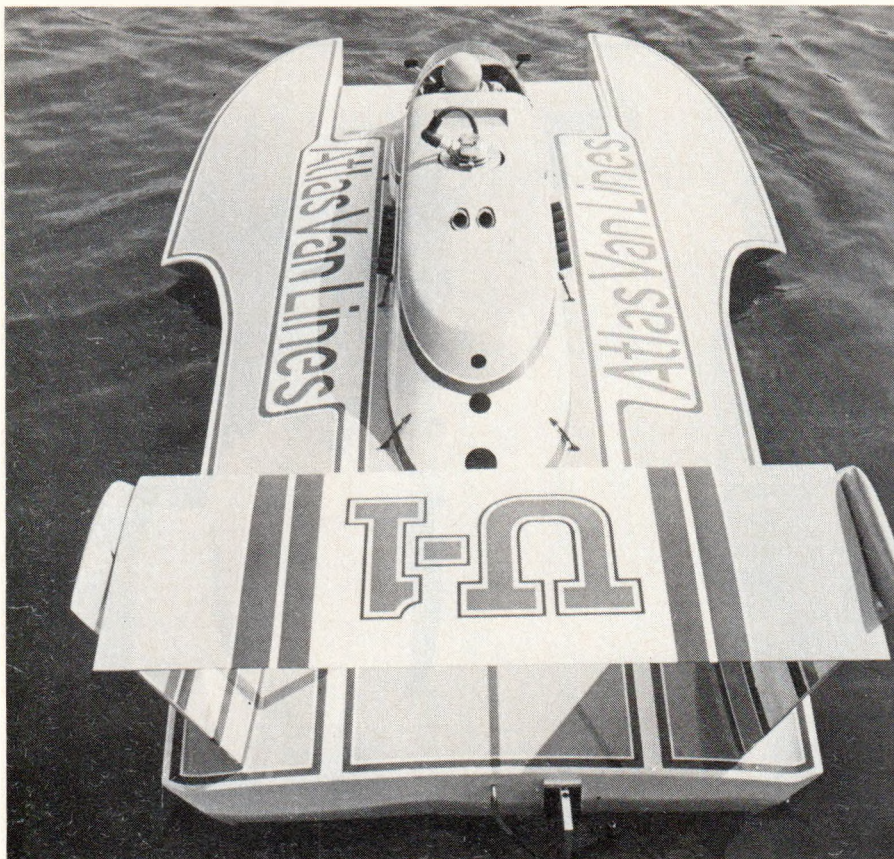
### Drive train

In a word, the only way to describe the hardware in the drive train is *impressive*. It was specifically designed for this boat by John Simone and American R/C. Every component is finished to perfection and the bearing support tube and shaft strut come anodized in blue. A very neat and professional job.

This drive train comes complete and consists of the aforementioned bearing support tube (stuffing box) and shaft strut complete with press fitted and sealed bearings;  $\frac{1}{4}$  inch stainless prop shaft with flats already ground in wherever a set screw is used; brass and steel ball bearing thrust bearings at *both* ends of the shaft; drive dog; prop nut *and* a 1475 Octura bronze prop. (This prop is sup-



To assist the final finish, American R/C sells a set mylar, stick-on decals (above left) for \$15.00. They're thin as a coat of paint. The rudder is quite impressive (above right) and is made from 1/4 inch aluminum stock. From any angle, the *Atlas Van Lines* leaves quite an image (below, bottom) even when at rest.



plied with the standard 1.5 to 1 overdrive ratio.) Also supplied with this drive train is American R/C's self designed clutch and bell housing made specifically for the 50cc Quadra. Along with the supplied driven pulley (mounts on prop shaft) and slotted drive belt, this drive train forms a very robust and simply engineered unit. With the power available from the 50cc Quadra, this drive train had to be built strong and, believe me, it is! Also mounted on the bearing support tube is a Zerk fitting for easy greasing of the prop shaft between runs. Additional parts in their package include a turn fin (Ocutura 60 sized rudder) and a rudder that must be seen to be believed! I'd trust this rudder on my full sized 26 foot Searay! This unit is machined from 1/4 inch aluminum stock and closely follows the full sized one in configuration. Integral with this rudder is the water pickup which is actually a hole drilled in the lower quarter of the rudder. Up to this point, every item I mentioned is included in this kit. With a 68 inch length and a 34 inch beam, this is obviously quite an impressive model. The list price of this kit is \$450.00. Now \$450.00 may be a lot of money to some people, but, in my opinion, this kit would be a bargain at \$100 over that! In fact I was so impressed with the quality and engineering of this kit, that I'll stake my reputation as a modeler, writer, and (hopefully) objective reviewer that there is nothing, at this time, around to compare it to! Needless to say, American R/C has seen a trend, and using state-of-the-art techniques, brought it to a level that's going to be hard to beat!

At this point in time, I can't say what, but American R/C has some more big surprises and goodies in the works for you giant scale boating fans. Believe me, you won't be disappointed!

Speaking of goodies, there are a few necessary items you will need to complete this project. The engine seems like a logical place to start. American R/C has specially modified the 50cc Quadra for this boat by adding a water cooling jacket around the cylinder head and reversed the rotation to accommodate their specially designed clutch and bell housing. The list price for this 3.6 HP brute is \$275. A really exciting option for this boat is the specially modified 70cc Hornet engine. This animal engine produces 4.2 HP and speeds close to 70 MPH can be expected with it. List price, \$375. Supplied with this engine is the clutch and drive pulley, again specially designed by American R/C.

Incidentally, I failed to mention that included in the kit is an engine mount that will accommodate either engine and is the same high quality as every other part in the drive train.

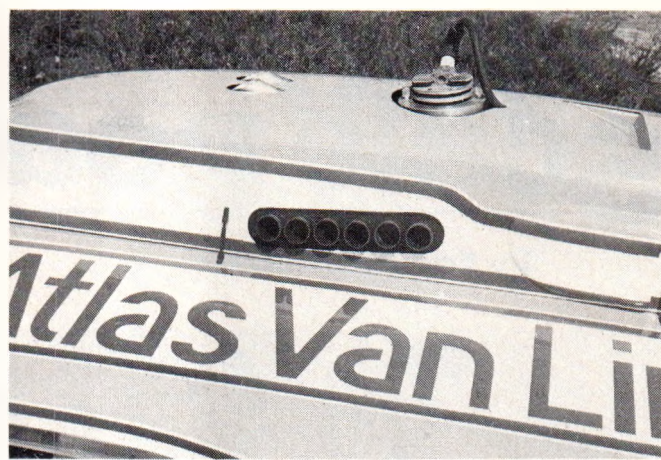
Also available from American R/C are mufflers for either engine at a list price of \$28.95. These mufflers are a must and very effectively channel exhaust gasses out of the boat.

Another item which I highly recommend are the decals for the *Atlas Van Lines*. These are mylar stick-ons and are about the thickness of a coat of paint. You all know how much I prefer to paint on all my graphics but these looked so good I had to try them. With several coats of clear Hobbypoxy over them it is difficult to tell that they are decals! List price for these are \$15.00.

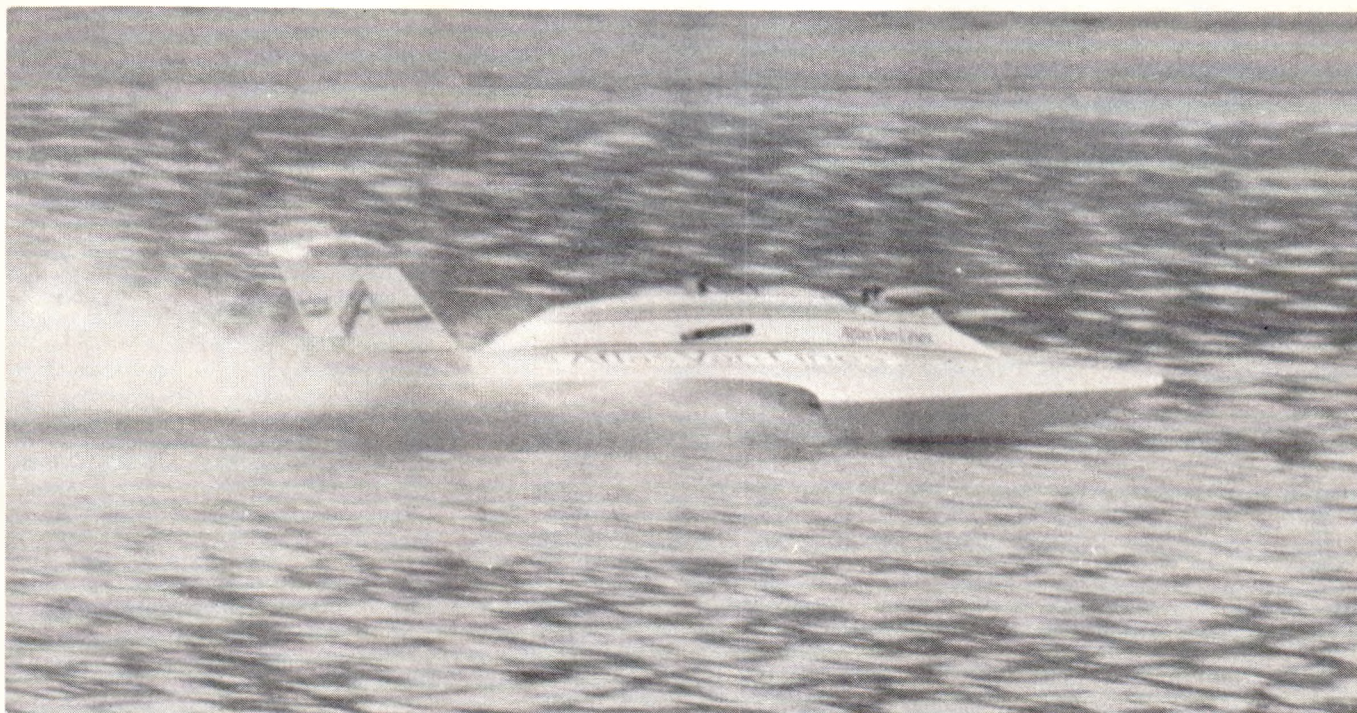
To say this kit is merely excellent would be an understatement! This is definitely a builder's model and you can expect to use many if not all of your building talents constructing



After a few coats of Hobbypoxy clear, you can't even notice that the graphics on the boat are really decals.



The engine hatch cover requires cut-outs for the engine head, the scale exhaust stacks, and the actual engine exhaust.



The final result justifies the building time spent. Though not difficult to complete, it does require the full complement of building skills to finish it. The concise instructions almost guarantee success.

this model. It's by no means difficult to build, it just requires exposure to many phases of model boat building. There is nothing about this model that can't be handled by a modeler with average skills and the very complete instruction manual will take you by the hand through any difficulty you might encounter. (I don't foresee any.)

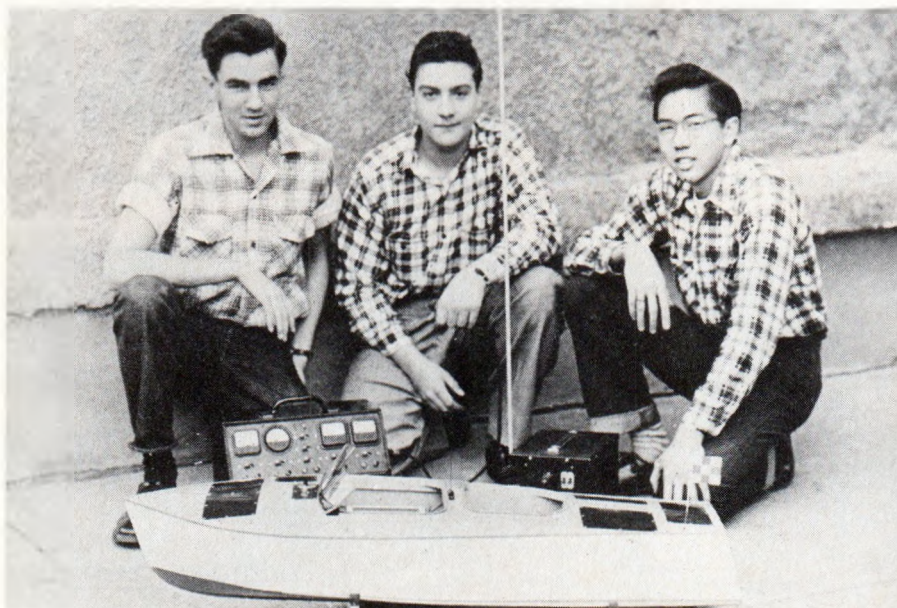
I've yet to run my model, but in viewing video tapes sent to me by American R/C you are in for quite a treat not only building this boat but running it as well. With the 50cc Quadra you can expect speeds well into the high 40's and with the 70cc Quadra you can expect speeds well into the high 40's and with the 70cc Hornet speeds approaching 70 MPH have been recorded!

I won't go into detail here, but for you die hard thrill seekers, American R/C also has an optional nitrous oxide injection system for an increase of over 50% in torque and explosive performance in the straights!

For more information on this kit and what's coming down the line, contact American R/C Helicopters Inc. at 635-11 North Twin Oaks Valley Road, San Marcos, CA. 92069 (619) 744-7533.

# R/C Scale Boats

By Eric Goldschrafe



PHOTOGRAPHY ERIC GOLDSCHRAFE

The mystery is solved! Bob Simmons (l), Charlie Lipari (c), and Don Typond (r) built the boat featured in the November 1983 Scale Boat column back in 1951 or '52. Look at the transmitter and power supply!

This column should be called "bits and pieces"; it's a collection of news items and short subjects of interest to model boaters. Several features are in the works, including the Huntington Nautical Festival V, which turned out to be the biggest scale boat meet in history.

Those of you that read the November, 1983, issue of FLYING MODELS and read the article on the antique boat will recall that a lot of the information was theoretical, for lack of hard facts. Well, the mysteries are

cleared up - one of the readers was the original builder of the boat! We received a letter and a few photos from Don Typond, who, along with Charlie Lipari and Bob Simmons, built the model in 1951 or 1952.

Some additional details which are interesting in comparison to model boating today were recalled by Don in his letter. We all kind of take for granted the hand-held transmitters we use these days, but the radio used for the boat in review was a large "ground mount" rig built by electronics expert Char-

lie Lipari. It required a motordriven generator powered by a large storage battery, and must have weighed a considerable amount. It was a little large to even consider carrying around while operating, and all this for rudder only! This rudder wasn't even proportional; in fact, it didn't even return to neutral by itself - the little flag on the model should have been shown on the rudder hatch, where it served as an indicator as to which way the rudder was pointing.

Don designed and built the boat originally to be powered by an Ohlsson 29 marine engine. Bob Simmons, the mechanically oriented member of the crew, tinkered with this installation for some time, but chronic overheating from poor air circulation dictated the switch to the electric motor that is presently in the craft.

The theory of a heavy framework hidden from view was incorrect. Don mentioned that the boat needed ballast, so they poured cement along the keel under the floorboards. My good friend, Chuck Dakin, who gave the model to me several years ago, originally received it from Charlie Lipari, and sent a copy of Don's letter and the magazine to Charlie. We're wondering if the third member of the "L.T.S." crew (Bob Simmons) will be heard from after all this.

Those that attended the Englishtown or Huntington shows this past summer got to see one of the more original R/C projects of recent times. It might be said that Alfred Stein, of Monsey, NY, has added new dimensions to scale modeling... or is that scale monstering? His five-foot plus sea monster has to be one of the most original ideas to benefit from radio control. Hand made of fiberglass, the beast can swim, dive, and maneuver, and it eats rubber alligators for lunch. Al looks like he's taking his life into his hands when he reaches down into the monster's throat to make an adjustment or two, but it's worth the risk, because spectators really enjoy seeing it run. A small model dinosaur was used as a guide, but Abe Taubman probably can get a set of plans for one.

Speaking of Abe Taubman; if you're a boat builder and you've never dealt with Taubman Plans Service, you should check this out. Abe has an exceptionally large selection of plans, books, and modelling aids available - it takes three or four catalogs to list everything. These plans come from all over the world, and cover just about any type of ship or boat imaginable. Many plans contain model building information, and the MAP plans catalog from England has a rating system that shows the skill level required to build off them, from novice to expert. I find these plans especially useful when super-detailing a kit or changing it to a different type or class of vessel. Even if a particular craft is not shown in these catalogs, Abe says he can probably locate a set of plans for it. The service is fast and courteous, and I've never got-



Say ahhhh! Al Stein's obedient monster opens wide for a check-up. The little critter's quite charming as it swims, dives, and maneuvers looking around for some "lunch". Make sure you keep him happy, Al.

ten an "out of stock" notice in the many years I've been dealing with Taubman. See the advertisements for more information.

It seems that the United States is being invaded by the Germans - at least to us model boaters. Robbe Model Sport began importing into the States last spring, and has become a household word in hobby shops, at least out on Long Island. In just a few months Robbe kits have become so popular that distributors can't keep up with the orders and there were separate events at the Huntington show just for Robbe boats. These kits are scale and semi-scale, and are extensively pre-fabricated. Robbe has a complete line of accessories and hardware to make completion and detailing an easy task. The hulls are plastic, with plastic, wood, and different metals used for the superstructures and fittings. Motors, speed controls, pumps, switches, and sound units are available to fit out the hull and provide realism. Large, full-sized plans and complete instruction manuals are supplied with high-quality parts and materials. The models go together well and look very nice right out of the box. About half of the kits are suitable for beginners, and some of the others would provide a lot of enjoyment for even an expert model builder. The electric-powered speedboats are quite fast, and the outboard motor installation eases drive train installation problems. The mechanical and electrical components are rugged and well made, and replacement parts are available should you damage or wear out a unit. The material used in the hulls is quite durable and very resistant to damage, even at the speeds these boats attain.

Robbe's scale detail is rather nicely executed on their larger boats, with dozens of fittings, lights, cranes, lifeboats, lifesaving gear, and hardware included in the kit or available separately. Action features, such as working fire monitors and winches, add to the realism of the model. A complete line of sound units to simulate horns, sirens, and engine exhaust are available to put the finishing touch on any model. The diesel noise generator is without a doubt the most realistic sound unit I've ever heard. Robbe models are priced competitively with similar kits, and the availability is becoming more widespread every day.

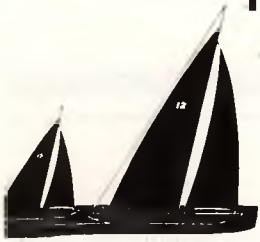
There is a strong probability that there will be a king-sized model boat show at the New Orleans World Expo in June, 1984. It will be at least a two day affair featuring scale, race, and sail boats, and is intended to be an international event. Boat clubs, groups, and individuals interested in attending such an affair are urged to contact me at their earliest opportunity. This show is being planned as the biggest and best meet ever, and we need to know what to provide for as far as participation is concerned. Write in care of this magazine or to 360 Wolf Hill Rd., Huntington Station, New York, 11746. ☺



Some of the Englishtown Boat Show flotilla riding at anchor (above). Show was quite successful. Ted Willers designed a pond side display table (below) on which to exhibit his models with all basic information.



# Mini-America's Cup 1983



By Richard Palmer



Buddy Black (with the mike) offers some remarks (above) to the assembled skippers and spectators after winning the Mini-Cup. Rich Palmer looks on. Ralph Lotito (l) of Providence, RI advises (below) Chris Jensen (r) of Itasca, IL.



These people kept the wind in the Mini-Cup sails. Standing (l to r): Rich Palmer, Ed Niles, Don Mohr, Dick Slaff, Bob Stover, Craig Slaff, Leeds Mitchell, Jack Payne, Mike Rosenthal. Sitting (l to r): Bobby Slaff, Linda Palmer, Louise Payne, Bea Stover. To the respective victors go the spoils (below). From l to r: the Silver Bucket from HIA, the Mini-America's Cup (R&R Promo.) and the Mayor's Cup (Newport, RI).



To say the least, the results of the 1983 America's Cup and Mini-America's Cup race series have been staggering, as well as exciting and dramatic.

The Mini-Cup, which was lost to John Cleave of England in 1980, was recaptured by Buddy Black in 1983, and will feature the

United States as "defender" during the next cup series. However, Australia's come-behind victory over the U.S. (winged keel and all) has left Newport, RI in a quandary.

The Mini-Cup's first four years of paralleling the racing was with the "big boys" in town. All that takes on a different viewpoint, with Perth, Australia the home site for the

next cup series. Already Alan Bond has announced that the name "America's Cup" will be retained due to its long heritage of over 132 years.

As things now stand, we feel that the Mini-America's Cup program should again return to Newport, RI and be held at the same time the races take place in Perth, Australia. Be-



ing the "only act in town," with the Mini-America's Cup theme, could add considerable media exposure to this event.

This article marks the final material prepared on behalf of the 1983 series. The site of the 1984 and 1985 U.S. trials have not yet been chosen. However, there will still be racing in Newport come September 1984 and 1985, as the Mayor's Cup Regatta continues to grow. This program has been previously held under Mayor Humphrey J. Donnelly and then with Mayor Paul L. Gaines.

With all of the other excitement in Newport, a new mayor has been elected by the name of Pat Kirby. Fort Adams will be the site and anyone interested in journeying from a far distance to attend this two day weekend event can get applications through the Mini-Cup office at 69 Route 46, Fairfield, NJ 07006.

EC-12 meter boats will be the featured models. Thus, you might say, the Mini-America's Cup will fill the void of the big 12's.

There were many people behind the scenes during the 1983 Mini-America's Cup. The long list of officials made our program a most successful one. The attached photo lists them by name.

Various hobby people were on hand to help with satellite activities held in concert with the MAC event. Walt Caddell of the Hobby Industry of America monitored the exhibit booths at the Newport Int'l. Sailboat Show, which continually directed traffic towards the Fort Adams program. Cutty Sark gave away T-shirts and visors to people visiting this booth. Nelson Goodsell of A.G. Industries and Jay Brandon of Dumas Products also had adjacent booths to tell the hobby story. FLYING MODELS magazines were made available to would-be hobbyists, which were gobbled up quickly.

At Fort Adams, a large display area was set aside to show off various hobby products. This was run in concert with the Mid-Atlantic Craft & Hobby Retailers and the New England Craft & Hobby Retailers.

Linda Palmer, wife of Rich Palmer, hosted a coffee outing and tour of the Breakers for all of the wives in attendance.

All in all, the final summation of this year's MAC series was one of exuberance and intensity by all skippers, officials and spectators. The event has gained enormous strides in publicity and is now recognized throughout the entire nautical world, as well as to those who are avid model sailing enthusiasts.

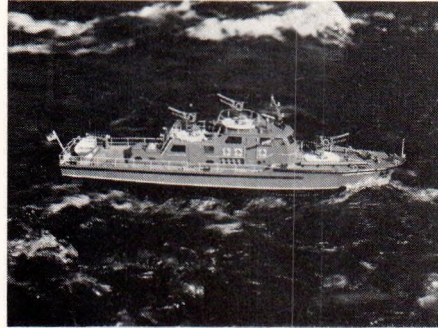
Buddy Black has found himself basking in the limelight, especially in his home Florida territory. He has already announced his intention to be back again when the next MAC race takes place.

The spotlight was on model sailboating the week before the well publicized America's Cup race event and, in our opinion, hobbies gained considerable exposure from this effort.

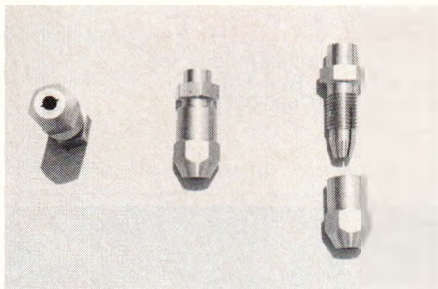
*Evening* magazine put together a segment on the cup races, which gave our Mini-America's Cup program an excellent review in the middle of the coverage. This followed coverage by Channel 6 in Boston (a CBS affiliate). Daily coverage was in all the local papers.

Finally, we are happy to report that all skippers and officials who drove well over a 1,000 miles to be in attendance returned home safely, with tired but pleasant feelings that they had been a part of this successful event.

# letter rip

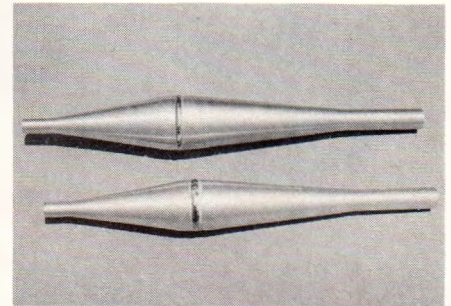


**ROBBE**, Princeton Meadows, Plainsboro, NJ 08536, has introduced a semi-scale model of the fire fighting ship, the Dusseldorf. This model was designed to incorporate many of the same working features as the original full-size ship. The fire fighting nozzles, crane, anchor, winch, radar, searchlights, blue light, horn and siren can be all made to operate. Two Robbe Navy-Kompakt drive systems are used to propel the model. Four large rudders give ample maneuverability in both forward and reverse speeds. Specifications: length - 45.6 in.; beam - 9.8 in.; draught - 2.95 in.; and, displacement - 9.7 lbs. The kit contains the hull, superstructure, other parts and plywood parts, three injection molded fire nozzle sets, rotating boat crane, two propellers, four rudder sets, and all essential R/C hardware. List price for the Dusseldorf kit, Robbe Model No. 1100, is \$134.50. To complete the scale effect and operating features a special fitting set (Robbe Model No. 1101) and a special functions set (Robbe Model No. 1103) are available. For more information, contact your local hobby dealer.



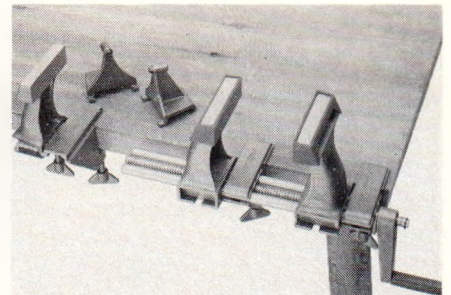
**STEVE MUCK'S R/C BOATS**, 6003 Daven Oaks Dr., Dallas, TX 75248, has a new product available, the *Camden Flex Cable Clamping Nut*. Designed by Camden Tool of Bedford, Texas expressly for Steve Muck, the nut is made to fit mostly all competition engines on the market today. The flex cable nut is made to fit each flywheel recess for proper seating against the flywheel, and the body of the nut incorporates a shoulder which matches a shoulder in the cap. As the cap is tightened, it aligns itself insuring proper nut alignment. For additional information, contact Steve Muck's R/C Boats at their address above.

**STEVE MUCK'S R/C BOATS**, 6003 Daven Oaks Dr., Dallas TX 75248, is now offering tuned pipes to competition boaters. The first two pipes available are the #4509 broad band pipe for .40-.45 size engines and the #6511 broad band pipe for .60-.71 size engines. These pipes develop more horsepower throughout the complete power range of the



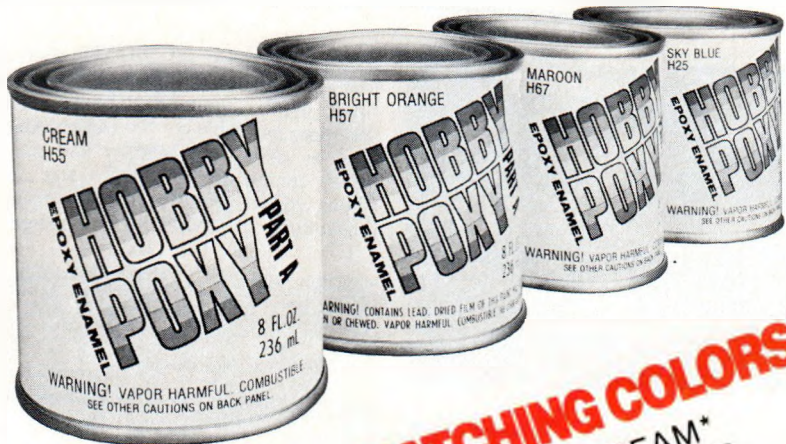
engine. This allows less critical needle valve settings. For more information, send \$1.00 to Steve Muck's R/C Boats for their current catalog to the address above.

**KIMBROUGH PRODUCTS**, 1430 East St. Andrews Place, Santa Ana, CA 92705, has introduced two new products designed to help R/C boaters. They are enlarged versions of their Servo Gear Saver. Approximately 50% larger, with over twice the spring pressure, the S.G.S.-L has three interchangeable plastic inserts so that it can be used on Futaba S-7, S-23, S-6, large Nacak or any servo with 4.5 = .177" square drive or Futaba S-28, S-29, S-30G, S-31S, or S-32 spline drive servos. Suitable for rudder hook-ups each model lists for \$5.00. The standard S.G.S.-L (Cat. #121) has a single arm while the S.G.S.-L-B has two arms (Cat. #122). These products are available direct from Kimbrough (minimum order, \$10.00) at their address or call (714) 557-4530.



**D.R.I. INDUSTRIES, INC.**, PO Box 20612, Bloomington, MN 55420, has consolidated all the clamps and vises needed in a home workshop into one tool called the Vunder Vise. It's a versatile clamp and vise system which can handle most any gripping job. Completely portable, it can be mounted almost any way or can be used free standing. The Vunder Vise is made of aluminum and comes with an

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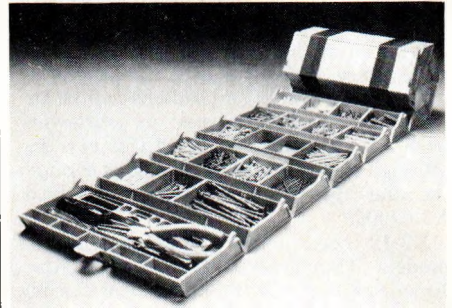
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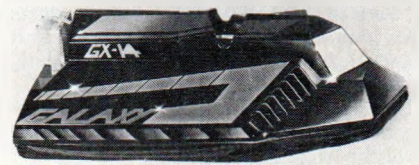
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alloy vise assembly, two clamping brackets, flush end stop, two turning centers, two slip-on jaw pads, and an auxiliary jaw. It sells for \$49.99 (plus \$4.90 shipping and handling) and is backed up by a five year warranty against defects and poor workmanship. If you'd like more information, or to order one, contact D.R.I. at their address above or call them at (612)944-3530.



TRIPLE-N-ENTERPRISES, PO Box 2346, Spring, TX 77379, has introduced a unique, portable storage system called the Rolykit. This unit consists of sturdy storage compartments that are nested into a small portable unit that unrolls, exposing all of the storage bins ready for use. Each Rolykit comes with a set of dividers to suit individual needs. Two models are presently available. Model S-11 rolls out to 3.5 feet, is 10.5 inches wide, has 11 to 27 compartments, and lists for \$22.95. Model S-14 rolls out to five feet, is 10.5 inches wide, has 14 to 38 compartments and lists for \$26.95. For more information about the new Rolykit, contact Triple-N-Enterprises at their address above.

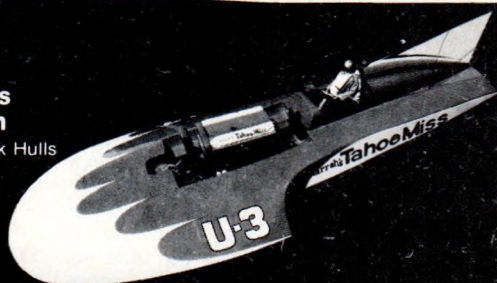


GALAXY RESEARCH, INC., 170 S.W. 20th Way, Dania, FL 33004, has announced the introduction of a unique R/C all-terrain vehicle. The Galaxy GX-14 ACV is a modelling first which really works. It can cruise at high speeds over smooth terrain, land or water. The ducted fan which powers the craft uses a

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.60 displacement engine or larger. Control utilizes ordinary two channel radios. Assembly and maintenance is easy. Galaxy Research, which did the patented design, is distributing the GX-14 ACV through local dealers and invites them to write or call for additional information about this air cushioned vehicle. Use the above address or call (800)327-7299; in Florida, (305)922-8740.

**NEWTON MARINE, 14518 167th Pl S.E., Renton, WA 98056**, has announced that they will be offering a plan service for the dedicated modeler of unlimited hydroplanes. Over 300 plans are in stock for boats that competed from the 1950's, such as Slo-mo-shun IV, Miss Thriftway, Shanty 1 and Hawaii Kai III, on through the 1980's with Miss Budweiser, Atlas Van Lines, and Pay'n Pak hulls. Scale is 1 1/2"=1'. All boats are built-up, wood frame construction and conform with IMPBA and NAMBA guidelines for R/C Unlimited Hydroplanes. For further information and a free catalog, send a SASE to the above address.

**Micro-Mark**

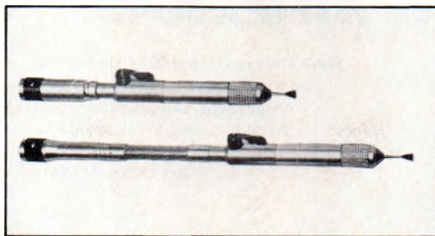
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**MICRO-MARK, 24 East Main St. Box 5112, Clinton, NJ 08809**, has just published their new Micro-Mark catalog which features over 550 small hand tools for the hobbyist or craftsmen. Along with already famous brands such as X-Acto or Dremel, there are hundreds of other lesser known but unique and equally valuable tools not ordinarily seen in local stores.



**FOREDOM ELECTRIC CO., Bethel, CT 06801**, has recently released two new quick change handpieces, the 10 and 10D for use with their line of flexible shaft drills. These two new handpieces both have ball bearings and run cool and true. The 10D features a duplex spring which provides extra balance and flexibility. Both take 3/32" shank accessories. For free information, write to Foredom at the above address and request catalog sheet #289.



**HÄFELE AMERICA CO., PO Box 1590, High Point, NC 27261**, has released their new Orbital Sander, one the many miniature power hand tools in their line of Minitools. This Sander is designed to finish outside contours, edges, and flat surfaces. It has a 2 1/2 x 3 1/2 inch sanding face and a weight of 6 1/4 ounces and a shape which allows the unit to fit comfortably in your hand. The varied sanding grits and papers supplied by Hafele for this tool allows work to be done on wood, ferrous metals, plastic, or other metals. The Orbital Sander operates at 4400 RPM using 12 volt DC electric power from either two six volt batteries or from a transformer. For more information about the Orbital Sander, or to place an order, contact Hafele at their address above.



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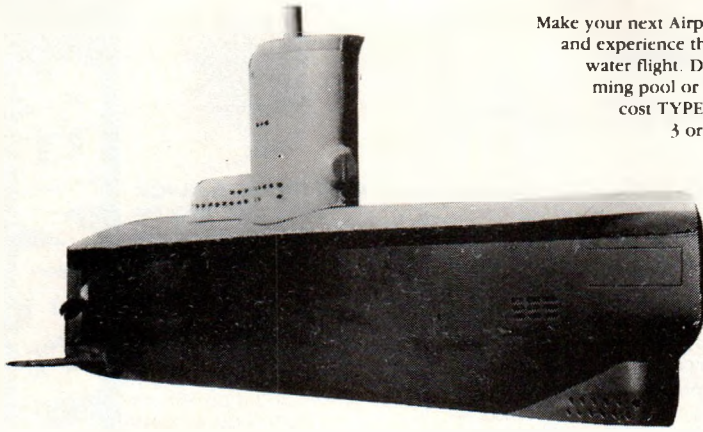
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WAHL CLIPPER CORP., Sterling, IL 61081, has introduced a completely redesigned version of its popular ISO-TIP hobby drill. The new 13,000 RPM drill features a higher speed motor and an improved 3-jaw chuck. Depressing a small button adjusts it to accommodate drills and burrs with a shank diameter up to .125 (1/8"). The drill weighs less than five ounces and is six inches long, easy to use in a confined space. An extra long, nine foot cord provides plenty of working radius. For information about where to purchase the new ISO-TIP, contact Wahl Clipper Corporation at their address above or call, (815)625-6525.



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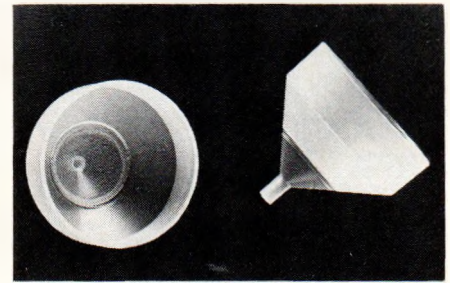
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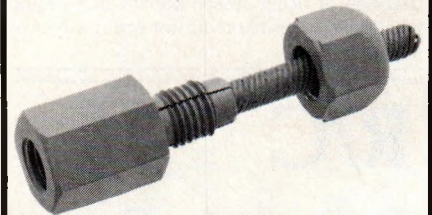


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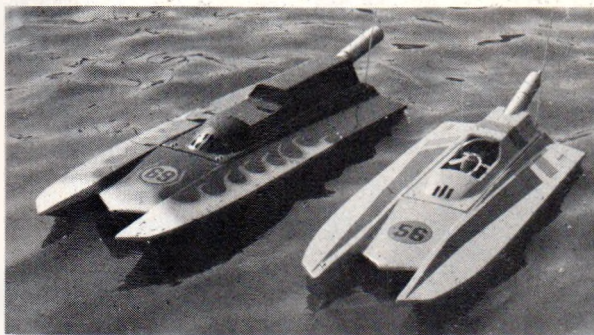
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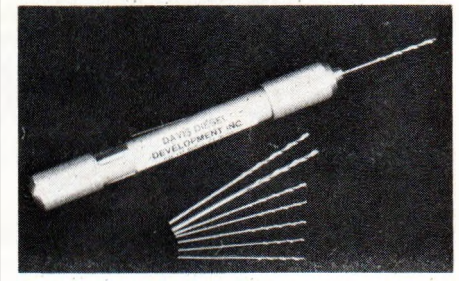
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**DAVIS DIESEL DEVELOPMENT, PO Box 141, Milford, CT 06460**, is now distributing its new **Pocket Drill Set**. It consists of a pin vise and twelve assorted drill bits. The pin vise is machined from aircraft alloy aluminum with a steel collet and pocket clip. The body is hollowed to allow storage of the drills which range from #50 (.015") to #70 (.060"). Price for the **Pocket Drill Set** is \$10.00.

# time table

of coming events

**HOUSTON, TEXAS**—December 3-4, IMPBA record trials - 1/8 mile straightaway and 1/4 mile oval, hosted by Lone Star Model Boat Club at 1 mile east of San Jacinto River on Hwy. 90. Contact: Scott McGuffin, 813 S. Pruett, Baytown, TX 77520. 713/427-5359.

**BARTOW, FLORIDA**—December 10-11, IMPBA time trials - 1/4 mile, oval, open to all classes, hosted by Racing Association of Miami at Square Lake, from dawn to dusk. Contact: Tom Pretzfeld, 10281 SW 110th St., Miami, FL 33176. 305/595-8099.

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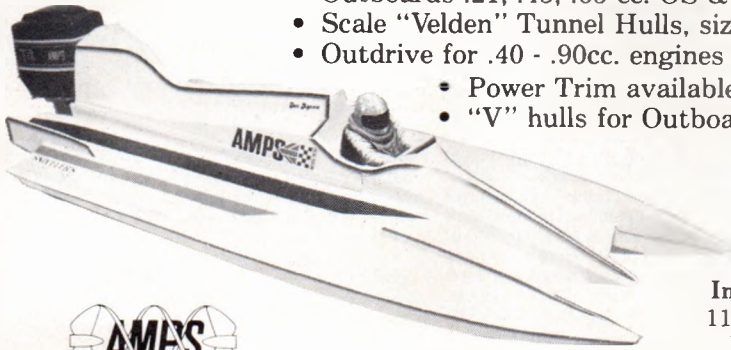
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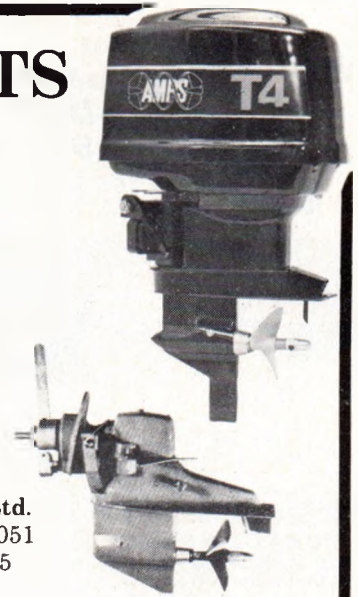
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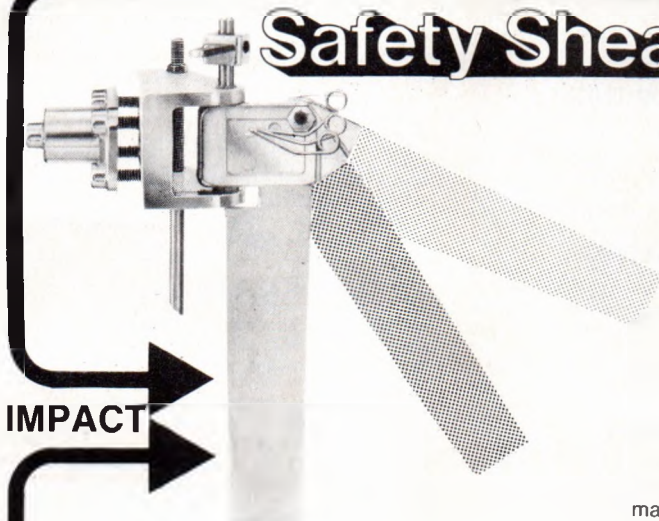


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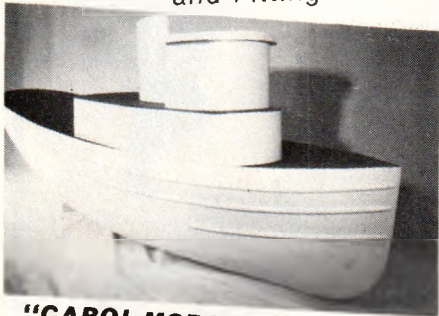


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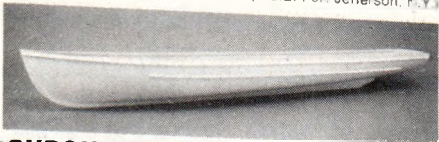
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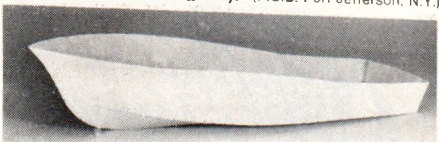


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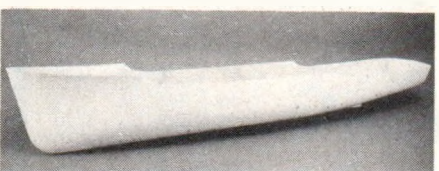


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## Advertising Index for January 1984

Ace, R/C, Inc.	14
Aeromarine Laminates	85
Aero Tech R/C, Inc.	19
American R/C Helicopters, Inc.	85
America's Hobby Center	7-9
Beehive R/C Model Aircraft Co.	20
The Book Hangar	35
Bruin International	70
Bru-Line Industries, Inc.	84
California Model Imports	13
Campbell Custom Kits	6
Carstens Flying Plans	31, 60, 61
Johnnie Casburn Mfg. Co., Inc.	6
Champion Model Aeroplane Co.	6
Circus Hobbies	17
Cleveland Model Supply Co.	14
D.G. Products	20
D&L Scale Ships	86
Gene Dubois	15
Dumas Boats	Cover II
Dynamic Model Products, Inc.	88
Addis Elmore	70
Empire Model Marine Supply	86
Executive Design Corp.	10
Flying Models Magazine	19, 20, 71
Flyline Models, Inc.	14
Foam Scale Models	21
Fox Mfg. Co.	14
Futaba	18, Cover IV
Golden Age Reproductions	6
Grish Brothers	11
Hafele American/MiniTool Division	70
Historic Aviation	3
Hobbyoxy Products	82
Hobby Warehouse	82
Hunt Models	82
Identify Check Company	15
Ikon N'Wst.	20
Indoor Model Supply	16
International Hobbies	87
International Marine Exchange	86
International Modeler Show	22
K&B Mfg.	83
King's Radio Control Hobbies, Inc.	11, 83
Paul Clements' Kitty Hawk Models	12
Mac's Products	15
Marine Specialties	87
Micro-Air Precision Products	16
Micro-Mark	70
Micro-X-Products	12
Model Engineering of Norwalk (M.E.N.)	10
Model Rectifier Corp.	Cover III
Norco Marinecraft	84
Octura Models	86
Peck Polymers	22
Penn Valley Hobby Center	20
The Pipeline	84
Prather Products	87
RLF Products	16
Repla-Tech International, Inc.	22
Richardson Precision Machine, Inc.	12
Russell Patterson	21
SR Batteries, Inc.	21
Saf-Flite Models	16
Satellite City	23
Sid Morgan Plans	15
Sig Mfg. Co., Inc.	16
Specialty Hardware Company	14
Steve Muck's R/C Model Boat Supplies	82
St. Croix of Park Falls Ltd.	6
Tarno Aero Engines	16
32nd Parallel	84
Tiny Tots	22
Top Flite Models, Inc.	21
Tower Hobbies	10
Twin-K Inc.	6
VL Products	12
WRAM Show	49
Wolf-Pak	21

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